

**INFORMATION SYSTEM FOR
R&D PLANNING IN A COMPLEX
R&D ORGANIZATION WITH SPECIAL
REFERENCE TO CSIR**

THESIS

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of the requirements for the
degree
of

DOCTOR OF PHILOSOPHY

by

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Under the Supervision of
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MAY 1994**

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CERTIFICATE

This is to certify that the thesis entitled INFORMATION SYSTEM FOR R&D PLANNING IN A COMPLEX R&D ORGANIZATION WITH SPECIAL REFERENCE TO CSIR and submitted by S. CHANDRASEKARAN, ID NO. 87PHXF402 for award of Ph. D. Degree of the Institute, embodies original work done by him under my supervision.

Signature in full of the Supervisor 

Name in block letters L.K. MAHESHWARI

Designation PROFESSOR & DEAN,
BITS, Pilani.

Date: 20th May, 1994

Dedicated to
My Parents and
My eldest Brother

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New Delhi

S. CHANDRASEKARAN

ABBREVIATIONS

AB	Advisory Board
BE	Budget Estimates
BITS	Birla Institute of Technology and Science
BTIS	Biotechnology Information System
CALIBNET	Calcutta Library Network
CC	Coordination Council
CSIR	Council of Scientific and Industrial Research
CSIR HQ.	CSIR Headquarters
DBT	Department of Biotechnology
DELNET	Delhi Library Network
DOD	Department of Ocean Development
DSIR	Department of Scientific & Industrial Research
DST	Department of Science & Technology
ICAR	Indian Council Of Agricultural Research
ICMR	Indian Council of Medical Research

(Abbreviations Continued)

IISc	Indian Institute of Science
IIT	Indian Institute of Technology
IMPACT	Integrated Management and Project Accounting
IMPRESS	Integrated Management of Pay Roll and Extended Salary System
IRIS	Integrated Research Information System
MALIBNET	Madras Library Network
MC	Management Council
NISSAT	National Information System for Science & Technology
NMIS	National Management Information System
NOIS	National Ocean Information System
NRDMS	Natural Resources Data Management System
PME	Planning, Monitoring and Evaluation
R&D	Research & Development

(Abbreviations Continued)

RC	Research Council
RE	Revised Estimates
RPG	Research Planning Group
S&T	Science & Technology
SE	Sanctioned Estimates
SIRNET	Scientific & Industrial Research Network
TAB	Technical Advisory Board

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CHAPTER - 1: BACKGROUND AND SCOPE OF PRESENT WORK

1.1 INTRODUCTION

Science and technology is visualized as an important pace setter for the development of any country leading to social and economic growth. In a situation where there are unlimited resources, one can endeavour research in any area. In a real life situation, particularly when the available resources are limited it becomes vital to make decisions to optimize resources for the development. The planning of scientific and technological research is an effective instrument for providing a specific direction for R&D to optimize available resources. The recent liberalization of industrial and trade policies has further put stress on the prioritization and choice of R&D to compete with the international technology.

Ever since it attained Independence, India has been emphasizing the development of indigenous capabilities and their utilization. A study of the objectives, emphasis, approach and policies of different Five Year Plans highlights the role and the importance given to S&T in the national plans.

With the considerable importance given to S&T by Pandit Jawahar Lal Nehru, the first Prime Minister of Independent India and also by the successive governments, India to-day has a vast S&T infrastructure interms of institutions, facilities, skills, manpower and policies for R&D.

The S&T plan allocations provided by the government has increased from Rs. 20 crore during the first five year plan i.e. during 1951-56 to an outlay of Rs. 9388 crore earmarked for the eighth five year plan (1992-97) (Ref. Table 1.1 and Table 1.2). Table 1.3 provides details of plan outlay for Eighth five year plan for Central S & T Agencies/Departments

Table 1.1: S&T Plan Allocations

Plan	Rs.Crore	% increase
First Plan 1951-56	20	--
Second Plan 1956-61	67	235
Third Plan 1961-66	144	115
Fourth Plan 1969-74	373	159
Fifth Plan 1974-78	1381	270
Sixth Plan 1980-85	3668	165
Seventh Plan 1985-90	8245	125
Eighth Plan 1992-97	9388	14

**TABLE 1.2: S&T PLAN OUTLAY FOR 8TH FIVE YEAR PLAN
(1992-97)**

a) Central S&T Agencies/ Departments	Rs. 4119 Cr.
b) Economic Departments	Rs. 5077 Cr.
c) States and Union Territories	Rs. 192 Cr.
Total	Rs. 9388 Cr.

**Table 1.3: PLAN OUTLAY FOR EIGHTH FIVE YEAR PLAN(1992-97)
FOR CENTRAL S&T AGENCIES/ DEPARTMENTS**

S.No.	Department	Rs. in Crore
1.	Department of Science and Technology	640
2.	Department of Scientific and Industrial Research	655
3.	Department of Biotechnology	265
4.	Department of Ocean Development	130
5.	Department of Space	1804
6.	Department of Atomic Energy	600
7.	Department of Electronics	588
8.	Department of Defence R&D (1991-92)	685
*		
	(1992-93)	779
	(1993-94) (expected)	960

* Projections for the remaining years of the Plan not available.

1.2 R&D ORGANIZATIONS IN INDIA

The different types of R&D organizations setup in India are briefly discussed to get an overview of the S&T infrastructure.

Autonomous Organizations

These were created as societies having their own rules and regulations for their research programmes, manpower policies and procedures for the utilization of resources. These were fully supported financially by the government. These organizations have their governing body, research advisory committees to look

into their broad areas of development and policy guidelines. The organizations are: The Council of Scientific and Industrial Research (CSIR); Indian Council for Agricultural Research (ICAR) and Indian Council for Medical Research (ICMR), etc.

Special Commissions

These are headed by eminent scientists. Each commission covers one new and emerging area of science and technology to decide broad policies and research programmes. These commissions are supported by departments of government. The chairman of the commission is the secretary to the department and is directly responsible to the minister concerned. This helps smooth and effective operation of the policies evolved. Examples of commissions are:

- i) Atomic Energy
- ii) Space
- iii) Oceanographic Research Board
- iv) Telecommunication

Institutions under Ministries

Ministries have R&D institutions under them to carry out research in specific areas, viz. agriculture, health, education, industry, railways, etc. The Department of Science and Technology under the Ministry of Science and Technology was established to coordinate research programmes spread over different agencies and departments and take new initiatives wherever it was found necessary.

Industrial R&D Establishments

The government provided grants for the establishment of research and development units for the Public Sector industrial organizations while it encouraged private industries to establish R&D units through tax concessions for research.

Co-operative Research Organizations

The cooperative research associations were formed by industry with the encouragement and support of government, the government meeting about 50% of expenses. The government introduced cess in industry and the money collected has been used for funding R&D for the industry. The areas concerned are: Textiles, Cement, Tea, Electricals.

Private Institutions

Government provided tax concessions to encourage people to invest in education and research. As an outcome of this policy of tax exemptions a large number of private societies, foundations, trusts were established providing fellowships or grants for research.

Universities

In addition to above six categories of research organizations, universities continue to encourage research in specific areas to endeavour new knowledge and expertise. The Indian Institutes of Technology (IITs), Birla Institute of Technology and Science (BITS) Pilani and The Indian Institute of Science (IISc) Bangalore are the leading institutions encouraging R&D through interaction and collaborations with industry as well as government research laboratories.

Table 1.4 gives the number of organizations under the various S&T agencies currently existing in the country.

TABLE 1.4: ORGANISATIONS UNDER S&T AGENCIES FOR INDUSTRIAL R&D

A. NATIONAL R&D INSTITUTIONS	NO.
Council of Scientific & Industrial Research	40
Indian Council of Medical Research	26
Indian council of Agricultural Research	61
Defence Research & Development Organization	51
Institutions attached to Ministries like RDSO (Railways); TRC (Communication); Central Power Research Institute (Department of Power); etc	150
State Funded Research Institutions	200
B. UNIVERSITIES, COLLEGES, etc.	
Universities	156
Deemed Universities	29
Institutes of National Importance	10
Indian Institute of Technology	5
Engineering Colleges	250
C COOPERATIVE RESEARCH ASSOCIATIONS	13
D IN-HOUSE R&D CENTRES	1230
E. SCIENTIFIC & INDUSTRIAL RESEARCH ORGANIZATIONS (SIROs)	400

1.3 MANAGEMENT INFORMATION SYSTEMS IN DIFFERENT SCIENTIFIC ORGANIZATIONS

Management Information System (MIS) is a system that provides the required information to the management to help the decision making process

Sequences, Immunology, Enzyme Engineering Immobilized Biocatalysts, Microbial Fermentation and Bioprocess Engineering. Further, each of these distributed information centres has its own distributed information sub-centres located in the universities and R & D institutions.

Besides many other computerized information services relevant to specific areas such as bibliographic information, online literature search, the BTIS provides management information on the projects, facilities, expertise, etc.

The **Department of Ocean Development (DOD)** has the National Ocean Information (NOIS) system, The NOIS comprising of 13 marine data centres, provides a comprehensive marine data.

Ministry of Environment and Forests

The Ministry has established an Environmental Information System (ENVIS). ENVIS provides information to decision makers, policy planners, scientists, engineers, researchers and general public in the area of environment and forests.

Indian Council of Medical Research (ICMR)

The ICMR has an inhouse MIS, viz Integrated Research Information System (IRIS) having data bases on the process, equipment, publications, etc.

Department of Scientific and Industrial Research (DSIR)

The National Information System for Science and Technology (NISSAT) was originally established under the Department of Science & Technology (DST) and is presently part of DSIR. The NISSAT network has been built around the existing infrastructure. Area specific information centres have been set up under NISSAT in various R&D organizations and quite a number of them are in CSIR Laboratories. They are NICLAI, leather technology in CLRI, Madras; NICFOS, Food Technology in CFTRI, Mysore; NICMAP, Machine Tools & Production Engineering at Central Machine Tools Institute, Bangalore; NICDAP, Drugs & Pharmaceuticals in CDRI, Lucknow; NICHEM, Chemical and allied industries

in NCL, Pune; NICAC, Advanced ceramics in CGCRI, Calcutta; NCB, Bibliometrics in INSDOC, New Delhi; NICRYS, Crystallography in Univ. of Madras and NICDROM at NAL Bangalore.

NISSAT has also got five specific access centres to international data base services (NACIDS), viz, NAL, Bangalore, Indian Association for the Cultivation of Science, Calcutta, CLRI Madras, INSDOC, New Delhi and NCL, Pune. It may be worth noting that four of these five are CSIR laboratories. NISSAT is also establishing library networks with an objective of sharing library facilities in different metropolitan cities viz DELHI, CALCUTTA, BOMBAY, PUNE & MADRAS. INSDOC is a major participant in this activity.

Table 1.5 gives the summary of the various information systems described above. Very few of them could be classified as MIS for R&D planning. Most of them are useful data bases which may help the planning process with specific reference to project identification, coordination and possible linkages with socioeconomic ministries, international state-of-art in the specific areas, etc.

1.4 INFORMATION FOR PLANNING AND MONITORING

As stated earlier, for an effective promotion of S&T for the development of the nation, planning of R&D becomes very vital. The planning process in India is a judicial mix of the top to bottom as well as bottom to top approach. Policy guidelines emerge from the top and are discussed at the national level, agency level and laboratory level. As a result of this, a plan is formulated with the involvement of scientists at various levels in the laboratory. These are coordinated / integrated at the agency level and then at the national level. The involvement of working scientists in the formulation of plan envisages the effective participation of the scientists in the implementation of plan in terms of actual R&D projects.

The planning process helps to provide direction and proper choice of R&D amongst the various alternatives available or envisaged. In this context information plays a vital role in decision making. The information generation has to help the decision maker in terms of converting the resources, - the three M's viz. Manpower, Machinery and Money -, into an useful and effective output. The role of information is to envisage courses of action to reach the end objectives.

According to Rahman and Wahid; "The process revolves around information for formulating the alternatives, reassessment of goals and objectives and turns up the evaluation."

Table 1.5: Information systems in different organizations

S.No.	Agency	Information System
1.	DST	S&T Resources NRDMS NMIS
2.	DBT	BTIS
3.	DOD	NOIS
4.	Min. of Environment & Forests	ENVIS
5.	ICMR	IRIS
6.	DSIR	NISSAT * NICLAI * NICFOS * NICMAP * NICDAP * NICHEM * NICAL * NCB * NICRYS * NICDROM * NACIDS * DELNET, CALIBNET, MALIBNET

The collection, analysis and transmission of timely, accurate and precise information needed for decision making is a major challenging task in most complex R&D organizations.

The focus of this thesis is centered around the study of the information requirements for the planning process of R&D in a premier industrial R&D organization namely, the Council of Scientific and Industrial Research, known as CSIR.

Before proceeding further, certain frequently used terms are defined below:

DATA

a representation of facts, concepts, or instructions in a formalized manner suitable for communication, interpretation, or processing by human or automatic means.

any representations such as characters or analog quantities to which meaning is or might be assigned.

Data is a word used to describe collection of facts and figures, i.e. names, numbers, project title, schedule, cost etc.

Data are the raw material of Information.

DATABASE

a collection of data fundamental to a system.

a collection of interrelated or independent data items stored together without unnecessary redundancy to serve one or more applications.

INFORMATION

is data placed in a meaningful context for its recipient i.e.,

$\text{Data} + \text{Meaning} = \text{Processed data which is information.}$

DATA PROCESSING

The systematic performance of operations upon data; e.g. handling, merging, sorting, computing, storing.

INFORMATION SYSTEM

A system or methodology by which information is not only generated but also communicated to the people concerned.

COMPUTER-BASED

INFORMATION SYSTEM

An information system where the computer is an integral part of the system and provides for the flow and storage of information.

DATABASE MANAGEMENT

SYSTEM

This is designed when there are:

- 1) Large amount of data, with many types of record occurring many times;
- 2) complex data structures including many relationships between items of data;
- 3) many different user requirements;
- 4) planned requirements of a well-defined and limited nature together with
- 5) a need for flexibility to allow for change.

It may also be necessary to have the understanding of some of the Information attributes. These are essential for any Information system to help meaningful decision making process for any organization interested in scientific management.

Information Attributes

- * TIMELINESS
- * ACCURACY
- * PRECISION
- * CLARITY
- * APPROPRIATENESS

- * COMPREHENSIVE
- * BIAS FREE
- * ACCESSIBILITY

These are further elaborated below:

TIMELINESS The generation and communication of Information to the concerned people with in the specific time frame, Information delayed is information denied.

ACCURACY The situation where error factor is tending to zero; In other words the degree of absence of error in information. Facts and information should be correct.

PRECISION A measure of the ability to distinguish between nearly equal values.

Providing the details; eg data as on date; The measurement details used in providing information.

CLARITY Unambiguous Information; The degree to which the Information is free from ambiguity

APPROPRIATENESS Too much information creates noise and negative impact. Information should be relevant to the users requirements

COMPREHENSIVE Information without any gaps or missing links ie the completeness of information. A critical missing fact, vital to a decision, may result in a poor decision.

BIAS FREE Information should be free from any bias. The screening may be required to filter the noise to

make the information appropriate to the user. But, alteration or modification of information to influence the recipients/users should be avoided.

ACCESSIBILITY

Obtaining data and generating information or obtaining information with ease and speed.

These attributes play vital role in any information system to provide the right information to the right person at the right time.

1.5 THE ORGANIZATION: CSIR

The focus of this thesis is on the information requirements for the planning process of R&D in the Council of Scientific & Industrial Research (CSIR). In this section, a brief introduction of the organisation is given.

The Council of Scientific and Industrial Research (CSIR) was constituted in 1942 by a resolution of the then Central Legislative Assembly and is an autonomous body registered under the Registration of Society Act XXI of 1860. During its existence of over 50 years CSIR has emerged as a premier national S&T agency. It has a vast network of national laboratories (40), extension and regional centres and complexes spread throughout the length and breadth of the country. The list of Councils laboratories are given in Table 1.6.

The functions assigned to the Council are:

- (1) Promotion, guidance and coordination of scientific and industrial research in India, including the institution and financing of specific researches;
- (2) Establishment or development of and assistance to special institutions or departments of existing institutions for scientific study of problems affecting particular industries and trades;
- (3) Establishment and award of research studentships and fellowships;
- (4) Utilization of the results of the researches conducted under the auspices

of the Council towards the development of industries in the country;

- (5) Establishment, maintenance and management of laboratories, workshops, institutes and organizations to further scientific and industrial research and to utilize any exploit for purposes of experiment or otherwise and discovery or invention likely to be use to Indian industries;
- (6) Collection and dissemination of information in regard not only to research but also to industrial matters generally;
- (7) Publication of scientific papers and journals; and
- (8) Any other activity or activities to promote generally the objects of the resolution.

Presently, DSIR in the Ministry of Science and Technology provides the administrative link between the Government of India and the Society.

The organizational structure of CSIR is given at Fig.1.1

Apex policy making bodies at Agency (CSIR) level are:

- Society
- Governing Body (GB)
- Advisory Board (AB)

Technical Advisory Boards (TABs) are in five areas:

- Chemical Sciences & Technology
- Biological Sciences & Technology
- Physical, Earth & Marine Sciences (Including Environment)
- Engineering Sciences (including Electronics & Computer)
- Material Sciences and Technology

Fig 1.1: ORGANIZATIONAL STRUCTURE OF CSIR

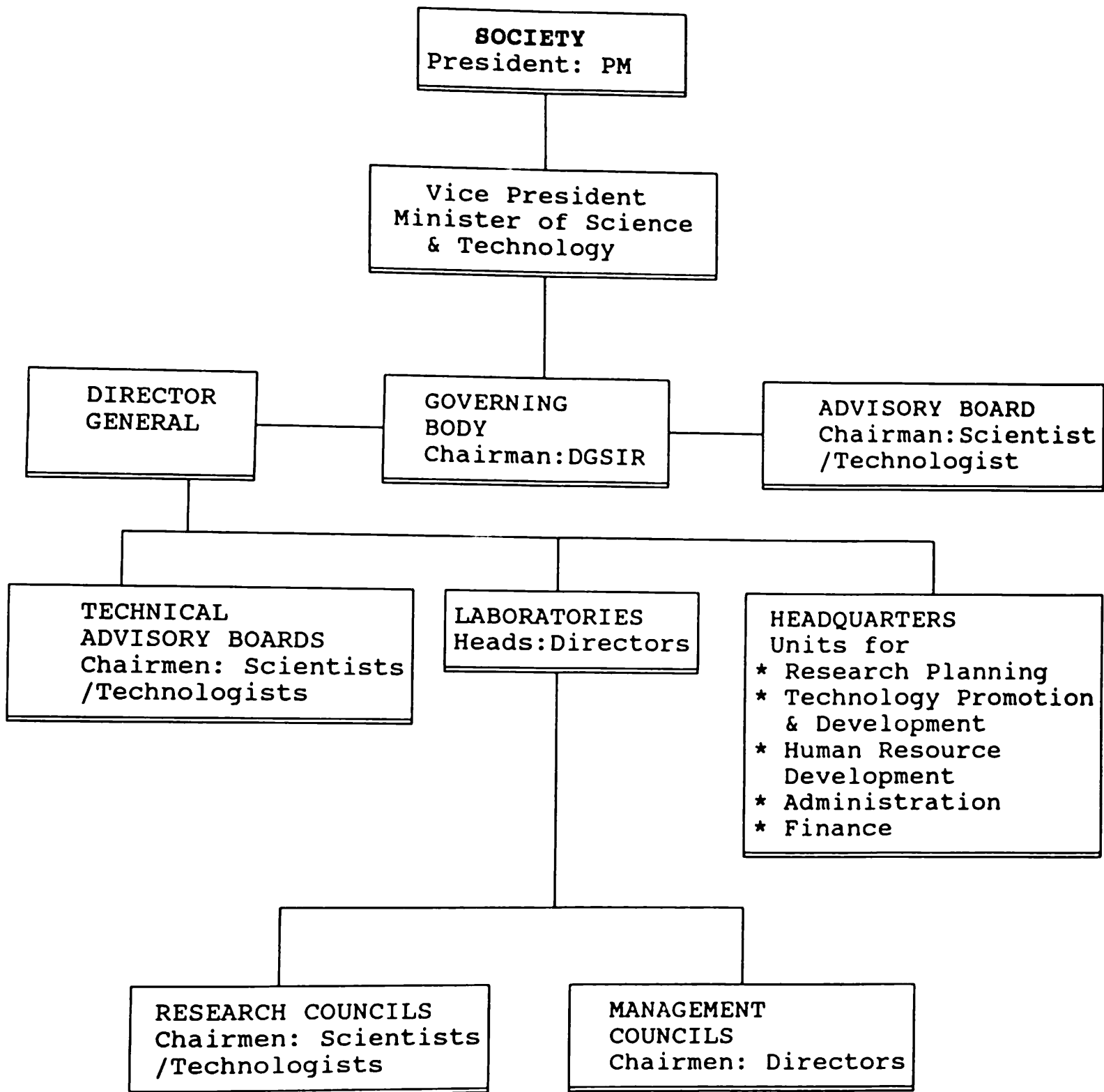


Table 1.6

COUNCIL'S LABORATORIES/INSTITUTES	Year of Establishment
CENTRAL BUILDING RESEARCH INSTITUTE (CBRI), ROORKEE	1951
CENTRE FOR BIOCHEMICALS TECHNOLOGY (CBT), DELHI	1966
CENTRE FOR CELLULAR AND MOLECULAR BIOLOGY (CCMB), HYDERABAD	1977
CENTRAL DRUG RESEARCH INSTITUTE (CDRI), LUCKNOW	1951
CENTRAL ELECTROCHEMICAL RESEARCH INSTITUTE (CECRI), KARAIKUDI	1953
CENTRAL ELECTRONICS ENGINEERING RESEARCH INSTITUTE (CEERI), PILANI	1953
CENTRAL FUEL RESEARCH INSTITUTE (CFRI), DHANBAD	1950
CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE (CFTRI), MYSORE	1950
CENTRAL GLASS AND CERAMIC RESEARCH INSTITUTE (CGCRI), CALCUTTA	1950
CENTRAL INSTITUTE OF MEDICINAL AND AROMATIC PLANTS (CIMAP), LUCKNOW	1959

(Table 1.4 Continued)

CENTRAL LEATHER RESEARCH INSTITUTE (CLRI), MADRAS	1953
CENTRAL MECHANICAL ENGINEERING RESEARCH INSTITUTE (CMERI),DURGAPUR	1958
CENTRAL MINING RESEARCH INSTITUTE (CMRI), DHANBAD	1955
CENTRAL ROAD RESEARCH INSTITUTE (CRRI), DELHI	1952
CENTRAL SCIENTIFIC INSTRUMENTS ORGANIZATION (CSIO), CHANDIGARH	1959
CENTRAL SALT & MARINE CHEMICALS RESEARCH INSTITUTE (CSMCRI),BHAVNAGAR	1954
INDIAN INSTITUTE OF CHEMICAL BIOLOGY (IICB), CALCUTTA	1935/1956
INDIAN INSTITUTE OF CHEMICAL TECHNOLOGY (IICT), HYDERABAD	1944/1956
INDIAN INSTITUTE OF PETROLEUM (IIP), DEHRADUN	1960
INSTITUTE OF MICROBIAL TECHNOLOGY (IMT), CHANDIGARH	1984
INDIAN NATIONAL SCIENTIFIC DOCUMENTATION CENTRE (INSDOC),NEW DELHI	1952

(Table 1.4 Continued)

INDUSTRIAL TOXICOLOGY RESEARCH CENTRE (ITRC), LUCKNOW	1965
NATIONAL AEROSPACE LABORATORIES (NAL), BANGALORE	1959
NATIONAL BOTANICAL RESEARCH INSTITUTE (NBRI), LUCKNOW	1953
NATIONAL CHEMICAL LABORATORY (NCL), PUNE	1950
NATIONAL ENVIRONMENTAL ENGINEERING RESEARCH INSTITUTE (NEERI), NAGPUR	1958
NATIONAL GEOPHYSICAL RESEARCH INSTITUTE (NGRI), HYDERABAD	1961
NATIONAL INSTITUTE OF OCEANOGRAPHY (NIO), GOA	1966
NATIONAL INSTITUTE OF SCIENCE TECHNOLOGY AND DEVELOPMENT STUDIES (NISTADS), NEW DELHI	1981
NATIONAL METALLURGICAL LABORATORY (NML), JAMSHEDPUR	1950
NATIONAL PHYSICAL LABORATORY (NPL), NEW DELHI	1950
CSIR COMPLEX PALAMPUR (CSIR-CX-PAL), PALAMPUR	1983
PUBLICATIONS & INFORMATION DIRECTORATE (PID), NEW DELHI	1951

(Table 1.4 Continued)

REGIONAL RESEARCH LABORATORY (RRL-BHO), BHOPAL	1981
REGIONAL RESEARCH LABORATORY (RRL-BHU), BHUBANESWAR	1964
REGIONAL RESEARCH LABORATORY (RRL-JMU), JAMMU	1957
REGIONAL RESEARCH LABORATORY (RRL-JOR), JORHAT	1961
REGIONAL RESEARCH LABORATORY (RRL-TRI), THIRUVANANTHAPURAM	1978
STRUCTURAL ENGINEERING RESEARCH CENTRE (SERC-G), GHAZIABAD	1965
STRUCTURAL ENGINEERING RESEARCH CENTRE (SERC-M), MADRAS	1965

At the Laboratory level, RC and MC are the main decision making bodies that help the Director of the Laboratory. The functioning of various decision making bodies as approved by the CSIR Society in February 1988 is presented in Annexure 1.1

Technical Secretariat at (CSIR) Headquarters (CSIR HQ)

The technical groups presently existing at the CSIR HQ. in New Delhi are:

- i. Research and Planning Group known as Planning Division
- ii. Technology Utilization Division including Patents unit
- iii. Human Resource Development Group

- iv. International Scientific Collaboration
- v. Unit for Science Dissemination and Source Communication
- v. Computer Division.

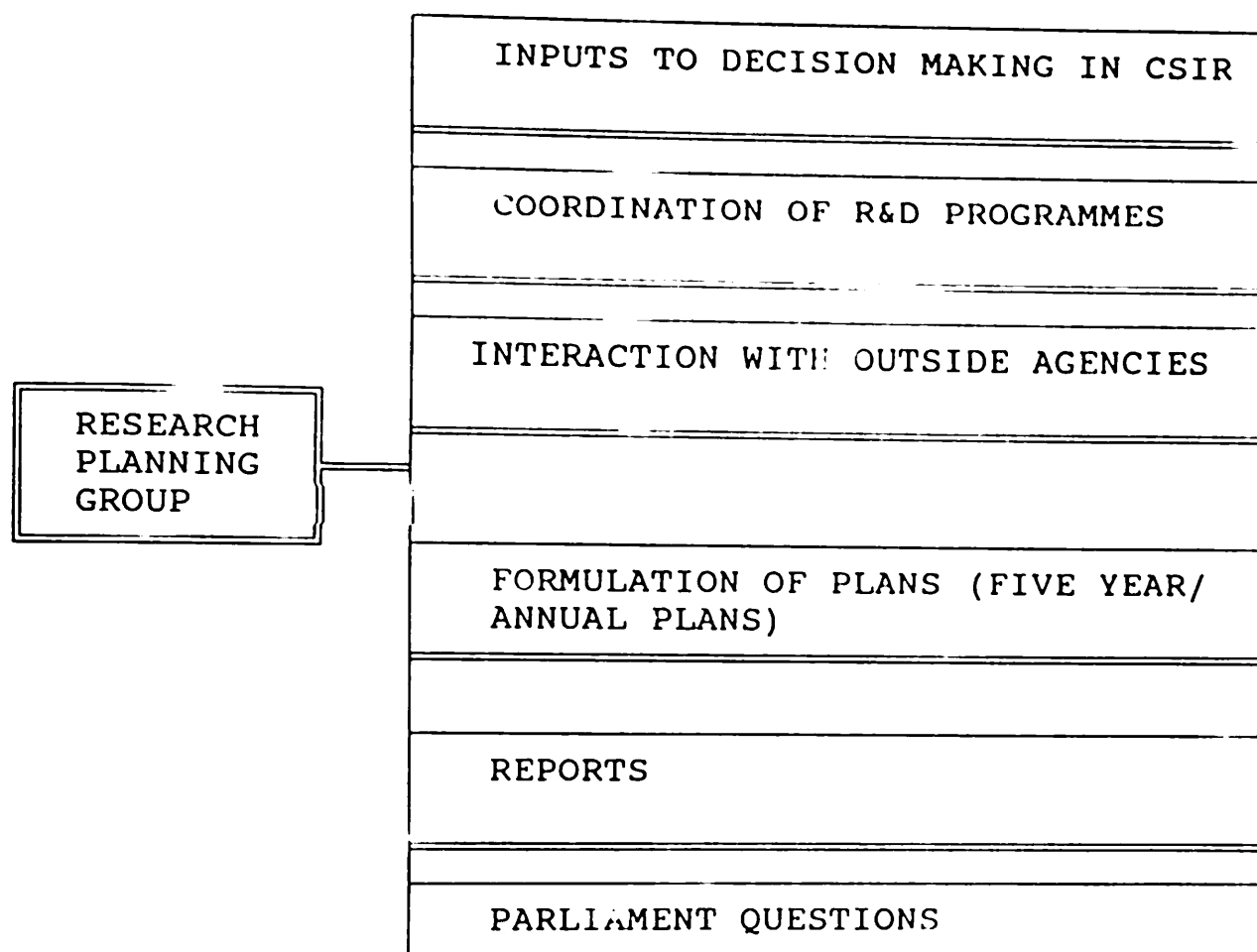
The main functions of Research planning are to

- Interact with Planning Commission, other agencies/departments to catalyse the development/economic plans to S&T Plans.
- Resolve these plans as Mission Projects and prepare/commission detailed project reports wherever necessary.
- Identify networking of laboratories and institutions.
- Provide secretariat for Mission Projects.
- Provide secretariat and technical support for TABs.
- Co-ordinate International Scientific Collaborations and Research Schemes.

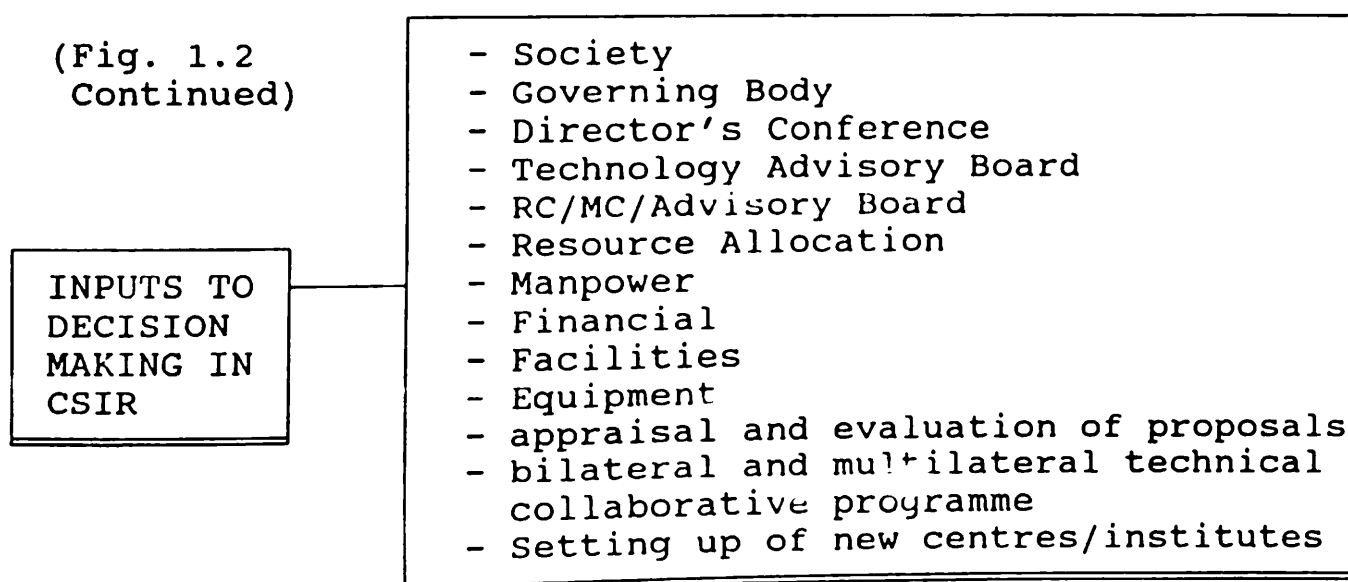
The Research Planning group is responsible for providing this support as per details given in Fig. 1.2 the functions of the other technical groups are not elaborated here as the present study interfaces essentially with the Research Planning Group.

TH-4476

Fig. 1.2 Functions of Research Planning Group and Details of Each Function.



(Fig. 1.2 Continued)



COORDINATION
OF R&D
PROGRAMMES

- Inter - Agency
- Inter - Laboratory
- Technological Missions
- Other Mission mode programmes & Coordinated Projects

INTERACTION
WITH
OUTSIDE
AGENCIES

- Planning Commission
- Socio Economic Ministries/ Depts.
- Public Sector Undertakings
- Representation of CSIR in Scientific Research Advisory Committees of Departments/ Ministries

FORMULATION
OF PLANS
(FIVE YEAR,
ANNUAL
PLANS)

- Formulation of five year and annual plans for CSIR in relation to national objectives and priorities/ socio-economic goals vis-a-vis other S&T agencies/ departments
- Identification of S&T component of socio-economic sectors depts./ Ministries
- Evaluation of projects and goals achieved
- Interaction with the National Laboratories
- Demands for grants Parliamentary Committees

REPORTS

- Annual Report
- Special Technical Reports
- Monitoring report on identified milestones of specific projects
- Monthly reports to PMO VP-CSIR, Cabinet Sectt.
- Laboratory Profiles

PARLIAMENT
QUESTIONS

- Reply/providing Information to parliament question

1.6 SCOPE AND OBJECTIVES OF PRESENT WORK

The **scope** of the present work encompasses different types and levels of information in the context of R&D planning.

(a) TYPES OF INFORMATION: The following three types of Information is considered:

1. **Scientific and Technical Information:** For any R&D problem, one looks at the information on the state of art. This may be obtained through

- * Literature Surveys
- * Seminar/ Conferences/ Symposia
- * Discussions with experts in the field
- * Specialized documentation services including literature search on specialized data bases through networks both national and international.

2. **Socio-economic information:**

This may perhaps be more relevant or applicable to Applied R&D.

- * Availability and cost of raw materials and manpower.
- * Efficiency and productivity of existing technical processes
- * Cost of products
- * User view points - user in rural, urban etc.
- * Market trends

3. **Management Information:**

Areas of research

Project details

Manpower details

Linkages

Target groups

Possible users

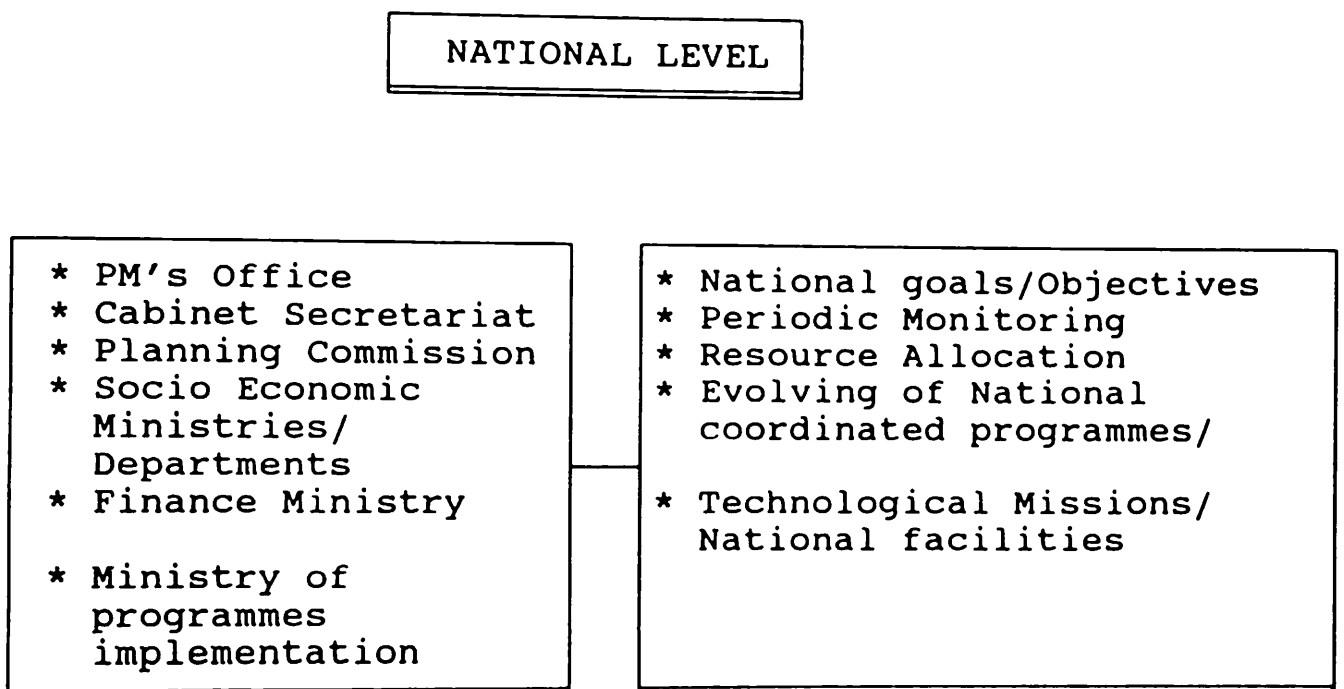
Resource requirements: Funds, facilities and equipment
Orientation in terms of basic or applied
Expected outputs
Periodic progress, Monitoring data
Physical and financial
Time delay and bottlenecks

(b) INFORMATION LEVELS

In the national scene, one could consider three levels of information viz. National, Agency and the Laboratory. The nature, type and details would vary at each level. One could consider adding two more levels viz. the individual research worker or project level and the international level. The international level could be considered a part of information required at the national level. The microscopic details required at the individual research worker/project level could be considered as a subsystem under the laboratory information system. The Information system under discussion in this thesis would consider the system requirements at the Agency level, in this case the CSIR HQ., with adequate interface with the National level and the Laboratory level.

At the national level, the country looks S&T to help through the activities of R&D organization to achieve the national objectives like eradication of poverty, self-reliance, employment generation, population control, providing food, shelter and clothing, alternate sources of energy, improving the literacy level, etc. The priority assessment at the national level will be between different socioeconomic sectors and the needs of developments of different regions, states, etc. At the laboratory level, the laboratory management normally concerns itself with the techno-economic feasibility of the project. At the agency level, the main problem is the linkage between the national policy guidelines, national goals and the laboratory capabilities. This needs an intense prioritizations and establishment of criteria for selection of projects to optimize the available resources. Information requirements vary at different levels and that depends very much on the apex bodies and decision making authorities involved at different levels as depicted in Fig. 1.3.

Fig.1.3 Information requirements at different Levels



AGENCY LEVEL

- * Society (PM/VP, CSIR)
- * Advisory Board (TAB)
- * Governing Body (GB)
- * DGSIR, assisted by Technical groups

- * Plan Formulation (Five year/Annual)
- * Coordination of national programmes/missing
- * Marketing/Tech-transfer
- * Patents
- * Human Resource Development
- * Manpower policies both New & Carrier development
- * Liason between National and lab system.
- * RC/MC- membership nomination
- * Policy inputs to RC/MC
- * External Cash Flow
- * Resource allocation
- * Interse priority/priority - setting
- * Output analysis

LAB LEVEL

- * Research Council (RC)
- * Management Council MC
- * Director

- * Project identification CSIR
- * Lab Management
- * Industrial Liason
- * Marketing/Technical Information
- * Output data
- * Intrest of bench level scientist
- * Technical Information
- * Socio-economic Information

Thus in its scope the present thesis deals with the Information needs at the three levels namely viz. National, Agency and Laboratory levels and for the types of information mentioned in this section.

Broadly, the **Objectives** of this thesis are to

- i. identify the information needs for the planning, monitoring and evaluation of R&D
- ii. analyse the existing Data Collection & Information System
- iii. understand the gaps, if any, in the present system
- iv. develop a Model Information System for computerised processing.

1.7 INFORMATION NEED FOR PLANNING, MONITORING & EVALUATION OF R&D

During the last five decades of its existence, CSIR has emerged as a premier National Science and Technology Agency with a vast network of National laboratories, extension and regional centres and complexes. The forty national laboratories and their several extension and regional centres under the umbrella of CSIR are spread through the length and breadth of the country. The programmes of CSIR are being implemented under the following major schemes, viz. (1) National laboratories including pilot plants, (2) Human resources development (special research programmes and Grant-in-aid, Scientists' Pool, (3) R&D Management Support (CSIR Headquarters - the Central Administration) and (4) Staff quarters and other amenities like schools, dispensary. The R&D programmes are carried out in the national laboratories. The laboratories are engaged in wide areas of research viz. Physics, Standards, Radio Science, Materials development, Superconductors, Geophysics, Electronics, Instrumentation, Oceanographic research, Organic & Inorganic Chemistry, Chemical synthesis, Catalysis, Electrochemicals, Corrosion, Drugs & Pharmaceuticals, Petroleum refining, Coal, Leather, Metallurgy, Glass & Ceramics, Mining, Machinery development, Aeronautics, Structural engineering, Building materials, Road transportation, Post-harvest technology, Natural

products, Medicinal and aromatic plants, Tea, Biotechnology, Genetic engineering, Modern biology, Toxicology, Microbial Technology, information Systems, Science Communication, Science Policy studies etc.

The activities of the laboratories could be categorized as: R&D projects; setting up of National facilities, Infrastructure development, Pilot plants, Routine testings and evaluation as research support activities.

R&D projects of the National laboratories could be continuing routine activities, long term projects, new major projects, applied or basic research etc. Some may be laboratory projects. Some may be a part of an inter-laboratory major project or inter-agency mission mode project. Some could be of international collaboration nature. In other words, there exists a mix of different complex activities in each laboratory. Further, as indicated above the laboratories are engaged in diversified fields of science & technology catering to the needs of different sectors adding to the complexity of the system. Thus, whole the CSIR system presents a complex R&D organization. Thus on the whole the CSIR system presents a complex R & D organization.

One can easily visualize the Research Planning Group (RPG), on behalf of the CSIR HQ., as a coordinating liaison group between the Government, Planning Commission, Finance Ministry, Socio-economic Ministries, user departments and Industries on the one hand and the constituent laboratories of the council at the other hand. The group has to have complete information on the strengths and weaknesses of each laboratory as well as the opportunities available to get the maximum benefits from the available limited resources. The government policies, the needs of the user departments, ministries and industries, and their linkages with various organizations provide the opportunities and threats for the R&D of the laboratories. These have to be coupled and matched with the strengths and weaknesses of the laboratories. The scientific expertise, availability of infrastructure and the base information system prevalent in each laboratory, the coordination between various laboratories both existing and required, all these aspects qualify for the strengths and weaknesses. In other words the information system for planning at CSIR HQ. should be able to generate information required to optimize the resources to put them into best use for achieving the goals.

At the laboratory level, the information sub-system should have complete basic data on all the projects and activities of the laboratories. It should also have the data on the outputs generated and expected in terms of a laboratory as a whole as well as the outputs pertaining to each project/activity. The laboratory system must have the linkage with the other systems may be online or other-wise to generate necessary information on the opportunities and threats relevant to them.

The existing data collection system for the planning process is described in **Chapter-2**. The planning system is mainly centred around data base on the R&D and other activities of the laboratories. The reporting system focusing on the methodology of data collection for various mandatory reports viz Monthly Cabinet summary, Quarterly reports on selected projects and the Annual Report on the major achievements of the laboratories is also discussed in this chapter.

The analysis of the data received from the laboratories are vital to generate the necessary information for the management. **Chapter-3** extensively discusses the various output format, the generation of laboratory profiles which serve as the background information for the decisions on the plan formulation, the area status reports, the software for generating quarterly milestones report and the analysis on the research output parameters.

In any system there will always be some gaps and problems. A detailed analysis of the various problems in the existing information system and the resulting gaps in information in meeting the demands and requirements of the organization is covered in **Chapter-4**.

The various facets of the model information system dealing specifically on the Project data base relevant to R&D Planning and Monitoring and its interface with other databases and information system are presented in **Chapter-5**.

The summary and conclusions arising out of this study and the scope for future work are outlined in **Chapter-6**

Annexure 1.1

Society

The Society of the Council of Scientific & Industrial Research Consists of the following members:

1. The Prime Minister of India who shall be the ex-officio president of the Society.
2. The Minister-in-charge of the Ministry or Department dealing with the Council of Scientific & Industrial Research who shall be the ex-officio Vice President of the Society:
3. Ministers-in-charge of Finance and Industry (ex-officio):
4. Members of the Governing Body: and
5. Chairman, Advisory Board.

The authorities of the Society are: the Governing Body, the President of the Society, the Vice-President of the Society, the Director General of the Council of Scientific & Industrial Research, and such other authorities as may be constituted by the Governing Body. The Director -General, Council of Scientific & Industrial Research, is ex-officio Secretary and the Principal Executive Officer of the Society. The CSIR Society has the powers of an autonomous organisation. It reviews the progress and performance of CSIR, gives policy direction to the Governing Body of CSIR and approves the annual accounts and report of CSIR.

Governing Body

The affairs and funds of CSIR shall be administered, directed, controlled, subject to the rules and regulations and byelaws and orders of the Society, by a Governing Body. The Governing Body of the Society for the purpose of Act XXI of 1860 shall consist of the following members:

1. The Director General, Council of Scientific & Industrial Research, ex-officio Chairman of the Governing Body;
2. Member Finance, (Secretary to the Government of India for financial matters concerning CSIR);

3. Chairman of two Technical Advisory Boards (TAB's)
4. Directors of two CSIR laboratories
5. Two eminent industrialists with one from the public sector;
6. Three eminent scientists, with one from academia;
7. Heads of two Scientific Departments/ Agencies of the Government of India.

All nominations of the Governing Body shall be by the President of the Society and for a period of three years.

The Governing Body shall meet as often as may be considered necessary but not less than four times a year.

Advisory Board

A high level Advisory Board (AB) with external experts from scientific, technical, social sciences and industrial fields, provides S&T inputs to the Governing Body; overviews the R&D programmes of CSIR to suggest inter-se priorities and resource allocations and organizes periodic reviews of specific R&D areas and laboratories of CSIR.

The Advisory Board is chaired by an eminent scientist/technologist from outside the CSIR system and has following members.

1. Director General, CSIR
2. Chairmen of Technical Advisory Boards
3. Three scientists/ technologists/industrialists
4. An eminent social scientist and
5. Four representatives of scientific departments/ agencies of the Government of India, as members.

Nominations to AB are made by the President of the Society.

Technical Advisory Boards

Technical Advisory Board (TAB) in broad areas of CSIR R&D activities is a forum for involving government departments/ agencies and users in research planning and programme identification. TAB is basically charged with the task of identifying newer R&D areas and evolving long term perspective plans for research priorities. TABs have been established in five broad R&D areas of CSIR. These are for

1. Chemical Sciences & Technology;
2. Biological Sciences & Technology;
3. Physical, Earth & Marine Sciences (including Environment);
4. Engineering Sciences and Technology including electronics and Computers and
5. Material Sciences & Technology

Each TAB has an eminent Scientist/ Technologist from outside the CSIR system as its chairman and a Scientist/ Emeritus Scientist of CSIR as convener. The members of TAB consist of

1. Laboratory Directors/Project Coordinators concerned with R&D programmes in the areas;
2. Eminent Scientists/Technologists in the areas from outside CSIR;
3. Representatives of concerned Scientific Departments/ Agencies of the Government.

All nominations to the TABs are made by DG, CSIR for a period of three years. Each TAB in its area of activity

1. Undertakes/commissions technological forecasting and prepares long term perspective plans for research priorities and strategies for CSIR and evolves new areas of R&D;
2. Identifies, formulates and monitors the progress of specific major R&D programmes, thrust area and mission projects and
3. Suggests net-working of laboratories in implementing the programmes identified.

Research Councils

Research Council (RC) at the laboratory level is a body of distinguished professionals in the area of specialization of the laboratory. RC is to provide thrust, suggest new areas of research and orient R&D programmes in desired direction, apart from serving as a professional vehicle for monitoring of resource allocations and their utilization in each laboratory. RC consists of:

1. Five external experts, one of whom is designated as Chairman;
2. Representatives of concerned scientific departments/agencies of the Government of India;
3. Director of the laboratory;
4. Senior scientists from another CSIR laboratory and
5. DG, CSIR or his representative as a permanent invitee.

The chairmen and members of the RC are nominated by DG, CSIR while the secretary of the RC is nominated by the Director of the laboratory who also provides the secretarial services for functioning of RC. RCs are to:

1. Advise and recommend the formulation of research programmes of the laboratory keeping the Five Year Plans and national priorities in view;
2. Conduct periodic reviews of the research activities, assess the progress of the research programmes and advise on future directions,
3. Advise on fostering linkages between the laboratory and academic institutions, other research organizations, industry and potential clients:

RCs have the power to:

1. Constitute Selection committees and Assessment Committees/Peer Groups for selection, merit and assessment promotions, from an approved panel of experts for all the S&T staff;
2. Recommend the resource allocations for major R&D activities of the laboratory;
3. Approve contract R&D programmes envisaging charges of over Rs. 50 lakh and
4. Recommend devolution of necessary power to the project leaders for the proper implementation of the research programmes.

Management Councils

The Management Councils also at the laboratory level, manage the affairs of the laboratories within the framework of rules, regulations, directions and guidelines issued by DG, CSIR, GB and the Society. The Chairman of Management Council (MC) is the Director of the laboratory. Other members consist of:

1. Four scientists of the laboratory representing the staff of various age groups
2. Two scientists of Director level from the same laboratory or senior scientists from other laboratories
3. Finance & Accounts Officer of the laboratory
4. Controller of Administration/AO: Member Secretary and
5. DG, CSIR or his nominee as a permanent invitee.

Members of the MCs are nominated by DG, CSIR and the period of nomination is three years. MC is to

1. Administer and manage the affairs and environs of the laboratory so as to support the research plan of the laboratory as approved by the Research Council
2. Serve as the appellate authority for employee grievances,
3. Write off irrecoverable loans of stores and monies within the limits prescribed by CSIR.

CHAPTER- 2: ANALYSIS OF EXISTING INFORMATION SYSTEM: DATA COLLECTION PROCESS

2.1 INTRODUCTION

Information is vital for any system. The effectiveness of information depends on the timeliness as well as other attributes described in Chapter-1. Information delayed is information denied. In CSIR, the planning process depends on the activities of the laboratories. Data from each laboratory serves as an input for the information system at the CSIR HQ., and the functions of the planning group could be broadly categorized as Plan formulation and the Reports generation.

The data collection system for the plan formulation is centred around data base on the R&D and other activities of the laboratories. On the other hand the reporting system would focus data on mandatory reports viz. monthly cabinet summary, quarterly reports on selected projects and the Annual Report based on the major achievements of the laboratories.

Further, the information generated from these two systems would help to meet the requirements of GB, AB, TAB, Interagency, Interlab coordination, Annual plan formulation, Interaction with Planning Commission, Ministries, Departments, Industries and Parliament Questions related to the R&D activities of the laboratories.

In this Chapter, the data collection system for the plan formulation and the reports generation is discussed in details.

2.2 BACKGROUND OF THE PLANNING PROCESS

Planning of R&D at the CSIR Headquarters can be traced to the establishment in 1963 of an operational research unit later known as the Research Survey and Planning Organization (RSPO). The Division conducted several studies, surveys and R&D policy analysis and contributed a lot to the process of planning and giving of a direction to R&D. At the national level, the need for S&T planning as a part of the Five Year Plan was recognised during the fifth

plan. This necessitated the importance of establishing coordination and monitoring of R&D efforts.

The RSPO was reconstituted in 1973, as the Planning, Coordination, Monitoring and Evaluation Division, (currently Planning Division). The Division was given the responsibility of coordinating the plans of the laboratories, and preparation of CSIR annual plans and five year plans. Many CSIR Directors were involved in various panels and committees for the formulation of national plans.

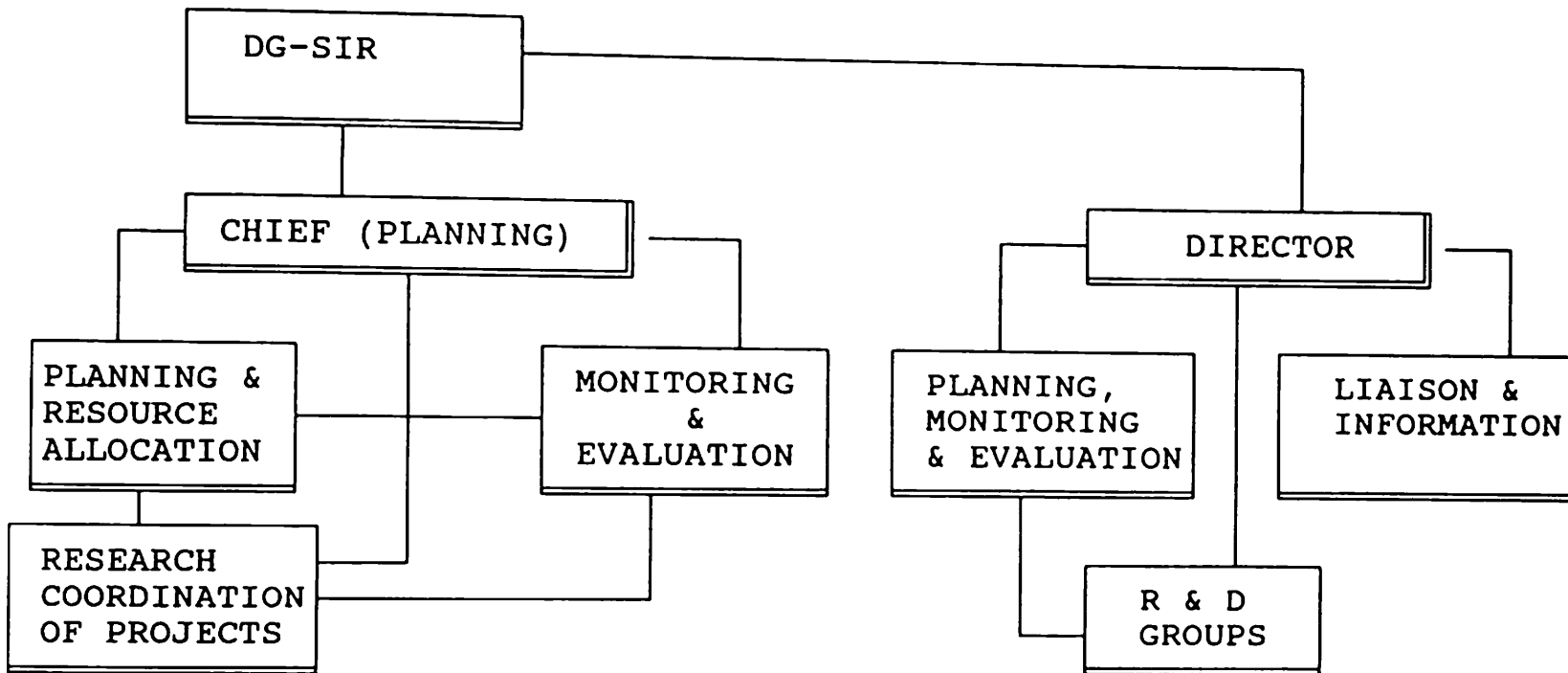
The responsibility of the formulation of Fifth Five Year Plan necessitated the Planning Division at CSIR Headquarters to look for planning data in terms of R&D projects of the laboratories and also the data for their subsequent monitoring and evaluation.

Two sets of questionnaire were formulated at the Headquarters for this purpose. These questionnaires included information on technical, economic as well as social aspects of research. The questionnaires were sent to the laboratories for testing and their comments were discussed at the Directors conference before actually being put to use. The laboratories filled the questionnaire and sent the data on projects to the Head quarters. The data were analyzed and the analysis was discussed at the Directors conference.

Establishment of PME Cells in the Laboratories:

For effective planning, a need to establish a Planning Monitoring and Evaluation (PME) group in each laboratory was also felt. The Planning Commission had also strongly recommended the establishment of a planning, evaluation and monitoring machinery at the CSIR Headquarters to be complemented by similar cells in the laboratories. The Directors' conference held in Jan/Feb. 1974 also recommended the formulation of PME group in each laboratory. The structure shown in Fig. 2.1 emerged as a result of various discussions.

FIG. 2.1: ORGANIZATIONAL CHART SHOWING LINKAGES BETWEEN PLANNING, MONITORING & EVALUATION (PME) CELLS AT CSIR HQ AND LABORATORIES



In the Figure, relationship between PME and other groups are only shown.

2.3 DATA COLLECTION FOR PLAN FORMULATION

CSIR needs to prepare its plan within the guidelines and framework of national priorities and Five Year Plans. The Planning Division of CSIR HQ. has the responsibility of defending the CSIR plan and mobilizing maximum resources for supporting R&D in the Laboratories. In order to facilitate resource allocations, the Planning Commission sends a proforma for collecting information about the plan programmes every year. The questionnaire for collection of plan proposals used to be designed by the Planning Division of CSIR HQ. taking into account the requirements of the Planning Commission and other decision making agencies.

The schedule for work related to Annual Plan preparation during the fifth and sixth plan period is as per Annexure 2.1

The activities of the laboratories were grouped as into five groups. They are:

Group I R&D projects:

A project may include all or some of the following stages.

- * Preliminary study/feasibility studies
- * Surveys
- * Research, Design and Development work
- * Prototype Fabrication
- * Process Development
- * Upscaling
- * Testing and field trials
- * Pilot Plant activity
- * Batch production activity.

Group II- Technical Infrastructure:

In order to complete the R&D projects a number of common facilities/supporting facilities/ infrastructural facilities are required to be maintained or created. They are:

- * Planning Monitoring and evaluation
- * Information system (e.g. NISSAT Centres.....)
- * Library
- * Information, Liaison, Publicity, Exhibitions
- * Workshop
- * Design and drawing office
- * Testing laboratories
- * Service and maintenance of instruments
- * Animal house
- * Glass blowing
- * Training programmes
- * Computer Centre

Group III

- * Civil construction
- * Electrical Installation
- * Maintenance pertaining to civil works, electrical works, sanitation, water supply etc.

Group IV

- * Administration
- * Stores and Purchase,
- * Accounts
- * Housekeeping activities like watch ward, Garden etc.
- * Amenities (such as dispensary, school, club, and other staff welfare activities)

Group V

Extension/Regional Centres etc.

Separate proformae were designed for R&D projects, Technical Infrastructure (Group II) and Extension centres. Separate questionnaire was designed for each group of activities. For Group III&IV, the laboratories were asked to fill in only the financial statements.

Besides Group I, R&D projects related to Group II- (Technical infrastructure) Group V- (Extension centres) were also covered under the same proforma.

Other routine activities under areas of group V were sent in separate simple proformae projecting the resource requirements.

The Information mainly sought was:

- * Title of the project
- * Project No.
- * Scientific & Technical objectives
- * State of art
- * Status of the project
- * Justification of continuing the ongoing project or justification for taking up the new proposal.
- * Duration planned as well as expected.
- * Involvement of users.
- * Related work in other organizations
- * Linkages of the project
 - with other projects
 - with other organizations
(already existing and planned)
- * Nature of Linkages: (Utilization of Results; Funding; Sharing of R&D work; Exchange of Scientist; Utilization of facilities; Utilization of specialized material or techniques developed by other laboratories; Trials and testing; etc).
- * Requirement of major equipment/ facilities
- * Total cost; expenditure incurred; future requirements
- * Manpower deployment;
- * Bar chart of activities
- * Area of R&D
- * Discipline of Research
- * Long term project
- * Short term project

- * Nature of project
- * Other characteristics linked to a project
Basic Research; Applied research; Survey and data collection; Impact of Applied Research and Long-term basic research; Project Approved by; State of work; Socio Economic Aim; Reasons for delay [Technical, Infrastructural]

A sample questionnaire is enclosed in Annexure-2.2

The planning committee in the laboratory consisting of the project coordinators, the senior scientists and the Director review the project proposals submitted by the scientists. They assign priorities to the research programmes and formulate the Annual Plan within the frame work of the five year plan. The plan document were to be approved by the Research Advisory committees before sending it to CSIR HQ in the above proforma.

The laboratories were grouped into five Coordination Councils. They were:

1. **Physical and Earth Sciences** (NPL, CEERI, CSIO, NGRI, NIO).
2. **Chemical Sciences** (NCL, CECRI, CSMCRI, RRL-Hyderabad(now known as IICT), RRL- Jorhat, IIP and CFRI).
3. **Biological Sciences** (CDRI, CFTRI, CLRI, NBRI, IICB, CFB(now known as CBT), CCMB, ITRC, CIMAP, IMTECH, RRL-Jammu, CSIR-CX-Palampur
CLRI has been recently grouped under Chemical Sciences. (TRA has now gone out of CSIR).
4. **Engineering Sciences** (NML, CGCRI, CMRS(now known as CMRI), CMERI, NEERI, NAL, SERC(GZ), SERC, Madras, RRL-Trivanthapuram, RRL- Bhubaneswar, CBRI, CRRI and RRL-Bhopal. ERDA has now gone out of CSIR.
5. **Information Science**
PID, INSDOC, NISTADS

One copy of the plan document of the laboratories was submitted to the Chairman of the concerned Coordination Council. The Chairmen were expected to give their assessment of the project particulars, plan proposals of the laboratories and prepare the annual plan documents of the concerned coordination councils with projections till the end of the plan period.

The Planning Division of CSIR in association with the internal financial adviser and the finance group used to hold discussions with each laboratory to have a better understanding of the R&D programmes and other activities of the laboratories. The Director and the laboratory scientists used to get a feeling of involvement to decide ranking and priority of projects.

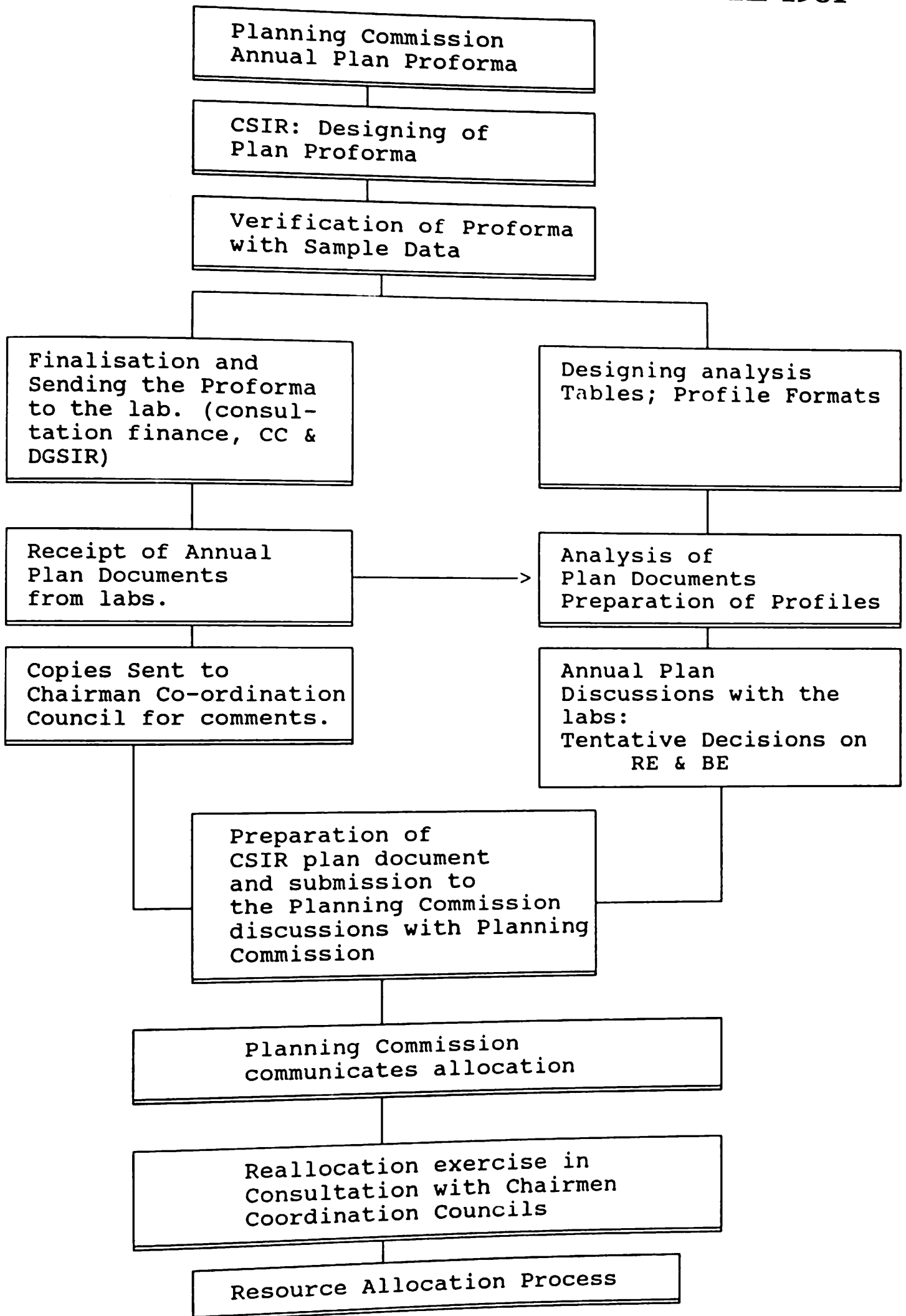
Based on the discussions with all the laboratories, CSIR prepared the overall CSIR plan document with resource estimates. This document after approval from Chairmen Coordination Councils, DGSIR and the Governing Body used to be submitted to the Planning Commission.

Planning Commission then discussed CSIR Plan with the CSIR HQ and they communicated the Plan allocation. The allocations to the individual laboratories were then decided in consultation with the Coordination Councils and circulated to the laboratories.

This process continued every year. However it was noted that in 1979, as a follow up of the recommendations of the chairman Co-ordinations councils, and also as per the perception of the then DGSIR, an Inter-organization Committee was formulated with representation from CSIR, DST, Department of Electronics and the Planning Commission to study and discuss the proforma sent by the Planning Commission seeking information on the Plan schemes of CSIR and evolve an appropriate information collection system and also arrive at a design of a common proforma suitable for various S&T organizations. From the records, it seems this committee never met formally and did not arrived at any decisions. Each of the organizations went ahead with itsown proformae.

Fig. 2.2 depicts the plan formulation process in CSIR till 1981.

Fig. 2.2. PLAN FORMULATION PROCESS TILL 1981



The Planning group of CSIR prepared and finalized the annual plan proforma for 1980-81 after a detailed discussion with the then Director, National Aeronautical laboratory, Dr. S.R. Valluri. NAL was chosen because it had been recognized for expertise in project planning, budgeting and cost accounting. These proforma were then sent to Chairmen co-ordination councils and Finance to dove-tail their comments and view points.

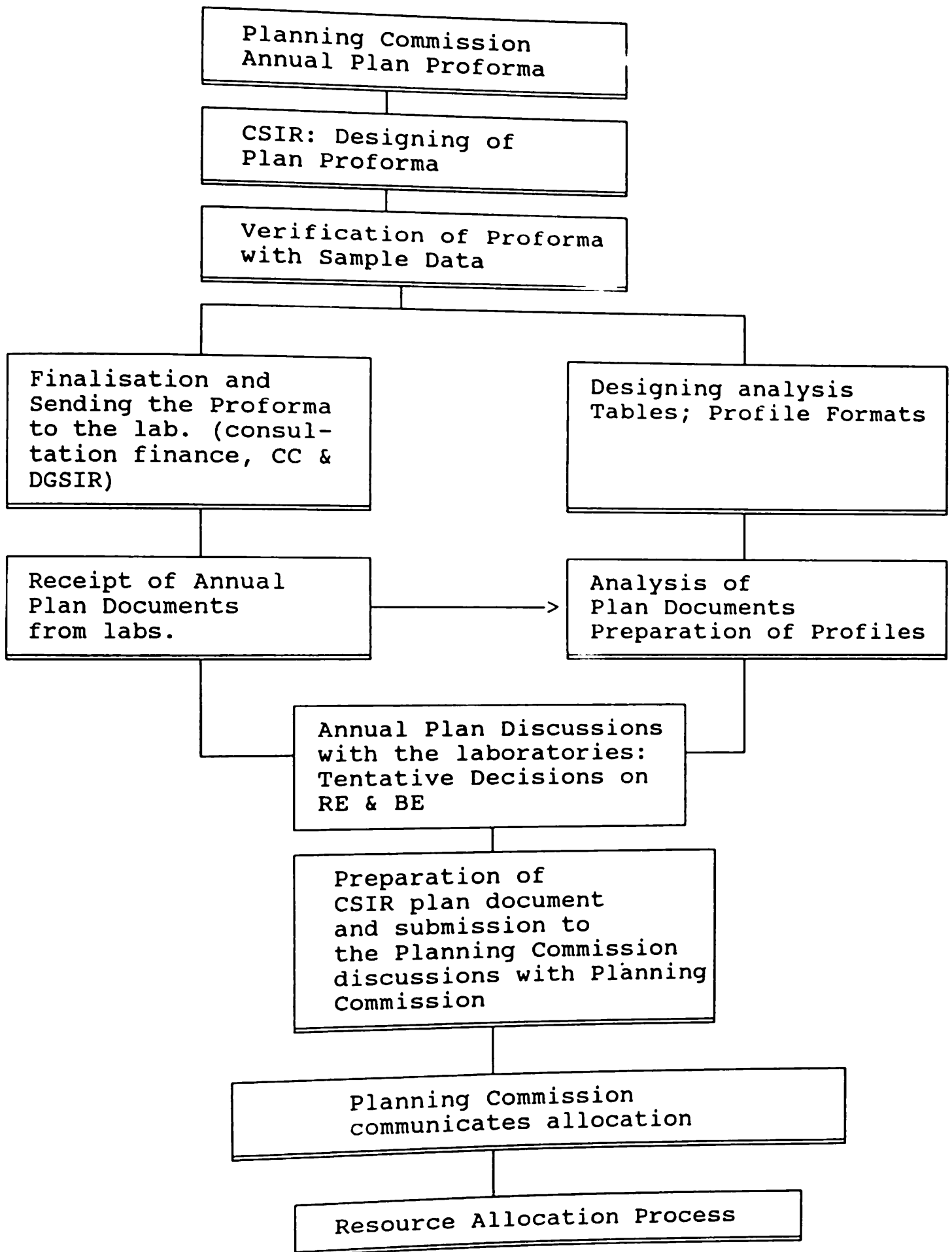
The plan proforma underwent changes every year. The experience of the previous year, the change in demand from Planning Commission, feedback received from the laboratories, change in policy guidelines change in leadership at the government and also at CSIR HQ seemed to have had an effect on the decision of designing a suitable questionnaire. The classification of projects and classification of R&D areas underwent revision almost every year.

Till the formulation of Annual Plan 1980-81, CSIR was following the laboratory approach in presenting its plan to the Planning commission. Specific projectwise presentation was done on the categories of All India Co-ordinated projects and Rural Development projects. Rest of the proposals were shown as requirements of the constituent individual laboratory. The integration of data at CSIR had no major problems.

The new sixth five year Plan (1980-85) was formulated during 1980-81. As per the mutual agreement between CSIR and the Planning Commission and also as per the policy guidelines of the then Vice-President CSIR, CSIR switched over to area approach from laboratory approach in presenting its plan proposals to the Planning Commission. The entire activity of CSIR laboratories were grouped into 26 areas. The UNESCO classification of discipline of Research followed till then as R&D areas was also continued. There was no change in the methodology of data collection system. CSIR continued to review the proforma sent by Planning Commission and designed its proforma and sent to the laboratories for enabling them to prepare their annual plans. The laboratory annual plan proposals were integrated into the 26 areas and the plan proposals projected to the Planning Commission. However the involvement of the Coordination Councils was not strictly followed and their role was also perhaps not effective as envisaged in the system.

Fig. 2.3 shows the Plan formulation process during the period 1981-87

Fig.2.3: PLAN FORMULATION PROCESS TILL 1981-87



The seventh five year plan (1985-90) of CSIR was formulated by a working group. The plan was arrived at, based on the identification of major areas and programmes by this group through several interactive meetings. The plan proposals received specifically for this purpose from the laboratories were integrated by the group of experts both from within and outside the CSIR laboratories. The plan was brought out in five volumes - one each for the five Coordination Councils viz. - Physical and Earth sciences, Chemical Sciences, Biological Sciences, Engineering Sciences and Information Sciences. Based on the above identification of the areas and programmes the laboratories used to send their annual plan proposals in the form of plan documents every year as per the proforma designed by the Planning Group of CSIR. CSIR continued the area approach and presented its plan proposals in 26 areas to the Planning Commission. However, these 26 areas were different from those followed during the 6th five year plan. The methodology followed for data collection continued to be in the form of questionnaire.

Since 1985-86, information on socio-economic relevance, the aim and emphasis of Basic research/Applied research, details of projectwise manpower deployment and re-deployment from completed/abandoned process was deleted in the proforma. The reason was because of the difficulty in getting the valid data on the projects of the laboratories and the inability at the CSIR HQ. of subsequent meaningful analysis of these parameters. However, all or some part of such information was sought in a piece-meal manner from time to time. A sample questionnaire followed during the seventh five year plan is enclosed in the Annexure 2.3.

The exercise on Annual Plan data collection in an organized manner through computer proforma was discontinued from 1987 till the beginning of a new eighth five year plan i.e five year plan 1992-97 and Annual plan 1992-93. In 1987, i.e. during the middle of the seventh five year plan, the then DGSIR introduced a concept known as 'Peer Review'. The plans of laboratories were discussed before invited peers and allocations were indicated for the remaining three years of the seventh plan. The annual plans were formulated based on these discussions and also on the proceedings of the research councils of the laboratories.

The exercise of annual plan meetings with the laboratories has virtually been wound up. Since the beginning of the eighth five year plan (1992-97), a revised annual plan proforma was designed and data were collected for plan formulation. The questionnaire followed during the eighth five year plan is enclosed in the Annexure 2.4. The entire exercise of CSIR plan formulation gets completed in two months in September - October of every year.

2.3.1 Interface with Finance: Project Costing, Budgeting and Accounting

Planning and Finance have definite linkages in their working since the Planning process aims at optimum utilisation of the available financial resources.

The plan formulation process integrates all the proposals and arrive at the budgetary requirements. The project proforma designed and used for the data collection expected projection of project-wise budget requirements. The proforma also had inbuilt consistency checks and also provision for matching of these project-wise requirements with the projection based on the conventional budget heads viz. salaries, contingencies, maintenance, chemicals & apparatus, works & services, equipment, furniture, library books, vehicles, pilot plants etc.. The data collection system could not ensure the one to one matching of these two projections.

Inspite of commitments given by the CSIR top Management to the policy making bodies the system of project costing and accounting could not be implemented in the laboratories. Each laboratory was following its own system. Attempts were made several times to simplify and standardize the system. A working group was formulated involving Finance and Planning people of CSIR HQ. and few selected laboratories who had the expertise on project costing (eg. NAL). This group was able to formulate the guidelines and circulated them to all the laboratories in 1984. Again, in September 1985, A get-to-gether of the PME scientists of all the laboratories was organized by the CSIR Planning Group and these were discussed in details. However, this never got implemented in most of the laboratories.

It was decided to overcome this deficiency in the data collection system through the computerisation of financial records having proper linkages with computerised system for project costing budgeting and accounting. The following section describes the attempts made in this direction.

2.3.2 Computerization of Financial Records

In July, 1986 the then Financial Adviser to CSIR Shri M.V. Ramakrishnan initiated the computerization of financial records. A conference of financial officers of CSIR was organized during 24- 25 July 1986 at CSIR New Delhi. The objective was emphasized as follows:

"The main objective of the introduction of computerization of accounting system is to optimize efficiency and faster disposal of day-to-day work to facilitate upto-date maintenance of information pertaining to the finance of the organization and then instantaneous retrieval as and when required for taking effective and meaningful management decisions. It is all the more necessary because of large volume of financial transactions involved in recording, classifying, collecting and summarizing the data in normal parlance known as book keeping and eventually leading to interpretance of information, resulting in management accounting and cost accounting subsystems".

Through this conference attended by the financial officers of all the CSIR laboratories, Computer specialists, experts in government finance departments, it was possible to impress and sell the idea of the importance of computerization. As an outcome of the conference, DGSIR constituted a working group and a sub-group for computerization. Computer and Financial experts from selected laboratories viz CEERI- Pilani, SERC-Madras, NAL- Bangalore, RRL-Hyderabad (now known as IICT, Hyderabad), NIC- Delhi, Finance Ministry and CSIR HQ. were the members of working groups and sub-groups.

Groups were formed for the development of specific packages on:

- * Pay Roll And Social Welfare Accounting System
- * Uniform Budgeting and Accounting System
- * Project Accounting and Costing System
- * Inventory Control System

In addition to these, a need was also felt for the development of personnel information system for the of certain information.

SERC Madras, NAL and CEERI were jointly involved in the development of software packages related to the first three items above. RRL, Hyderabad was the nodal centre for the development of an inventory control package.

Systems report for the development of the first three items was submitted in two parts in Jan - 1987 and the report was accepted. NAL and SERC, Madras went ahead with the development of the package.

In September 1987, a decision was taken to restrict the inventory control package to only those portions relating to financial accounting and project accounting.

The restricted approach was made due to the fact that development of a complete package required evolving a standard coding pattern for all stores used in various laboratories engaged in diversified fields of R&D which in turn would have required extensive time to prepare item history, vendor details vendor performance, stock control, purchase, issue controls etc.

A decision was also taken that

- "i. COBOL will be used for conventional processing and reporting system and
- ii. DBASE III will be used for data input capture, validation daily reporting as well as for handling queries".

The Project Particulars were prepared by NAL keeping the Annual Plan Proforma sent by CSIR as the basis. The items included were:

Title of the Project; Continuing or New; Date of Commencement (Planned Date, Actual Date, Reasons for delay); Expected date of completion; Emphasis of the project in terms of Basic Research, Applied research, Experimental Development, Surveys etc.); Stages of Work; Linkages of the Project- Name of the agency, Nature of Linkages, nature of assistance; Name of the Collaborator and nature of collaboration; End User - Name of the user, Nature of Commitment.

A format was also designed (Fig. 2.4) to facilitate project costing exercise as a part of computerisation in the project accounting and costing system.

One more development occurred during the time of implementation at the CSIR HQ. A separate division "**Computer Division**" was established. Quite a few new programmers were inducted. They were also given the responsibility of coordination work related to the computerization and supply of packages developed to all the laboratories. Decisions on Hardware were also taken.

The packages were developed and the softwares supplied to all the laboratories. All the laboratories were also provided with PC-AT system from CSIR HQ, specially for implementing the computerization. The project costing package was developed based on the guidelines on project costing prepared and circulated to all the laboratories during 1984 as an outcome of CSIR's commitment.

However, the package could not be implemented in most of the laboratories as well as in CSIR HQ.

One of the major reasons for the failure could be the lack of appreciation at the laboratory level of the need for computerization and implementing the uniform software packages. Computerization and smooth flow of information to CSIR HQ, were perhaps, viewed as control mechanisms interfering with the freedom of the laboratory management. Besides these sociological problems, these packages also had technical compatibility deficiencies because of the usage of combination of COBOL, DBASE III and the limited package on inventory control. Project costing and accounting was never considered essential by the laboratory management.

The packages worked very well under trial runs according to almost all the persons actually involved in the development of the packages, the computer experts as well as the financial experts.

**Fig. 2.4: DATA FORMAT FOR PROJECT-COSTING
AND ACCOUNTING SYSTEM**

Head of Account	Total Estimated Cost	Expenditure for the Month	Cumulative Expr. on the Proj.	Balance available (2-4)
1	2	3	4	5
(A) <u>Cash-Flow Items</u>				
1. Salary				
2. Other Allowance				
3. Consumable (P)				
4. Consumable (G)				
5. Capital Equipment				
6. Works/Service				
7. S. Equipment Service				
8. Service Charges				
9. Others				
10. Overheads				
Total (A)				
(B) <u>Non-Cash flow Items</u>				
11. Depreciation Charges				
12. Others				
Total (B)				
(C) Less: Transfer adjustments				
Total Cost (A + B - C)				

Perhaps, the Top Management had neither any intentions nor appreciation for completely switching over to Computerization of financial records with well-knit interface with the Project Accounting and Costing System. The implementation of the package was never made mandatory. The laboratories were asked to maintain the manual accounting system and records also in parallel to the computerization of records. Obviously, it involved huge work load and persons who were not having any inspiration for working in the computers never intended to use the software package supplied.

One more problem was the difference of views on the responsibility of Project costing and accounting. The PME scientists thought it was the responsibility of the Finance whereas the Finance thought it otherwise. The guidelines for project costing and accounting circulated by the CSIR had recommended strengthening of the PME cells in the laboratories to facilitate the implementation of Project Costing and Accounting procedures in the laboratories. This never happened.

Because the system was not prevalent in most of the laboratories, the computerization and supply of uniform software packages never helped to switch over to the new system.

2.4 DATA COLLECTION FOR REPORTS

The data collection process for generating the following mandatory reports at CSIR HQ. is described in this section.

1. CSIR Annual Report
2. Monthly report and
3. Quarterly Reports on predetermined milestones on important projects.

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2.4.1 CSIR Annual Report

There has been no specific proforma for data collection for the annual report. The data generally related to the major achievements in terms of technology development (Product or process, new or improvement), technology transfer, progress on major projects or major areas, achievements in basic research, research outputs, inputs of processes, products, papers, monographs, patents etc, honours and awards pertaining to the laboratory as a whole or to individual and other important events which needed specific reporting, manpower and financial data.

The Schedule for Data Collection for CSIR Annual Report is given below:

First week of April:	Letters to laboratories asking for information for inclusion in the annual report relating to the financial year just ended, to be sent by first week of May.
First week of May:	Reminders to laboratories who have not sent. (Response is approximately 30% by this time).
First week of June:	Processing of information received from laboratories. In those cases where information is not available, alternative sources are tapped and a first draft edited. Data have to be gathered from other technical divisions of CSIR with regard to technology utilization, fellowships, international programmes etc.
First week of July:	First draft submitted to DGSIR for his consideration and approval.
First week of August:	DGSIR approves the draft.

- First week of September: The draft, revised on the basis of modifications etc. suggested and submitted to DGSIR for approval.
- First week of November: Draft submitted to the Governing Body for their approval.
- First week of December: The draft again revised on the basis of the decision of the Governing Body, CSIR submitted to CSIR Society. Report published and circulated.
(Since Prime Minister is the President of CSIR Society, the society meeting depends on his convenience and sometimes this may get delayed by a few months).

2.4.2 Monthly Report

Important major achievements of CSIR, during the previous month need to be reported to the PM's Secretariat & Cabinet Secretariat every month during the first week. Laboratories used to send their data by the 3rd of every month and these were screened for their relevance. A consolidated report was sent to the Cabinet secretariat.

The format for the monthly reports is :

- * Details on sponsored/consultancy projects completed during the year (Title, Date of start, agency name, amount)
- * Surveys completed (Nature of Surveys)
- * Training in India and abroad - (area, organization, duration of training)
- * Technologies Transferred during the month (Technology, agency to whom transferred, Terms and Conditions)

- * Major constructions completed during the month
- * Utilization of services offered by the laboratory during the month.
- * Installation of major equipment/ Computer/ facility during the month
- * Name(s) of equipment, facilities and the cost; significant major R&D projects completed during the month and highlights.
- * Outputs on pilot plants
- * Any other major events need to be reported to PM/ Cabinet
 - e.g. Honours/ awards;
 - Special functions like foundation day;
 - Special Training programmes organized by the lab for the benefit of general public or specialized construction
 - Special visits of dignitaries;
 - International collaboration signed;

2.4.3 Quarterly Monitoring Reports

A meeting was organised by the Secretary to the Prime Minister on 25th November, 1985 to review the position regarding targeting in scientific departments. The following departments (scientific) were represented by their Secretaries:

- * DST
- * Space
- * Electronics
- * Ocean Development
- * DAE
- * DSIR
- * Environment & Forests

Dr. S. Varadarajan, the then Secretary, DSIR and Director General, CSIR emphasized to the need of strengthening the monitoring system in CSIR involving

various parameters such as strengthening of CSIR HQ. staff, removal of restrictions on mobility of scientists and a system of monitoring physical progress of research projects in the national laboratories. In general, the need was stressed to evolve a system of Annual Action Plan to reflect the manner and time frame of action in respect of the activities, functions to be performed by the departments, organizations during the course of the year. This system started functioning from the year 1986-87 i.e. beginning April, 1986.

After several iterations and interactions with national laboratories CSIR in April 1986, prepared a document entitled "Activity Milestone (Upto March 1987) Significant Research Projects". The research programmes were broadly classified as -

- a. Projects of interest to Industry, Commerce, Agriculture:
- b. High Technology:
- c. Societal Missions:
- d. Specialized Information, Data Bases
- e. Modelling applications
- f. Manpower development
- g. Basic Sciences:

Specific major projects were identified under each of the above areas. The project details included in the document were:

Title ; Name of the Principal Investigator; Participating Laboratories/ Agencies/ Organizations; Milestones for different quarters

This document was sent to all the Directors requesting them to follow the system of monitoring so that a proper reporting could be sent to the PM's office every quarter as per the decision taken at the high level meeting on 25.11.1985. A monitoring mechanism was devised according to which a planning scientist at the CSIR HQ. was linked to a set of projects in one or more areas and their Principal Investigators and Project Leaders in different laboratories. The Project Leader, with the approval of the Director of the Laboratory, was expected to send a Monitoring Report every quarter on the pre-defined milestone relevant to that particular quarter. The identified milestones were for one or all of the 4

quarters. The milestones were identified for 4 quarters, namely by end of June, by end of September, by end of December and by end of March. A particular project can have a milestone for any of these 4 quarters and not necessarily for all the 4 quarters. The reports received from the laboratories were consolidated and a comprehensive Monitoring Report called "Quarterly Milestone Report" was sent to the PM's Office.

However, because of the federal structure of CSIR Laboratories as well as the autonomous nature enjoyed by each laboratory, the direct linkage between the CSIR Planning Scientists and the respective Project Investigators in the Laboratories did not function effectively and CSIR HQ. obtained the information through the Laboratory Director.

This system continued with the updating of the Activity milestone Document every year and this became a process of preparation of CSIR Annual Action Plan for a few selected major projects e.g. Mission Projects on Water, Oilseeds, etc. From the beginning of the eighth five year plan, laboratories have been asked to specify quarterly milestones for the selected projects as a part of their Annual Plan proposals.

2.5 PARLIAMENT QUESTIONS

It will be extremely difficult to predict the nature and type of Parliament questions. The questions generally cover wide areas ranging from Policy matters, specific micro-details of any project, consolidated information on laboratories, data on finance, manpower, projects, investment etc. The annual plan documents serve as the base information for answering parliament questions. However, invariably, the questions used to be transmitted to the concerned laboratory for getting specific replies with authentic data/information.

2.6 OTHER SOURCES OF INFORMATION

In addition to the Annual Plan proforma, Information was generated through

- i. Agenda and proceedings of the Research councils/ Advisory Councils.

- ii. Agenda and proceedings of the Management Councils
- iii. Agenda and proceedings of the Coordination councils/ Technical Advisory boards
- iv. News letter of the laboratory
- v. Personal interaction with the Directors and other officers of the laboratories
- vi. International meetings

2.7 CONCLUSIONS

The data collection system involving questionnaire and other modes prevalent since the inception of the planning process in CSIR has been discussed in detail. How far this system was successful in meeting the information requirements of the decision making authorities? What were the problems in the data/ information flow from the laboratories to the CSIR HQ. and vice versa? There are many such questions which may not elicit any satisfactory answers straightaway. It all depended on the response to the questionnaire and other queries as well as the analysis of data which converted the data received from the laboratories to information needed for the decision making.

Some of these aspects on the analysis of information are discussed in the next chapter.

Annexure-2.1 Schedule of work for CSIR Annual Plan- Prevalent during the Fifth and Sixth Five year plans. (i.e. between 1976-1985)

- First week June:** Designing of the proforma for the Annual Plan taking into consideration the essential requirements of the Planning Commission and Headquarters.
- Third week June** Feedback from the laboratories. Physical verification of problems of data sought from a sample of laboratories.
- First week of July** Finalisation of the annual Plan proforma with the approval of Chairman of Coordination Councils and DGSIR.
- Third week of July** Printing and sending of Annual Plan proforma along with instructions with a request to send the documents so that they are received at the HQ and Chairman, Coordination Council by 15th Sept.
- August till end of September:** Designing of profiles, analysis of programmes etc. Coordination Council Chairman to give their assessment of the project particulars, annual plan of labs, and prepare the annual plan document of Coordination Council along with projection till and of new plans. CC document to reach Chief(Planning) from the Chairman by 30th september.
- October :** Discussion of Annual Plan, RE and BE and other issues with the laboratories and suggestions of estimates for and tentative estimate of BE for the coming year.
- November :** Preparation of overall estimates for Budget and the Draft Annual Plan document.
- Second week of Dec:** Preparation of final document of Annual Plan.

(Annexure 2.1 Continued)

Third week

of Dec: Discussion of the final document with the Chairmen Coordination Councils, submission to DGSIR, and for approval.

Fourth Week

of Dec: Discussion with the Planning Commission.

January: Await final communication for Planning Commission.

February-March: Reallocation exercise on the basis of allocations by the Planning Commissions.

Ist week of April: Draft reallocations for circulation amongst Chairmen, Coordination Council.

Third week of

April: Discussion with Chairman of C.C. of the reallocation figures for SE and communication of figures.

May: Feedback from the laboratories on the SE.

Annexure 2.2
Sample Questionnaire used during the Sixth Five Year (1980-85) Plan

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCHANNUAL PLAN 1982-83ANDPROJECT BUDGETRE 1981-82 & BE 1982-83

Review of achievements in 1980-81. Progress anticipated in 1981-82 and Thrust proposed to be given in 1982-83.

- I.
1. Major R&D achievements in different "Area of R&D" during 1980-81. Please highlight the results, possible applications and impact.
 2. Projects completed in different "Area of R&D" during 1980-81. Please give - Titles, total cost, manpower released and step taken to productionise the results.
 3. R&D Infrastructural facilities created for different "Area of R&D" in 1980-81.
- II.
1. The thrust proposed to be given to the work of the laboratory in different "Area of R&D" during 1981-82.
 2. Titles of major projects in different "Area of R&D" as defined in V (1.1) to be taken up during 1981-82.
 3. Infrastructural facilities proposed to be created for different "Area of R&D" during 1981-82.
- III.
1. "Area of R&D" to which major thrust is planned during the annual plan 1982-83.
 2. New proposals/projects that are in advanced stage of processing and approval in different "Area of R&D" and hence likely to commence during 1982-83.
 3. Infrastructural facilities planned to be created for different "Areas of R&D" during 1982-83.
- IV.
1. "Areas of R&D" to which major thrust is planned during 1983-85.
 2. New proposals/projects to be taken up in different "Areas of R&D" during 1982-85.
 3. Infrastructural facilities planned to be created for different "Areas of R&D" during 1982-85.

- V. 1.1 Kindly arrange the R&D project particulars as per proforma I in the plan document in the following order:
- (i) Nationally important and coordinated projects
 - (ii) Rural Development projects
 - (iii) Major projects
- (a) UNDP, PL-480 and other internationally or foreign supported projects, etc.
- (b) DST, Electronics Commission, ISRO, ICAR, ONGC, ICMR and Ministry/Department supported projects, etc.
- (c) Other in-house projects of the laboratory whose financial input (Plan+Non-plan) is estimated to exceed Rs. 25 lakhs over the VI plan period 1980-81 to 1984-85.
- (d) Project particulars of other minor projects are to be filled separately for each and arranged R&D area-wise "area of R&D" as per Appendix I).
- 1.2 Information particulars of Infrastructure items covered under Group II (Appendix VII) are to be given as per proforma II separately for each centre.
- 1.3 Information particulars of infrastructure items covered under Group V (Appendix VII) are to be given as per proforma III separately for each centre.
- Note 1: If infrastructure groups and extension/regional centres have any R&D projects, the details of such projects may be given as per proforma I.
- Note 2: No proforma to be filled for infrastructure covered under Group III and IV. Financial details for these are also to be provided along with others in the overall statements 1.1 to 5. Please also fill statement 1 and 2 for these groups.
- VI. 2.1 Financial (Plan + Non-Plan) deployment for RDP and major projects (as defined in V (1.1) is also to be given separately in the overall statements 1.1 to 5 in the order specified above in V (1.1).
- 2.2 For all other minor projects financial (Plan + Non-Plan) may be clubbed R&D areawise.

2.3 Requirements for infrastructure, separately for each, also be arranged in the same order as the infrastructure particulars.

Note 3: The items to be focussed under I & II need be highly selective and description need be pointed and crisp. Focus on a few important ones where most of the finances would be deployed.

(Description on I, II, III should normally not exceed five pages in all).

General Instructions

1. Proforma details are to be filled by the Scientists and project Leaders, and Heads of Infrastructure facilities.
2. Consolidated statements 1.1 to 5 and lists are to be prepared by Planning Group of the laboratory. While preparing these, an overview may be taken so as to avoid duplication of any kind in requirements. Planning Group and ACCount Section may kindly ensure that project budget and Conventional budget information and figures are in agreement. Kindly also ensure information provided in the proforma of project and infrastructure particulars in the Statements 1.1 to 5 and in the lists are consistent.
3. Planning Group of the laboratory may help the scientists in filling the proforma for annual plan. It could also discuss the state of the projects and the requirements with the project leaders in the light of the tasks contemplated to be performed and existing facilities in the laboratory.
4. Planning Committee of the laboratory consisting of the Director and project coordinators may kindly critically go through the review and details of each project assess the merit of the proposals in all their aspects and the additional requirements being suggested in the light of the state of the project and level of effort required to achieve the terminal objectives of the project within the contemplated time frame.

Ten (10) copies of the Review (I, II, III), project details and Consolidated Statements 1.1 to 5 Appendix of Lists need be sent duly bound.

"Area of R&D" AS PER APPENDIX I

R & D AREASCode

- 010 MATERIAL DEVELOPMENT
- 011 Ferrous & Non-ferrous Material
012 Other Materials
013 Paper Technologies
014 Industrial Ceramics
- 020 POLYMER SCIENCE & TECHNOLOGY
- 030 CATALYSIS
- 040 CORROSION
- 050 CHEMICALS
- 051 Synetic Pesticides/Pesticides from Plant Sources
052 Biological Evaluation of pesticides & other agro-chemicals
053 Process Technology for drugs & Intermediates
054 Paints & Resins/Varnishes
055 Electro Chemistry
056 Inorganic
057 Salt & Marine Chemicals
058 Any other (specify)
- 060 BIO-TECHNOLOGIES
- 061 Tissue Culture
062 Fermentation Technology
063 Enzyme Engineering
064 Utilisation of Agriculture & Forest residues/Products
and slaughter wastes
065 Emerging Areas
066 Molecular Biology
- 070 ENERGY
- 071 Coal Utilisation - MHD Gasification, LTC etc.
072 Solar Energy & Biogas
073 Biomass & Energy Plantation
074 Batteries
075 Geothermal Energy
076 Conservation of Energy
077 Any other (specify)

- 080 ELECTRONICS
- 081 Instrumentation
082 Control Systems
083 Solid State devices
084 Communication & TV systems
085 Accoustic & Audio Engg.
086 Any other (specify)
- 090 NATURAL PRODUCTS
- 091 Surveys & Screening
092 Medicinal & Aromatic Plants
093 Other Economic Plants
094 Ornamental Plants
095 Aerobiological Survey
096 Fungal based products
097 Chemistry of Natural products
098 Plant Breeding
099 Phyto-Chemistry
100 Botany & Pharmacognosy
101 Plant pathology
102 Entomology
103 Any other (specify)
- 200 MACHINERY DEVELOPMENT
- 300 OCEANOGRAPHY & ALLIED FIELD
- 301 Oceanographic Research
302 Allied fields
303 Any other (specify)
- 400 ENVIRONMENTAL RESEARCH
- 500 OTHER AREAS OF RESEARCH
- 501 Post harvest technologies
502 Health
503 Health environment
504 Production of Bio-chem.
505 Experimental medicine
506 Housing
507 Mining & Metallurgy
508 Aeronautics
509 Standards (Maintenance)
510 Instrumentation

- 511 Civil Engineering
- 512 Leather
- 513 Drugs
- 514 Industrial Toxicology
- 515 Geological exploration
- 516 Information system, Information Dissemination
including publication

- 518 Any other (specify)

DISCIPLINES OF RESEARCH

1. PHYSICS & ALLIED SCIENCES

CodeDISCIPLINES OF RESEARCH

101	Atmospheric & Ionospheric Physics & Radio propagation
102	Aeronautics
103	Ultrasonics
104	Physical Oceanography
105	Aerodynamics
106	Biophysics
107	Low Temperature physics and cryogenics
108	High pressure physics and technology
109	Semiconductors
110	Solid State physics
111	Lasers and Masers
112	Liquid crystals
113	Thin film technology
114	Microwave technology
115	Ultra-High vacuum technology
116	Ferrites
117	Fuel cells
118	Optics and Optical instruments
119	Visible
120	Ultraviolet
121	Infrared
122	Spectroscopy
123	Instrumentation
124	Metrology
125	Cybernetics
126	Applied mathematics
127	Statistics and operations research
128	Material science
129	Materials characterisation
130	Solar energy
131	Digital electronics and process control instruments
132	Precise determination of fundamental physical constants and standards for physical measurements
133	Resonance spectroscopy
134	Carbon products
135	Electrophotography
136	Building physics
137	Cryogenic materials
138	Meteorology
	Other (specify)

2. CHEMISTRY

- 201 Solid state chemistry
- 202 Radiation chemistry
- 203 Thermodynamics
- 204 Spectroscopy
- 205 Polymer chemistry
- 206 Chemistry of magnetic materials
- 207 Coordination compounds
- 208 Catalysis and catalytic agents
- 209 Silicones and boranes and allied compounds
- 210 Chemistry of Natural products
- 211 Heterocyclic chemistry
- 212 Synthetic organic chemistry and organic reaction mechanism
- 213 Bioorganic and bio-inorganic chemistry
- 214 Pharmaceuticals and drugs, particularly in the areas of population control, parasitic diseases, tuberculosis and leprosy
- 215 Inorganic pigments
- 216 Electrochemicals
- 217 Fine chemicals
- 218 Marine chemicals
- 219 Dyestuffs
- 220 Petrochemicals
- 221 Perfumery chemicals
- 222 Carbohydrates
- 223 Tanning agents
- 224 Paints, resins and varnishes
- 225 Oils
- 226 Fats and surfactants
- 227 Chemical Oceanography or Marine chemistry
- 228 Chemistry of building materials
- 229 Inorganic and organic ion exchanges
- 230 Metal finishing
- 231 Batteries
- 232 Electrometallurgy
- 233 Insecticides
- 234 Pesticides
- 235 Herbicides and Weedicides
- 236 Corrosion and its prevention
- 237 Electrochemistry
- 238 Analytical chemistry
- 239 Electronealytical Chemistry
- Other (specify)

3. BIOLOGICAL SCIENCES

- 301 Phycology including marine alogology
- 302 Mycology & Plant pathology
- 303 Genetics and Plant Breeding
- 304 Neurobiology
- 305 Industrial microbiology
- 306 Molecular biology

7. ENGINEERING & TECHNOLOGICAL FIELDS

- 701 Electronics
- 702 Instrumentation technology
- 703 Chemical Technology and Engineering
- 704 Biochemical and biomedical engineering
- 705 Measurement engineering
- 706 Fibre technology (including composition)
- 707 Fuel technology and engineering
- 708 Combustion engineering
- 709 Petroleum technology and engineering
- 710 Food technology
- 711 Public Health Engineering
- 712 High-way Engineering
- 713 Civil Engineering
- 714 Structural engineering (including vibration and aeroelasticity)
- 715 Coastal engineering
- 716 Earthquake engineering
- 717 Foundation engineering
- 718 Water resources engineering
- 719 Mechanical engineering
- 720 Electrical engineering
- 721 Central systems engineering and automation
- 722 Refrigeration technology
- 723 Metallurgy
- 724 Solvent extraction of metals
- 725 Bacterial leaching of minerals
- 726 Heat treatment
- 727 Powder metallurgy
- 728 Welding technology
- 729 Automobile engineering
- 730 High pressure technology
- 731 Textile technology
- 732 Chemistry of fibres
- 733 Fibre physics
- 734 Leather technology
- 735 Mining engineering
- 736 Mineral engineering
- 737 Aeronautical engineering
- 738 Offshore structures
- 739 Marine instrumentation
- 740 Marine electronics
- 741 Glass & Ceramic Technology
- 742 Refractories
- 743 Tribology (Friction, wear and lubrication)
- 744 Polymer concrete
- 745 Computer software development for engineering application
- 746 Studies in rural technology
- 747 Architecture and town planning
- 748 Forest engineering
- 749 Fire prevention technology

Others (specify)

8. SCIENCE POLICY, SCIENCE PLANNING, TECHNOLOGY TRANSFER AND FUTUROLOGY

- 801 Technological forecasting
- 802 Social implications of science and technology
- 803 Industrial and organisational psychology
- 804 Science Policy
- 805 Planning, Monitoring, Evaluation and Coordination
- 806 Technology Assessment
- 807 Technology Transfer
- 808 Training
- 809 Information Processing
- 810 Documentation, Reprography
- 811 Translation
- 812 Publication, Printing
- 813 Industrial Liaison and Extension
- 814 Surveys (Economic and Industrial) and Economic and O R studies

Others (specify)

APPENDIX III

- | CODE | Nature of project |
|------|--|
| 1. | Nationally Important and Coordinated Projects |
| 2. | RDP |
| 3. | Major Project (UNDP, PL-480 etc. supported) |
| 4. | Major Project (DST, ISRO, Electronic Commission ONGC, Ministry /Department, supported) |
| 5. | Major inhouse project (costing more than Rs.25 lakhs & more over the Vth Plan Period). |
| 6. | Minor project. |

APPENDIX IV

- | CODE | Socio-economic Aim |
|------|---|
| 1. | Development of Agriculture, Forestry and Fishing |
| 2. | Promotion of Industrial development |
| 3. | Promotion of rural development |
| 4. | Production, conservation and distribution of Energy |
| 5. | Development of transport and communications, Telecommunication. |

6. Development of Health Services
7. Development of Education
8. Exploration, Assessment and Protection of Earth, the sea, the atmosphere

APPENDIX V

Bottlenecks

a) Technical

- 1 - Unexpected technical problems;
- 2 - Project redefined;
- 3 - Accorded Lower priority and resources diverted elsewhere;
- 4 - Some other related project behind schedule;
- 5 - Inadequacy of scientific/technical expertise;
- 6 - Inadequacy of co-operation or indifference from collaborator / sponsor;
- 7 - Redundancy;
- 8 - Obsolescence;
- 9 - Deputation or study leave of project leader;
- 10 - Project leader resigned or retired;
- 11 - Other (specify).

b) Infrastructural

- 1 - Inadequacy of space;
- 2 - Inadequacy of relevant literature with documentation facilities;
- 3 - Non-availability of equipment;
- 4 - Equipment failure;
- 5 - Non-availability of materials/chemicals;
- 6 - Inadequacy of supporting technical manpower;
- 7 - Inadequacy of funds;
- 8 - Administrative rules/procedures;
- 9 - Other (specify).

APPENDIX VI

Codes for stages of work

Level I

01 - Exploratory studies, 11 - Laboratory experimental work with a view to optimise different parameters, 12 - feasibility of upscaling to bench level, level II, 21 - bench scale experimentation at larger scale with a view to optimise different parameters from commercialisation point of view, 22 - feasibility of taking up Pilot Plant trials on the basis of techno-economic and market viability, level III, 31 - Pilot Plant trials/proto-types making/batch production, 32 - feasibility report, level IV, 41 - User trials/demonstrations, 42 - Commercial production by entrepreneur with technical assistance of the laboratory, 42 - any other (specify).

Grouping of R&D projects and Infrastructure

Different proforma have been designed for R&D projects and infrastructure. For all R&D projects proforma I and statement is to be filled. The infrastructure items have been classified into groups (Group I to IV). For these information particulars vary from that of Group I. Extension/Regional Centres etc. form the V group.

Group-I R&D Projects

Separate questionnaire will be filled up for each project. The project may include all or some of the following stages:-

Preliminary study/Feasibility Study, Surveys, Research, Design and Development work, Prototype, Development, testing and field trial/pilot Plant/Batch production activity. Proforma I and statement 1.

In order to complete the R&D projects in a laboratory a number of co-mmon facilities/suporting facilities/infrastructural facilities are required to be maintained or created. These may be grouped as:-

Group-II

<ul style="list-style-type: none"> 2.1 Library 2.2 Information, Liaison, Publicity, Exhibitions 2.3 Planning, monitoring and evaluation 2.4 Training programmes etc. 2.5 Design and Drawing Office 2.6 Workshop 2.7 Testing labs. 2.8 Service & maintenance of Instruments 2.9 Animal House 2.10 Glass blowing 2.11 Others (specify) 	}	Proforma II, statement 1&2
---	--	-------------------------------

Group-III

Civil construction, Electrical Installation and Maintenance pertaining to civil works, Electrical works, sanitary, water supply etc.	}	Statement 1 and 2.
--	--	--------------------

Group-IV

4.1 Administration, Accounts, Establishment activities like wat. Ward Garden etc.	}	Statement 1 and 2
---	--	-------------------

Annexure 2.2

4.2 Purchase, Stores.

4.3 Dispensary, School, Club and other Staff Welfare activities.

Statement
1 and 2.



Group-V

Extension/Regional Centre's etc.

Proforma III
statement 1 and 2.



•
•
•
•
•
•
•
•
•
•
•

PROFORMA - I
For all R&D Projects
(To be filled in by Project Lead)

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH

ANNUAL PLAN 1982-83

PROJECT BUDGET STATEMENT: R.E. 1981-82, B.E. 1982-83
& SIXTH FIVE YEAR PLAN PROJECTION (1980-81 to 1984-85)

PROJECT PARTICULARS

1. Name of the Laboratory/Institute :
2. Title of the Project :
3. Project No. :
4. Scientific & Technical objectives of the project :
5. Importance of the project * :
6. Status of Technology * :
7. Current status of the project & further work proposed to attain the objectives :
8. Justification for continuing the on going project or taking up the new proposal . :
9. Name and address of the User if any and the extent they are involved or committed. Please indicate nature of commitment also. :
10. Please outline the work being done by the universities, other agencies, institutes related to the projects. :
11. Please list here the ministries/ financial institutions/public sector undertaking/universities/ other organisation with whom you would like to collaborate. Also indicate the nature of collaboration required. :

12. Do you need any major Equipment, if yes please indicate the specifications and the cost along with the justifications. :
13. Please indicate here construction work to be undertaken Please give with details of work and cost involved. Including the justification. :

14. Give a BAR chart of the project. (Showing proposed programme of work during July 1980 - March 1982 and programme planned vs. actual progress during July 1980 - June 1981). (Only for Major Projects).

S.No.	Activity Name	1980	1981	1982	1983
		July August September October November December	January February March April May June July August September October November December	January February March April May June July August September October November December	January February March

15. Characteristics of the project

Classification of Project		Nature of Project**	Gestation Period	Socio-economic Aim**		
Area of R&D+	Continuing (taken up before April 1978)	□	Long term	□		
	New (taken up during 1978-81)		Short term	□		
Discipline of Research *	New proposed (start during 1981-83)	□				
	New to be taken during (1983-85)					
Type of Project:	Aim:	Emphasis of basic research:		Impact of Applied Research and Long-term basic research:		
Basic Research □	Capability Building □	- To enhance the frontiers of knowledge	□	Usage of raw material	Impor- ted	Indi- genous
	Technique Development □	- Initiate work in new & emerging areas	□	Renewable: Use of Agri- cultural Products	□	□
		- To explore alternative ways for development of existing products/process	□	Forest Products	□	
		- To develop improved techniques of testing and analysis	□	Other (pl. specify)	□	
Applied Research □	Aim	Emphasis of Applied Research		Non-renewable		
	Development □	Product □	New in India □	Type of Tech- nology	Labour Cap. Inten- sive	Inten- sive
	Design Engg. □		Product/Process Efficiency □	Aimed at:	□	□
	Pilot plant □	Process □	Improvement of Quality □	Emphasis:	Import substitution	□
		Turnkey □	Raw material Development □	Export promotion	□	
			Utilization of byproducts/residues □	Need:		
Survey and Data collection □	Aim	Emphasis of survey & data collection:				
	- Statistical & OR Studies □	- Assessment of resources of the region & R&D needs □		- Market for the product exists	□	□
Testing & related routine work e.g. Wind Tunnel/Fatigue Testing/Benefitiation □	- Building of information System □	- Assessment of market and market intelligence □		- Reduction of Production costs	□	□
Any other (specify) □	- Geological data □	- Location of skills □		- Exploitation of natural resources	□	□
	- Environmental data □	- Information organization to cater to the needs of Industry & Research □		- Saving of Energy	□	□
	- Oceanographical data □			- Generation of Employment through Utilisation of results	□	□
	- Meteorological data □			- Substitution of foreign collaboration	□	□
	- Pollution Data □			- Development of S&T capabilities in strategic areas	□	□
	- Any other (specify) □					

* Please fill in relevant code from Appendix II
 ** Please fill in relevant code from Appendix III
 *** Please fill in relevant code from Appendix IV
 + Please fill in the relevant codes from Appendix I

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Date of commencement		Date of completion			Approved by**	Stages of work++ (At what stage the project was and will be:	
Planned date +	Actual date	Reasons for delay*	At the time of approval+	Now		Reasons for delay*	1980-81
						1980-81	1981-82
						1982-83	
Linkages of the Project:			Is the project		Nature of Assistance		
Name of Agency/Lab.	Nature of Linkage***	- Sponsored	<input type="checkbox"/>	Equipment & Machinery	<input type="checkbox"/>	Foreign Experts	<input type="checkbox"/>
1.		- Consultancy	<input type="checkbox"/>	Materials	<input type="checkbox"/>	Fellowships	<input type="checkbox"/>
2.		- Supported	<input type="checkbox"/>	Training	<input type="checkbox"/>	Additional staff	<input type="checkbox"/>
3.		- Turnkey	<input type="checkbox"/>				
Financial commitment of the other organisations/agencies							
Name of the Agency	Total commitment	Funds Received till March '81	Funds Promised during 81-82	Funds expected 1982-83			
FINANCIAL STATEMENT:		Salaries & Allowances P1+P2+Ps	Chemicals & Apparatus P7	Works & Services P5(1)+P5(2)	Equipment P5(3)	Others	Total
1.	Expect total cost at the time of commencement						
2.	Expenditure Incurred so far (31.3.1980)						
3.	Expenditure Incurred during 1980-81						
4.	Sanctioned Estimate, 1981-82						
5.	Revised Estimate, 1981-82						
6.	@Budget Estimate 1982-83						
7.	@Budget Estimate 1983-84						
8.	@Budget Estimate 1984-85						

+++ CSIR Component only.

+ In this item indicate the month and year, e.g. June 1977 should be filled up as 0677.

++ Please see Appendix VI for codes.

* Please fill in relevant code from Appendix V.

** Use 1 - GB; 2 - EC; 3 - Director; 4 - Other (specify).

*** Use 1 - Utilisation of Results; 2 - Funding; 3 - Sharing of R&D work;
 4 - Exchange of Scientists; 5 - Utilisation of facilities;
 6 - Utilisation of specialised material or techniques developed by other laboratories;
 7 - Trials and testing; 8 - Other (specify).

@ Please indicate the total only.

" Please attach the list of equipment, works and services.

Statement 1Deployment of Manpower @

Name of the project/Infrastructure:

Sl. No.	Name	Age	Designation	Degrees	Field of specialisation	Area of Experience	Man-months involvement in the Project/Infrastructure
---------	------	-----	-------------	---------	-------------------------	--------------------	--

Existing

- 1.
- 2.
- 3.
- 4.
- ..
- ..
- ..

Number of persons	Designation	Field of specialisation	Man-month involvement
-------------------	-------------	-------------------------	-----------------------

Additional during 1981-82

- 1.
- 2.
- 3.
- 4.
- ..
- ..
- ..

Additional during 1982-83

- 1.
- 2.
- 3.
- 4.
- ..
- ..

Additional during* 1983-84
1984-85

Arrange the names in order of seniority. Put + against Project Coordinator and ++ against Project Leader/Head of Infrastructure.

* Please give only the total irrespective of the designation. Man Month involvement in the project may not be given.

Please fill this statement for Infrastructure Group III and IV.

Please give name upto JTA/JSA level only. For other low level mention only the designations, total number and their man-months involvement.

PROFORMA-II
(For infrastructure Group-II)

C.S.I.R. ANNUAL PLAN 1981-83
BUDGET STATEMENT R.E. 1981-82 AND B.E. 1982-83

To be filled by Heads of Divisions/
Sections in charge of

- 2.1 Library
- 2.2 Information, Liaison, Publicity, Exhibitions, etc.
- 2.3 Planning Monitoring, Evaluation, etc.
- 2.4 Training programme etc.
- 2.5 Design and Drawing Office
- 2.6 Workshop
- 2.7 Testing Laboratories
- 2.8 Service & Maintenance of Instruments
- 2.9 Animal House
- 2.10 Glass blowing
- 2.11 Others (specify)

Infrastructure Particulars

- 1. Name of the Laboratory :
- 2. Title of Infrastructure :
- 3. Nature of activities :
- 4. Additional Facilities required :
to be created; :
Give full justification :
- 5. Major bottlenecks, if any :
(Use codes given in Appendix V
- 6. Please fill in statement 1 and 2 also.

C.S.I.R. ANNUAL PLAN 1982-83
BUDGET STATEMENT R.E. 1981-82 and B.E. 1982-83

To be filled up by Scientist-in-charge of Extension Centres,
Field Stations, Regional Centres, Zonal Centres, S&M
Centres, Polytechnological Clinics, etc.

Particulars

1. Name of the Laboratory :
2. a) Name of the Centre :
b) Location :
3. Nature of activities :
4. Additional facilities required
to be created during 1981-82,
1982-83 and 1983-85 with full
justification
5. Achievements
a) during 1980-81
b) expected during 1981-82
6. Major bottlenecks if any
(Use codes given in Appendix V)
7. Please fill in statement 1 and 2 also

____/____

STATEMENT 1.1 : PROPOSED DEPLOYMENT OF PLAN + NON PLAN RESOURCES FOR S.E. 1981-82

Name of the Laboratory :

(To be filled by PME Cell of the Laboratory) (Duplicate to Labho)

Title of the Project/Area	RECURRING					CAPITAL										
	Salary & Allow. P1, P2&P3	Contingencies P4	Maintenance P6	Chem. & App. P7	Total Recurring	Works ^{oo} P5(1)	Ser- ^{oo} vices P5(2)	Equip- ^{oo} ment P5(3)	Furni- ^{oo} ture P5(4) (i)	Vehi- ^{oo} cle P5(4) (ii)	Model ^{oo} & Im. P5(4) (iii)	U/Utore P5(4) (iv)	Lib- ^{oo} rary Books	Misc.	Total Capital	Grand Total (6-16)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
I NATIONALLY IMPORTANT COORDINATED PROJECTS																
1.			1													
2.																
3.																
TOTAL I																
II RURAL DEVELOPMENT PROJECTS																
1.																
2.																
3.																
TOTAL II																
III MAJOR PROJECTS																
1.																
2.																
3.																
TOTAL III																
IV OTHER R&D ACTIVITIES (AREA WISE)^o																
1.																
2.																
3.																
TOTAL IV																
V INFRASTRUCTURE																
1.																
2.																
3.																
TOTAL V																
VI PILOT PLANTS																
1.																
2.																
3.																
TOTAL VI																
VII EXTENSION/REGIONAL CENTRES																
1.																
2.																
3.																
TOTAL VII																
GRAND TOTAL (I TO VII)																

^o The projects for which it is not possible to estimate these heads of expenditure separately, put them under infrastructure
^{oo} Details of Works/Services to be provided in the Statement 4

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Annexure 2.2

Title of the Project/Area	RECURRING					CAPITAL										Grand Total (6+16)
	Salaries & Allow. P1, P2&P3	Contingencies P4	Maintenance P6	Chem. & App. P7	Total Recurring	Works P5(1)	Repairs P5(2)	Equip-ment P5(3)	Furni-ture P5(4) (i)	Vehi-cle P5(4) (ii)	Model & Ex. P5(4) (iii)	W/Store P5(4) (iv)	Lib-rary Books	Misc.	Total Capital	
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
I <u>NATIONALLY IMPORTANT COORDINATED PROJECTS</u>																
1.																
2.																
3.																
..																
TOTAL I																
II <u>RURAL DEVELOPMENT PROJECTS</u>																
1.																
2.																
3.																
..																
TOTAL II																
III <u>MAJOR PROJECTS</u>																
1.																
2.																
3.																
..																
TOTAL III																
IV <u>OTHER R&D ACTIVITIES (AREA WISE)⁺</u>																
1.																
2.																
3.																
..																
TOTAL IV																
V <u>INFRASTRUCTURE</u>																
1.																
2.																
3.																
..																
TOTAL V																
VI <u>PILOT PLANTS</u>																
1.																
2.																
3.																
..																
TOTAL VI																
VII <u>EXTENSION/REGIONAL CENTRES</u>																
1.																
2.																
3.																
..																
TOTAL VII																
GRAND TOTAL (I TO VII)																

* The projects for which it is not possible to estimate these heads of expenditure separately, put them under infrastructure
 ** Details of Works/Services to be provided in the Statement 4

+ As per Appendix I.

Title of the Project/Area	RECURRING					CAPITAL										
	Salaries & Allow. P1, P2 & P3	Contingencies P4	Maintenance P5	Chem. & App. P7	Total Recurring	Works P5(1)	Services P5(2)	Equip-ment P5(3)	Furni-ture P5(4) (i)	Vehi-cle P5(4) (ii)	Model ^s & Ex. P5(4) (iii)	W/Store P5(4) (iv)	Lib-rary Books	Misc.	Total Capital	Grand Total (6+16)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
I NATIONALLY IMPORTANT COORDINATED PROJECTS																
1.																
2.																
3.																
..																
TOTAL I																
II RURAL DEVELOPMENT PROJECTS																
1.																
2.																
3.																
..																
TOTAL II																
III MAJOR PROJECTS																
1.																
2.																
3.																
..																
TOTAL III																
IV OTHER R & D ACTIVITIES (AREA WISE)																
1.																
2.																
3.																
..																
TOTAL IV																
V INFRASTRUCTURE																
1.																
2.																
3.																
..																
TOTAL V																
VI PILOT PLANTS																
1.																
2.																
3.																
..																
TOTAL VI																
VII EXTENSION/REGIONAL CENTRES																
1.																
2.																
3.																
..																
TOTAL VII																
GRAND TOTAL (I TO VII)																

* The projects for which it is not possible to estimate these heads of expenditure separately, put them under infrastructure
 ** Details of Works/Services to be provided in the Statement 4

† As per Appendix I.

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Sl. No.	Title of the Project/Area	Project Number	Phasing of total requirements over the plan period					1983-84 (P. E. Anticipated)	1984-85 (B. E. Anticipated)	Total (Columns 4+6+7+8+9)
			1979-80 (Actuals)	1980-81 (Actuals)	S. E. 1981-82	1981-82 (R. E. proposed)	1982-83 (B. E. proposed)			
	1	2	3	4	5	6	7	8	9	10
I NATIONAL IMPORTANT COORDINATED PROJECTS										
	1.									
	2.									
	3.									
	..									
	TOTAL I									
II RURAL DEVELOPMENT PROJECTS										
	1.									
	2.									
	3.									
	..									
	TOTAL II									
III MAJOR PROJECTS										
	1.									
	2.									
	3.									
	..									
	TOTAL III									
IV OTHER R & D ACTIVITIES (AREA WISE) +										
	1.									
	2.									
	3.									
	..									
	TOTAL IV									
V INFRASTRUCTURE										
	1.									
	2.									
	3.									
	..									
	TOTAL V									
VI PILOT PLANTS										
	1.									
	2.									
	3.									
	..									
	TOTAL VI									
VII EXTENSION/REGIONAL CENTRES										
	1.									
	2.									
	3.									
	..									
	TOTAL VII									
	GRAND TOTAL (I TO VII)									

2-54

+ As per Appendix I.

STATEMENT 3

PROJECTION OF PLAN & NON-PLAN EXPENDITURE OVER THE PLANT PERIOD
1980-81 to 1984-85

(To be filled by PME Cell of the Laboratory)
(Rs. in lakhs)

Name of the Laboratory	1980-81			S.E. 1981-82			Proposed F.E. 1981-82			Proposed B.E. 1982-83			Anticipated 1983-84			Anticipated 1984-85			Total 1980-85		
	Actuals																				
	Plan	Non-Plan	Total	Plan	Non-Plan	Total	Plan	Non-Plan	Total	Plan	Non-Plan	Total	Plan	Non-Plan	Total	Plan	Non-Plan	Total	Plan	Non-Plan	Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
F1, F2, F3 Salries & allowances																					
F4-Contingences																					
F6-Maintenance																					
F7-Chex. & Appar.																					
TOTAL																					
RECURRING:																					
P5(1) - Works																					
P5(2) - Services																					
P5(3) - Equipment																					
P5(4) (i) - Furniture																					
(ii) - Lib. Books																					
(iii) - Vehicles																					
(iv) - Models & Exhibits																					
(v) - W/Store																					
(vi) - Miscellaneous																					
TOTAL CAPITAL																					
TOTAL RECURRING & CAPITAL																					

Annexure 2.2

STATEMENT 4 : WORKS/PS(1)/SERVICES P(5)(2) IN PROGRESS AND PROPOSED FOR 1980-81 to 1984-85

(To be filled by FME Cell of the Laboratory)

(Rs. in lakhs)

Sr. No.	Name of Works/Services	Sanction No. & sanctioning authority	Original estimates	Present estimates	Amount spent upto 1979-80	Amount spent in 1980-81	S.E. 1981-82	R.E. 1981-82	Amount proposed for B.E. 1982-83	Anticipated	
										1983-84	1984-85
	1	2	3	4	5	6	7	8	9	10	11
I. NATIONALLY IMPORTANT COORDINATED PROJECTS											
1.											
2.											
3.											
:											
:											
TOTAL I											
II. RURAL DEVELOPMENT PROJECTS											
1.											
2.											
3.											
:											
:											
TOTAL II											
III. MAJOR PROJECTS											
1.											
2.											
3.											
:											
:											
TOTAL III											
IV. OTHER R&D ACTIVITIES (AREA WISE)*											
1.											
2.											
3.											
:											
:											
TOTAL IV											
V. INFRASTRUCTURE											
1.											
2.											
3.											
:											
:											
TOTAL V											
VI. PILOT PLANTS											
1.											
2.											
3.											
:											
:											
TOTAL VI											
VII. EXTENSION/REGIONAL CENTRES											
1.											
2.											
3.											
:											
:											
TOTAL VII											
GRAND TOTAL (I TO VII)											

Note: Give separately for works and services

* As per Appendix I.

CONSOLIDATED INFORMATION ON R&D PROJECTS/SCHEMES/STUDIES

Name of the Laboratory :

Sl.No.	Item	1980-81 Actuals	1981-82 Expected	1982-83 Proposal
1	2	3	4	5
1.	PROJECTS IN HAND (No.)			
1.1	NICP Nationally Important and Coordinated projects			
1.2	RDP			
1.3	Foreign Assisted Projects			
1.4	Sponsored Projects			
1.5	In house projects			
1.6	Consultancy projects			
2.	PROJECTS COMPLETED (No.)			
2.1	Nationally Important & Coordinated projects			
2.2	RDP			
2.3	Foreign Assisted			
2.4	Sponsored Projects			
2.5	Inhouse Projects			
2.6	Consultancy projects			
3.	PROJECTS TERMINATED (No.)			
3.1	Nationally Important & Coordinated projects			
3.2	RDP			
3.3	Foreign Assisted			
3.4	Sponsored Projects			
3.5	Inhouse Projects			
3.6	Consultancy projects			
4.	PRODUCTS/PROCESSES (No.)			
4.1	Developed			
4.2	Licensed to Industry			
4.3	Went into production			
4.4	In continuous production			
4.5	Estimated value of Production (Rs. in lakhs) of 4.4			
5.	EARNINGS FROM (Rs. in lakhs)			
5.1	Sponsored Projects			
5.2	Consultancy			
5.3	Royalty			
5.4	Premia			
5.5	Analytical Testing			
5.6	Pilot Plant Products			
5.7	Sale of Lab. Products			
6.	PUBLICATIONS (NUMBER)			
6.1	Papers			
6.2	Technical Reports			
6.3	Books			
6.4	Journals			
7.	PATENTS			
7.1	Filed			
7.2	Sealed			

Following Lists may kindly be enclosed in the form of an Appendix

- I. PRODUCTS AND PROCESSES DEVELOPED DURING 1980-81
(Titles, Current Status).
- II. IN HOUSE-PROJECTS COMPLETED/DROPPED DURING 1980-81
(Titles)
- III. SPONSORED PROJECTS COMPLETED IN 1980-81
(Give title, sponsor, amount paid by sponsor)
- IV. SPONSORED PROJECTS IN HAND IN 1981-82
(Give title, sponsor, Total Financial Commitment of sponsor, Amount paid and to be paid in 1981-82).
- V. PRODUCTS/PROCESSES REPORTED TO HAVE GONE IN TO PRODUCTION FOR THE FIRST TIME IN 1980-81 (Titles)
- VI. PRODUCTS/PROCESSES RELEASED TO INDUSTRY FOR COMMERCIAL EXPLOITATION DURING 1980-81. (Titles)
- VII. CONSULTANCY SERVICES COMPLETED DURING 1980-81
(Title, consultee, Total Consultancy fee paid by Consultee).
- VIII. CONSULTANCY PROPOSALS IN HAND DURING 1981-82.
(Give title, consultee total financial commitment, Amount paid and to be paid in 1981-82).
- IX. VALUE OF PRODUCTION DURING 1980-81 AS A RESULT OF EXPLOITATION OF PRODUCTS AND PROCESSES DEVELOPED BY THE LABORATORY. (Titles product/process, value of production during 1980-81).

NOTE: Financial amounts to be given as Rs. _____ Lakhs
e.g. Rs. 4.509 Lakhs.

Annexure 2.3
Sample Questionnaire used during the Seventh Five Year (1985-90) Plan

PROFORMA I A
(FOR ONGOING PROJECTS STARTED IN SIXTH PLAN OR BEFORE
AND TO BE CONTINUED IN 1987-88 AND BEYOND AND ALSO
FOR NEW PROJECTS PROPOSED TO BE STARTED DURING 1985-
86 AND/OR THEREAFTER DURING THE SEVENTH PLAN PERIOD)

COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH
ANNUAL PLAN 1987-88

PROJECT BUDGET B.E. 1986-87 AND B.E. 1987-88
& SEVENTH FIVE YEAR PLAN PROJECTION (1985-86 TO 1989-90)

1. Title of the Project
2. Project No
3. Area of R & D (Fill in code as per APPENDIX-I)
4. Indicate whether the project is ONGOING or NEW
5. Indicate whether a comprehensive Project Report is available Yes / No
6. Scientific & Technical objectives of the project
 - A. Targets
 - B. Expected Results
- 7.1 Indicate progress status of the project at the end of March 1986
- 7.2 Progress expected during 1986-87
- 7.3 Proposed work for 1987-88
- 8.1 Whether the project is on schedule Yes/No
- 8.2 If no, give new schedule and expected date of completion. Also indicate reasons for change (Please see Appendix III for codes)
9. If there is delay in the completion of the project and any change in the objective & programme please indicate whether approval obtained of:
 1. RAC Yes/No
 2. EC Yes/No
 3. Collaborator/user Yes/No
10. (a) Has the Project been approved by RAC and endorsed by EC. A / B / C
 (b) Indicate the Priority assigned by RAC
 (c) Any other Comments of RAC
11. Justification for taking up the New proposal
12. Do you need any major equipment if yes, please indicate the specification and the cost along with the justifications.

* NOTE: Maximum field for Project number is Eight (8) characters.
 Also kindly see Item 2 of General Instructions in page 3

@ NOTE: The project report referred is cumulative since the inception of the project till todate.

13. Please list here the ministries/financial institutions/public sector undertaking/universities/other organisation with whom you would like to collaborate. Also indicate the nature of collaboration required.
14. Name and address of the user, if any and please indicate nature of the commitment.

15. Details of activity Milestones

Activity Milestones								Explanatory Notes
1986-87			1987-88					
S86	D86	M87	J87	S87	S87	M88		
3	4	5	6	7	8	9		
							3 (Sept 86)	
							4 (Dec 86)	
							5 (Mar 87)	
							6 (June 87)	
							7 (Sept 87)	
							8 (Dec 87)	
							9 (Mar 88)	

If no milestone is entered for any quarter fill in --, Maintain the same number as it is given here for each quarter.

Example

- 4 -

Example

- - 7 8 -

Example

4. Development of improved formula with addition of friction modifiers and friction dust.
7. Fabrication and characterisation of of break lining materials.
8. Development of heat resistant adhesive.

NOTE

The Nos. 3,4,5,6,7,8,9 are fixed and related to particular quarter -ending They are not to be changed.

eg: For activities ending in September 1987 the corresponding Col No. can and should be 7 only.

TIMEFRAME, LINKAGES, BUDGET BY SOURCE

Date of Commencement		Date of completion		Approved by**	Stages of work ⁰⁰⁰ (at what stage the project was and will be)
Planned date	Actual date	Reasons for delay	At the time of approval	Now	Reasons for delay *
					1985-86 1987-88 1986-87

Emphasis of the project [Tick (✓) whichever is applicable for the project]

i) Of High Plan Priority,	iv) Application of Available Scientific Knowledge,
ii) Of Direct Relevance to Socio-Economic Development,	v) Relevance to Industry;
iii) Involving Significant Development of High Technology,	vi) Sociatal Mission,
	vii) Modelling applications,
	viii) Specialised Information / data bases
	ix) Basic sciences.

Linkage of the Project	Nature of Linkages***	Is the project	Nature of Assistance	Foreign Ex
Name of the Agency/ Laboratory.		-Sponsored -Consultancy -Supported -Turnkey	Equipment & Machinery Materials Visit Abroad	Fellowships Training
1				
2				

FINANCIAL COMMITMENT OF THE OTHER ORGANISATIONS/AGENCIES

Sl	Name of the Agency	Total commitment	Funds Received till March 1984	Funds Promised during the Year 1984-87	(Rupees in lakhs)	
					Funds Received so far during 1984-87	Funds Expected during the year 1987-88
1						
2						
3						

FINANCIAL STATEMENT⁰⁰⁰

ESTIMATES	(Rupees in lakhs)					
	Salaries & Allowances P1+P2+P3	Chemicals & Apparatus	Works & Services P5(1)+P5(2)	Equipment P5(3)	Others	Total
1	2	3	4	5	6	7
1 Expected total cost at the time of commencement						
2 Expenditure incurred so far (31.3.86)						
3 Sanctioned Estimate 1986-87						
4 Revised Estimate 1986-87						
5 Budget Estimate 1987-88						
6 Budget Estimates 1987-88						
7 Budget Estimates 1988-89						
8 Budget Estimates 1989-90						

⁰⁰⁰ CBIR Component only. Information of Items 1, 2 and 3 are essential

⁰ In this item indicate the month and year, e.g. June 1977 should be filled up as 0677

⁰⁰ Please see Appendix IV for codes

^{*} Please fill in relevant code from Appendix III

^{**} Use 1-GB; 2-EC, 3-Director, 4- Other (specify)

^{***} Use 1 - Utilisation of Results, 2 - Funding; 3 - Sharing of R&D work, 4 - Exchange of Scientist,

5 - Utilisation of facilities 6 - Utilisation of specialised material or techniques developed by other laboratories;

7 - Trials and testing, 8 - Other (specify)

MANPOWER STATEMENT
Deployment of Manpower

Name of the Project

S No.	Name	Age as on 1.7.1986	Designation	Degrees with Field of \$ Specialisation	Area of Experience	Manmonths involvement in the Project. 1987- 1987- 87 88	From which completed/ dropped Proj. redeployed. If so, give project no. & manmonths. (000)	Expected date of release from this project/infra	
1	2	3	4	5	6	7	8	9	10

Existing

- 1
- 2
- 3
- 4
- 5
- 6

Arrange the names in order of seniority. Put (+) against Project Coordinator and (++) against Project Leader/Head of infrastructure.
Please give name upto JTA/JSA level only. For other low level mention only the designations, total number and their man-months involvement. Include also Research Fellows, Visiting Scientists, Emeritus Scientists.
\$ M.Sc. (Physics), PH.D. (Bio-Chemistry) Etc.
Proj. No. (Man-month) e.g. Bio12(7); B&AN23(9).

PROFORMA IB

(For R&D projects completed / to be completed in 1986-87
and also
For R&D projects dropped / to be dropped in 1986-87)

(NOTE:
For Projects started from April 1986 and after, and expected
to be completed/ dropped before 31 March 1987 use Proforma IA only and NOT Proforma IB;
However, for such projects kindly provide information for Item No:6 or 7 of
Proforma IB also)

1. Title of the Project
2. Project No. (Kindly see item 2 of general instruction in page 3.)
3. Area of R & D
(Please fill in the code from APPENDIX- I)
4. Indicate whether the Project is
COMPLETED or DROPPED
4. Duration
Date of Start
Date of Completion/Termination
5. Estimate of total cost up to the
completion / termination
of the project
6. Brief report of the results
achieved and its scientific,
technical & economic significance
as reported in RAC / Annual Report.
(for completed projects)
7. Reasons for dropping the project
if any, and indicate whether any
of the findings could be utilised
as reported in RAC
(for dropped projects)
8. Observation of EC, RAC, CC, on this
project.
9. Redeployment details of released manpower:

Sl.	Name	Age as on 1.7.1986	Designation	Degree with field of specilisation	Area of Experience	Project to which Deployed/proposed to be redployed (Give Project No. along-with man-months)@@
1	2	3	4	5	6	7
1.						
2.						
3.						

(@) M.Sc. Physics; Ph.D. (Bio-Chemistry) etc,
(@@) Proj.NO.(Man-months) e.g. biol2(8)

10. Financial Statement

Estimates	Salaries & Allowances P1+P2+P3	Chemicals & Apparatus P7	Works & Services P5(1)+P5(2)	Equipment P5(3)	Others	Total
1	2	3	4	5	6	7
1. Expected total cost at the time of commencement.						
2. Estimate & Expenditure incurred upto 31.3.1986						
3. S E. 1986-87						
4. R E. 1986-87						
5. Estimate of Total Expenditure till the completion/Termination						

PROFORMA II
(For infrastructure Group II)

C S I R ANNUAL PLAN 1987-88
BUDGET STATEMENT R.E. 1986-87 & B.E. 1987-88
SEVENTH PLAN PROJECTION 1985-86 to 1989-90

(To be filled by Heads of Divisions/Sections in charge of)

- 2.01 Library
- 2.02 Information, Liaison, Publicity, Exhibition, etc.
- 2.03 Planning, Monitoring, Evaluation, etc.
- 2.04 Training Programme etc.
- 2.05 Design and Drawing Office
- 2.06 Workshop
- 2.07 Testing Laboratories
- 2.08 Service & Maintenance of Instruments
- 2.09 Animal House
- 2.10 Glass blowing
- 2.11 Others (specify)

Infrastructure Particulars

- 1. Title of Infrastructure
- 2. Infrastructure Number:
- 3. Nature of activity
- 4. Additional Facilities required to be created
Give full justification
- 5. Major bottlenecks, if any
(Use codes given in Appendix III)
- 6. Please fill in Financial and Manpower statements.

*NOTE: Maximum field for Infrastructural number is Eight (8) characters.
Also kindly see Item 2 of General Instruction in Page 2.

MANPOWER STATEMENT
Deployment of Existing Manpower

Name of the Infrastructure:

S.No.	Name	Age as on 1.7.1986	Designation	Degrees with Field of Specialisation	Area of Experience	Manmonths involvement		From which completed/ dropped Proj. redeployed. If so, give project no. & manmonths. (000)	Expected date of release from this project/infra.
						1986- 87	1987- 88		
1	2	3	4	5	6	7	8	9	10

Existing

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

① Arrange the names in order of seniority. Put (+) against Project Coordinator and (++) against Project Leader/Head of infrastructure.
 ② Please give name upto JTA/JSA level only. For other low level mention only the designations, total number and their man-month involvement. Include also Research Fellows, Visiting Scientists, Emeritus Scientists.
 † M.Sc. (Physics); ph.D (Bio-chemistry) etc
 00 Proj.No. (Man-month). e.g. Bio12(7); B&AN23(9);

Information on the requirement of additional Manpower.

Additional during the Year	Designation	Number	Field/Area Specialisation	Manmonths involvement	If the requirement be met by internal redeployment, indicate from which project/infra.no. (Manmonth)
0	1	2	3	4	5

1986-87

- 1.
- 2.
- 3.

1987-88

- 1.
- 2.

1988-89, 1989-90

- 1.
- 2.
- 3.

FINANCIAL STATEMENT*

(Rupees in lakhs)

Name of the Infrastructure:

	Salaries & Allowances P1+P2+P3	Chemicals & Apparatus P7	Works & Services P5(1)+P5(2) 6	Equipment P5(3) 6	Others (specify)	Total
1. Expenditure incurred during 1985-86						
2. Sanctioned Estimate 1986-87						
3. Revised Estimate 1986-87						
4. Budget Estimate 1987-88						
5. Budget Estimate 1988-89						
6. Budget Estimate 1989-90						

- * Please attach the list of Equipment/works/services also
- * CBIR component only.

PROFORMA III

(For infrastructure Group V)

C S I R ANNUAL PLAN 1987-88

BUDGET STATEMENT R.E. 1986-87 AND BE 1987-88 &

SEVENTH PLAN PROJECTION 1985-86 to 1989-90

To be filled up by Scientist-in-charge of Extension Centres, Field Station, Regional Centre, Zonal Centres, S&M Centres, Polytechnological Clinics, etc.

Particulars

1. Name of the Laboratory
2. a) Name of the Centre
b) Location
3. Nature of activities
4. Additional facilities being created during 1986-87, and to be created during 1987-88 with full justification
5. Achievements
 - a) during 1985-86
 - b) Expected during 1986-87
6. Major bottlenecks if any
(Use codes given in Appendix III)
7. Please fill in Financial and manpower statement also.

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MANPOWER STATEMENT
(Deployment of Existing Manpower) 0

Name of the extension/regional centre:

S.No	Name	Age as on 1.7.1986	Designation	Degrees with Field of Specialisation	Area of Experience	Manmonths involvement in the Project	From which completed/ dropped Proj. redeployed. If so, give project no & manmonths. (006)	Expected date of release from this project/infra	
1	2	3	4	5	6	7	8	9	10

Existing

- 1
- 2
- 3
- 4
- 5
- 6

0 Arrange the names in order of seniority Put(+) against Project Coordinator and (++) against Project Leader/Head of infrastructure. Please give name upto JTA/JSA level only. For other low level mention only the designations, total number and their man-month involvement. Include also Research Fellows, Visiting Scientists, Emeritus Scientists.

1 M Sc (Physics), Ph D (Bio-chemistry) etc

00 Proj; No (Man-month) e.g. Bio12(7), B&AN23(9).

Information on the requirement of additional Manpower.

Additional during the Year	Designation	Number	Field/Area Specialisation	Manmonths involvement	If the requirement be met by internal redeployment, indicate from which project/infra no (Manmonth)
0	1	2	3	4	5
1986-87					
1					
2					
3					
1987-88					
1					
2					
1988-89, 1989-90					
1					
2					
3					

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FINANCIAL STATEMENT*

Name of the Infrastructure:	(Rupees in lakhs)					Total
	Salaries & Allowances P1+P2+P3	Chemicals & Apparatus P7	Works & Services P5(1)+P5(2) ₹	Equipment P5(3) ₹	Others (specify)	
1. Expenditure incurred during 1985-86						
2. Sanctioned Estimate 1986-87						
3. Revised Estimate 1986-87						
4. Budget Estimate 1987-88						
5. Budget Estimate 1988-89						
6. Budget Estimate 1989-90						

₹ Please attach the list of Equipment/works/services also
 * CSIR component only.

FOR EACH ITEM COVERED UNDER INFRASTRUCTURE GROUP III & GROUP IV
 (Please refer APPENDIX V) KINDLY FILL IN MANPOWER AND FINANCIAL
 STATEMENTS.

Annexure 2.4
Sample Questionnaire used during the Eighth Five Year (1992-97) Plan

**PROJECT PROFORMA
FOR THE CONTINUING AND NEW PROJECTS
FOR
EIGHTH FIVE YEAR PLAN (1992-97)
and
ANNUAL PLAN 1992-93**

1. TITLE OF THE PROJECT :
 - 1.1 WHETHER MAJOR/MINOR :
 - 1.2 PROJECT NO :
2. CLASSIFICATION
 - (i) R&D AREA (AS PER ANNEXURE - I) Please indicate Code No. :
 - (ii) CATEGORY (AS PER ANNEXURE - II) Please indicate Code No. :
 - (iii) EMPHASIS (AS PER ANNEXURE -III) Please indicate Code No. :
 - (iv) IMPACT (AS PER ANNEXURE - IV) Please indicate Code No. :
3. BRIEF OBJECTIVE :
4. TARGETS-PROPOSED TO BE ACHIEVED DURING 8TH PLAN(1992-97) :
5. DATE OF START :
6. TYPE OF PROJECT : CONTINUING (Projects started before 1.4.92)
NEW (to start on or after 1.4.92)
7. STATUS OF R&D WORK DONE
 - 7.1 STATUS OF R&D WORK TILL 31ST MARCH 1991:
(IN CASE OF CONTINUING PROJECTS)
 - 7.2 STATUS OF R&D WORK EXPECTED TILL 31ST MARCH 1992:
(IN CASE OF CONTINUING PROJECTS)
 - 7.3 STATE OF ART (IN CASE OF NEW PROJECTS):

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Annexure 2.4

8. EXPECTED DATE OF COMPLETION:
9. LINKAGES OF THE PROJECT
 - 9.1 WITH OTHER PROGRAMMES
 - a) Established :
 - b) Planned:
 - 9.2 WITH OTHER ORGANISATIONS
 - a) Established
 - b) Planned
10. YEARLY MILESTONES DURING THE 8TH FIVE YEAR PLAN(1992-97):
11. QUARTERLY MILESTONES FOR THE YEAR 1992-93 :
12. EXPECTED OUTPUTS
 - (i) DURING 1992-93 :
 - (ii) DURING 1992-97 :
13. WHETHER ALREADY APPROVED BY (i)TAB - YES/NO (Tick whichever
(ii)RC - YES/NO is applicable)

14. PROJECT COST AND BUDGET ESTIMATES (Rs. in Lakhs)

(PROJECT COST and BUDGET ESTIMATES to INCLUDE BOTH THE CSIR COMPONENT AS WELL AS COMPLEMENTARY FUNDING and FUNDS FROM EXTERNAL SOURCES; THIS GUIDELINE TO BE FOLLOWED FOR PROVIDING INFORMATION IN 14.1, 14.2, 14.3 and 14.4)

14.1 Estimated Cost of Existing manpower, consumables and facilities

Sr. No.	Head	PLAN(P) NON-PLAN(NP)	upto 31.3.92	1992-93	93-94	94-95	95-96	96-97	Total (92-97)	Beyond 1997	Grand Total
1	2	3	4	5	6	7	8	9	10	11	12
1.	MANPOWER P1,P2,P3	P NP									
2.	EQUIPMENT P5(3)	P NP									
3.	APPARATUS/CONSUMABLES P7	P NP									
4.	WORKS & SERVICES P5(1),(2)	P NP									
5.	OTHERS	P NP									
6.	TOTAL	P NP									

14.2 ESTIMATED COST OF NEW REQUIREMENTS. (Plan component only)

Sr. No.	Head	PLAN (P)	UPTO 31.3.92	92-93	93-94	94-95	95-96	96-97	Total (92-97)	Beyond 1997	Grand Total
1	2	3	4	5	6	7	8	9	10	11	12
1.	MANPOWER P1,P2,P3	P									
2.	EQUIPMENT P5(3)	P									
3.	APPARATUS/CONSUMABLES P7	P									
4.	WORKS & SERVICES P5(1),(2)	P									
5.	OTHERS	P									
6.	TOTAL	P									

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14.3 TOTAL PROJECT COST (14.1 + 14.2)

Sr. No.	Head	PLAN(P) NON-PLAN(NP)	upto 31.3.1992	1992-93	93-94	94-95	95-96	96-97	Total (92-97)	Beyond 1997	Grand Total
1.	MANPOWER P1,P2,P3	P NP									
2.	EQUIPMENT P5(3)	P NP									
3.	APPARATUS/CONSUMABLES P7	P NP									
4.	WORKS & SERVICES P5(1),(2)	P NP									
5.	OTHERS	P NP									
6.	TOTAL	P NP									

14.4 BUDGET REQUIRED WITH REFERENCE TO TOTAL PROJECT COST vide para 14.3

Sr. No.	Head	PLAN(P) NON-PLAN(NP)	1991-92		1992-93		93-94		94-95		95-96		96-97		Total (92-97)		Beyond 1997		Grand Total	
			C	E	C	E	C	E	C	E	C	E	C	E	C	E	C	E	C	E

C- CSIR COMPONENT; E- COMPONET EXTERNAL TO CSIR;

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----

1.	MANPOWER P1P2,P3	P NP																		
2.	EQUIPMENT P5(3)	P NP																		
3.	APPARATUS/CONSUMABLES P7	P NP																		
4.	WORKS & SERVICES P5(1),(2)	P NP																		
5.	OTHERS	P NP																		
6.	TOTAL	P NP																		

15. SOURCES OF FUNDING (RS. IN LAKH) (TO BE CONSISTENT WITH 14.4)

SOURCE	ACTUALS		B.E 1991-92	PROJECTED ESTIMATES					TOTAL 1992-97	Beyond 97 if applica ble	GRAND TOTAL
	1985-90	1990-91		1992-93	93-94	94-95	95-96	96-97			
1	2	3	4	5	6	7	8	9	10	11	12
15.1 CSIR FUNDING *											
15.2 COMPLEMENTARY FUNDING FOR PLAN PROGRAMMES (IF APPLICABLE)											
a) GRANT/AID/LOAN FROM INTERNATIONAL AGENCIES (eg. UNDP, UNESCO etc)											
i)											
ii)											
iii)											
b) GRANT/AID FROM GOVT. AGENCIES (eg. DST, DOD, DBT, etc.)											
i)											
ii)											
iii)											
c) ANY OTHER SOURCE (Please specify)											
TOTAL {15.1 + 15.2}											

* LABORATORY FUNDING FROM ANNUAL BUDGET PROVIDED BY CSIR TO THE LABORATORY

16. SPECIAL EQUIPMENTS REQUIREMENTS (COSTING MORE THAN RS. FIVE LAKH EACH) DURING 1992-97
 in ref: to projections at para 14.3)
 (LIST OUT EXISTING EQUIPMENTS and PROPOSED NEW AQUISITIONS SEPARATELY)

(LIST IN ORDER OF PRIORITY)

S.NO	NAME OF THE EQUIPMENT	TOTAL EXPECTED COST	IMPORT CONTENT	TENTATIVE YEAR OF PROCUREMENT	SOURCE OF FUNDING ** FOR PROCUREMNET
1	2	3	4	5	6

EXISTING

- 1.
- 2.

NEW AQUISITIONS PROPOSED

- 1.
- 2.

** FROM .CSIR BUDGET PROVIDED TO THE LAB;
 .TECHNICAL ASSISTANCE FROM UNDP, UNESCO,.....etc;
 .GRANT FROM DST, DBT, DOD,DNES, DOEF, ... etc;
 .INDUSTRY and OTHER SOURCES;

LISTS AND TABLES

THE FOLLOWING CONSOLIDATED INFORMATION, LISTS and TABLES MAY KINDLY BE PROVIDED FOR THE LABORATORY AS A WHOLE IN THE FORM OF APPENDIX.

LISTS

- I. a) LIST OF PROJECTS COMPLETED/DROPPED DURING 1990-91
- b) LIST OF PROJECTS TO BE COMPLETED/DROPPED DURING 1991-92
- II. a) LIST OF TECHNOLOGIES READY FOR EXPLOITATION BY 31.3.92
INDICATING THE FOLLOWING:
 - 1) POTENTIAL FOR EMPLOYMENT GENERATION - NUMBERS
 - 2) POTENTIAL FOR EXPORT PROMOTION - FOREIGN EXCHANGE
EARNINGS (AMOUNT)
 - 3) POTENTIAL FOR IMPORT SUBSTITUTION- FOREIGN EXCHANGE
SAVINGS (AMOUNT)
- b) LIST OF TECHNOLOGIES EXPECTED TO BE DELIVERED DURING
1992-97, INDICATING PROBABLE YEAR OF RELEASE, INDICATING
THE FOLLOWING:
 - 1) POTENTIAL FOR EMPLOYMENT GENERATION - NUMBERS
 - 2) POTENTIAL FOR EXPORT PROMOTION - FOREIGN EXCHANGE
EARNINGS (AMOUNT)
 - 3) POTENTIAL FOR IMPORT SUBSTITUTION- FOREIGN EXCHANGE
SAVINGS (AMOUNT)

TABLES

TABLE - 1

LIST ITEMS FOR

- a) UPGRADATION OF THE EXISTING FACILITY
- b) REPLACEMENT OF OBSOLETE EQUIPMENT/MACHINERY
- c) MODERNISATION

S.NO	NAME OF THE FACILITY/ EQUIPMENT	ESTIMATED COST (RS. LAKH)	PROPOSED YEAR OF PURCHASE	REMARKS: INDICATE U - for UPGRADATION R - for REPLACEMNT M - for MODERNIZATION
1	2	3	4	5
1.				
2.				
3.				
4.				
5.				
.				
.				

Annexure 2.4

TABLE - 2

SOURCES OF FUNDING:

a) CONSOLIDATED PROJECT-WISE LISTING FOR 1992-93.

S.NO	TITLE OF THE PROJECT	TOTAL COST OF THE PROJECT (RS. LAKH)	BUDGET REQUIRED IN 1992-93 (RS. LAKH)	EXPECTED FUNDING FOR THE BUDGET 1992-93 (RS. LAKH)				
				CSIR	INTERNATIONAL AGENCIES	GOVT.	OTHERS	TOTAL
1	2	3	4	5	6	7	8	9
1.								
2.								
G. TOTAL								

b) CONSOLIDATED PROJECT WISE LISTING FOR 1992-97

S.NO	TITLE OF THE PROJECT	TOTAL COST OF THE PROJECT (RS. LAKH)	BUDGET REQUIRED FOR 1992-97 (RS. LAKH)	EXPECTED FUNDING FOR THE BUDGET 1992-97 (RS. LAKH)				
				CSIR	INTERNATIONAL AGENCIES	GOVT.	OTHERS	TOTAL
1	2	3	4	5	6	7	8	9
1.								
2.								
G. TOTAL								

TABLE - 3

PROJECTIONS FOR EXPECTED CASH FLOW FROM SOURCES OTHER THAN
CSIR YEARWISE FROM 1991-92 TILL 1996-97

SOURCE	TOTAL EXPECTED CASH FLOW (RS. LAKH)							TOTAL 1992-97
	1991-92	92-93	93-94	94-95	95-96	96-97		
1	2	3	4	5	6	7	8	
a) COMPLEMENTARY FUNDING FROM INTERNATIONAL AGENCIES								
b) COMPLEMENTARY FUNDING FROM GOVT. AGENCIES								
c) SPONSORED								
(i) GOVT.								
(ii) PUBLIC SECTOR UNDERTAKINGS(PSU)/ AUTONOMOUS BODIES								
(iii) PRIVATE INDUSTRY/INDIVIDUALS								
d) CONSULTANCY								
(i) GOVT.								
(ii) PUBLIC SECTOR UNDERTAKINGS(PSU)/ AUTONOMOUS BODIES								
(iii) PRIVATE INDUSTRY/INDIVIDUALS								

(Continued)

(TABLE - 3 Continued)

SOURCE	TOTAL EXPECTED CASH FLOW (RS. LAKH)							TOTAL 1992-97
	1991-92	92-93	93-94	94-95	95-96	96-97		
1	2	3	4	5	6	7	8	

e) ANALYTICAL TESTING

(i) GOVT.

(ii) PUBLIC SECTOR
UNDERTAKINGS(PSU)/
AUTONOMOUS BODIES

(iii) PRIVATE INDUSTRY/INDIVIDUALS

f) OTHER SERVICES

(i) GOVT.

(ii) PUBLIC SECTOR
UNDERTAKINGS(PSU)/
AUTONOMOUS BODIES

(iii) PRIVATE INDUSTRY/INDIVIDUALS

g) ROYALTY/PREMIA

(i) GOVT.

(ii) PUBLIC SECTOR
UNDERTAKINGS(PSU)/
AUTONOMOUS BODIES

(iii) PRIVATE INDUSTRY/INDIVIDUALS

(Continued)

(TABLE - 3 Continued)

SOURCE	TOTAL EXPECTED CASH FLOW (RS. LAKH)						TOTAL
	1991-92	92-93	93-94	94-95	95-96	96-97	1992-97
1	2	3	4	5	6	7	8
h) OTHER MISC. RECEIPTS							
(i) GOVT.							
(ii) PUBLIC SECTOR UNDERTAKINGS (PSU) / AUTONOMOUS BODIES							
(iii) PRIVATE INDUSTRY/INDIVIDUALS							
G. TOTAL							

TABLE - 4
MANPOWER STATUS & PROJECTION OF ADDITIONAL REQUIREMENTS

GRADE	Sanctioned Ceiling Strength	Existing AS ON 31.3.91	Additional Requirement		Minimum Additional Projections				
			Planned during 1991-92 within the ceiling	Additional Requirement	During Eighth Plan(1992-97)		During Annual Plan 1992-93		
			Nos.	Amount	Nos.	Amount	Nos.	Amount	
				(P1,P2,P3)		(P1,P2,P3)		(P1,P2,P3)	
				(Rs. lakh)		(Rs. lakh)		(Rs. lakh)	
	1	2	3	4	5	6	7	8	9

1. Group IV Scientists

Director*
 G
 F
 EII
 EI
 C
 B

(* Including Director Grade Scientists)

2. Group III Scientists

E1
 C1
 B1
 A1
 SSA/STA
 JSA/JTA

Continued...)

(TABLE - 4 Continued)

GRADE	Sanctioned Ceiling Strength	Existing AS ON 31.3.91	Additional Requirement		Minimum Additional Projections				
			Planned during 1991-92 within the ceiling	Additional Requirement	During Eighth Plan(1992-97)		During Annual Plan 1992-93		
			Nos.	Amount	Nos.	Amount	Nos.	Amount	
			(P1,P2,P3)	(Rs. lakh)	(P1,P2,P3)	(Rs. lakh)	(P1,P2,P3)	(Rs. lakh)	
	1	2	3	4	5	6	7	8	9
3. Group II									
4. Group I									
5. GROUP V									
6. Administrative									
7. Non-Technical (Class IV)									
Total									

TABLE - 5.1
PROPOSED DEPLOYMENT OF (PLAN + NON-PLAN) RESOURCES
FOR 1992-93 (CSIR COMPONENT ONLY)

ITEM	1992-93 (Rs. in Lakh)					
	MANPOWER	EQUIPMENT	APPARATUS & CONSUMABLES	WORKS & SERVICES	OTHERS	TOTAL
	(P1,P2,P3)	P5(3)	P7	P5(1) P5(2)		
1.	2.	3.	4.	5.	6.	7.
1. ALL R & D PROGRAMMES						
2. ALL INFRASTRUCTURE AND SUPPORTING ACTIVITIES						
3. PILOT PLANT						
4. EXTENSION/ REGIONAL CENTRES						
G.TOTAL (1 TO 4)						

TABLE - 5.2
PROPOSED DEPLOYMENT OF (PLAN + NON-PLAN) RESOURCES
FOR 1992-97 (CSIR COMPONENT ONLY)

ITEM	1992-97					(Rs. in Lakh)
	MANPOWER	EQUIPMENT	APPARATUS & CONSUMABLES	WORKS & SERVICES	OTHERS	TOTAL
	(P1,P2,P3)	P5(3)	P7	P5(1),P5(2)		
1	2	3	4	5	6	7
1. ALL R & D PROGRAMMES						
2. ALL INFRASTRUCTURE AND SUPPORTING ACTIVITIES						
3. PILOT PLANT						
4. EXTENSION/ REGIONAL CENTRES						
<hr/>						
G.TOTAL (1 TO 4)						

TABLE - 6
BUDGET ESTIMATES (PLAN AND NON-PLAN) FOR EIGHTH PLAN (1992-97)
(CSIR COMPONENT ONLY)

(RS. IN LAKH)

BUDGET HEAD	ACTUALS	ACTUALS	S.E.	R.E	PROJECTED BUDGET ESTIMATES					TOTAL
	1985-90	1990-91	91-92	91-92	92-93	93-94	94-95	95-96	96-97	1992-97
1	2	3	4	5	6	7	8	9	10	11
I. RECURRING										
SALARIES (P1,P2,P3)										
CONTINGENCIES (P4)										
MAINTENANCE (P6)										
CHEMICALS & APPARATUS (P7) *										
TOTAL RECURRING (I)										

(Continued)

(TABL3 - 8 Continued)

(RS. IN LAKH)

BUDGET HEAD	ACTUALS 1985-90	ACTUALS 1990-91	S.E. 91-92	R.E 91-92	PROJECTED 92-93	BUDGET 93-94	ESTIMATES 94-95	ESTIMATES 95-96	ESTIMATES 96-97	TOTAL 1992-97
1	2	3	4	5	6	7	8	9	10	11
II. CAPITAL										
WORKS (P5(1))										
SERVICES (P5(2))										
EQUIPMENT (P5(3))*										
LIBRARY BOOKS (P5(4))*										
FURNITURE, VEHICLES MISC. ETC. *										
TOTAL CAPITAL (II)										
TOTAL RECURRING & CAPITAL (I+II)										
STAFF QUARTERS (Q)										

* NOTE: FOREIGN EXCHANGE COMPONENT INCLUDED ABOVE IN P7, P5(3), P5(4) BOOKS and OTHER ITEMS MAY BE INDICATED IN BRACKETS.

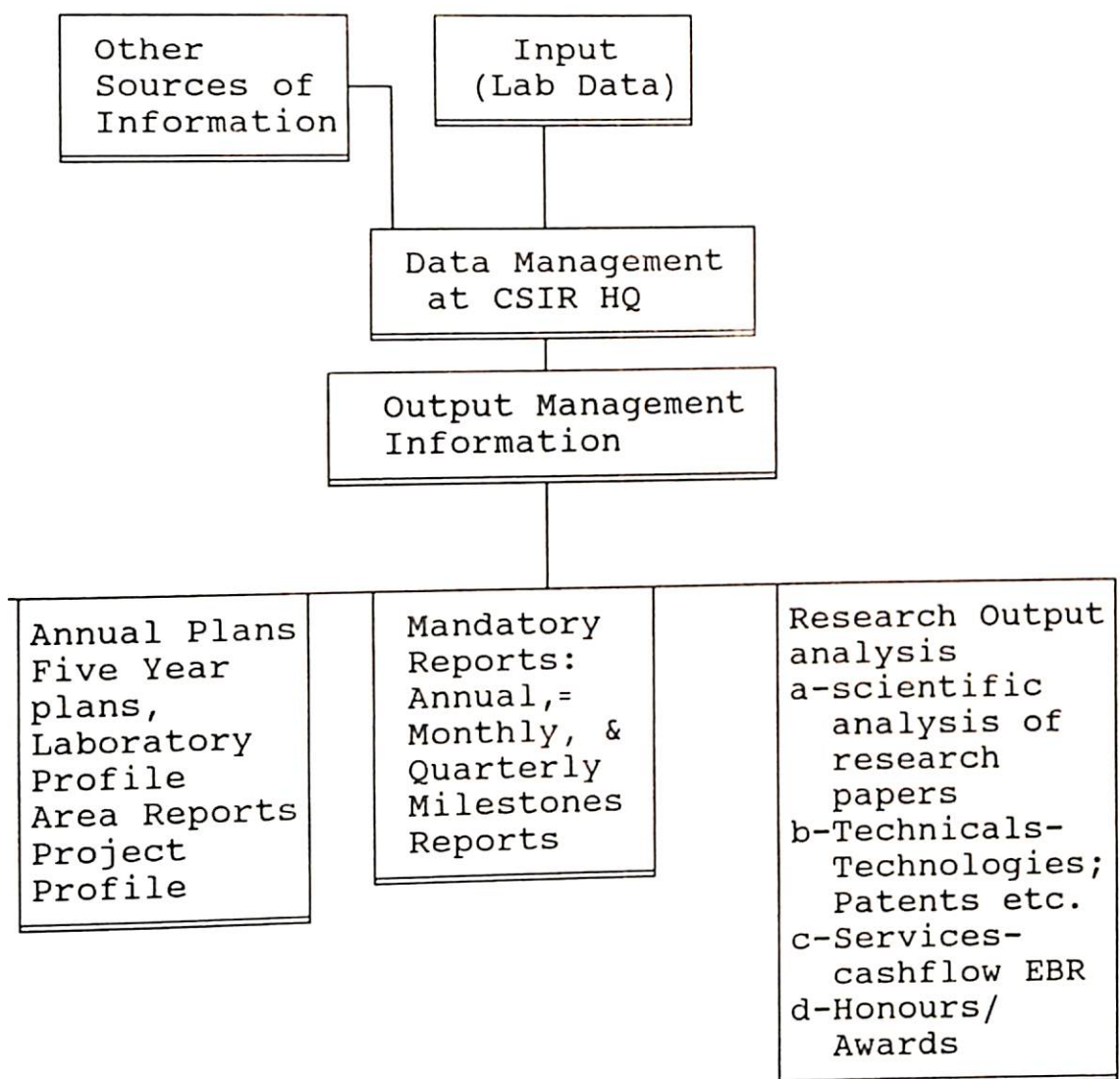
CHAPTER-3: ANALYSIS OF EXISTING INFORMATION SYSTEM: DATA ANALYSIS AND INFORMATION GENERATION

3.1 INTRODUCTION

The analysis of data received from the laboratories to serve as the background information for the decision making will be discussed in this chapter. This would give a better understanding of the existing system of information generation. This would also enable one to appreciate the problems in built in the existing system for the generation of appropriate information at various stages at the Agency level.

The data received from the laboratories serve as an input for the CSIR HQ. system and these data are processed to generate the required outputs for the Management as depicted in Fig. 3.1.

Fig. 3.1



The trend analysis to project the budgetary and manpower needs is also made using the data available from the laboratories.

The data are of different types . e.g. Numerical data, Textual data and Alphanumerical data.

The Numerical Data involves budget, project cost, manpower. The Textual/ Alpha Numerical data are available for Plans, Reports, Achievements, Research Publications, Parliament Questions, Annual Plans, Five year Plans, Manpower profiles and Project databases.

3.2 FIVE YEAR PLANS/ANNUAL PLANS:

As discussed in Chapter 2, most of the laboratories send their plans in the prescribed proforma to the CSIR HQ. The system prevalent requires formulation of the Five Year Plans first and then formulation of annual plans within the five year plans. The plan proforma designed takes into account this requirement and the laboratory annual plans project targets and requirements for the entire plan period indicating break-ups for every year.

CSIR HQ. analyses the laboratory plan documents and prepares CSIR plan by integrating the plans of the laboratories. Between 1977 and 1980, CSIR plan document presented the plans in the following format.

- a) Plans of All India Coordinated Projects, Project-wise information.
- b) Plans of Rural Development Projects, Project-wise Information
- c) Plans of Laboratories other than (a) & (b), laboratory wise.
- d) Special Infrastructure Requirements.

Starting from the Sixth Five Year Plan, CSIR is following an area approach instead of laboratory approach in presenting its plan to the Planning Commission. These plans enable Planning Commission to arrive at plan allocations for CSIR both for five year and annual plans.

The Plan document received from a laboratory is a source document for meeting any information requirements at the Headquarters. Further, the laboratory profile is also generated from this source. This profile serves as the background information for the Annual Plan discussions with the concerned laboratory.

3.3 LABORATORY PROFILES

The basis for these profiles was the annual plan documents and conventional budget documents received from the laboratories. The PME cells in the laboratories are responsible for the preparation of the plan document while the finance office has the responsibility of formulating the conventional budget document.

The analysis of the plan documents and the subsequent generation of laboratory profiles had gone through several phases during various time intervals viz. 1977-80; 1980-85; 1985-87, 1987-92 and eighth Plan (i.e. after 1992)

1977-80 These were the initial years when the system of annual plan proforma/ Annual Plan document was started systematically.

CSIR had no inhouse computer and depended mainly on the computing resources of Delhi University for the purpose of the analysis in the formats given in Tables 3.1-3.19.

LABORATORY PROFILE

Name of Lab:
Table 3.1: Details of Projects in Progress
 proposed to be taken up

Sl. No.	Title	Time Span			Budget (Rs. lakh)		Area of R & D (Code)	Nature of Linkages (Code)
		Start date of Comp.	Expected date of Comp.	New date of Comp.	R.E. B.E.			
	<u>AICP</u>							
	1.							
	2.							
	3.							
	.							
	<u>RDP</u>							
	1.							
	2.							
	3.							
	.							
	<u>MAJOR</u>							
	1.							
	2.							
	3.							
	.							
	<u>Infra-structure</u>							
	1.							
	2.							
	3.							
	.							
	<u>Extension</u>							
	1.							
	2.							
	3.							
	4.							

Table 3.2: Status of R&D Projects - Commencement and Completion

Sl. No.	Category	No. of Projects	No. of Projects expected to be completed in the year			
			80-81	81-82	82-83	After Man 1983
1.	Continuing Major Minor					
2.	New Major Minor					
3.	Total Major Minor					

Table 3.3 Classification of R&D Projects - Nature and Budget

S. No	Category	No. of Projects	Budget (Rs. in lakh)		Man Months
			RE 1980	SE 1981-82	
1.	AICP				
2.	RDP				
3.	Major				
4.	Minor				
	Total				

Table 3.4 Classification of R&D Projects Socio-Economic Aim and Budget

S. No	Category	No. of Projects	Budget (Rs. in Lakh)	
			RE 1980-81	BE 1981-82
1.	Development of agriculture Forecasting and Fishing			
2.	Promotion of Industrial development			
3.	Promotion of Rural Development			
4.	Production, conservation and distribution of energy			
5.	Development of Transport and communication, Telecommunication.			
6.	Development of Health Services			
7.	Development of Education			
8.	Exploration, Assessment and Protection of Earth, the sea, the Atmosphere.			

Table 3.5: Field of R&D-Wise and Infrastructure-wise Deployment of Resources

S. No	Category	Nature of Projects	No. of Projects	Budget (Rs. in Lakh)	
				RE 1980-81	SE 1991-82
A.	<u>Field of R&D</u>				
1.	Polymer Chemistry	Major			
		Minor			
2.	Food Technology etc.				
	Total				
B.	Infrastructure				
	Total				
	Grand Total				

MAP, NICTP/AICP, RDP Clubbed under Major

Table 3.6 Type-wise Distribution of R&D Projects

S. No	Category	No. of Projects	Budget (Rs. in Lakh)	
			RE 1980-81	SE 1981-82
1.	Basic Research			
2.	Applied Research			
3.	Survey & Data Collection			
4.	Testing and related routine work			

Table 3.7: Aim-wise Distribution of R&D projects

S.No	Category	No. of Projects
1.	Capability Building	
2.	Technique Development	
3.	Development	
4.	Design Engineering	
5.	Pilot Plant	
6.	Statistical and O.R. Studies	
7.	Building of Information on Geological Data	
8.	Building of Information on Oceanographical Data	
9.	Building of Information on Meteorological Data	
10.	Building of Information on Pollution Data	

Table 3.8: Emphasis-wise Distribution of R&D Projects

S.No	Category	No. of Projects
1.	To enhance frontiers of knowledge	
2.	To initiate work in new and emerging areas	
3.	To explore alternative ways for development of Existing products/Processes	
4.	To develop improved techniques of testing and analysis	
5.	New in India	
6.	Product/Process efficiency	
7.	Improvement in Quality	
8.	Raw material Development	
9.	Utilization of byproducts/residues	
10.	Assessment of resources of region and R&D needs	
11.	Assessment of Market and Market Intelligence	
12.	Location of Skills	
13.	Information Organization to cater to the needs of Industry and Research	

Table 3.9: Type of Linkage of R&D Projects

S. No	Category	No. of Projects
1.	Sponsored/Indian Supported	
2.	Consultancy	
3.	Foreign Supported	
4.	Turnkey	

Table 3.10 Nature of Linkage for Sponsored and Consultancy Projects

S. No	Category	No. of Projects
1.	Utilization of Results	
2.	Funding	
3.	Sharing of R&D Work	
4.	Exchange of Scientist	
5.	Utilization of Facilities	
6.	Utilization of Specialized material of technique developed by Other Laboratories	
7.	Trials and Testing	

Table 3.11 Nature of Assistance for Foreign Supported R&D Projects

S. No	Category	No. of Projects
1.	Equipment and machinery	
2.	Foreign Experts	
3.	Materials	
4.	Fellowships	
5.	Visits abroad	
6.	Training	
7.	Additional Staff	

Table 3.12: Financial Commitment of the Outside Organizations for linked R&D Projects

S. No	Category	No. of Projects	Funds (Rs. in Lakh)	
			Sponsored	Foreign Supported
1.	Total Commitment			
2.	Received			
3.	Proposed during 1980-81			
4.	Proposed during 1981-82			

Table 3.13: Size of R&D projects (Total expected Cost)

S. No	Category	No. of Projects
1.	Upto Rs. 2 lakhs	
2.	Rs. 2 - 5 lakhs	
3.	Rs. 5 - 10 lakhs	
4.	Rs. 10- 15 lakhs	
5.	Rs. 15 - 20 lakhs	
6.	Rs. 20 - 25 lakhs	
7.	More than Rs. 25 lakhs	
8.	Data Not Available	

Table 3.14: Annual Budget

S. No	Category	No. of Projects
1.	Upto Rs. 2 lakhs	
2.	Rs. 2 - 5 lakhs	
3.	Rs. 5 - 10 lakhs	
4.	Rs. 10- 15 lakhs	
5.	Rs. 15 - 20 lakhs	
6.	Rs. 20 - 25 lakhs	
7.	More than Rs. 25 lakhs	
8.	Data Not Available	

: Escalation in time Schedule for R&D Projects

S. No	Category	No. of Projects
1.	Ahead of Schedule	
2.	Nil	
3.	Upto 6 months	
4.	6 - 12 months	
5.	12 - 18 months	
6.	18 - 24 months	
7.	More than 24 months	
8.	Data Not Available	

Figure 3.16: Age of R&D Projects as on 1.4. 1980

S. No	Category	No. of Projects
1.	Upto 2 Years	
2.	2 - 5 Year	
3.	5 - 10 Year	
4.	More than 15 Years	
5.	Not available	

Table 3.17: Socio-Economic Relative Aspects for R&D Project

S.No	Category	No. of Projects
Use of Raw Materials		
1.	Imported	
2.	Indigenous	
<u>TECHNOLOGY</u>		
3.	Labour Intensive	
4.	Capital Intensive	
<u>EMPHASIS</u>		
5.	Import Substitution	
6.	Export Promotion	
<u>NEEDS</u>		
7.	Market for the Product excess	
8.	Reduction & Production Cost	
9.	Exploitation of Natural Resources	
10.	Saving of Energy	
11.	Generation of Employment through Utilization of results.	

Table 3.18: Bottlenecks Retarding the Progress of R&D Projects

S. No	Category	No. of Projects
<u>TECHNICAL</u>		
1.	Unexpected Technical Problem	
2.	Project Redefined	
3.	Accorded lower priority and resources diverted elsewhere	
4.	Some Other related project behind schedule	
5.	Inadequacy of Scientific/Technical expertise	
6.	Inadequacy of Cooperation or indifference from Collaborator Sponsor	
7.	Redundancy	
8.	Obsolescence	
9.	Long absence of Project Leader	
<u>Infrastructural</u>		
10.	Inadequacy of Space	
11.	Inadequacy of relevant literature with documentation facilities	
12.	Non availability of equipment	
13.	Equipment Failure	
14.	Non availability of materials/chemicals	
15.	Inadequacy of Supporting Manpower	
16.	Inadequacy of Funds	
17.	Administrative Rules/procedures	

Table 3.19: Additional Manpower Requirement

Sl. No	Year	Manpower Requirement			Total
		Scientific Administrative	Technical		
1.	1980-81				
2.	1981-82				
3.	1982-83				
4.	1983-84				
5.	1984-85				

The data received were coded, entered and processed and the laboratory profiles prepared. The dependence on the computing resources elsewhere put tremendous pressure in meeting the deadlines.

1980-85 During these years, in addition to the analysis discussed above and presented as laboratory profiles, an additional set of laboratory profiles for each laboratory indicating mainly trend analysis of finance, manpower, per scientist expenditure, percentage of investment in different types of activities and also degree of utilization i.e. capability of the laboratory to utilize the resources allocated, were also prepared to help the decision making. This helped in the planning process and resource allocations.

1985-87 Since 1985, the above laboratory profiles were merged and a single profile was prepared for each laboratory. This was possible mainly because of the availability of inhouse computer system in CSIR.

The "Laboratory Profile" covered the following:

1. Scope and objective of the laboratory.
 - * Areas of Thrust identified for the year
 - * Major initiatives proposed for the year
 - * Major infrastructure facilities proposed for the year.

2. List of R&D projects of the laboratories both ongoing and new proposed. The list provided information on R&D area, Title of the project, reference to the page no of plan document, project code, duration of time span. Nature of the project (viz Major, Minor, MAP and the financial projection for the current year and the next year.
3. Summary of the analysis of expenditure and manpower
 - a. Average Growth rate/annum as well as overall Growth rate for all the Conventional Budget heads, viz, Salaries, Contingencies, Maintenance, Chemicals, Works & Services, Equipment, library books, Total.
 - b. Actual Cumulative expenditure on Additional facilities provided to the laboratory - in terms of construction (works & services), sophisticated equipment and Library Books.
 - c. Average expenditure per scientist per annum
 - d. Ratio of Scientific and Technical personnel
 - e. Distribution of Resources on the conventional heads as percentage of Total; Distribution of resources on the projects (specialized, Major, Minor, Infrastructure) as percentage of total
4. Budget allocation and details of works and services for the current year.
5. Financial projection for ten years 1980-90
6. Sub-headwise break-up of year-wise actual expenditure since 1975-76 till previous year, RE for the current year and BE for the next year.
7. Distribution of proposed investment in different functional activities - Actuals, SE, RE and BE.
8. Project-wise financial projection as demanded by the laboratory.
9. Project-wise Financial Commitment (if any) of the other organizations/Agencies.

10. Financial resources received from various sources including CSIR.
11. Trend of Manpower deployment since 1975.
12. Designation/Category-wise consolidated manpower statement as on 1 July current year.
13. Detailed information on existing scientists - name, age/ Date of birth, Degree with field of Specialization, Involvement in the project and Infrastructure
14. List of obsolete equipment costing more than Rs. one lakh.
15. List of Major equipment required.
16. List of project-wise requirement of Works & Services
17. Degree of utilization under different conventional budget heads since 1975-76; i.e. analysis of the data in terms of Resources asked for (estimated expenditure), actually Sanctioned allocation, Revised allocation and Actual expenditure under each head viz Total, Salaries, Contingencies, Chemicals, Works & Services and Equipment.
This analysis helped to understand the planning process of the laboratories as well as the capability to utilize the allocated resources. In most of the cases, actual Sanctioned allocation used to be 50% of the projected estimates. Laboratories could be classified in terms of those having Actuals < SE, those having Actuals < RE and those having Actuals > RE.
18. Consolidated information on R&D projects/Schemes/ Products/ Publication/ Patents; etc. viz

i. Projects in Hand (No)

- i.1 Specially funded projects
- i.2 Major projects

- i.3 Other in-house R&D projects
- i.4 Foreign Assisted projects
- i.5 Sponsored Projects
- i.6 Consultancy projects

ii. Projects Completed (No)

- ii.1 Specially funded projects
- ii.2 Major Projects
- ii.3 Other In-house R&D projects
- ii.4 Foreign assisted projects
- ii.5 Sponsored Projects
- ii.6 Consultancy projects

iii. Projects Terminated (No.)

iv. Products/Processes (No.)

- iv.1 Developed
- iv.2 Licensed to Industry
- iv.3 Went into production
- iv.4 In continuous production
- iv.5 Estimated value of production (Rs. in lakh)

v. Earnings from (Rs. lakhs)

- v.1 Sponsored projects
- v.2 Consultancy
- v.3 Royalty
- v.4 Premia
- v.5 Analytical Testing
- v.6 Pilot Plant projects
- v.7 Sale of Laboratory projects

vi. Publications (No.)

- vi.1 Paper
- vi.2 Technical Reports
- vi.3 Books
- vi.4 Journals (bimonthly)

vii. Patents

- vii.1 Filed
- vii.2 Sealed

19. LISTS as given in the Annual Plan document indicating the projects in hand completed dropped in terms of in-house sponsored & consultancy projects, products and processes, and Value of production as a result of exploitation of products and processes developed by the laboratory.

1987-90 Peer Review Meetings: The system of annual plan document, the annual plan meetings preceding CSIR plan discussions with the laboratories was discontinued with the introduction of the Peer Review Meetings in the Year 1987. This was a new concept introduced for the first time in CSIR. The laboratory Directors and senior scientists were requested to plan for the remaining three years (1987-90) of the Seventh five year plan (1985-90) and make a presentation before the Peers. Based on the presentation and the following interaction, the three year allocations for the laboratories in terms of financial requirements, manpower ceiling upto March, 1990, thrust areas of research etc. were indicated. Decisions on areas of thrust, clearance of posts for filling up the vacancies and the resource allocations for the last two years of the Seventh Five Year Plan i.e. for 1988-89 and 1989-90 were taken annually within the purview of decisions taken for three years during these Peer Review Meetings.

1990-92: There were lot of uncertainties during these two years. The Eighth Five Year Plan (1990-95) was scheduled to begin during 1990-91. CSIR formulated the Eighth Five Year Plan and forwarded the base document to all the laboratories seeking their comments and inputs. The activities of the laboratories

were grouped in terms of: National Missions, CSIR in National S&T Programmes, CSIR Missions or CSIR Thrust areas, Major National Facilities and Laboratory Thrust area Programmes.

Based on the feed back received from the laboratories, the Eighth Plan (1990-95) was formulated twice once during 1990-91 and again during 1991-92. However, the government treated these two years as annual plans and resources were allocated with marginal increases over the previous year allocations. CSIR continued the concept of Peer Review Meetings with the laboratories to arrive at the resource allocations for the laboratories and also to stream line the committed expenditure to optimise the available resources.

1992 Onwards: The Eighth Five Year Plan (1992-97) was revised and actually came into effect from 1992-93. The allocations were decided on the past trends for committed expenditure and some special allocations were being made for specific programmes.

Various computer systems were used in the analysis. Table 3.20 illustrates the chronological order of computer systems and software and generation of laboratory profiles.

Some of the analysis tables and graphs are presented in Annexure-3.2 and Annexure-3.3

3.4 AREA-WISE STATUS REPORT

In addition to laboratory profiles, Area-wise status reports giving details of projects in each area were also prepared based on the inputs received from laboratories. The area reports constitutes project profiles giving details of each project in the area in terms of objectives, targets, linkages and the resource requirements

Year	Computer System	Activities	Packages used/developed
1	2	3	4
Before 1981	IBM 360 Delhi University	Listing of Profile Lab Profile	Fortran IV Application Programme Written by CSIR
1981-84	Inter Data 8/82 Planning Commission	"	"
1980-84	DCM Micro- system 1121/1122 Inhouse Cassettes, Magcards Teleprinter as printer	Trend analysis graph pattern Histogram	Specific Machine Assembly language Programme
1984	PSI- Action station 64 KB RAM 8" FDD Two printers one LQP 35 cps and one 8 colour DMP 200 cps in house	Lab Profile Project listing Trend analysis Plan Reports Monthly Reports	C-BASIC Word Processor Supercal-2 Electronic Spreadsheet Graphics
1985-90	1) PSI-OMNI system 16-bit Mini Computer 2) AS-16-PCXT min. one 51/2 one 8" FDD Including	All activity of Planning Research output analysis' Terminal to OMNI AS8 also served as a terminal to OMNI	Word Processor Electronic spreadsheet, COBOL DBMS, DBPLUS C-BASIC etc.

1	2	3	4
1987	ESPL-SM32 Motorola 68020 Unix based Min. Computer with 26 Terminal one are PCAT/ PCXT/PC etc.	SM-32 Never worked PCAT worked	DBPLUS STORY Harward Graphics
1991 - Till date	HCL PCAT-386 PCXT Busy Bee	All activities of PME	Many application Software used

3.5.2 Monthly Report

Monthly reports are received from the laboratories as per the format discussed in the Chapter-2. Major breakthroughs used to be reported every month to the cabinet. Only very few laboratories send their reports well in time. The reports of laboratories who respond are included in the next months report.

3.5.3 Quarterly Milestones Report

The genesis of the quarterly milestones monitoring was discussed in Chapter-2. The report on the identified milestones included in the Activity Milestones document for the year has to be sent by the laboratories as per the following format.

Format for Reporting Every Quarter

Name of the Laboratory:

1. Title of the Project
2. Milestones for the Quarter:
 - June
 - Sept
 - Dec
 - March
3. Whether Milestones Reached or not: Yes or No
4. If yes, Highlights
5. If No, a) Reasons/ Bottlenecks
To which quarterly the Milestones to be shifted
6. Remarks if any

Signature of the
Project Investigator
Date

Signature of the
Director
Date

Table 3.20 Continued.

1	2	3	4
1987	ESPL-SM32 Motorolla 68020 Unix based Min. Computer with 26 Terminal one are PCAT/ PCXT/PC etc.	SM-32 Never worked PCAT worked	DBPLUS STORY Harward Graphics
1991 - Till date	HCL PCAT-386 PCXT Busy Bee	All activities of PME	Many application Software used

Presently a data base is available having financial and manpower data since 1975.

3.5 MANDATORY REPORTS

3.5.1 Annual Reports

The data received from the laboratories were edited and the items needed to be included in the CSIR annual report were marked with a specific area code. The criteria for selecting the items are:

Continuity of progress reported in the earlier report; projecting the major technological achievement; important breakthrough in basic research; essential technical services rendered; avoiding duplication of earlier reports; etc.

The selected information was entered into the computer as laboratory file with each item having area identification. After finalizing each laboratory file, area files were generated for each laboratory. These were then merged and integrated as the CSIR Annual Report master file. This master file is used by PID for the publication of the CSIR Annual report.

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4. If yes, Highlights
5. If No, a) Reasons/ Bottlenecks
To which quarterly the Milestones to be shifted
6. Remarks if any

Signature of the
Project Investigator

Date

Signature of the
Director
Date

Software for the Quarterly Milestones:

In 1988-89, a menu driven software was developed for this purpose specifically. The Software has the facility to generate laboratory-wise report, area-wise report for each quarter as well as generation of list of projects and their milestones for every quarter and the complete document as such. The software has the facility to generate laboratory wise list of projects having milestones for a particular quarter. These lists are generated in the first week of June, September, December and March for the respective quarters and sent to the laboratories seeking the reports on these projects. The reports received from the laboratories are used to generate the Quarterly milestone report and

The details and list of the SOFTWARE FOR MONITORING REPORT FOR MILESTONES PROJECTS are given below:

(Developed by Planning Division, CSIR, New Delhi)

M A I N M E N U

1. REPORT FOR QUARTER ENDING JUNE
2. REPORT FOR QUARTER ENDING SEPT.
3. REPORT FOR QUARTER ENDING DEC.
4. REPORT FOR QUARTER ENDING MARCH
5. DETAILS OF ALL PROJECTS-WHOLE YEAR
6. UPDATING/EDITING OF DATA BASE
7. FUNDS/MANPOWER/TIME SCHEDULE
8. EXIT

CHOOSE NUMBER BETWEEN 1 AND 8

ENTER CHOICE :

Choice between 1 to 4 will almost give similar submenu for the 4 different quarters.

CHOICE 1

SUBMENU 1

- =====
- PROJECTS HAVING MILESTONES FOR QUARTER ENDING JUNE
1. HORIZONTAL PRINTING FOR ALL PROJECTS (PRINTING)
 2. PROJECTWISE - REPORTING (PRINTER)
 3. PROJECTWISE - REPORTING (MONITOR)
 4. EXIT TO MAIN MENU

=====

ENTER OPTION 1 OR 2 OR 3 OR 4

CHOICE 2

SUBMENU 2

- =====
- PROJECTS HAVING MILESTONES FOR QUARTER ENDING SEPT.
1. HORIZONTAL PRINTING FOR ALL PROJECTS (PRINTER)
 2. PROJECTWISE - REPORTING (PRINTER)
 3. PROJECTWISE - REPORTING (MONITOR)
 4. EXIT TO MAIN MENU

=====

ENTER OPTION 1 OR 2 OR 3 OR 4

CHOICE 3

SUBMENU 3

- =====
- PROJECTS HAVING MILESTONES FOR QUARTER ENDING DEC.
1. HORIZONTAL PRINTING FOR ALL PROJECTS (PRINTER)
 2. PROJECTWISE - REPORTING (PRINTER)
 3. PROJECTWISE - REPORTING (MONITOR)
 4. EXIT TO MAIN MENU

=====

ENTER OPTION 1 OR 2 OR 3 OR 4

CHOICE 4

SUBMENU 4

=====
PROJECTS HAVING MILESTONES FOR QUARTER ENDING
MARCH

- 1. HORIZONTAL PRINTING FOR ALL PROJECTS (PRINTER)
2. PROJECTWISE - REPORTING (PRINTER)
3. PROJECTWISE - REPORTING (MONITOR)
4. EXIT TO MAIN MENU

=====

ENTER OPTION 1 OR 2 OR 3 OR 4
UNDER THE SUBMENU 1 TO 4, THERE ARE 4 OPTIONS

OPTION 1 gives print output of details of all projects and Milestones
pertaining to the specific quarter.

OPTION 2 gives the print output of project wide milestones report

Name of the Laboratory: Title of the
Project:

Milestones for the Quarter:
Project Co-ordinator Head-quarter
Co ordinator

Whether Reached or Not: Yes /No If Yes,
Highlights of Achievements
and If No,
Bottlenecks, Reasons for not reaching
Whether Milestones to be Shifted to another
Quarter.

If so, to Which Quarter.
Remarks

This can be stopped at any time by typing 'q' or 'Q'.
OPTION 3 Same as OPTION 2. ONLY DIFFERENCE THE REPORT
IS VIEWED IN THE MONITOR. THIS CAN ALSO BE STOPPED BY
PRESSING 'q' OR 'Q'

OPTION 4 EXIT TO MAIN MENU

CHOICE 5 will generate complete list of projects with details of milestones defined for different quarters for the whole year. in other words it generates the complete milestones document.

CHOICE 6 ENABLES UPDATING, EDITING OF A DATA BASE

OPTION 1 ALLOWS ADDING RECORDS

OPTION 2 ALLOWS EDITING OF ANY EXISTING RECORD

THIS ENABLES TO ENTER THE MILESTONES ACHIEVEMENTS AND BOTTLENECKS AS REPORTED IN EACH QUARTER BY THE LABORATORIES

OPTION 3 EXIT TO MAIN MENU

CHOICE 6

===SCREEN FOR UPDATING MILESTONE DATA BASE===

1. ADD PROJECTS
2. UPDATE DATA
3. EXIT

=====

ENTER OPTION 1 OR 2 OR 3

CHOICE 7 LEADS TO SCREEN FOR FINANCIAL, MANPOWER AND TIME SCHEDULE DETAILS

OPTION 1 ONE CAN GET THE INFORMATION FOR A SPECIFIC PROJECT BY INDICATING THE PROJECT NUMBER

OPTION 2 PROVIDES PROJECTWISE INFORMATION ON ALL PROJECTS

OPTION 3 INFORMATION ON ALL PROJECTS AT A GLANCE

EVEN OF TIME OPTIONS HAS FURTHER OPTIONS TO GET A PRINT OUTPUT OF VIEWING IN THE MONITOR OR STOPPING AT ANY TIME.

OPTION 4 - EXIT TO MAIN MENU

CHOICE 7

==SCREEN FOR FINANCIAL, MANPOWER AND TIME SCHEDULE DETAILS==

1. INFORMATION FOR A SPECIFIC PROJECT
2. PROJECT-WISE INFORMATION ON ALL PROJECTS
3. INFORMATION ON ALL PROJECTS AT A GLANCE
4. EXIT TO MAIN MENU

=====

ENTER OPTION 1 OR 2 OR 3 OR 4

CHOICE 8 GIVES ARE YOU SURE Y OR N

IF 'Y' - EXIT AND ANY OTHER KEY AGAIN MAIN MENU

CHOICE 8

ARE YOU SURE Y OR N

IF Y EXIT TO C>

IF N RETURN TO MAIN MENU

3.6 Research Output Analysis: Performance Evaluation

One of the important outputs of a national laboratory is the publication of research papers in journals. An attempt by the author and Dr. N.R. Rajagopal to analyze the papers published in journals during 1985 and 1986 resulted in a **document entitled "RESEARCH OUTPUT OF NATIONAL LABORATORIES (Papers Published During 1985 and 1986)"** This document was released by the then Prime Minister at CDRI, Lucknow. As an outcome of this publication, a need for a detailed bibliometric analysis of papers published by the scientists of laboratories was felt by the management and the project was undertaken by INSDOC in collaboration with CSIR Headquarters.

The bibliometric analysis started in the year 1986, is being continued every year by INSDOC. CSIR headquarters coordinates the data collection and the data received from the laboratories, are passed on to the bibliometric group of INSDOC for analysis. Papers published in Journals are only included in the analysis. The main emphasis is the impact factor of the journals. The impact of any paper could be considered as the number of citations the paper receives in its field. In CSIR, the analysis is carried out immediately and there is not sufficient time to have a proper measure of the impact factor of the paper. So,

INSDOC group is adopting an indirect method of using the IF of the Journal for the preceding year.

"The Impact factor (IF) of a journal has been defined as the ratio of total number of citations received by it to the total number of citable items published by the journal during a fixed period"

The IF of journals are taken from the journal citations reports (JCR) of the Science Citations Index (SCI).

This also did not solve the problem completely because CSIR scientists are engaged in diversified fields of R&D and the papers published by them are widely scattered in more than 90 subjects. The range of the highest IF values varies from subject to subject. It will be very high in the biology area where as very low in some of the engineering subjects. If IF is to be used as a comparative indicators among the various laboratories, this analysis may lead to incorrect decision or judgment on the performance of a particular laboratory. So, a decision was taken to apply a normalization factor. **"The IF of the topmost research periodical/Journal in a subject category has been normalized using a suitable multiplier. Using the same multiplier, the Normalized Impact Factor (NIF) of the other periodicals/journals figuring with in the same subject category have been determined"**. INSDOC is carrying out the analysis using both IF and NIF. The analysis from 1986 - 1991 is presented in Table 3.21.

Since papers published in journals are only a very small part of the output indicators, this has not helped much in decision making especially with regards to performance evaluation.

In continuation of this project, it was decided to analyze other aspects of research output. **A data base was created for the first time for the ABCD analysis.** The ABCD analysis aims at the evolution of quantitative and qualitative parameters on A- the Science component, based on the analysis of scientific papers published in the Journals, B- the Technology component such as development of processes, products, patents, value of industrial production, based on the CSIR know-how etc., C- the Service component such as the

quantum of external cash flow and other parameters and D- the recognition component measured in terms of various awards.

Parameters included under A, B, C, D are:

A. Scientific

- * Number of Scientists
- * Number of papers: Total
 - in SCI Journal
 - in Non SCI Journal
 - Ratio of SCI/Non SCI
 - In indian Journal
 - In foreign Journal
 - Ratio of Indian/Non Indian
- * Impact Factor (IF)
 - Total IF
 - Average IF/ paper
 - Average IF/ Scientist
- * Normalized Impact Factor (NIF)
 - Total NIF
 - Average NIF/paper
 - Average NIF/ Scientist
- * Major Fields of Publications
- * Papers with
 - A=IF > 0.6
 - B=NIF > 2.0
 - Indices A/Total Papers
 - B/Total papers

B. Technological

- * Annual Industrial production
 - based on lab technology (Rs. in crore)
- * New knowhow developed (Numbers)
- * Know how licensed (Nos)
- * Commercial production of technologies (New

Nos.)

- * Patent applications (Nos.) filed,
Sealed, accepted

C. Services (Rs. lakh)

- * Committed cash flow during the year
 - * Lab Budget
 - * Actual cash flow
 - * % increase
 - * Excess or short fall during the year
 - * Satisfaction factor
- $S1 = \text{Actual cash flow} / \text{Target}$
- $S2 = \text{Actual Cash flow} / \text{Expenditure of lab Budget}$

D. Awards Recognition

- * National awards
- * Academy awards
- * Special awards

This exercise was attempted for the first time in 1987. Because of the detailed analysis of papers published in journals, the data on A - i.e. Scientific part was available. The authentic information on the other 3 components viz. B - technological C - services and D - awards could not be generated due to the non availability of a proper information system both at the CSIR HQ. level as well as at the individual laboratory level. Further, there are several other sub components in A itself such as papers presented in the conference (symposia), monographs, books, technical reports, review articles, etc. which are not taken into account.

The conceptual design visualized was the generation of an Index (I) for the laboratory such that

$$I = aA + bB + cC + dD$$

where ,a,b,c & d are the weightage factors for the four components defined earlier.

Summation of a,b,c & d could be assumed as 1. The factor d will be a function of a,b,c.

The weightage factors depend on the charter and nature of the activities of each laboratories.

In order to facilitate such an analysis, a data collection format have been designed and sent to the laboratories in April 1993. The response from the laboratory is not very good. This has to be an integral part of the information system at the lab level, so that there is a smooth flow of such information to the agency to facilitate meaningful analysis. The formats are given in Annexure 3.1.

3.7 CONCLUSIONS

The plan documents of the laboratories form the base information for the preparation of overall CSIR five year plans and subsequent annual plans.

The various analysis made based on the data received in the form of plan documents served as the background materials in the form of laboratory profiles for the annual plan discussions with the laboratories and helped the process of resource allocations. The trend analysis and other information on thrust areas etc. provided the insight into the direction and growth of the laboratories. The analysis on the degree of utilization under various conventional budget heads narrated the existence of the planning process and availability of effective leadership.

The project-wise financial data viz. cost data, expenditure incurred were mostly the problem area and invariably were not provided by most of the laboratories. The continuity of data with respect to project information has always been the weak link in the system mainly because of the exercise being done

annually and not continuously. This had enabled to arrive at overall allocations to the laboratories based on the past trends in terms of certain percentage increase rather than project-wise allocations based on the projections on the project requirements.

The dependability and reliability of data are essential for any meaningful analysis and subsequent decisions based on such an analysis.

There were not major problems with respect to mandatory reports. However, the laboratories were not focusing on reporting only important items to form the part of CSIR report. It required perceptions by the editors to decide the items to be included. The data on total investment made on the development of technology/process/product were not available.

Performance evaluation is the role mainly of the research councils of the laboratories. The information system is expected to take care of the availability of the data for such an exercise. There has never been any consensus on the performance indicators for a project, a lab , or CSIR as a whole.

Besides helping the decision process, information is also required generation of information for various other purposes. The problems in information generation and the gaps in information as per the present system are discussed in the next Chapter.

Table 3.21 : RESEARCH PAPERS 1986-1991.

LAB	YEAR	PAPERS	SCI	NSCI	INDIAN	FOREIGN	IF	AVG IF/ PAPER	NIF	AVG NIF/ PAPER	IF	NIF
											7.6	7.2
NPL												
	1986	76	62	14	0	76	59.727	0.786	203.553	2.678	31	0
	1987	127	75	52	63	64	58.972	0.464	190.326	1.499	36	36
	1988	144	107	37	56	88	101.355	0.704	396.268	2.752	63	60
	1989	135	103	32	55	77	85.590	0.630	287.093	2.130	51	57
	1990	173	98	75	77	96	136.559	0.789	377.437	2.182	56	57
	1991	219	176	43	95	124	195.482	0.693	541.099	2.471	99	90
CEERI												
	1986	16	6	10	0	16	7.178	0.449	28.882	1.805	2	0
	1987	14	8	6	3	11	9.987	0.713	33.947	2.425	7	6
	1988											
	1989	34	20	14	11	23	27.033	0.800	76.943	2.263	14	12
	1990	9	6	3	5	4	7.447	0.827	20.981	2.331	3	3
	1991	21	16	5	4	17	7.600	0.362	24.936	1.187	3	3
CSIO												
	1986	2	1	1	0	2	0.105	0.021	0.607	0.121	1	0
	1987	6	4	2	2	4	1.468	0.245	5.247	0.874	0	1
	1988	3	3	0	1	2	2.973	0.991	9.633	3.211	2	2
	1989	4	3	1	1	1	2.540	0.640	7.132	1.780	1	2
	1990	10	2	8	5	5	3.250	0.325	12.562	1.256	2	2
	1991	9	2	7	6	3	2.472	0.275	5.747	0.639	1	1
NGRI												
	1986	57	42	15	0	57	45.255	0.794	141.732	2.486	27	23
	1987	53	28	25	17	36	50.479	0.952	93.498	1.764	0	20
	1988	47	29	18	24	23	20.723	0.441	61.963	1.318	13	11
	1989	31	19	12	16	15	14.373	0.464	35.578	1.150	5	6
	1990	38	26	12	14	24	22.677	0.597	62.003	1.632	12	12
	1991	40	34	6	19	21	19.546	0.489	48.976	1.224	13	6
NID												
	1986	96	66	30	0	96	35.588	0.371	157.205	1.638	19	0
	1987	91	64	27	51	40	34.551	0.380	111.132	1.221	15	16
	1988	125	85	40	68	57	54.517	0.436	190.347	1.523	32	32
	1989	13	9	4	7	6	6.047	0.465	22.469	1.728	21	16
	1990	108	81	27	45	63	84.572	0.783	164.977	1.528	38	40
	1991	109	85	24	48	61	109.149	1.001	209.126	1.919	35	35

LAB	YEAR	PAPERS	SCI	NSCI	INDIAN	FOREIGN	IF	AVG IF/ PAPER	NIF	AVG NIF/ PAPER	IF	NIF
											7.6	7.2
NCL												
	1986	172	159	23	0	172	154.607	0.899	571.149	3.321	91	0
	1987	166	145	21	37	129	150.633	0.907	411.527	2.479	89	97
	1988	48	40	8	12	36	40.153	0.837	125.129	2.607	25	23
	1989	169	155	14	25	142	212.300	1.260	650.684	3.850	110	117
	1990	156	147	9	20	136	203.236	1.311	448.968	2.878	107	91
	1991	182	161	21	21	161	207.567	1.140	610.298	3.353	120	108
CECRI												
	1986	91	11	80	0	91	22.659	0.249	110.899	1.219	5	0
	1987	83	19	64	64	19	20.773	0.250	82.593	0.995	15	13
	1988	133	10	123	120	13	19.482	0.146	104.528	0.786	3	8
	1989	150	20	130	131	18	33.836	0.226	148.459	0.990	12	15
	1990	106	19	87	84	22	32.992	0.311	118.127	1.114	15	17
	1991	96	48	48	40	56	49.382	0.514	204.063	2.126	32	34
CSMCRI												
	1986	38	28	10	0	38	25.561	0.672	82.178	2.162	12	11
	1987	39	25	14	21	18	19.580	0.502	49.493	1.269	11	9
	1988											
	1989	55	38	17	21	31	54.228	0.990	172.769	3.140	29	13
	1990	64	46	18	36	29	40.402	0.631	7.748	1.199	27	14
	1991	59	38	21	18	41	31.472	0.533	70.240	1.191	25	7
IICT												
	1986	79	59	20	0	79	72.780	0.921	206.423	2.612	38	0
	1987	86	69	17	23	63	76.001	0.884	237.308	2.759	46	41
	1988	120	96	24	44	76	91.086	0.759	309.484	2.579	59	61
	1989	173	140	33	18	155	165.553	0.960	555.727	3.210	93	102
	1990	196	166	130	45	151	193.059	0.985	628.462	3.206	113	111
	1991	134	105	29	23	111	137.382	1.025	419.306	3.129	77	62
RRL-JOR												
	1986	45	27	18	0	45	23.852	0.530	80.692	1.793	15	0
	1987	41	25	16	22	19	21.013	0.513	64.473	1.573	11	11
	1988	27	10	17	18	9	10.814	0.401	32.208	1.193	15	5
	1989	30	23	7	12	18	20.002	0.670	73.254	2.440	8	4
	1990	43	30	13	21	22	24.259	0.564	99.374	2.311	12	15
	1991	35	18	17	13	22	19.032	0.544	77.117	2.203	13	16
IIP												
	1986	28	25	3	0	28	15.732	0.562	75.955	2.713	9	0
	1987	31	28	3	11	20	13.849	0.447	62.621	2.020	8	12
	1988	20	15	5	8	12	8.975	0.449	66.023	3.301	6	10
	1989	20	13	7	2	18	7.984	0.400	47.788	2.390	7	10
	1990	29	23	6	11	18	13.430	0.463	56.726	1.956	5	11
	1991	29	20	9	9	20	8.263	0.285	51.799	1.786	3	12

LAB	YEAR	PAPERS	SCI	NSCI	INDIAN	FOREIGN	IF	AVG IF/ PAPER	NIF	AVG NIF/ PAPER	IF 7.6	NIF 7.2
CLRI	1986	29	10	19	0	29	23.542	0.811	85.971	2.964	8	0
	1987	84	28	56	12	72	40.824	0.486	126.620	1.507	23	16
	1988	42	22	20	19	23	35.463	0.844	81.866	1.949	17	15
	1989	48	29	19	25	21	19.156	0.400	72.799	8.520	10	14
	1990	29	14	15	13	16	14.646	0.505	25.262	0.871	9	5
	1991	58	30	28	20	38	25.719	0.443	75.027	1.294	17	13
CFRI	1986	22	6	16	0	22	6.107	0.278	42.745	1.942	3	0
	1987	26	1	25	25	1	3.641	0.140	21.254	0.817	1	1
	1988	35	11	24	23	12	12.758	0.365	98.519	2.815	9	11
	1989	10	3	7	7	3	3.295	0.330	13.393	1.340	3	3
	1990	12	3	9	9	3	3.378	0.282	15.894	1.324	2	2
	1991	19	5	14	16	3	2.430	0.128	18.815	0.990	1	3
NML	1986	9	3	6	0	9	2.672	0.296	10.606	1.178	1	0
	1987	17	6	11	12	5	1.494	0.088	6.699	0.394	0	0
	1988										3	3
	1989	21	12	9	10	9	10.096	0.480	44.195	2.104	8	10
	1990	21	12	9	8	13	6.758	0.322	32.055	1.526	5	6
	1991	26	17	9	7	19	11.157	0.429	46.816	1.801	11	11
CGCRI	1986	16	9	7	0	16	8.211	0.513	75.694	4.730	4	0
	1987	35	20	15	9	26	18.363	0.525	113.540	3.244	11	17
	1988											
	1989	34	19	15	8	26	16.254	0.480	78.229	2.300	14	18
	1990	36	20	16	10	26	14.583	0.405	66.463	1.846	7	10
	1991	30	16	14	12	18	10.950	0.365	61.844	2.061	7	9
CMRS	1986	26	2	24	0	26	5.885	0.226	18.404	0.707	1	0
	1987	27	4	23	21	6	6.498	0.241	21.903	0.811	3	4
	1988	30	5	25	18	12	4.805	0.160	21.888	0.730	3	3
	1989	25	9	16	13	12	5.524	0.220	31.260	1.250	3	3
	1990	12	0	12	10	2	0.238	0.020	0.799	0.067	0	0
	1991	16	3	13	10	6	1.243	0.078	4.247	0.265	0	0
NEERI	1986	35	10	25	0	35	7.338	0.209	33.707	0.963	1	0
	1987	68	14	54	50	18	18.790	0.276	93.552	1.375	8	9
	1988	52	9	43	39	13	11.433	0.220	50.936	0.980	7	7
	1989	42	5	37	26	16	6.972	0.170	29.765	0.710	1	2
	1990	75	23	52	49	26	17.055	0.227	72.139	0.962	10	0
	1991	53	5	48	52	1	2.014	0.038	7.441	0.140	0	0
CMERI	1986	12	0	12	0	12	0.756	0.063	7.992	0.666	0	0
	1987	14	0	14	14	0	0.490	0.035	3.651	0.261	0	0
	1988											
	1989	3	3	0	1	2	0.729	0.234	2.834	0.945	0	1
	1990	3	2	1	0	3	0.798	0.266	5.678	1.893	0	2
	1991				NO	JOURNAL	PAPER	REPORTED				

	1987	7	1	6	4	3	1.440	0.206	7.563	1.080	1	0
	1988	9	6	3	2	7	2.709	0.301	46.423	4.047	1	4
	1989	6	1	5	5	1	0.080	0.010	0.956	0.160	0	0
	1990	9	3	6	5	4	1.168	0.130	6.150	0.683	0	1
	1991	21	4	17	11	10	2.481	0.118	23.519	1.120		
RRL-BHU	1986	30	12	18	0	30	7.886	0.262	34.044	1.134	5	0
	1987	42	27	15	19	23	14.026	0.334	66.419	1.581	11	11
	1988											
	1989	20	6	14	7	11	4.010	0.200	18.788	0.940	3	5
	1990	22	11	11	9	13	5.903	0.268	28.219	1.283	4	6
	1991	22	9	13	8	14	5.398	0.245	22.367	1.017	3	3
RRL-TRI	1986	27	17	10	0	27	9.916	0.367	65.984	2.443	6	0
	1987	20	6	14	8	12	4.635	0.232	35.717	1.786	4	5
	1988	25	14	11	14	11	9.569	0.383	32.509	1.300	5	7
	1989	23	14	12	10	16	11.431	0.497	42.335	1.840	6	9
	1990	52	37	15	14	38	35.193	0.677	138.996	2.673	18	25
	1991	51	41	10	7	44	52.475	1.029	200.112	3.924	30	27
CBRI	1986	12	1	11	0	12	1.112	0.093	11.597	0.966	0	0
	1987	14	1	13	12	2	0.543	0.039	5.025	0.359	0	0
	1988	8	5	3	2	6	2.181	0.273	21.032	2.629	1	2
	1989	8	0	8	6	2	0.600	0.075	5.599	0.070	0	1
	1990	19	4	15	10	9	0.959	0.031	3.488	0.184	0	1
	1991	12	2	10	8	4	0.839	0.070	6.949	0.579	0	1
CARI	1986	19	2	17	0	19	0.290	0.068	12.460	0.656		
	1987	10	0	10	10	0	0.426	0.043	4.686	0.469	0	0
	1988	17	1	16	17	0	0.078	0.005	0.542	0.032	0	0
	1989	13	1	12	13	0	0.099	0.007	0.875	0.067	0	0
	1990											
	1991	17	3	14	15	2	1.118	0.066	9.782	0.575	0	0

No Journal Paper Reported

LAB	YEAR	PAPERS	SCI	NSCI	INDIAN	FOREIGN	IF	AVG IF/ PAPER	NIF	AVG NIF/ PAPER	IF 7.6	NIF 7.2
RRL BHO	1986	14	10	4	0	14	9.598	0.685	87.568	6.254	5	0
	1987	7	7	0	0	7	6.096	0.871	32.092	4.585	5	7
	1988	49	41	8	17	32	19.648	0.401	95.455	1.948	17	20
	1989	39	30	9	19	19	15.745	0.404	58.180	1.490	12	10
	1990	35	34	11	12	23	10.848	0.310	40.700	1.163	5	6
	1991	47	27	20	21	26	14.755	0.314	54.262	1.155	11	13
CFTRI	1986	108	81	27	0	108	62.655	0.580	290.522	2.690	35	0
	1987	140	91	49	47	93	70.011	0.500	317.255	2.266	56	57
	1988	100	72	28	44	56	49.145	0.491	209.274	2.093	31	31
	1989										26	35
	1990	74	46	28	34	40	27.015	0.365	117.943	1.594	16	20
	1991	109	65	44	57	52	44.167	0.405	186.230	1.709	30	26
CDRI	1986	177	115	62	0	177	132.117	0.742	282.778	1.583	56	0
	1987	171	105	66	86	85	105.818	0.619	229.195	1.340	50	35
	1988	172	117	55	88	84	102.214	0.594	251.785	1.464	47	44
	1989	181	116	65	55	125	88.070	0.490	242.825	1.340	47	35
	1990	208	133	75	97	111	143.327	0.689	321.569	1.546	67	57
	1991	125	83	42	57	68	77.341	0.619	178.901	1.431	34	31
NBRI	1986	76	17	59	0	76	20.309	0.267	62.709	0.825	7	0
	1987	85	17	68	41	44	16.398	0.139	47.826	0.563	7	4
	1988	49	22	27	24	25	11.570	0.236	45.531	0.929	6	7
	1989	62	27	35	30	32	16.776	0.270	51.343	0.830	9	8
	1990	66	18	48	34	32	8.670	0.131	24.429	0.370	6	5
	1991	73	28	45	36	37	17.501	0.240	46.473	0.637	9	8
IICB	1986	62	55	7	0	62	83.475	1.346	135.625	2.187	40	0
	1987	85	67	18	26	59	124.720	1.467	179.023	2.106	55	36
	1988	60	55	5	17	43	78.909	1.315	134.914	2.249	36	22
	1989	69	57	12	19	50	125.331	1.820	190.949	2.760	35	28
	1990	56	55	1	7	49	97.105	1.734	140.964	2.517	46	29
	1991	69	58	11	14	55	96.798	1.403	131.515	1.906	50	28
CFB	1986	3	1	2	0	3	1.430	0.476	2.808	0.936	1	0
	1987	9	5	4	5	4	8.009	0.890	16.437	1.826	4	2
	1988	2	2	0	0	2	2.029	1.015	5.975	2.988	2	0
	1989	12	11	1	0	12	55.734	4.640	34.524	2.880	11	5
	1990											0
	1991	12	8	4	4	8	11.762	0.980	23.916	1.993	6	5
CCMB	1986	26	25	1	0	26	44.259	1.702	63.115	2.428	16	16
	1987	23	21	2	7	16	38.703	1.683	35.594	1.548	0	5
	1988	26	25	1	11	15	32.690	1.257	54.501	2.096	13	7
	1989	41	36	5	1	39	105.551	2.570	140.228	3.420	32	23
	1990	23	23	0	4	19	66.990	2.913	57.647	2.506	17	10
	1991	23	22	1	7	16	38.634	1.680	33.674	1.464	14	5

LAB	YEAR	PAPERS	SCI	NSCI	INDIAN	FOREIGN	IF	AVG IF/ PAPER	NIF	AVG NIF/ PAPER	IF	NIF
											7.6	7.2
ITRC	1986	85	57	28	0	85	65.868	0.774	189.031	2.230	41	0
	1987	119	74	45	87	32	83.300	0.700	175.657	1.476	48	47
	1988	130	87	43	57	73	63.326	0.487	225.970	1.738	49	46
	1989	109	75	34	23	81	54.864	0.500	176.311	1.620	50	39
	1990	72	61	11	18	54	51.944	0.721	129.860	1.804	38	30
	1991	121	88	33	28	93	76.538	0.633	193.524	1.599	42	37
CIMAP	1986	60	29	31	0	60	30.242	0.504	96.497	1.608	0	0
	1987	48	22	26	19	27	22.730	0.474	60.762	1.266	17	15
	1988	37	25	12	5	32	25.025	0.676	66.640	1.801	18	18
	1989	90	56	34	15	74	39.833	0.443	115.595	1.280	28	24
	1990	74	41	33	28	46	26.999	0.365	76.902	1.039	19	19
	1991	86	46	40	37	49	36.940	0.430	81.252	0.945	27	24
RRL-JMU	1986	62	22	40	0	62	15.583	0.251	70.183	0.251	3	0
	1987	55	25	30	35	20	21.436	0.390	46.750	0.390	12	11
	1988	50	30	20	24	26	28.151	0.563	69.980	1.400	5	13
	1989	26	12	11	10	13	11.315	0.440	22.257	0.860	4	15
	1990	73	38	35	53	20	20.575	0.282	57.446	0.787	15	10
	1991	54	21	33	33	21	20.972	0.388	50.686	0.939	12	13
IMT	1986	0	0	0	0	0	0.000	0.000	0.000	0.000	0	0
	1987	0	0	0	0	0	0.000	0.000	0.000	0.000	0	0
	1988	4	3	1	0	4	3.111	0.778	12.738	3.185	3	3
	1989	4	4	0	0	4	20.755	5.190	18.722	4.690	4	3
	1990										5	4
	1991	3	3	0	1	2	3.622	1.207	7.710	2.570	1	1
CSIR-PAL	1986											
	1987											
	1988	2	0	2	0	2	0.500	0.250	1.135	0.568	0	0
	1989	3	1	2	2	1	0.945	0.320	1.910	0.640	1	0
	1990	7	5	2	3	4	6.974	0.996	14.323	2.046	3	3
	1991	6	2	4	4	2	5.782	0.964	12.446	2.074	2	2
PID	1986											
	1987											
	1988											
	1989	12	7	5	10	1	2.658	0.220	7.651	0.640	1	1
	1990						NO DATA RECEIVED FOR ANALYSIS					
	1991	4	1	3	3	1	0.394	0.099	0.519	0.130	0	0
INSDOC	1986											
	1987											
	1988											
	1989	10	2	8	5	5	1.920	0.190	11.540	1.150	2	1
	1990	6	1	5	4	2	0.673	0.112	4.157	0.693	0	2
	1991	7	0	7	7	0	0.260	0.037	1.547	0.221	0	0

LAB	YEAR	PAPERS	SCI	NSCI	INDIAN	FOREIGN	IF	AVG IF/ PAPER	NIF	AVG NIF/ PAPER	IF	NIF
											7.6	7.2
NISTADS	1986											
	1987											
	1988											
	1989	12	3	9	7	5	2.528	0.210	13.841	1.150	2	2
	1990										0	0
	1991	8	5	2	6	2	1.868	0.234	6.250	0.781	1	1

Annexure 3.1: Data collection format for Research Output Analysis.

Lab:

for the period
1.1.1992 to
31.12.1992

A. PUBLICATIONS

- A1 List of Papers published in journals.
List of papers presented in symposia/conferences

List of Monographs, Review articles etc.
- A2 List of technical reports, books, designs surveys, feasibility studies, DPRS, Data generated and published and software generated for inhouse consumption.
- A3 Number of scientists - Group-IV (B and upwards) as on 1.4.1992 and 1.4.1993

(Each list separately please)

Annexure 3.1 Continued.

Lab: B Value of Technologies Transferred for the period 1.4.1992 to 31.3.1993

Value in rupee terms of technologies transferred

B1 Cash received between 1.4.1992 and 31.3.1993 for technologies developed before 1.4.1992

S. No	Technology	Developed in the year (before 1.4.1992)	Cash received (Rs. in lakh) between 1.4.1992 and 31.3.1993

Annexure 3.1 Continued.

B2: Cash received for technologies developed and transferred during the current financial year.

S. No.	Technology	Cash received (during 1992-93) Rs. in lakh)

B3: Number of patents (in India and abroad) filed, accepted and sealed (between 1.4.92 and 31.3.93)

Annexure 3.1 Continued.

Lab:

C1: Major Services Offered by the Laboratory

**C2: Value of Services Rendered For the Period 1.4.1992 to
31.3.1993**

S.No.	Category of Services	Cash received (Rs. in lakh)
		Total

Annexure 3.1 Continued.

**C3: Notional Value of Services Rendered Gratis For the period
1.4.1992 to 31.3. 1993**

S. No.	Category of Services	Value (Rs. in lakh)	Reasons for No Cash inflow
	Total		

Lab:

For the period
1.4.1992 to 31.3.1993

D: Honours and Awards

D1: To the Lab (please list)

D2: To individuals (please list)

Annexure 3.2:
Group-wise and Laboratory-wise Trend Analysis of Financial Growth (1975-76 to 1992-93)
and also
Year-wise comparative expenditure on Salaries vs R&D for different laboratories (1985-86 to 1992-93)

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH

1975-76 TO 1992-93

(RS. LAKH)

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	1407.19	2123.00	10.83	8431.09	2387.62	4889.27	19.62	17902.19	5523.78	9389.46	14.18	37658.15	10324.17	11506.18	13403.24	35233.59
CONT.+ MAINT.	263.70	373.05	9.06	1633.80	456.32	972.60	20.83	3571.47	1145.98	2015.60	15.16	7669.31	2320.22	2486.93	2596.82	7403.98
CHEMICALS	319.36	553.37	14.73	2266.57	682.83	1292.55	17.30	4995.51	1523.78	1842.94	4.87	8065.99	2055.71	2293.82	2207.49	6557.02
CONSTRUCTION	160.25	342.35	20.90	1233.12	494.04	1135.98	23.14	3981.05	1494.30	1232.30	-4.71	7475.24	1025.52	933.67	967.66	2926.85
EQUIPMENT	417.99	1029.09	25.26	3514.94	1021.72	1802.69	15.25	7810.61	3163.23	2590.91	-4.87	11727.48	2207.10	2196.29	1508.72	5912.10
LIB. BOOKS	72.82	103.93	9.30	418.92	124.72	267.65	21.03	980.28	300.84	521.72	14.76	2045.52	604.04	712.63	794.04	2110.70
OTHERS	35.55	49.01	8.36	234.50	67.70	108.60	12.54	499.40	151.90	485.60	33.50	1188.00	395.10	401.30	258.00	1054.40
RECURRING	1990.25	3049.42	11.26	12331.46	3526.76	7154.42	19.34	26469.17	8193.54	13248.00	12.76	53393.45	14700.10	16286.93	18207.55	49194.58
CAPITAL	686.61	1524.38	22.07	5401.48	1708.18	3314.92	18.03	13271.34	5111.27	4830.54	-1.40	22436.24	4231.76	4243.88	3528.42	12004.05
TOTAL	2676.85	4573.81	14.33	17732.93	5234.94	10469.34	18.92	39740.51	13304.81	18078.53	7.97	75829.69	18931.86	20530.81	21735.97	61198.64

PHYSICAL & EARTH SCIENCES GROUP
1975-76 TO 1992-93

(RS. LAKH)

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	258.74	364.93	8.98	1522.98	420.91	556.48	19.44	3148.05	973.19	1651.11	14.13	6630.56	1821.07	2037.97	2395.47	6254.51
CONT.+ MAINT.	56.88	69.70	5.21	320.54	81.96	162.61	18.68	691.85	206.94	342.44	13.42	1309.67	349.57	396.51	414.53	1160.60
CHEMICALS	91.30	155.87	14.31	699.49	219.05	359.77	13.21	1507.78	389.98	379.64	-0.67	1817.68	415.36	500.07	413.81	1329.24
CONSTRUCTION	41.39	47.54	3.52	233.87	65.06	140.71	21.27	452.46	124.22	203.61	13.15	857.01	144.68	87.74	155.79	388.21
EQUIPMENT	127.58	231.70	16.09	815.33	216.04	467.74	21.30	2045.66	649.52	545.45	-4.27	2472.29	528.77	567.58	216.02	1312.37
LIB. BOOKS	9.63	15.62	12.85	58.43	20.48	38.14	16.82	146.20	43.66	72.75	13.61	292.85	74.82	83.54	98.70	257.06
OTHERS	7.17	7.25	0.28	47.74	6.13	19.92	34.26	68.42	22.76	56.11	25.30	174.60	35.27	53.51	38.66	127.44
RECURRING	406.92	590.50	9.76	2543.01	721.92	1378.87	17.56	5347.69	1570.11	2373.19	10.88	9757.91	2585.99	2934.55	3223.81	8744.35
CAPITAL	185.77	302.11	12.93	1155.37	307.71	666.50	21.32	2712.73	840.16	877.92	1.11	3796.76	783.54	792.37	509.17	2085.08
TOTAL	592.69	892.61	10.78	3698.38	1029.63	2045.37	18.72	8060.42	2410.27	3251.10	7.77	13554.67	3369.54	3726.92	3732.98	10829.43

N P L, DELHI
1975-76 TO 1992-93

HEADS	1975-76	1979-80	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	85.07	118.54	8.65	493.08	131.94	289.16	21.67	1065.27	327.15	539.00	13.29	2179.32	587.59	628.93	744.17	1960.69
CONT.+ MAINT.	19.67	20.61	1.17	106.60	22.89	51.90	22.71	211.33	70.95	102.15	9.54	433.79	112.43	136.45	138.72	387.60
CHEMICALS	13.42	21.90	13.02	94.87	31.85	62.52	18.37	227.54	57.04	84.28	10.25	322.80	74.82	113.17	81.94	269.93
CONSTRUCTION	4.90	15.62	33.62	66.62	9.29	24.48	27.40	96.61	31.99	54.86	14.43	209.45	88.90	27.46	33.10	149.46
EQUIPMENT	16.89	53.17	33.20	200.93	69.87	102.60	10.08	517.68	197.89	239.69	4.91	951.17	106.37	97.22	50.29	253.88
LIB. BOOKS	3.62	6.51	15.80	24.45	7.49	13.29	15.41	50.48	15.73	32.02	19.44	125.49	30.00	31.64	40.00	101.64
OTHERS	0.36	0.66	16.36	4.16	0.67	2.86	43.90	9.20	3.26	3.01	-2.03	25.72	25.94	25.41	11.38	62.73
RECURRING	118.16	161.05	8.05	694.55	186.68	403.59	21.26	1504.15	455.14	725.42	12.26	2935.92	774.85	878.54	964.83	2618.22
CAPITAL	25.77	75.96	31.03	296.16	87.32	143.22	13.17	673.96	248.88	329.57	7.27	1311.82	251.20	181.73	134.77	567.70
TOTAL	143.93	237.01	13.28	990.71	274.00	546.81	18.86	2178.11	704.02	1054.99	10.64	4247.74	1026.05	1060.27	1099.60	6371.85

C E E R I, PILANI
1975-76 TO 1992-93

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	41.85	58.98	8.96	246.34	70.75	137.76	18.13	501.43	156.62	260.80	13.60	1050.27	278.38	314.34	376.49	969.22
CONT.+ MAINT.	7.08	9.40	7.34	40.72	10.67	27.74	26.98	141.32	29.15	53.82	16.57	192.16	52.03	58.46	63.09	173.58
CHEMICALS	14.92	14.77	-0.25	70.89	18.93	58.37	32.51	195.53	59.93	45.01	-6.91	252.75	43.62	54.57	33.50	131.68
CONSTRUCTION	9.86	8.84	-2.69	62.96	16.93	23.07	8.04	91.92	34.78	42.51	5.14	189.02	35.52	27.72	45.03	108.27
EQUIPMENT	10.04	37.50	39.02	106.07	55.49	132.99	24.42	539.85	196.15	144.00	-7.44	653.45	131.48	114.62	71.11	317.20
LIB. BOOKS	1.52	3.00	18.53	8.47	3.49	8.16	23.66	25.65	8.50	12.50	10.14	48.12	12.50	13.30	15.17	40.97
OTHERS	0.51	2.10	42.45	7.39	0.60	2.04	35.79	7.08	3.53	3.85	2.23	29.59	2.65	5.62	2.45	10.72
RECURRING	63.85	83.15	6.83	357.95	100.35	223.87	22.21	838.28	245.70	359.63	9.99	1495.18	374.03	427.37	473.08	1274.48
CAPITAL	21.93	51.44	23.76	184.89	76.51	166.26	21.41	664.50	242.95	202.86	-4.41	920.17	182.15	161.25	133.76	477.16
TOTAL	85.78	134.59	11.92	542.84	176.86	390.13	21.87	1502.78	488.65	562.49	3.58	2415.35	556.18	588.62	606.84	3503.28

C S I O, CHANDIGARH
1975-76 TO 1992-93

(RS. LAKH)

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	53.31	72.98	8.17	302.81	85.58	158.96	16.74	601.77	181.68	277.01	11.12	1181.24	320.56	369.05	427.20	1116.80
CONT.+ MAINT.	7.82	14.43	16.55	55.98	17.19	24.29	9.03	105.21	31.52	45.95	9.88	184.94	49.46	51.02	72.00	172.48
CHEMICALS	16.81	24.93	10.35	98.41	31.07	34.76	2.85	158.11	39.71	30.27	-6.56	166.55	27.98	29.84	27.00	84.82
CONSTRUCTION	12.49	6.13	-16.30	33.44	6.32	21.90	36.44	52.95	16.12	26.54	13.28	115.27	13.51	4.00	16.12	33.63
EQUIPMENT	10.97	34.94	33.59	113.38	31.84	44.38	8.66	191.12	96.20	85.68	-2.85	309.82	58.97	45.07	39.99	144.03
LIB. BOOKS	1.50	1.65	2.41	7.60	2.00	3.55	15.42	15.26	3.99	7.34	16.48	29.69	8.75	12.00	13.50	34.25
OTHERS	2.36	1.22	-15.21	8.92	1.90	0.93	-16.36	7.02	1.00	2.20	21.88	16.59	0.77	1.00	2.00	3.77
RECURRING	77.94	112.34	9.57	457.20	133.84	218.01	12.97	865.09	252.91	353.23	8.71	1532.74	398.00	449.91	526.20	1374.10
CAPITAL	27.32	43.94	12.61	163.34	42.06	70.76	13.89	266.35	117.30	121.75	0.94	471.37	82.00	62.07	71.61	215.68
TOTAL	105.26	156.28	10.38	620.54	175.90	288.77	13.19	1131.44	370.21	474.99	6.43	2004.11	479.99	511.98	597.81	3179.57

N G R I, HYDERABAD
1975-76 TO 1992-93

(RS. LAKH)

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	49.41	70.78	9.40	300.65	81.60	154.82	17.36	571.76	174.39	352.09	19.20	1294.90	376.47	438.66	502.64	1317.77
CONT.+ MAINT.	14.53	14.48	-0.09	73.33	18.24	29.90	13.15	126.17	37.94	91.89	24.75	283.43	85.85	94.12	91.26	271.23
CHEMICALS	14.47	28.50	18.47	116.21	34.17	37.24	2.17	182.78	50.78	52.43	0.80	262.56	75.75	106.76	81.37	263.88
CONSTRUCTION	6.36	12.56	18.54	41.86	15.94	9.60	-11.91	88.52	24.11	19.18	-5.56	210.55	4.10	0.69	18.54	23.33
EQUIPMENT	6.85	62.41	73.74	125.14	24.99	86.48	36.39	325.96	68.02	69.75	0.63	277.34	24.73	25.20	25.20	75.13
LIB. BOOKS	1.55	2.18	8.90	8.71	2.50	4.45	15.51	16.57	6.16	10.10	13.18	36.89	13.18	14.61	16.03	43.82
OTHERS	2.49	2.09	-4.28	19.41	1.97	7.85	41.29	23.14	10.03	46.06	46.39	83.70	5.91	20.87	18.35	45.13
RECURRING	78.41	113.76	9.75	490.19	134.01	221.96	13.44	880.71	263.10	496.41	17.20	1840.90	538.07	639.54	675.27	1852.88
CAPITAL	17.25	79.24	46.40	195.12	45.40	108.38	24.30	454.19	108.32	145.09	7.58	608.49	47.92	61.37	78.12	187.40
TOTAL	95.66	193.00	19.18	685.31	179.41	330.34	16.49	1334.90	371.42	641.50	14.64	2449.38	585.99	700.90	753.39	4080.57

N I O, GOA
1975-76 TO 1992-93

(RS. LAKH)

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	29.10	43.65	10.67	180.09	51.04	115.78	22.72	407.21	133.36	222.21	13.62	924.82	258.06	287.00	344.97	890.03
CONT.+ MAINT.	7.78	10.78	8.50	43.91	12.97	28.78	22.05	107.76	37.38	48.63	6.80	215.34	49.79	56.46	49.46	155.71
CHEMICALS	31.68	65.27	19.81	318.57	103.03	166.88	12.81	743.83	182.53	167.65	-2.10	813.02	193.18	195.74	190.00	578.92
CONSTRUCTION	7.78	4.39	-13.33	28.97	16.58	61.66	38.87	122.47	17.22	60.53	36.93	132.73	2.65	27.87	43.00	73.52
EQUIPMENT	82.83	43.68	-14.78	269.81	33.85	101.29	31.52	471.06	91.27	6.33	-48.68	280.51	207.23	285.47	29.43	522.13
LIB. BOOKS	1.44	2.28	12.17	9.19	5.00	8.69	14.82	38.21	9.29	10.79	3.81	52.66	10.39	12.00	14.00	36.39
OTHERS	1.45	1.18	-5.02	7.85	0.99	6.24	58.45	21.95	4.95	1.00	-32.99	18.97	0.00	0.61	4.48	5.09
RECURRING	68.56	119.70	14.95	542.57	167.04	311.44	16.85	1258.80	353.26	438.50	5.55	1953.18	501.04	539.19	584.43	1624.66
CAPITAL	93.50	51.53	-13.84	315.82	56.42	177.88	33.25	653.69	122.72	78.66	-10.53	484.87	220.27	325.94	90.91	637.12
TOTAL	162.06	171.23	1.39	858.39	223.46	480.32	21.65	1912.49	475.99	517.15	2.10	2438.06	721.31	865.14	675.34	4523.58

CHEMICAL SCIENCES GROUP
1975-76 TO 1992-93

(RS. LAKH)

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	341.76	579.19	14.10	2191.05	663.80	1406.27	20.64	5089.48	1602.51	2610.35	12.97	10542.81	2874.91	3145.30	3582.02	9602.24
CONT.+ MAINT.	49.02	91.13	16.77	360.24	105.60	264.28	25.78	891.11	285.59	463.45	12.87	1780.54	516.63	588.53	578.82	1683.97
CHEMICALS	77.12	121.78	12.10	490.00	135.93	213.21	11.91	935.89	281.89	328.40	3.89	1492.99	401.73	485.66	497.48	1384.87
CONSTRUCTION	29.78	92.71	32.83	311.36	131.81	219.34	13.58	872.72	269.12	173.60	-10.38	936.79	160.47	202.75	224.72	587.94
EQUIPMENT	83.58	218.97	27.22	769.22	290.68	324.58	2.80	1700.22	746.53	574.18	-6.35	2781.80	453.95	532.93	443.74	1430.61
LIB. BOOKS	17.68	22.36	6.05	92.60	26.70	63.30	24.09	220.72	71.09	125.98	15.38	498.40	150.18	173.02	203.13	526.33
OTHERS	7.50	10.73	9.37	58.64	20.01	28.16	8.92	119.50	41.98	83.36	18.71	232.60	45.08	36.32	44.04	125.44
RECURRING	467.90	792.10	14.07	3041.28	905.32	1883.76	20.10	6916.48	2169.99	3402.20	11.90	13816.34	3793.26	4219.49	4658.32	12671.08
CAPITAL	138.54	344.77	25.60	1231.83	469.21	635.38	7.87	2913.16	1128.72	957.12	-4.04	4449.59	809.68	945.02	915.63	2670.33
TOTAL	606.44	1136.87	17.01	4273.11	1374.53	2519.14	16.35	9829.64	3298.70	4359.31	7.22	18265.93	4602.94	5164.51	5573.95	15341.41

N C L, PUNE
1975-76 TO 1992-93

HEADS	1975-76	1979-80	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	92.05	116.00	5.95	500.84	133.68	252.88	17.28	950.78	302.04	490.06	12.86	1960.41	528.83	571.75	667.75	1768.34
CONT.+ MAINT.	11.45	21.30	16.79	83.21	23.41	42.00	15.73	185.62	57.00	126.30	22.01	438.19	154.79	157.67	148.05	460.51
CHEMICALS	21.21	26.54	5.76	120.91	29.20	45.00	11.42	199.80	65.00	76.14	4.03	319.48	77.36	102.58	110.00	289.94
CONSTRUCTION	8.79	20.43	23.47	74.52	22.34	64.61	30.41	180.51	37.58	13.38	-22.76	127.85	30.51	57.41	48.74	136.65
EQUIPMENT	20.29	80.41	41.09	197.71	78.00	69.00	-3.02	471.79	126.00	131.70	1.11	584.54	110.11	149.41	90.00	349.52
LIB. BOOKS	7.89	8.80	2.77	37.94	11.10	20.42	16.46	77.12	23.00	37.00	12.62	160.25	44.00	46.00	60.00	150.00
OTHERS	0.70	4.00	54.61	22.53	4.00	3.00	-6.94	18.01	3.08	5.38	14.97	37.76	5.40	5.18	1.95	12.53
RECURRING	124.71	163.84	7.06	704.96	186.29	339.88	16.22	1336.20	424.04	692.50	13.05	2718.07	760.98	832.00	925.80	2518.78
CAPITAL	37.67	113.64	31.79	332.70	115.44	157.03	8.00	747.43	189.65	187.46	-0.29	910.40	190.01	258.00	200.69	648.70
TOTAL	162.38	277.48	14.33	1037.66	301.73	496.91	13.28	2083.63	613.70	879.95	9.43	3628.47	950.99	1090.00	1126.49	6334.96

C E C R I. KARAIKUDI
1975-76 TO 1992-93

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	51.57	63.03	5.14	283.69	73.54	144.53	18.40	518.55	160.99	270.50	13.85	1068.11	298.86	350.86	389.31	1039.03
CONT.+ MAINT.	7.81	10.97	8.87	47.45	11.96	17.44	9.89	72.84	25.15	47.00	16.92	164.57	40.89	53.10	50.97	144.97
CHEMICALS	15.10	15.58	0.79	75.72	20.82	24.34	3.98	125.44	30.19	40.49	7.62	175.49	52.27	54.31	45.49	152.07
CONSTRUCTION	5.97	9.08	11.05	38.04	19.68	22.51	3.42	112.71	30.05	54.25	15.92	173.39	35.92	12.53	18.18	66.64
EQUIPMENT	12.48	20.65	13.42	75.95	37.94	26.64	-8.46	170.68	98.92	56.68	-13.00	301.17	55.23	78.89	52.80	186.93
LIB. BOOKS	1.92	1.81	-1.46	8.46	2.25	4.02	15.61	15.00	5.92	13.05	21.85	45.77	10.16	16.64	18.00	44.80
OTHERS	0.63	0.44	-8.58	5.17	1.77	4.41	25.64	10.93	5.87	28.07	47.90	46.21	10.65	1.67	2.63	14.95
RECURRING	74.48	89.58	4.72	406.86	106.32	186.31	15.05	716.83	216.33	358.00	13.42	1408.17	392.03	458.27	485.77	1336.07
CAPITAL	21.00	31.98	11.09	127.62	61.64	57.58	-1.69	309.32	140.75	152.05	1.95	566.54	111.97	109.73	91.61	313.31
TOTAL	95.48	121.56	6.22	534.48	167.96	243.89	9.77	1026.15	357.09	510.05	9.32	1974.71	504.00	568.00	577.38	3298.75

C S M C R I, BHAVNAGAR
1975-76 TO 1992-93

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	31.32	40.19	6.43	174.76	47.32	85.00	15.77	324.43	99.92	155.61	11.71	650.53	168.50	189.60	210.84	568.94
CONT.+ MAINT.	3.06	5.51	15.84	22.15	6.77	14.69	21.37	56.01	21.80	35.80	13.20	149.48	34.68	38.94	38.00	111.62
CHEMICALS	5.74	9.40	13.12	37.89	11.12	20.11	15.96	82.63	24.01	40.00	13.61	157.50	41.00	49.40	44.99	135.39
CONSTRUCTION	3.40	4.72	8.55	30.73	7.52	8.08	1.81	39.81	18.49	11.50	-11.20	67.99	11.48	10.91	11.55	33.94
EQUIPMENT	7.62	11.20	10.11	52.70	25.41	33.36	7.04	145.58	92.50	49.00	-14.69	265.88	35.50	39.59	29.46	104.55
LIB. BOOKS	1.18	1.80	11.13	7.07	2.00	7.50	39.16	20.30	5.50	11.50	20.24	41.54	16.54	23.00	27.12	66.66
OTHERS	0.94	0.49	-15.03	3.52	1.40	0.69	-16.21	6.58	5.29	6.59	5.64	21.51	9.27	2.56	3.60	15.43
RECURRING	40.12	55.10	8.25	234.80	65.21	119.80	16.42	463.07	145.73	231.41	12.26	957.50	244.18	277.94	293.83	815.95
CAPITAL	13.14	18.21	8.50	94.02	36.33	49.63	8.11	212.27	121.78	78.58	-10.37	396.92	72.80	76.06	71.73	220.58
TOTAL	53.26	73.31	8.32	328.82	101.54	169.43	13.65	675.34	267.51	309.59	3.75	1354.43	316.97	354.00	365.56	2073.06

I I C T, HYDERABAD
1975-76 TO 1992-93

(RS LAKH)

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	87.08	110.54	6.15	481.65	130.11	258.02	18.67	950.35	287.46	488.01	14.15	1908.75	526.50	575.01	648.26	1749.77
CONT.+ MAINT.	14.39	19.00	7.19	91.41	24.10	46.65	17.95	189.60	58.51	86.80	10.36	328.02	88.00	116.00	113.90	317.90
CHEMICALS	18.72	31.01	13.45	121.06	30.87	52.00	13.92	216.35	55.56	78.23	8.93	305.10	90.50	115.00	121.00	326.50
CONSTRUCTION	6.48	15.27	23.90	49.02	27.94	37.96	7.96	151.87	45.56	25.03	-13.91	117.06	23.00	51.49	71.00	145.49
EQUIPMENT	30.20	50.73	13.85	247.63	50.65	60.89	4.71	312.26	119.75	83.75	-8.55	415.13	63.39	85.39	80.22	229.00
LIB. BOOKS	2.77	3.01	2.10	14.35	3.93	8.00	19.45	29.13	11.62	20.99	15.95	76.03	23.28	25.00	28.00	76.28
OTHERS	1.02	1.18	3.71	7.62	4.98	5.59	2.93	27.83	10.55	12.19	3.67	43.12	8.84	17.11	18.40	44.35
RECURRING	120.19	160.55	7.51	694.12	185.08	356.67	17.82	1356.30	401.53	653.04	12.93	2541.86	705.00	806.01	883.16	2394.17
CAPITAL	40.47	70.19	14.76	318.62	87.50	112.44	6.47	521.09	187.47	141.96	-6.72	651.34	118.50	178.99	197.62	495.12
TOTAL	160.66	230.74	9.47	1012.74	272.58	469.11	14.54	1877.39	589.00	795.00	7.79	3193.20	823.50	985.00	1080.78	5778.56

R R L, JORHAT
1975-76 TO 1992-93

(RS LAKH)

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	33.73	50.89	10.83	208.72	55.69	115.47	20.00	420.72	131.09	249.50	17.46	938.01	325.82	298.00	339.44	963.26
CONT.+ MAINT.	4.12	8.13	18.52	31.96	8.56	18.48	21.22	64.85	25.86	26.50	0.61	128.33	30.89	32.20	33.76	96.85
CHEMICALS	6.20	13.58	21.65	52.20	14.35	27.26	17.40	108.07	29.84	29.47	-0.31	146.77	27.00	25.00	31.00	83.00
CONSTRUCTION	2.72	14.27	51.34	53.82	16.46	48.12	30.76	182.85	45.99	11.53	-29.24	111.49	7.76	8.00	27.38	43.14
EQUIPMENT	7.02	14.38	19.63	66.10	19.79	48.54	25.14	189.75	51.66	59.32	3.52	234.02	51.52	34.00	55.00	140.52
LIB. BOOKS	2.25	4.17	16.68	15.00	3.50	8.66	25.42	31.40	8.92	14.30	12.52	57.12	18.40	17.00	20.00	55.40
OTHERS	2.21	0.71	-24.71	6.71	2.35	4.01	14.29	19.92	6.59	1.37	-32.46	12.91	0.50	0.50	3.00	4.00
RECURRING	44.05	72.60	13.30	292.88	78.60	161.21	19.67	593.64	186.79	305.46	13.08	1213.12	383.71	355.20	404.20	1143.11
CAPITAL	14.20	33.53	23.96	141.63	42.10	109.33	26.94	423.92	113.15	86.51	-6.49	415.54	78.17	59.50	105.38	243.05
TOTAL	58.25	106.13	16.18	434.51	120.70	270.54	22.36	1017.56	299.94	391.97	6.92	1628.66	461.88	414.70	509.58	2772.31

I I P, DEHRADUN
1982-83 TO 1992-93

HEADS	1982-83	1984-85	AV.GROWTH RATE PER ANNUM	1982-85 3 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	123.28	161.55	14.47	422.89	181.94	285.41	11.91	1175.69	322.96	351.00	399.35	1073.31
CONT.+ MAINT.	18.25	73.71	100.95	112.38	28.32	34.12	4.77	145.79	39.80	55.50	52.00	147.30
CHEMICALS	21.84	6.47	-45.57	49.81	26.92	3.78	-38.78	137.72	46.00	55.00	60.00	161.00
CONSTRUCTION	5.77	15.94	66.20	28.29	21.44	4.35	-32.89	67.93	13.10	17.00	18.00	48.10
EQUIPMENT	20.05	36.58	35.09	87.24	95.59	84.67	-2.98	448.36	51.67	68.03	55.50	175.20
LIB. BOOKS	5.01	7.00	18.24	18.01	7.50	10.35	8.38	45.64	11.82	17.00	19.01	47.84
OTHERS	1.49	5.68	95.25	8.97	1.10	7.92	63.65	14.01	3.40	2.12	3.49	9.01
RECURRING	163.38	241.73	21.64	585.09	237.17	323.31	8.05	1459.21	408.76	461.50	511.35	1381.61
CAPITAL	32.31	65.20	42.05	142.50	125.62	107.29	-3.87	575.95	80.00	104.15	96.00	280.15
TOTAL	195.69	306.93	25.24	727.59	362.79	430.60	4.38	2035.15	488.76	565.65	607.35	3323.51

C L R I, MADRAS
1975-76 TO 1992-93

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	46.01	64.20	8.69	279.73	71.18	126.79	15.53	479.91	147.13	245.46	13.65	1027.17	256.37	313.60	362.06	932.03
CONT.+ MAINT.	8.19	12.81	11.84	61.88	12.07	20.56	14.25	78.75	27.87	50.75	16.17	194.64	64.65	72.79	76.71	214.15
CHEMICALS	10.15	12.49	5.31	58.68	13.66	20.09	10.13	74.61	25.84	34.89	7.79	134.01	40.60	56.00	55.00	151.60
CONSTRUCTION	2.42	10.64	44.80	41.71	15.76	18.48	4.06	87.62	41.57	42.58	0.60	182.55	23.44	35.41	19.70	78.55
EQUIPMENT	5.97	20.12	35.49	89.34	32.63	24.84	-6.59	141.87	79.64	66.73	-4.33	347.74	47.57	62.61	63.31	173.49
LIB. BOOKS	1.67	1.63	-0.60	7.55	2.00	4.20	20.38	16.42	5.03	13.50	27.97	50.75	16.50	18.39	20.00	54.89
OTHERS	2.00	1.50	-6.96	8.57	2.77	3.39	5.15	12.17	4.39	13.09	31.44	33.61	5.30	5.18	9.42	19.90
RECURRING	64.35	89.50	8.60	400.29	96.90	167.44	14.65	633.26	200.84	331.09	13.31	1355.81	361.62	442.39	493.77	1297.78
CAPITAL	12.06	33.89	29.47	147.17	53.17	50.91	-1.08	258.08	130.64	135.89	0.99	614.65	92.80	121.60	112.43	326.83
TOTAL	76.41	123.38	12.73	547.46	150.07	218.35	9.83	891.34	331.48	466.98	8.95	1970.46	454.42	563.99	606.20	3249.22

C F R I, DHANBAD
1978-79 TO 1992-93

HEADS	1978-79	1979-80	AV.GROWTH RATE PER ANNUM	1978-80 2 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	127.30	134.34	5.53	261.64	152.28	262.03	14.53	1021.84	291.95	425.81	9.89	1814.16	447.07	495.49	565.01	1507.56
CONT.+ MAINT.	13.77	13.41	-2.61	27.18	18.73	30.75	13.19	131.08	41.09	56.19	8.14	231.52	62.93	62.32	65.43	190.69
CHEMICALS	12.36	13.18	6.63	25.54	15.91	17.94	3.05	79.19	24.53	25.40	0.87	116.92	27.00	28.37	30.00	85.37
CONSTRUCTION	5.21	18.30	251.25	23.51	22.11	3.64	-36.30	89.04	28.45	11.00	-21.15	88.53	15.27	10.00	10.17	35.44
EQUIPMENT	18.30	21.48	17.38	39.78	46.26	24.73	-14.49	181.06	82.48	42.33	-15.36	184.96	38.96	15.00	17.45	71.41
LIB. BOOKS	1.08	1.14	5.56	2.22	1.92	3.50	16.20	13.33	3.60	5.30	10.14	21.30	9.47	10.00	11.00	30.47
OTHERS	2.13	2.41	13.15	4.54	2.74	1.39	-15.61	15.09	5.13	8.77	14.37	23.51	1.73	2.00	1.55	5.28
RECURRING	153.43	160.93	4.89	314.36	186.92	310.72	13.55	1232.11	357.56	507.40	9.14	2162.60	537.00	586.18	660.44	1783.62
CAPITAL	26.72	43.33	62.16	70.05	73.03	33.26	-17.85	298.52	119.65	67.39	-13.37	318.31	65.42	37.00	40.17	142.59
TOTAL	180.15	204.26	13.38	384.41	259.95	342.98	7.25	1530.63	477.22	574.79	4.76	2480.90	602.42	623.19	700.61	3852.43

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	472.32	723.49	11.25	2803.86	821.91	1527.42	16.76	5807.23	1722.80	2934.49	14.24	11736.99	3199.71	3619.37	4308.55	11127.63
CONT.+ MAINT.	83.81	113.65	7.91	500.53	147.28	258.32	15.08	1009.27	308.63	570.87	16.62	2196.69	666.59	704.46	746.62	2117.67
CHEMICALS	81.58	115.31	9.04	494.78	128.35	237.07	16.58	944.42	305.52	446.13	9.93	1841.49	506.99	492.56	505.40	1504.94
CONSTRUCTION	63.07	80.02	6.13	338.01	101.15	258.65	26.46	765.67	326.36	405.26	5.56	2037.83	389.09	452.68	313.81	1155.57
EQUIPMENT	136.70	311.58	22.87	1082.37	283.85	487.71	14.49	2173.56	1035.48	898.09	-3.50	3894.00	698.15	554.77	446.38	1699.30
LIB. BOOKS	20.23	29.50	9.90	118.29	34.30	58.76	14.41	241.41	70.13	128.89	16.43	472.04	144.63	179.31	176.04	499.98
OTHERS	12.29	15.01	5.13	71.05	21.29	20.15	-1.37	146.10	43.46	213.60	48.89	452.50	125.00	209.20	79.59	413.79
RECURRING	637.71	952.44	10.55	3799.17	1097.54	2022.81	16.52	7760.92	2336.94	3951.49	14.03	15775.17	4373.28	4816.39	5560.57	14750.24
CAPITAL	232.29	436.11	17.06	1609.72	440.58	825.27	16.99	3326.73	1475.42	1645.84	2.77	6856.38	1356.87	1395.95	1015.82	3768.64
TOTAL	869.99	1388.55	12.40	5408.89	1538.12	2848.08	16.65	11087.65	3812.36	5597.33	10.08	22631.55	5730.15	6212.34	6576.39	18518.88

N M L, JAMSHEDPUR
1975-76 TO 1992-93

(RS LAKH)

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	85.27	107.45	5.95	468.32	123.90	209.93	14.09	812.44	235.09	403.65	14.47	1609.67	446.87	488.65	580.55	1516.07
CONT.+ MAINT.	20.00	17.06	-3.90	87.48	23.10	33.03	9.35	136.56	34.00	63.34	16.83	302.15	101.41	120.48	119.69	341.58
CHEMICALS	10.93	12.34	3.08	60.03	12.04	16.23	7.75	72.78	18.00	23.18	6.52	122.19	23.19	25.54	30.00	78.73
CONSTRUCTION	7.90	2.88	-22.30	22.49	3.28	7.90	24.58	21.86	-2.91	75.42	ERR	240.32	39.39	36.81	23.26	99.46
EQUIPMENT	16.75	32.61	18.12	143.28	20.12	31.21	11.60	128.95	122.59	102.43	-4.39	438.89	60.96	64.52	60.00	185.47
LIB. BOOKS	3.09	2.84	-2.09	12.50	3.80	6.00	12.10	24.29	6.28	15.03	24.38	49.11	14.89	20.90	23.00	58.79
OTHERS	0.58	0.45	-6.15	2.54	0.58	0.10	-35.56	6.39	1.85	6.66	37.76	29.38	5.78	8.40	4.99	19.17
RECURRING	116.20	136.85	4.17	615.83	159.04	259.19	12.99	1021.78	287.10	490.17	14.31	2034.01	571.47	634.67	730.24	1936.38
CAPITAL	28.32	38.78	8.18	180.81	27.78	45.21	12.95	181.49	127.81	199.54	11.78	757.70	121.02	130.43	111.25	362.90
TOTAL	144.52	175.63	4.99	796.64	186.82	304.40	12.98	1203.27	414.91	689.71	13.55	2791.71	692.49	765.29	841.49	4598.55

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	53.28	61.36	3.59	281.12	72.58	143.14	18.50	520.60	156.01	278.00	15.54	1080.17	290.00	321.00	355.08	966.08
CONT.+ MAINT.	7.39	7.42	0.10	40.95	10.67	21.27	18.82	81.52	29.46	49.01	13.57	190.05	62.00	54.50	50.98	167.48
CHEMICALS	8.25	7.62	-1.97	43.15	10.31	26.73	26.89	95.44	31.30	28.50	-2.32	126.71	32.59	30.00	33.79	96.38
CONSTRUCTION	2.53	4.97	18.39	15.69	1.69	17.46	79.28	61.64	7.89	6.30	-5.48	23.27	5.35	3.35	5.46	14.16
EQUIPMENT	17.32	26.20	10.90	99.02	38.75	45.12	3.88	235.24	69.76	88.38	6.09	281.12	79.25	63.13	44.32	186.70
LIB. BOOKS	1.34	1.80	7.66	8.27	2.21	3.72	13.90	15.66	4.25	9.91	23.60	28.69	15.00	14.99	16.97	46.96
OTHERS	0.71	0.00	-100.00	1.44	0.31	1.72	53.48	6.93	1.46	3.61	25.35	2.90	2.31	20.52	1.64	24.47
RECURRING	68.92	76.40	2.61	365.22	93.56	191.14	19.55	697.56	216.77	355.51	13.17	1396.93	384.59	405.50	439.85	1229.94
CAPITAL	21.90	32.97	10.77	124.42	42.96	68.02	12.17	319.47	83.36	108.20	6.74	335.97	101.91	101.99	68.39	272.29
TOTAL	90.82	109.37	4.76	489.64	136.52	259.16	17.38	1017.03	300.13	463.71	11.49	1732.90	486.49	507.49	508.24	3004.45

SALARIES	48.29	56.00	3.77	250.64	61.54	127.03	19.86	456.61	141.32	221.08	11.00	112.83	211.00	11.00
CONT. + MAINT.	7.49	9.73	6.76	45.90	11.39	29.22	26.56	93.79	29.35	46.38	12.12	181.69	33.00	40.85
CHEMICALS	4.99	7.98	12.45	33.63	8.51	14.03	13.31	57.87	16.01	18.14	3.16	83.80	25.81	29.23
CONSTRUCTION	2.78	8.58	32.54	27.56	6.92	15.10	21.54	55.45	18.82	28.13	10.57	129.00	34.94	6.62
EQUIPMENT	1.86	5.96	33.79	22.01	10.89	19.00	14.93	108.75	67.97	13.46	-33.29	190.05	29.45	24.20
LIB. BOOKS	0.97	1.61	13.50	6.44	1.67	2.31	8.45	9.92	3.43	7.34	20.96	24.01	5.99	13.05
OTHERS	0.67	0.38	-13.22	3.27	0.61	1.23	19.16	8.48	8.10	16.46	19.38	42.62	11.22	20.22
RECURRING	60.77	73.71	4.94	330.17	81.44	170.28	20.25	608.27	186.89	285.59	11.18	1177.84	276.60	310.15
CAPITAL	6.28	16.53	27.37	59.28	20.09	37.64	17.00	182.60	98.32	65.40	-9.69	385.68	81.60	64.09
TOTAL	67.05	90.24	7.71	389.45	101.53	207.92	19.63	790.87	285.21	350.99	5.33	1563.52	358.21	374.23
														420.58
														2306.04
														192.73
														960.29
														36.70
														24.41
														64.61
														67.01
														65.84
														96.44

C M R S, DHANBAD
1975-76 TO 1992-93

(RS LAKH)

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	48.08	59.66	5.54	264.25	66.59	120.49	15.98	462.79	136.98	237.35	14.73	919.33	279.92	310.31	337.69	927.92
CONT.+ MAINT.	6.99	7.82	2.84	39.73	8.59	18.34	20.88	67.78	24.85	42.12	14.10	166.45	44.17	37.12	69.96	151.25
CHEMICALS	5.09	2.01	-20.73	16.55	2.60	6.02	23.35	23.18	12.30	32.29	27.29	104.50	20.40	18.37	16.00	54.77
CONSTRUCTION	2.13	1.49	-8.55	10.82	2.84	7.55	27.69	36.46	25.99	9.81	-21.62	94.23	4.58	8.00	15.00	27.58
EQUIPMENT	6.83	4.29	-10.98	35.37	22.16	50.76	23.02	171.27	90.00	48.28	-14.42	219.42	42.50	51.00	30.00	123.50
LIB. BOOKS	1.20	1.57	6.95	7.24	1.88	3.41	16.05	12.34	3.75	4.00	1.61	21.75	4.42	6.00	7.00	17.42
OTHERS	0.25	0.63	25.99	3.35	0.60	2.00	35.12	6.93	3.05	1.16	-21.52	14.21	1.00	1.00	7.48	9.48
RECURRING	60.16	69.49	3.67	320.53	77.78	144.85	16.82	553.75	174.13	311.75	15.67	1190.29	344.49	365.80	423.65	1133.94
CAPITAL	10.41	7.98	-6.43	56.78	27.48	63.72	23.40	227.00	122.79	63.25	-15.28	349.61	52.50	66.00	59.48	177.98
TOTAL	70.57	77.47	2.36	377.31	105.26	208.57	18.64	780.75	296.91	375.00	6.01	1539.90	396.99	431.80	483.13	2623.84

N E E R I, NAGPUR
1975-76 TO 1992-93

(RS LAKH)

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	48.29	56.00	3.77	250.64	61.54	127.03	19.86	456.61	141.52	221.08	11.80	912.36	217.79	240.07	340.15	798.01
CONT.+ MAINT.	7.49	9.73	6.76	45.90	11.39	29.22	26.56	93.79	29.35	46.38	12.12	181.69	33.00	40.85	22.59	96.44
CHEMICALS	4.99	7.98	12.45	33.63	8.51	14.03	13.31	57.87	16.01	18.14	3.16	83.80	25.81	29.23	10.80	65.84
CONSTRUCTION	2.78	8.58	32.54	27.56	6.92	15.10	21.54	55.45	18.82	28.13	10.57	129.00	34.94	6.62	25.45	67.01
EQUIPMENT	1.86	5.96	33.79	22.01	10.89	19.00	14.93	108.75	67.97	13.46	-33.29	190.05	29.45	24.20	10.96	64.61
LIB. BOOKS	0.97	1.61	13.50	6.44	1.67	2.31	8.45	9.92	3.43	7.34	20.96	24.01	5.99	13.05	5.37	24.41
OTHERS	0.67	0.38	-13.22	3.27	0.61	1.23	19.16	8.48	8.10	16.46	19.38	42.62	11.22	20.22	5.26	36.70
RECURRING	60.77	73.71	4.94	330.17	81.44	170.28	20.25	608.27	186.89	285.59	11.18	1177.84	276.60	310.15	373.54	960.29
CAPITAL	6.28	16.53	27.37	59.28	20.09	37.64	17.00	182.60	98.32	65.40	-9.69	385.68	81.60	64.09	47.04	192.73
TOTAL	67.05	90.24	7.71	389.45	101.53	207.92	19.63	790.87	285.21	350.99	5.33	1563.52	358.21	374.23	420.58	2306.04

C M E R I, DURGAPUR
1975-76 TO 1992-93

(RS LAKH)

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	85.68	104.24	5.02	459.85	118.29	210.25	15.46	800.20	237.77	384.71	12.78	1555.54	397.67	462.99	574.09	1434.76
CONT.+ MAINT.	15.19	14.94	-0.41	74.97	16.22	22.02	7.94	100.49	24.65	52.44	20.76	177.05	58.31	56.61	69.70	184.61
CHEMICALS	10.65	9.84	-1.96	46.45	7.89	12.93	13.14	62.06	18.85	21.66	3.54	96.85	23.20	25.86	45.00	94.06
CONSTRUCTION	6.16	5.63	-2.22	28.86	9.09	4.15	-17.80	32.35	4.36	2.00	-17.69	57.84	4.49	40.00	38.25	82.74
EQUIPMENT	7.71	13.60	15.24	50.23	5.24	19.95	39.69	84.07	83.11	53.77	-10.32	193.27	5.69	32.13	30.41	68.22
LIB. BOOKS	2.63	3.09	4.11	13.36	3.45	4.68	7.92	19.95	5.69	8.83	11.60	36.04	9.38	9.01	11.00	29.39
OTHERS	1.00	2.22	22.06	7.55	1.34	0.95	-8.24	5.86	2.90	43.62	96.92	45.24	-5.54	8.96	25.28	28.70
RECURRING	111.52	129.02	3.71	581.27	142.40	245.20	14.55	962.75	281.27	458.81	13.01	1829.43	479.18	545.45	688.79	1713.42
CAPITAL	17.50	24.54	8.82	100.00	19.12	29.73	11.67	142.23	96.05	108.21	3.02	332.40	14.01	90.09	104.94	209.05
TOTAL	129.02	153.56	4.45	681.27	161.52	274.93	14.22	1104.98	377.32	567.02	10.72	2161.83	493.19	635.55	793.73	3844.94

NAL+NTAF, BANGALORE
1975-76 TO 1992-93

(RS LAKH)

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	99.39	136.75	8.30	577.35	155.27	275.71	15.44	1136.78	309.99	514.00	13.48	2130.11	571.10	673.71	773.00	2017.81
CONT.+ MAINT.	15.88	20.43	6.50	115.39	34.02	42.83	5.93	200.30	51.29	90.00	15.09	364.10	105.72	117.00	125.00	347.71
CHEMICALS	29.33	42.23	9.54	192.52	49.49	81.18	13.17	326.05	116.82	141.00	4.82	635.30	168.58	183.25	207.00	558.82
CONSTRUCTION	32.96	16.51	-15.87	112.50	18.06	15.96	-3.04	87.16	19.04	26.00	8.09	116.76	29.99	33.97	27.28	91.24
EQUIPMENT	66.38	118.88	15.68	515.86	104.48	104.38	-0.02	651.61	203.12	234.59	3.67	753.68	193.87	52.91	91.06	337.84
LIB. BOOKS	6.49	9.36	9.59	42.20	10.71	14.30	7.49	65.46	19.34	22.00	3.27	106.24	24.00	28.00	28.00	80.00
OTHERS	6.13	6.81	2.66	35.63	1.73	3.17	16.35	54.64	7.55	40.41	52.12	103.78	59.73	82.08	23.06	164.87
RECURRING	144.60	199.41	8.37	885.26	238.78	399.72	13.75	1663.13	478.10	745.00	11.73	3129.52	845.39	973.96	1105.00	2924.35
CAPITAL	111.96	151.56	7.86	706.19	134.98	137.81	0.52	858.67	249.05	322.99	6.72	1080.46	307.60	196.96	169.40	673.96
TOTAL	256.56	350.97	8.15	1591.45	373.76	537.53	9.51	2522.00	727.15	1067.99	10.09	4209.98	1152.99	1170.92	1274.40	3598.31

S E R C-GZ, GHAZIABAD
1975-76 TO 1992-93

(RS LAKH)

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	13.39	15.18	3.19	71.84	16.64	28.39	14.29	111.83	31.77	38.63	5.01	192.01	53.82	59.25	72.43	185.51
CONT.+ MAINT.	2.10	2.50	4.46	11.64	3.10	4.40	9.15	18.54	7.55	19.50	26.77	66.81	31.53	25.35	35.10	91.98
CHEMICALS	3.00	3.78	5.95	16.00	4.63	4.71	0.43	27.84	6.94	11.39	13.19	36.78	29.43	7.00	6.92	43.34
CONSTRUCTION	0.34	0.00	-100.00	1.49	0.00	29.54	ERR	58.36	98.53	120.35	5.13	669.22	64.85	59.25	7.84	131.94
EQUIPMENT	2.04	4.25	20.14	12.94	6.89	5.96	-3.56	21.21	6.73	38.52	54.68	293.98	16.11	53.51	16.13	85.74
LIB. BOOKS	0.55	0.73	7.33	3.31	0.74	0.00	-100.00	3.85	1.67	1.62	-0.77	10.22	8.23	9.76	12.01	30.01
OTHERS	0.15	0.10	-9.64	0.92	0.20	1.85	74.40	3.32	1.68	0.00	-100.00	6.70	0.03	0.00	0.00	0.03
RECURRING	18.49	21.46	3.79	99.48	24.37	37.50	11.38	158.21	46.26	69.52	10.72	295.60	114.77	91.60	114.45	320.82
CAPITAL	1.08	5.08	13.33	18.66	7.83	17.77	47.79	66.74	108.61	160.48	10.25	980.11	89.22	122.52	35.98	247.73
TOTAL	21.57	26.54	5.32	118.14	32.20	74.85	23.48	244.95	154.87	230.01	10.39	1275.71	204.00	214.12	150.43	568.55

S E R C, MADRAS
1975-76 TO 1992-93

(RS LAKH)

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	11.06	17.57	12.27	71.25	20.33	49.70	25.04	166.48	56.30	119.41	20.68	430.15	127.00	147.75	168.38	443.13
CONT.+ MAINT.	1.21	2.64	21.54	9.43	2.90	8.58	31.15	28.30	12.04	27.49	22.93	90.12	32.30	39.00	38.33	109.63
CHEMICALS	4.24	5.94	8.79	24.71	7.54	19.06	26.09	69.49	25.00	40.03	12.49	161.20	47.70	48.25	49.96	145.91
CONSTRUCTION	0.00	0.00	ERR	0.00	0.00	0.00	ERR	0.00	50.90	30.74	-11.84	265.30	61.26	70.05	58.99	190.30
EQUIPMENT	2.76	8.77	33.51	27.43	9.03	37.87	43.10	161.48	102.99	37.31	-22.42	243.01	61.82	35.31	48.72	145.85
LIB. BOOKS	0.88	0.70	-5.56	3.51	1.10	0.25	-30.95	7.55	3.50	6.98	18.84	25.76	7.37	8.54	10.00	25.91
OTHERS	0.56	0.51	-2.31	2.57	10.52	1.50	-38.55	15.82	2.00	43.03	115.37	94.43	17.55	39.00	5.28	61.83
RECURRING	16.51	26.15	12.18	105.39	30.77	77.34	25.91	264.27	93.33	186.93	18.96	681.47	207.00	235.00	256.67	698.67
CAPITAL	4.20	9.98	24.16	33.51	20.65	39.62	17.69	184.85	159.39	116.07	-7.23	628.49	148.00	152.90	122.99	423.88
TOTAL	20.71	36.13	14.93	138.90	51.42	116.96	22.81	449.12	252.73	304.99	4.81	1309.96	355.00	387.89	379.66	1122.55

C S I R - C - MADRAS
1975-76 TO 1992-93

(RS LAKH)

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	7.03	9.05	6.52	32.23	10.16	16.17	12.33	63.95	18.36	34.32	16.92	131.41	34.57	37.46	41.77	113.79
CONT.+ MAINT.	3.58	3.79	1.44	15.15	4.25	7.30	14.46	31.94	10.43	15.23	9.94	57.63	14.93	17.53	20.99	53.45
CHEMICALS	0.00	0.00	ERR	0.00	0.00	0.00	ERR	0.00	0.00	0.00	ERR	0.00	0.00	0.00	0.00	0.00
CONSTRUCTION	4.69	7.00	10.54	46.63	19.82	54.87	29.00	195.07	6.52	3.89	-12.12	30.62	9.66	8.10	6.38	24.14
EQUIPMENT	0.00	0.00	ERR	0.00	0.41	1.70	43.14	3.21	0.74	0.00	-100.00	3.85	2.37	1.79	0.00	4.16
LIB. BOOKS	0.00	0.00	ERR	0.00	0.00	0.10	ERR	0.30	0.15	0.10	-9.64	0.65	0.10	0.10	0.08	0.28
OTHERS	0.78	0.59	-6.60	3.04	0.56	1.30	23.54	5.23	1.87	1.45	-6.09	6.25	0.50	4.52	1.05	6.07
RECURRING	10.60	12.83	4.89	47.38	14.41	47	12.97	95.89	28.79	49.56	14.54	189.04	49.50	54.98	62.76	167.24
CAPITAL	5.46	7.59	8.56	49.68	20.78	57.97	29.24	203.80	9.28	5.44	-12.49	41.37	12.62	14.52	7.51	34.65
TOTAL	16.07	20.42	6.18	97.05	35.19	81.44	23.34	299.68	38.07	55.00	9.63	230.41	62.12	69.50	70.27	201.89

RRL, BHUBNESWAR
1975-76 TO 1992-93

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	20.85	27.13	6.81	117.03	32.23	64.46	18.92	235.68	78.06	144.87	16.72	619.24	157.93	183.37	215.20	556.50
CONT.+ MAINT.	3.99	5.59	8.79	25.61	7.28	18.11	25.59	62.56	23.65	43.26	16.30	175.06	47.40	55.69	51.05	154.14
CHEMICALS	5.10	8.10	12.26	35.31	9.08	24.81	28.57	85.87	20.45	32.51	12.29	154.70	45.40	47.60	36.42	129.42
CONSTRUCTION	3.59	15.16	43.37	43.06	12.42	15.61	5.88	63.34	58.03	16.16	-27.36	145.85	5.25	7.30	12.59	25.14
EQUIPMENT	15.05	35.49	23.93	97.79	27.59	39.74	9.55	213.53	69.94	32.80	-17.25	234.64	51.71	42.40	29.22	123.33
LIB. BOOKS	3.08	2.71	-3.13	12.21	2.80	7.95	29.81	23.01	7.15	16.03	22.37	65.53	18.99	33.56	21.16	73.71
OTHERS	1.46	0.39	-28.18	3.85	0.44	1.07	24.88	3.79	1.72	10.36	56.59	38.95	8.52	5.90	3.95	18.36
RECURRING	29.94	40.82	8.06	177.95	48.59	107.38	21.93	384.11	122.16	220.65	15.93	949.00	250.73	286.66	302.67	840.06
CAPITAL	23.17	53.75	23.42	156.91	43.25	64.37	10.45	303.67	136.85	75.36	-13.86	484.97	84.46	89.16	66.92	240.54
TOTAL	53.10	94.57	15.52	334.86	91.84	171.75	16.94	687.78	259.01	296.00	3.39	1433.98	335.18	375.82	369.59	2161.19

R R L, THIRUVANANTHAPURAM
1975-76 TO 1992-93

HEADS	1976-77	1979-80	AV.GROWTH RATE PER ANNUM	1976-80 4 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	3.78	13.52	29.02	33.65	17.85	38.68	21.33	140.43	45.14	94.82	20.39	362.07	110.86	131.00	144.66	386.52
CONT.+ MAINT.	0.58	2.94	38.21	7.88	4.13	5.66	8.20	24.14	8.91	14.04	12.04	59.10	14.93	19.06	20.27	54.26
CHEMICALS	0.47	2.81	43.16	5.90	3.75	6.00	12.47	25.02	8.02	24.29	31.92	89.03	19.22	18.94	20.00	58.16
CONSTRUCTION	0.00	11.24	ERR	18.94	9.53	3.76	-20.75	22.05	8.68	50.51	55.31	98.78	90.00	120.00	15.00	225.00
EQUIPMENT	0.40	40.26	151.26	48.88	15.75	19.54	5.54	102.87	63.70	93.84	10.17	288.49	14.28	8.81	15.82	38.91
LIB. BOOKS	0.31	2.50	52.15	6.01	3.13	5.00	12.42	20.18	5.24	14.34	28.61	44.16	14.90	15.59	17.02	47.51
OTHERS	0.05	1.72	100.45	5.43	1.07	1.05	-0.47	6.50	1.01	5.37	51.96	11.59	9.82	5.80	5.40	21.02
RECURRING	4.83	19.26	31.87	47.43	25.73	50.34	18.27	189.59	62.07	133.15	21.02	510.20	145.00	169.00	184.93	498.93
CAPITAL	0.76	55.72	135.94	79.26	29.48	29.35	-0.11	151.60	78.63	164.06	20.18	443.01	129.00	150.20	53.24	332.44
TOTAL	5.59	74.97	68.07	126.69	55.21	79.69	9.61	341.19	140.70	297.20	20.56	953.20	273.99	319.20	238.17	831.36

C B R I, ROORKEE
1978-79 TO 1992-93

HEADS	1978-79	1979-80	AV.GROWTH RATE PER ANNUM	1978-80 3 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	60.80	65.63	7.94	126.43	71.31	128.10	15.77	488.12	148.11	228.00	11.39	931.81	260.00	284.00	366.09	910.09
CONT.+ MAINT.	7.61	6.35	-16.56	13.96	7.79	16.04	19.79	56.02	21.55	43.94	19.50	156.59	39.30	43.18	35.53	118.01
CHEMICALS	7.85	8.08	2.93	15.93	8.48	11.17	7.13	51.42	20.15	48.56	24.59	154.53	47.86	35.65	24.47	107.98
CONSTRUCTION	3.41	0.53	-84.46	3.94	1.80	2.00	2.67	12.61	10.22	19.95	18.20	68.47	18.03	21.00	21.23	60.26
EQUIPMENT	8.31	8.19	-1.44	16.50	3.45	43.57	88.51	69.15	61.00	91.92	10.79	346.98	63.60	35.60	10.76	109.96
LIB. BOOKS	0.65	0.77	18.46	1.42	0.73	1.86	26.34	6.37	2.20	8.38	39.66	21.35	5.41	5.18	5.77	16.36
OTHERS	0.22	0.17	-22.73	0.39	0.13	0.96	64.85	2.22	5.49	20.38	38.82	28.71	2.29	1.39	3.47	7.16
RECURRING	76.26	80.06	4.98	156.32	87.58	155.71	15.40	595.56	189.81	320.50	13.99	1242.93	347.16	362.83	426.09	1136.07
CAPITAL	12.59	9.66	-23.27	22.25	6.11	48.39	67.76	90.35	78.91	140.62	15.54	465.51	89.34	63.17	41.23	193.74
TOTAL	88.85	89.72	0.98	178.57	93.69	203.70	21.43	685.91	268.72	461.12	14.45	1708.44	436.49	426.00	467.32	2659.62

C R R I, DELHI
1979-80 TO 1992-93

HEADS	1979-80 ACTUALS	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	49.95	55.22	102.51	16.73	383.06	112.69	192.37	14.30	777.55	204.11	225.60	268.92	698.63
CONT.+ MAINT.	12.45	13.84	17.07	5.38	75.30	24.92	46.75	17.04	172.39	63.00	57.60	54.74	175.35
CHEMICALS	4.58	4.03	7.21	15.65	34.30	8.23	10.13	5.32	44.19	8.98	9.55	10.00	28.54
CONSTRUCTION	6.03	15.70	5.58	-22.79	32.86	18.78	9.12	-16.53	73.01	8.31	10.24	10.18	28.72
EQUIPMENT	13.08	19.09	16.72	-3.26	82.55	42.36	30.75	-7.69	172.37	25.23	47.56	15.71	88.51
LIB. BOOKS	1.82	2.08	3.49	13.81	14.15	4.00	7.74	17.91	26.17	8.07	7.16	10.00	25.23
OTHERS	1.04	3.19	0.29	-45.09	7.63	3.78	5.81	11.33	18.89	7.79	5.02	3.93	16.75
RECURRING	66.98	73.09	126.79	14.76	492.66	145.84	249.25	14.34	994.14	276.09	292.76	333.66	902.51
CAPITAL	21.97	40.06	26.08	-10.17	137.19	68.93	53.42	-6.17	290.44	49.40	69.99	39.82	159.21
TOTAL	88.95	113.15	152.87	7.81	629.85	214.77	302.67	8.96	1284.57	325.50	362.75	373.48	2123.45

RRL- BHOPAL
ACTUALS FOR 1981-82 TO 1992-93

HEADS	1981-82	1984-85	AV.GROWTH RATE PER ANNUM	1981-85 4 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	1.21	12.86	60.43	28.25	15.00	43.27	30.32	140.53	48.08	54.22	70.54	172.84
CONT.+ MAINT.	2.69	14.45	39.97	42.02	5.99	17.39	30.52	53.16	18.59	20.50	30.69	69.78
CHEMICALS	0.00	6.99	ERR	13.11	3.45	14.46	43.14	41.27	14.64	13.32	15.04	43.00
CONSTRUCTION	0.61	79.17	164.63	86.45	1.50	6.90	46.43	23.15	12.99	27.98	46.90	87.87
EQUIPMENT	1.59	52.19	101.02	139.69	51.47	32.04	-11.18	212.42	51.33	41.90	43.27	136.50
LIB. BOOKS	2.39	5.69	18.94	18.02	3.47	6.59	17.42	25.37	7.88	7.48	8.66	24.01
OTHERS	1.97	2.94	8.34	12.39	1.00	15.32	98.09	13.52	3.99	6.35	4.07	14.40
RECURRING	3.90	34.30	54.47	83.38	24.44	75.12	32.41	234.96	81.32	88.04	116.27	285.63
CAPITAL	6.56	139.99	84.43	256.55	57.43	60.85	1.46	274.46	76.18	83.71	102.90	262.79
TOTAL	10.46	174.29	75.53	339.93	81.87	135.97	13.52	509.43	157.49	171.75	219.17	1096.82

BIOLOGICAL SCIENCES GROUP
1975-76 TO 1992-93

(RS. LAKH)

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	284.90	386.07	7.89	1629.26	439.98	921.43	20.30	3266.13	1030.51	1863.36	15.96	7387.19	2073.31	2301.23	2659.54	7034.08
CONT.+ MAINT.	44.84	79.47	15.38	329.59	99.66	777.37	22.36	779.47	284.71	553.94	18.10	2016.88	681.21	685.61	752.70	2119.52
CHEMICALS	69.36	129.42	16.88	518.09	163.30	392.08	24.48	1277.87	448.70	572.66	6.29	2459.96	610.54	672.75	654.12	1937.41
CONSTRUCTION	24.13	106.80	45.05	308.54	174.78	453.54	26.92	1552.70	733.63	439.03	-12.05	3527.59	328.11	176.15	264.45	768.71
EQUIPMENT	66.48	249.14	39.14	760.83	224.96	491.93	21.60	1783.84	693.37	546.61	-5.77	2474.04	511.78	487.44	380.12	1379.33
LIB. BOOKS	15.59	23.40	10.69	94.89	29.77	76.72	26.70	250.37	86.61	149.06	14.47	592.21	191.37	227.59	260.54	679.50
OTHERS	6.53	14.51	22.09	48.02	18.93	36.96	18.21	137.10	42.14	86.28	19.62	247.60	132.90	56.72	67.34	256.96
RECURRING	399.10	594.96	10.50	2476.94	702.94	1536.88	21.60	5323.48	1763.92	2989.97	14.10	11864.04	3365.06	3659.59	4066.36	11091.01
CAPITAL	112.73	393.85	36.72	1212.28	448.44	1059.15	23.97	3724.01	1555.95	1220.99	-5.88	6841.43	1164.16	947.89	972.45	3084.50
TOTAL	511.83	988.81	17.90	3689.22	1151.38	2596.03	22.54	9047.49	3319.87	4210.95	6.12	18705.47	4529.22	4607.49	5038.81	14175.51

C F T R I, MYSORE
1975-76 TO 1992-93

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	82.22	99.31	4.83	444.92	113.04	207.60	16.41	773.48	223.04	368.00	13.34	1520.62	391.53	438.00	514.99	1344.52
CONT.+ MAINT.	10.77	16.20	10.75	74.40	17.25	29.25	14.11	118.58	34.00	55.85	13.21	214.15	56.16	63.74	72.05	191.95
CHEMICALS	15.85	24.16	11.11	96.54	26.25	40.25	11.28	164.90	41.75	55.60	7.42	213.45	69.90	52.77	58.00	180.67
CONSTRUCTION	9.43	25.00	27.60	77.46	17.44	14.00	-2.13	70.01	20.00	0.95	-53.31	59.62	8.77	5.04	12.50	26.30
EQUIPMENT	17.86	42.14	23.94	140.69	36.03	58.54	12.90	198.10	82.20	73.65	-2.71	267.94	49.79	36.24	21.38	107.41
LIB. BOOKS	3.25	4.50	8.48	18.79	5.00	8.16	13.03	31.23	8.13	16.00	16.45	58.13	23.47	30.19	33.80	87.46
OTHERS	0.88	2.79	33.44	7.58	3.00	2.03	-9.30	16.79	4.37	4.95	3.16	27.33	9.26	9.01	4.07	22.34
RECURRING	108.84	139.67	6.43	615.86	156.54	277.10	15.35	1056.96	298.79	479.45	12.55	1948.22	517.59	554.51	645.04	1717.13
CAPITAL	31.42	74.43	24.06	244.52	61.47	84.73	8.35	316.13	114.70	95.56	-4.46	413.02	91.28	80.48	71.75	243.51
TOTAL	140.26	214.10	11.15	860.38	218.01	361.83	13.50	1373.09	413.49	575.00	8.59	2361.23	608.87	634.99	716.79	3921.29

C D R I, LUCKNOW
1975-76 TO 1992-93

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	69.39	91.18	7.07	392.82	98.12	187.44	17.56	694.11	208.53	361.29	14.73	1476.72	387.41	418.00	484.01	1289.42
CONT.+ MAINT.	9.92	20.38	19.72	82.00	25.12	49.40	18.42	192.37	59.27	89.85	10.96	372.19	103.00	113.00	119.04	335.04
CHEMICALS	20.35	29.30	9.54	130.07	40.78	63.33	11.63	259.63	75.52	96.00	6.18	452.05	75.00	89.99	91.09	256.08
CONSTRUCTION	3.17	15.19	47.95	51.53	31.35	25.87	-4.69	154.28	39.49	18.56	-17.20	117.12	18.11	16.00	0.79	34.90
EQUIPMENT	15.91	48.00	31.79	122.50	31.00	40.65	7.01	195.87	83.33	71.38	-3.80	342.48	48.63	69.55	54.65	172.83
LIB. BOOKS	3.76	5.00	7.39	21.85	5.25	9.00	14.42	37.75	9.98	25.00	25.79	84.97	39.50	54.00	65.00	158.50
OTHERS	0.49	0.90	16.42	4.16	1.50	11.44	66.18	19.18	10.56	2.92	-27.50	28.60	1.32	0.00	2.35	3.67
RECURRING	99.66	140.86	9.04	604.89	164.02	300.17	16.31	1146.11	343.32	547.13	12.36	2300.96	565.41	620.99	694.14	1880.53
CAPITAL	23.33	69.09	31.18	200.04	69.10	86.96	5.92	407.08	143.37	117.86	-4.78	573.16	107.56	139.55	122.79	369.89
TOTAL	122.99	209.95	14.30	804.93	233.12	387.13	13.52	1553.19	486.69	664.99	8.12	2874.12	672.96	760.53	816.93	4500.84

C F B, DELHI
1978-79 TO 1992-93

HEADS	1978-79	1979-80	AV.GROWTH RATE PER ANNUM	1978-80 3 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	4.10	4.76	16.10	8.86	6.98	18.25	27.16	59.12	19.81	42.64	21.13	155.98	82.76	68.83	78.85	230.44
CONT.+ MAINT.	3.21	3.93	22.43	7.14	4.41	6.59	10.56	28.40	8.55	12.12	9.12	44.95	13.70	37.17	50.51	101.37
CHEMICALS	4.69	1.95	-58.42	6.64	5.23	9.78	16.94	34.76	10.09	21.82	21.26	92.66	26.85	24.93	24.28	76.06
CONSTRUCTION	1.31	0.41	-68.70	1.72	0.86	11.38	90.73	13.67	149.67	89.12	-12.16	652.71	41.43	19.10	26.00	86.53
EQUIPMENT	2.93	5.63	92.15	8.56	5.76	14.12	25.13	38.79	24.77	20.15	-5.03	88.48	25.66	33.12	25.82	84.61
LIB. BOOKS	0.05	0.06	20.00	0.11	0.07	0.29	42.67	0.77	0.30	2.58	71.77	6.88	3.49	4.98	7.99	16.46
OTHERS	0.32	0.37	15.63	0.69	0.27	0.96	37.32	2.86	0.14	0.74	51.52	1.61	1.00	0.54	0.12	1.66
RECURRING	12.00	10.64	-11.33	22.64	16.62	34.62	20.14	122.28	38.45	76.58	18.80	293.59	123.30	130.93	153.64	407.87
CAPITAL	4.61	6.47	40.35	11.08	6.96	26.75	40.02	56.09	174.88	112.59	-10.42	749.69	71.59	57.74	59.93	189.26
TOTAL	16.61	17.11	3.01	33.72	23.58	61.37	27.01	178.37	213.32	189.17	-2.96	1043.28	194.89	188.67	213.57	1194.25

N B R I, LUCKNOW
1975-76 TO 1992-93

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	42.88	54.44	6.15	236.00	59.97	109.47	16.24	416.16	129.27	219.90	883.00	883.77	238.00	271.30	307.58	816.88
CONT.+ MAINT.	6.00	8.26	8.32	37.02	9.11	17.51	17.74	65.51	21.11	34.42	313.33	131.33	39.00	39.00	53.00	131.00
CHEMICALS	5.33	13.65	26.50	54.21	18.18	31.13	14.39	109.73	31.70	36.70	170.61	170.61	42.00	47.30	41.08	130.38
CONSTRUCTION	2.73	8.05	31.04	27.00	19.97	10.91	-14.03	85.47	16.94	11.87	78.77	78.77	7.50	8.00	19.80	35.30
EQUIPMENT	2.07	12.50	56.76	44.55	10.00	51.03	50.30	110.84	40.74	35.40	131.20	131.20	13.25	20.50	25.00	58.75
LIB. BOOKS	1.94	2.60	7.60	9.94	2.87	8.00	29.21	21.07	6.00	10.16	41.45	41.45	12.00	15.50	17.00	44.50
OTHERS	0.25	0.59	23.94	2.82	2.94	2.90	-0.34	13.07	5.12	4.54	23.53	24.29	0.25	0.70	1.50	2.45
RECURRING	54.21	76.35	8.94	327.23	87.26	158.11	16.02	591.40	182.08	291.02	12.44	1185.72	319.00	357.60	401.66	1078.26
CAPITAL	6.99	23.74	35.75	84.31	35.78	72.84	19.45	230.45	68.80	61.97	-2.58	275.71	33.00	44.70	63.30	141.00
TOTAL	61.20	100.09	13.09	411.54	123.04	230.95	17.05	821.85	250.88	353.00	8.91	1461.43	352.00	402.30	464.96	1219.26

N B R I, LUCKNOW
1975-76 TO 1992-93

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	42.88	54.44	6.15	236.00	59.97	109.47	16.24	416.16	129.27	219.90	883.00	883.77	238.00	271.30	307.58	816.88
CONT.+ MAINT.	6.00	8.26	8.32	37.02	9.11	17.51	17.74	65.51	21.11	34.42	313.33	131.33	39.00	39.00	53.00	131.00
CHEMICALS	5.33	13.65	26.50	54.21	18.18	31.13	14.39	109.73	31.70	36.70	170.61	170.61	42.00	47.30	41.08	130.38
CONSTRUCTION	2.73	8.05	31.04	27.00	19.97	10.91	-14.03	85.47	16.94	11.87	78.77	78.77	7.50	8.00	19.80	35.30
EQUIPMENT	2.07	12.50	56.76	44.55	10.00	51.03	50.30	110.84	40.74	35.40	131.20	131.20	13.25	20.50	25.00	58.75
LIB. BOOKS	1.94	2.60	7.60	9.94	2.87	8.00	29.21	21.07	6.00	10.16	41.45	41.45	12.00	15.50	17.00	44.50
OTHERS	0.25	0.59	23.94	2.82	2.94	2.90	-0.34	13.07	5.12	4.54	23.53	24.29	0.25	0.70	1.50	2.45
RECURRING	54.21	76.35	8.94	327.23	87.26	158.11	16.02	591.40	182.08	291.02	12.44	1185.72	319.00	357.60	401.66	1078.26
CAPITAL	6.99	23.74	35.75	84.31	35.78	72.84	19.45	230.45	68.80	61.97	-2.58	275.71	33.00	44.70	63.30	141.00
TOTAL	61.20	100.09	13.09	411.54	123.04	230.95	17.05	821.85	250.88	353.00	8.91	1461.43	352.00	402.30	464.96	1219.26

I I C B, CALCUTTA
1975-76 TO 1992-93

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	23.66	31.24	7.19	133.30	36.40	80.11	21.80	283.74	88.25	158.00	15.67	619.15	177.49	193.84	229.94	601.28
CONT.+ MAINT.	2.94	5.02	14.31	21.85	6.82	17.24	26.10	58.37	21.38	49.80	23.54	172.87	44.31	51.48	52.91	148.70
CHEMICALS	3.50	6.60	17.18	26.17	10.77	58.04	52.36	150.58	48.80	65.00	7.43	269.80	68.65	91.12	76.01	235.78
CONSTRUCTION	2.01	4.90	24.95	21.23	9.37	48.35	50.72	138.86	45.34	76.99	14.15	277.58	87.99	51.98	50.41	190.38
EQUIPMENT	3.67	37.99	79.37	96.02	29.44	56.68	17.80	215.83	57.49	45.90	-5.47	244.24	61.50	33.38	22.72	117.59
LIB. BOOKS	2.45	4.00	13.04	16.10	5.00	9.95	18.77	36.47	12.45	8.00	-10.47	69.45	19.02	18.01	20.00	57.02
OTHERS	0.10	0.30	31.61	1.14	0.89	0.70	-5.83	8.58	1.87	6.28	35.44	15.95	2.50	9.59	9.84	21.93
RECURRING	30.10	42.86	9.24	181.32	53.99	155.40	30.25	492.70	158.42	272.79	14.55	1061.82	290.45	336.44	358.86	985.75
CAPITAL	8.23	47.19	54.74	134.49	44.70	115.69	26.84	399.75	117.15	137.18	4.02	607.23	170.99	112.95	102.97	386.92
TOTAL	38.33	90.05	23.80	315.81	98.69	271.09	28.74	892.45	275.57	409.96	10.44	1669.04	461.45	449.40	461.83	2745.34

C F B, DELHI
1978-79 TO 1992-93

HEADS	1978-79	1979-80	AV.GROWTH RATE PER ANNUM	1978-80 3 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	4.10	4.76	16.10	8.86	6.98	18.25	27.16	59.12	19.81	42.64	21.13	155.98	82.76	68.83	78.85	230.44
CONT.+ MAINT.	3.21	3.93	22.43	7.14	4.41	6.59	10.56	28.40	8.55	12.12	9.12	44.95	13.70	37.17	50.51	101.37
CHEMICALS	4.69	1.95	-58.42	6.64	5.23	9.78	16.94	34.76	10.09	21.82	21.26	92.66	26.85	24.93	24.28	76.06
CONSTRUCTION	1.31	0.41	-68.70	1.72	0.86	11.38	50.73	13.67	149.67	89.12	-12.16	652.71	41.43	19.10	26.00	86.53
EQUIPMENT	2.93	5.63	92.15	8.56	5.76	14.12	25.13	38.79	24.77	20.15	-5.03	88.48	25.66	33.12	25.82	84.61
LIB. BOOKS	0.05	0.06	20.00	0.11	0.07	0.29	42.67	0.77	0.30	2.58	71.77	6.88	3.49	4.98	7.99	16.46
OTHERS	0.32	0.37	15.63	0.69	0.27	0.96	37.32	2.86	0.14	0.74	51.52	1.61	1.00	0.54	0.12	1.66
RECURRING	12.00	10.64	-11.33	22.64	16.62	34.62	20.14	122.28	38.45	76.58	18.80	293.59	123.30	130.93	153.64	407.87
CAPITAL	4.61	6.47	40.35	11.08	6.96	26.75	40.02	56.09	174.88	112.59	-10.42	749.69	71.59	57.74	59.93	189.26
TOTAL	16.61	17.11	3.01	33.72	23.58	61.37	27.01	178.37	213.32	189.17	-2.96	1043.28	194.89	188.67	213.57	1194.25

C C M B, HYDERABAD
1977-78 TO 1992-93

HEADS	1977-78	1979-80	AV.GROWTH RATE PER ANNUM	1977-80 3 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	3.41	6.37	36.68	14.28	10.62	46.43	44.60	126.01	52.04	134.30	26.75	470.61	161.30	183.00	205.83	550.13
CONT.+ MAINT.	0.50	2.00	100.00	3.75	3.25	23.43	63.86	54.95	43.20	157.83	38.25	497.72	241.52	158.15	168.50	568.17
CHEMICALS	3.44	4.10	9.17	11.54	8.50	53.50	58.39	134.74	82.48	125.78	11.12	442.38	142.18	161.85	149.50	453.53
CONSTRUCTION	1.00	10.15	218.59	11.15	38.42	190.01	49.13	621.84	173.99	24.71	-38.61	594.15	2.66	0.36	6.70	9.73
EQUIPMENT	33.64	27.01	-10.39	89.15	22.97	64.00	29.20	275.35	120.00	166.20	8.48	607.86	151.30	128.62	72.76	352.68
LIB. BOOKS	1.75	0.95	-26.32	5.30	3.50	8.70	25.56	29.49	9.84	19.96	19.35	73.57	20.38	22.23	25.04	67.65
OTHERS	0.50	2.57	126.72	3.55	2.08	4.00	17.76	18.41	3.50	41.22	85.21	65.95	43.55	8.13	10.75	62.44
RECURRING	7.35	12.47	30.25	29.57	22.37	123.36	53.24	315.70	177.72	417.91	23.83	1410.71	545.00	502.99	523.83	1571.82
CAPITAL	36.89	40.68	5.01	109.15	66.97	266.71	41.27	945.09	307.33	252.09	-4.83	1341.53	217.90	159.35	115.25	492.50
TOTAL	44.24	53.15	9.61	138.72	89.34	390.07	44.55	1260.79	485.05	670.00	8.41	2752.24	762.89	662.34	639.08	4128.63

I T R C, LUCKNOW
1975-76 TO 1992-93

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	15.94	26.66	13.72	102.57	31.21	63.44	19.40	233.11	71.68	150.40	20.35	561.26	165.50	190.00	215.58	571.08
CONT.+ MAINT.	3.29	6.16	16.98	27.22	9.05	16.44	16.09	58.70	21.68	41.17	17.40	145.58	47.00	48.83	60.55	156.38
CHEMICALS	5.00	13.38	27.90	46.63	14.57	28.81	18.58	105.39	36.37	30.19	-4.55	169.75	45.39	44.50	47.71	137.60
CONSTRUCTION	1.19	3.96	35.06	9.63	9.56	9.31	-0.66	56.75	16.25	1.89	-41.59	60.04	17.42	14.99	14.33	46.74
EQUIPMENT	5.18	15.96	32.49	67.84	21.96	23.24	1.43	86.06	69.83	23.60	-23.75	169.82	25.00	22.94	19.95	67.89
LIB. BOOKS	0.75	2.00	27.79	7.06	2.08	4.11	18.56	16.14	6.74	7.21	1.67	38.30	6.60	8.00	9.00	23.60
OTHERS	0.74	0.80	1.97	4.18	1.00	1.87	16.94	10.59	4.43	1.54	-23.26	14.74	0.58	2.89	0.91	4.38
RECURRING	24.23	46.20	17.51	176.42	54.83	108.69	18.66	397.20	129.73	221.76	14.34	876.59	257.89	283.33	323.84	865.06
CAPITAL	7.86	22.72	30.39	88.71	34.60	38.53	2.73	169.54	97.25	34.23	-22.97	282.90	49.60	48.82	44.19	142.61
TOTAL	32.09	68.92	21.06	265.13	89.43	147.22	13.27	566.74	226.98	256.00	3.05	1159.49	307.49	332.15	368.03	2015.33

R R L, JAMMU
1975-76 TO 1992-93

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV. GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV. GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV. GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	37.42	50.22	7.63	218.15	58.26	126.13	21.30	437.46	139.21	230.09	883.00	934.24	244.40	273.65	309.51	827.56
CONT.+ MAINT.	5.25	9.80	16.89	40.20	14.25	22.97	12.68	89.03	27.06	28.65	313.33	132.45	28.55	25.88	26.80	81.23
CHEMICALS	15.01	26.34	15.10	112.89	28.23	43.56	11.45	191.36	49.20	44.00	170.61	218.16	38.40	41.87	41.30	121.57
CONSTRUCTION	3.50	11.68	35.16	44.80	13.48	15.00	2.71	92.41	10.85	13.66	78.77	46.85	9.36	8.40	11.70	29.46
EQUIPMENT	17.21	42.84	25.61	145.14	40.95	51.30	5.80	266.50	62.00	31.69	131.20	177.04	48.05	41.85	45.00	134.89
LIB. BOOKS	2.43	2.75	3.14	10.85	3.75	7.45	18.72	28.81	9.00	13.00	41.45	53.95	13.86	19.10	21.00	53.96
OTHERS	3.25	3.27	0.15	15.44	1.50	1.00	-9.64	16.95	3.56	2.89	23.53	13.56	2.99	0.65	1.00	4.64
RECURRING	57.68	86.36	10.62	371.24	100.74	192.66	17.60	717.85	215.47	302.75	8.67	1284.86	311.35	341.40	377.61	1030.36
CAPITAL	26.39	60.54	23.07	216.23	59.68	74.75	5.79	404.67	85.41	61.25	-7.98	291.40	74.25	70.00	78.70	222.95
TOTAL	84.07	146.90	14.97	587.47	160.42	267.41	13.63	1122.52	300.88	363.99	4.88	1576.25	385.60	411.40	456.31	1253.30

I M T, CHANDIGARH
1983-84 TO 1992-93

HEADS	1983-84	1984-85	AV.GROWTH RATE PER ANNUM	1983-85 2 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	6.18	12.50	102.27	18.68	13.99	25.25	15.90	107.41	34.32	41.84	67.52	143.68
CONT.+ MAINT.	8.25	15.55	88.48	23.80	18.81	41.55	21.91	127.76	63.69	97.14	97.67	258.50
CHEMICALS	3.08	23.35	658.12	26.43	28.00	41.99	10.67	174.26	40.00	49.29	50.00	139.29
CONSTRUCTION	59.29	60.49	2.02	119.78	215.68	160.00	-7.19	1438.67	99.99	35.00	91.92	226.91
EQUIPMENT	107.33	91.00	-15.21	198.33	83.00	50.65	-11.61	265.36	42.61	45.00	35.00	122.61
LIB. BOOKS	5.31	11.32	113.18	16.63	13.42	30.00	22.28	94.41	30.00	28.00	31.00	89.00
OTHERS	2.25	4.79	112.89	7.04	1.43	10.55	64.93	23.84	60.38	15.71	26.00	102.09
RECURRING	17.51	51.40	193.55	68.91	60.80	108.79	15.66	409.42	138.00	188.28	215.19	541.47
CAPITAL	174.18	167.60	-3.78	341.78	313.53	251.21	-5.39	1822.28	232.98	123.71	183.92	540.61
TOTAL	191.69	219.00	14.25	410.69	374.33	360.00	-0.97	2231.71	370.98	311.98	399.11	2164.14

C S I R, PALAMPUR
1983-84 TO 1992-93

HEADS	1983-84	1984-85	AV. GROWTH RATE PER ANNUM	1983-85 2 YEARS TOTAL	1985-86	1989-90	AV. GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	0.22	2.62	1077.93	2.84	5.56	25.50	46.35	82.53	30.90	36.55	41.27	108.72
CONT.+ MAINT.	1.21	6.83	466.33	8.04	9.84	9.50	-0.88	46.58	11.50	13.90	16.00	41.40
CHEMICALS	0.37	12.39	3295.07	12.76	14.30	19.75	8.41	81.56	24.00	33.05	36.00	93.05
CONSTRUCTION	0.00	0.97	ERR	0.97	14.99	8.34	-13.64	37.11	5.90	7.00	27.00	39.90
EQUIPMENT	1.96	3.12	59.06	5.08	9.45	13.93	10.19	40.12	28.50	38.94	38.08	105.51
LIB. BOOKS	0.01	3.61	72040.00	3.61	3.57	4.90	8.23	22.82	6.50	9.00	10.00	25.50
OTHERS	1.24	3.75	202.58	4.99	3.94	2.08	-14.79	14.77	2.70	4.56	6.63	13.89
RECURRING	1.79	21.84	1117.90	23.63	29.70	54.75	16.52	210.66	66.40	83.50	93.27	243.17
CAPITAL	3.20	11.44	257.07	14.64	31.95	29.24	-2.19	114.81	43.59	59.50	81.71	184.80
TOTAL	5.00	33.27	566.01	38.27	61.65	83.99	8.04	325.47	109.99	143.00	174.98	427.97

INFORMATION SCIENCES GROUP
1975-76 TO 1992-93

(RS LAKH)

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	49.47	69.32	8.80	283.95	41.02	177.67	44.26	591.31	194.78	330.16	14.10	1332.25	355.16	402.31	457.66	1215.13
CONT.+ MAINT.	29.15	19.10	-10.03	122.90	21.82	64.02	30.88	199.76	60.10	84.90	9.02	352.87	106.23	111.82	104.15	322.20
CHEMICALS	0.00	31.00	ERR	64.21	36.20	90.42	25.72	329.54	97.69	116.10	4.41	453.87	121.10	142.78	136.68	400.56
CONSTRUCTION	1.88	15.29	68.87	41.33	21.24	63.74	31.62	337.51	40.98	10.79	-28.36	116.01	3.17	14.35	8.89	26.42
EQUIPMENT	3.65	17.70	48.40	87.18	6.19	30.73	49.27	107.33	38.34	26.59	-8.74	105.35	14.45	53.58	22.46	90.49
LIB. BOOKS	9.69	13.05	7.73	54.72	13.47	30.73	22.90	121.59	29.15	45.04	11.49	190.02	43.04	49.16	55.36	147.56
OTHERS	2.06	1.52	-7.32	9.08	1.34	3.42	26.40	28.18	2.51	46.16	107.06	80.37	56.87	45.57	28.36	130.80
RECURRING	78.62	119.42	11.02	471.06	99.04	332.11	35.32	1120.61	352.57	531.16	10.79	2138.99	582.50	656.91	698.49	1937.89
CAPITAL	17.28	47.56	28.80	192.31	42.24	128.62	32.10	594.61	110.97	128.58	3.75	491.75	117.53	162.66	115.07	395.27
TOTAL	95.90	166.98	14.87	663.37	141.28	460.73	34.38	1715.22	463.54	659.74	9.22	2630.74	700.03	819.57	813.56	2333.16

P I D, NEW DELHI
1975-76 TO 1992-93

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	20.79	31.89	11.29	124.03	36.66	72.25	18.48	269.91	82.90	133.51	12.65	550.26	161.67	185.40	209.22	556.29
CONT.+ MAINT.	13.96	9.06	-10.24	65.64	10.62	19.16	15.90	74.97	21.75	26.02	4.58	123.49	32.83	33.70	29.03	95.56
CHEMICALS	0.00	17.65	ERR	28.50	22.73	45.86	19.18	201.28	55.94	79.76	9.27	291.57	80.46	96.55	91.65	268.67
CONSTRUCTION	1.88	0.15	-46.85	15.90	0.35	0.01	-58.89	1.71	5.74	0.00	-100.00	12.54	0.00	6.41	3.94	10.35
EQUIPMENT	0.68	8.95	90.47	55.30	3.50	8.16	23.57	32.31	24.62	9.99	-20.18	50.42	0.00	36.45	20.17	56.62
LIB. BOOKS	1.26	1.30	0.78	5.60	1.96	3.50	15.60	15.25	3.50	5.61	12.53	25.11	6.53	6.62	7.00	20.15
OTHERS	0.50	0.99	18.62	5.51	0.96	0.26	-27.86	4.55	1.20	0.11	-44.84	2.71	3.50	0.47	0.00	3.97
RECURRING	34.75	58.60	13.96	218.17	70.01	137.27	18.33	546.16	160.59	239.28	10.48	965.32	274.97	315.64	329.90	920.51
CAPITAL	4.32	11.39	27.43	82.31	6.77	11.93	15.22	53.82	35.06	15.72	-18.17	90.77	10.03	49.96	31.11	91.10
TOTAL	39.07	69.99	15.69	300.48	76.78	149.20	18.07	599.98	195.65	254.99	6.85	1056.09	285.00	365.60	361.01	2023.21

I N S D O C, NEW DELHI
1975-76 TO 1992-93

HEADS	1975-76 ACTUALS	1979-80 ACTUALS	AV.GROWTH RATE PER ANNUM	1975-80 5 YEARS TOTAL	1980-81	1984-85	AV.GROWTH RATE PER ANNUM	1980-85 5 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS	
SALARIES	28.68	37.43	6.88	159.92	4.36	78.71	106.13	260.56	83.12	140.96	14.12	566.36	135.22	149.98	166.65	451.86	
CONT.+ MAINT.	15.19	10.04	-9.83	57.26	11.20	31.56	29.56	89.77	26.39	42.13	12.41	158.14	52.94	54.99	49.12	157.05	
CHEMICALS	0.00	13.35	ERR	35.71	13.47	34.86	26.84	109.17	30.54	24.23	-5.63	109.41	24.88	31.60	30.95	87.43	
CONSTRUCTION	0.00	15.14	ERR	25.43	20.89	57.78	28.96	313.56	28.35	4.02	-38.64	70.03	1.30	6.96	2.08	10.34	
EQUIPMENT	2.97	8.75	31.01	31.88	2.69	15.34	54.53	34.63	4.86	16.59	35.95	37.68	12.95	17.13	2.29	32.37	
LIB. BOOKS	8.43	11.75	8.66	49.11	11.51	24.73	21.07	99.00	22.94	30.94	7.76	138.76	24.47	31.88	34.99	91.34	
OTHERS	1.56	0.53	-23.65	3.57	0.38	1.90	49.53	18.33	0.78	37.90	163.68	65.66	47.77	15.03	6.26	69.06	
RECURRING	43.87	60.82	8.51	252.89	29.03	145.13	49.53	459.50	140.05	207.32	10.30	833.91	213.04	236.57	246.72	696.33	
CAPITAL	12.96	36.17	29.25	109.99	35.47	99.75	29.50	465.52	56.93	89.44	11.95	312.14	86.49	71.00	45.62	203.11	
TOTAL		56.83	96.99	14.30	362.88	64.50	244.88	39.59	925.02	196.98	296.76	10.79	1146.04	299.53	307.57	292.34	1798.89

N I S T A D S, DELHI
1981-82 TO 1992-93

HEADS	1981-82	1984-85	AV.GROWTH RATE PER ANNUM	1981-85 4 YEARS TOTAL	1985-86	1989-90	AV.GROWTH RATE PER ANNUM	1985-90 5 YEARS TOTAL	1990-91	1991-92	1992-93	1990-93 TOTAL 3 YEARS
SALARIES	4.94	26.71	40.15	60.84	28.76	55.70	17.97	215.63	58.27	66.93	81.79	206.98
CONT.+ MAINT.	3.70	13.30	29.16	35.03	11.97	16.75	8.77	71.24	20.46	23.14	26.00	69.60
CHEMICALS	0.00	9.70	ERR	19.10	11.21	12.12	1.98	52.89	15.76	14.63	14.08	44.47
CONSTRUCTION	1.08	5.95	40.68	22.23	6.89	6.77	-0.42	33.45	1.87	0.98	2.87	5.72
EQUIPMENT	12.36	7.23	-10.17	40.39	8.86	0.02	-79.72	17.25	1.50	0.00	0.00	1.50
LIB. BOOKS	0.50	2.50	37.97	7.34	2.70	8.49	33.15	26.14	12.04	10.66	13.37	36.06
OTHERS	1.17	1.26	1.49	5.29	0.53	8.16	98.24	12.00	5.60	30.07	22.10	57.77
RECURRING	8.64	49.71	41.90	114.97	51.93	84.56	12.96	339.76	94.49	104.69	121.87	321.05
CAPITAL	15.11	16.94	2.31	75.25	18.98	23.43	5.41	88.84	21.01	41.71	38.34	101.05
TOTAL	23.75	66.65	22.92	190.22	70.91	108.00	11.09	428.60	115.50	146.40	160.21	844.21

SALARIES VS R&D FOR THE YEAR: 1985-86

NAME OF THE LABORATORY	SALARIES	INFRA (SAL, CONT, MAIN)	EQUIP-MENT	R&D (CHEM, WKS, EQUIP, BOOKS, MISC.)	GRAND TOTAL
NPL			197.891	305.917	704.021
CEERI	327.154	398.104	196.146	302.882	488.645
CSIO	156.617	185.763	96.198	157.002	370.205
NGRI	181.682	213.203	68.020	159.091	371.415
NIO	174.385	212.324	91.265	305.249	475.985
NCL	133.355	170.736	126.000	254.654	613.695
CECRI	302.040	359.041	98.919	170.941	357.086
CSMCPI	160.991	186.145	92.502	145.792	267.507
IICT	99.816	121.715	119.747	243.026	588.997
RRL-JOR	287.498	345.971	51.657	142.988	299.937
IIP	131.091	156.949	95.585	152.540	362.790
CLRI	181.935	210.250	79.644	156.482	331.477
CFRI	147.129	174.995	82.480	144.184	477.215
NML	291.946	333.031	122.592	145.814	414.908
CGCRI	235.094	269.094	69.757	114.656	300.127
CMRS	156.009	185.471	89.996	135.085	296.913
NEERI	136.983	161.828	67.968	114.333	285.208
CMERI	141.524	170.875	83.108	114.903	377.322
NAL	237.766	262.419	203.115	365.865	727.146
SERC-GZ	309.988	361.281	6.729	115.554	154.873
SERC-M	31.770	39.319	102.994	184.393	252.729
CSIR-C-M	56.301	68.336	0.740	9.278	38.070
RRL-BHUB	18.363	28.792	69.944	157.300	259.005
RRL-TRIV	78.056	101.705	63.700	86.651	140.700
CBRI	45.139	54.049	61.002	99.062	268.720
CRI	148.110	169.658	42.362	77.163	214.770
RRL-BHD	112.692	137.607	51.468	60.877	81.868
CFTRI	15.001	20.991	82.199	156.447	413.486
CDRI	223.039	257.039	83.334	218.887	486.686
NBRI	208.534	267.799	40.740	100.503	250.876
IICB	129.265	150.373	57.492	165.947	275.573
CFB	88.247	109.626	24.767	184.967	213.322
CCMB	19.809	28.355	120.000	389.815	485.053
ITRC	52.039	95.238	69.831	133.624	226.982
CIMAP	71.681	93.358	60.556	132.079	231.053
RRL-JMU	79.137	98.974	61.998	134.610	300.879
IMT	139.208	166.269	83.000	341.525	374.325
CSIR-PAL	13.992	32.800	9.448	46.250	61.648
PID	5.559	15.398	24.622	91.002	195.652
INSDOC	82.901	104.650	4.855	87.474	196.981
NISTADS	83.117	109.507	8.862	30.186	70.910
	28.759	40.724			
Total	5523.782	6669.762	3163.233	6634.998	13304.76

SALARIES VS R&D FOR THE YEAR: 1986-87

NAME OF THE LABORATORY	SALARIES	INFRA (SAL, CONT, MAIN)	EQUIP-MENT	R&D (CHEM, WKS, EQUIP, BOOKS, MISC.)	GRAND TOTAL
NPL	378.170	456.670	211.500	352.450	809.120
CEERI	189.000	224.000	139.500	249.200	473.200
CSIO	216.180	245.990	67.000	141.950	387.940
NGRI	217.000	262.090	64.500	187.800	449.890
NIO	166.000	202.390	96.750	300.570	502.960
NCL	340.320	407.920	128.000	235.530	643.450
CECRI	178.100	202.140	65.000	123.710	325.850
CSMCRI	120.000	153.281	50.000	93.186	246.467
IICT	336.000	393.300	72.000	156.600	549.900
RRL-JOR	156.000	182.020	58.500	126.010	308.030
IIP	220.000	247.450	65.000	120.060	367.510
CLRI	178.000	209.760	58.000	141.910	351.670
CFRI	320.880	359.440	45.000	93.860	453.300
NML	280.000	325.650	1.000	138.920	464.570
CGCRI	185.000	208.500	45.000	89.100	297.600
CMRS	160.000	188.800	31.700	83.630	272.430
NEERI	173.510	210.440	46.500	91.110	301.550
CMERI	268.000	291.100	0.700	64.450	355.550
NAL	369.000	432.900	72.000	262.260	695.160
SERC-G	34.500	45.600	0.000	213.230	258.830
SERC-M	68.000	81.500	53.000	146.610	228.110
CSIR-C-M	22.000	29.000	0.000	10.100	39.100
RRL-HUB	100.000	128.450	45.730	103.950	232.400
RRL-TRIV	63.000	74.750	35.000	66.500	141.250
CBRI	172.000	200.830	63.000	108.800	309.630
CRRI	137.000	164.000	35.000	63.290	227.290
RRL-BHO	21.270	35.770	33.000	55.880	91.650
CFTRI	266.850	303.580	90.000	129.050	432.630
CDRI	260.000	318.000	30.000	222.770	540.770
NBRI	156.000	177.010	60.000	96.480	273.490
IICB	109.000	136.000	12.000	164.700	300.700
CFB	27.000	36.650	98.000	197.710	234.360
CCMB	69.250	156.050	37.140	305.960	462.010
ITRC	93.110	115.790	30.000	109.570	225.360
CIMAP	96.000	117.280	40.000	109.020	226.300
RRL-JMU	167.000	194.540	66.000	117.900	312.440
IMT	23.500	44.000	10.000	320.500	364.500
CSIR-PAL	12.500	22.100	7.800	35.100	57.200
PID	96.980	127.960	0.000	73.550	201.510
INSDOC	100.000	122.000	4.000	100.670	222.670
NISTADS	36.000	52.000		22.540	74.540
TOTAL	6582.120	7886.701	2117.320	5826.186	13712.89

SALARIES VS R&D FOR THE YEAR: 1987-88

NAME OF THE LABORATORY	SALARIES	INFRA (SAL, CONT, MAIN)	EQUIP-MENT	R&D (CHEM, WKS, EQUIP, BOOKS, MISC.)	GRAND TOTAL
NPL	445.000	537.196	104.188	201.801	738.997
CEERI	207.866	247.563	81.808	187.657	435.220
CSIO	249.370	284.333	15.526	86.694	371.027
NGRI	267.428	312.945	35.535	153.054	465.999
NIO	199.509	241.506	41.165	227.352	468.858
NCL	396.988	483.774	77.496	226.409	710.183
DECRI	217.210	248.646	59.286	147.918	396.564
CSMCRI	133.000	159.486	43.119	95.497	254.983
IICT	364.080	432.484	54.627	163.619	596.103
RRL-JOR	198.923	221.032	33.980	93.923	314.955
IIP	248.338	275.407	116.003	171.337	446.744
CLRI	216.585	257.000	40.709	102.523	359.523
CFRI	377.525	424.214	1.485	50.119	474.333
NML	329.926	389.776	129.026	189.586	579.362
CGCRI	219.211	263.853	39.211	55.433	319.286
CMRS	185.000	220.692	10.824	57.240	277.932
NEERI	184.619	215.151	27.023	79.106	294.257
CMERI	320.952	354.509	33.237	70.484	424.993
NAL	453.614	528.423	109.042	298.717	827.140
SERC-G	40.388	53.037	145.000	291.955	344.992
SERC-M	88.999	105.034	15.827	146.417	251.451
CSIR-C-M	27.526	40.796	1.607	8.950	49.746
RRL-BHUB	110.643	137.744	41.15	129.058	266.802
RRL-TRIV	75.052	85.451	56.750	86.600	172.051
CBRI	189.700	219.970	58.064	102.491	322.461
CRR I	158.086	193.318	42.129	81.297	274.615
RRL-BHO	26.715	34.755	36.588	69.389	104.144
CFTRI	327.530	369.840	46.763	93.155	462.995
CDRI	312.998	389.975	17.261	178.002	567.977
NBRI	178.360	204.154	44.844	78.823	282.977
IICB	123.910	160.603	15.384	163.205	323.808
CFB	29.614	35.986	106.573	170.931	206.917
CCMB	99.641	205.842	25.773	359.158	565.000
ITRC	116.603	143.933	19.181	83.068	227.001
CIMAP	118.168	144.153	25.095	103.764	247.917
RRL-JMU	190.000	214.650	35.702	86.350	301.000
IMT	19.791	40.944	3.643	520.814	561.758
CSIR-PAL	17.470	26.860	0.000	33.121	59.981
PID	111.868	134.868	7.004	60.065	194.933
INSDOC	116.833	149.530	1.373	54.653	204.183
NISTADS	44.046	56.771		28.388	85.159
TOTAL	7739.086	9246.204	1841.922	5588.123	14834.33

SALARIES VS R&D FOR THE YEAR: 1988-89

NAME OF THE LABORATORY	SALARIES	INFRA (SAL, CONT, MAIN)	EQUIP- MENT	R&D (CHEM, WKS, EQUIP, BOOKS, MISC.)	GRAND TOTAL
NPL	490.000	580.000	197.900	360.610	940.610
CEERI	235.987	270.485	92.000	185.315	455.800
CSIO	257.000	299.700	45.420	100.250	399.950
NGRI	284.000	347.000	39.536	173.580	520.580
NIO	203.747	254.687	45.000	218.413	473.100
NCL	431.000	531.500	121.339	249.690	781.190
CECRI	241.300	278.240	21.286	106.920	385.160
CSMCR I	142.000	174.112	31.262	101.368	275.480
IICT	433.200	490.200	85.000	173.000	663.200
RRL-JOR	202.500	230.350	30.570	83.410	313.760
IIP	240.010	268.850	87.100	158.660	427.510
CLRI	240.000	283.850	102.660	176.960	460.810
CFRI	398.000	447.000	13.670	54.270	501.270
NML	361.000	460.310	83.835	182.850	643.160
CGCRI	241.951	285.389	38.775	66.797	352.186
CMRS	200.000	235.000	38.615	82.620	317.620
NEERI	191.620	230.120	35.090	101.390	331.510
CMERI	344.112	387.412	22.462	49.538	436.950
NAL	483.510	567.610	134.940	324.930	892.540
SERC-G	46.720	62.730	103.730	224.280	287.010
SERC-M	97.440	118.500	33.880	154.174	272.674
CSIR-C-M	29.200	40.900	1.500	7.600	48.500
RRL-BHUB	130.712	167.652	66.854	138.198	305.850
RRL-TRIV	84.060	98.060	39.200	103.940	202.000
CBRI	194.000	226.000	73.000	120.510	346.510
CRRI	177.400	215.900	22.120	49.330	265.230
RRL-BHO	34.273	41.518	36.000	54.252	95.770
CFTRI	335.200	380.460	42.500	96.660	477.120
CDRI	333.900	422.000	51.000	191.692	613.692
NBRI	200.250	229.250	7.800	71.840	301.090
IICB	140.000	178.000	16.180	181.000	359.000
CFB	36.918	45.177	117.092	154.340	199.517
CCMB	115.375	219.065	13.442	351.119	570.184
ITRC	129.463	162.178	15.740	61.942	224.120
CIMAP	133.610	164.610	18.256	96.530	261.140
RRL-JMU	207.940	232.488	30.000	65.452	297.940
IMT	24.872	50.622	3.100	520.500	571.122
CSIR-PAL	21.500	29.750	8.000	62.250	62.650
PID	125.000	146.750	9.240	65.080	209.000
INSDOC	125.450	160.370	3.000	25.070	225.450
NISTADS	51.130	64.930			90.000
TOTAL	8395.350	10078.725	2014.094	5779.230	15857.96

SALARIES VS R&D FOR THE YEAR: 1989-90

NAME OF THE LABORATORY	SALARIES	INFRA (SAL, CONT, MAIN)	EQUIP-MENT	R&D (CHEM, WKS, EQUIP, BOOKS, MISC.)	GRAND TOTAL
NPL	538.998	641.145	239.686	413.842	1054.987
CEERI	260.797	314.618	143.998	247.869	562.487
CSIO	277.009	322.959	85.677	152.026	474.985
NGRI	352.090	443.975	69.752	197.517	641.492
NIO	222.212	270.846	6.333	246.307	517.153
NCL	490.059	616.357	131.700	263.596	879.953
CECRI	270.504	317.503	56.680	192.538	510.041
CSMCRI	155.609	191.409	49.001	118.581	309.990
IICT	488.007	574.810	83.751	220.185	794.995
RRL-JOR	249.497	275.994	59.317	115.979	391.973
IIP	285.410	319.529	84.674	111.068	430.597
CLRI	245.455	296.200	66.725	170.781	466.981
CFRI	425.807	481.997	42.327	92.789	574.786
NML	403.649	466.990	102.433	222.718	689.708
CGCRI	278.002	327.013	88.378	136.695	463.708
CMRS	237.348	279.464	48.283	95.536	375.000
NEERI	221.082	267.458	13.464	83.532	350.990
CMERI	384.707	437.143	53.765	129.874	567.017
NAL	514.002	604.003	234.586	463.991	1067.994
SERC-G	38.633	58.132	38.516	171.874	230.006
SERC-M	119.409	146.897	37.312	158.099	304.996
CSIR-C-M	34.321	9.555	0.000	5.441	54.996
RRL-BHUB	144.873	188.133	32.804	107.864	295.997
RRL-TRIV	94.820	108.858	93.835	188.345	297.203
CBRI	227.999	271.937	91.917	189.179	461.116
CRRI	192.370	239.117	30.754	63.549	302.666
RRL-BHO	43.271	60.657	73.654	75.318	135.975
CFTRI	368.000	423.849	71.379	151.155	575.004
CDRI	361.287	451.135	35.401	213.856	664.991
NBRI	219.898	254.319	45.904	98.677	352.996
IICB	157.995	207.791	20.151	202.172	409.963
CFB	42.643	54.761	166.199	134.407	189.168
CCMB	134.301	292.130	23.603	377.863	669.993
ITRC	150.401	191.574	14.051	64.422	255.996
CIMAP	147.992	181.198	31.691	103.659	284.857
RRL-JMU	230.094	258.748	50.653	105.244	363.992
IMT	25.251	66.800	13.927	293.202	360.002
CSIR-PAL	25.499	34.998	9.994	48.992	83.990
PID	133.506	159.521	16.585	95.473	254.994
INSDOC	140.960	183.094	0.015	113.665	296.759
NISTADS	55.697	72.444		35.551	107.995
TOTAL	9389.464	11405.061	2590.913	6673.431	18078.49

SALARIES VS R&D FOR THE YEAR: 1990-91

NAME OF THE LABORATORY	SALARIES	INFRA (SAL, CONT, MAIN)	EQUIP-MENT	R&D (CHEM, WKS, EQUIP, BOOKS, MISC.)	GRAND TOTAL
NPL			106.365	326.028	1026.053
CEERI	587.591	700.025	131.477	225.767	556.180
CSIO	278.383	330.413	58.969	109.978	479.994
NGRI	320.555	370.016	24.728	123.670	585.993
NIO	376.474	462.323	207.234	413.454	721.311
NCL	259.063	307.857	110.112	267.370	950.993
CECRI	528.833	683.623	55.232	164.259	503.995
CSMCRI	298.864	359.756	55.499	113.795	316.971
IICT	168.500	203.176	63.387	209.003	823.501
RRL-JOR	526.499	614.498	51.519	105.172	461.881
IIP	325.819	356.709	51.674	126.004	488.761
CLRI	322.961	362.757	47.568	133.400	454.420
CFRI	256.369	321.020	38.956	92.422	602.421
NML	447.068	509.999	60.955	144.210	692.492
CGCRI	446.868	548.282	79.245	134.495	486.494
CMRS	290.002	351.999	42.500	72.896	396.991
NEERI	279.922	324.095	29.451	107.418	358.209
CMERI	217.793	250.791	5.685	37.217	493.198
NAL	397.673	455.981	193.871	476.170	1152.985
SERC-G	571.099	676.815	16.105	118.647	203.995
SERC-M	53.823	85.348	61.818	195.696	354.995
CSIR-C-M	126.995	159.299	2.369	12.620	62.119
RRL-BHUB	34.565	49.499	51.712	129.861	335.184
RRL-TRIV	157.927	205.323	14.277	148.213	273.994
CBRI	110.856	125.781	63.598	137.197	436.494
CRRI	259.999	299.297	25.234	58.384	325.496
RRL-BHO	204.109	267.112	51.330	90.816	157.494
CFTRI	48.084	66.678	49.788	161.179	608.865
CDRI	391.530	447.686	48.634	182.554	672.962
NBRI	387.410	490.408	13.250	74.998	351.998
IICB	238.000	277.000	61.495	239.647	461.446
CFB	177.494	221.799	25.664	98.435	194.888
CCMB	82.758	96.453	151.300	360.073	762.894
ITRC	161.302	402.821	25.000	94.987	307.487
CIMAP	165.500	212.500	17.489	109.613	302.122
RRL-JMU	159.704	192.509	48.045	112.646	385.595
IMT	244.400	272.949	28.497	272.979	370.980
CSIR-PAL	34.315	98.001	0.000	67.595	109.992
PID	30.899	42.397	12.950	90.495	284.997
INSDOC	161.672	194.502	1.501	111.369	299.533
NISTADS	135.224	188.164		36.768	115.497
	58.265	78.729			
TOTAL	10324.17	12644.390	2207.097	6287.480	18931.87

SALARIES VS R&D FOR THE YEAR: 1991-92

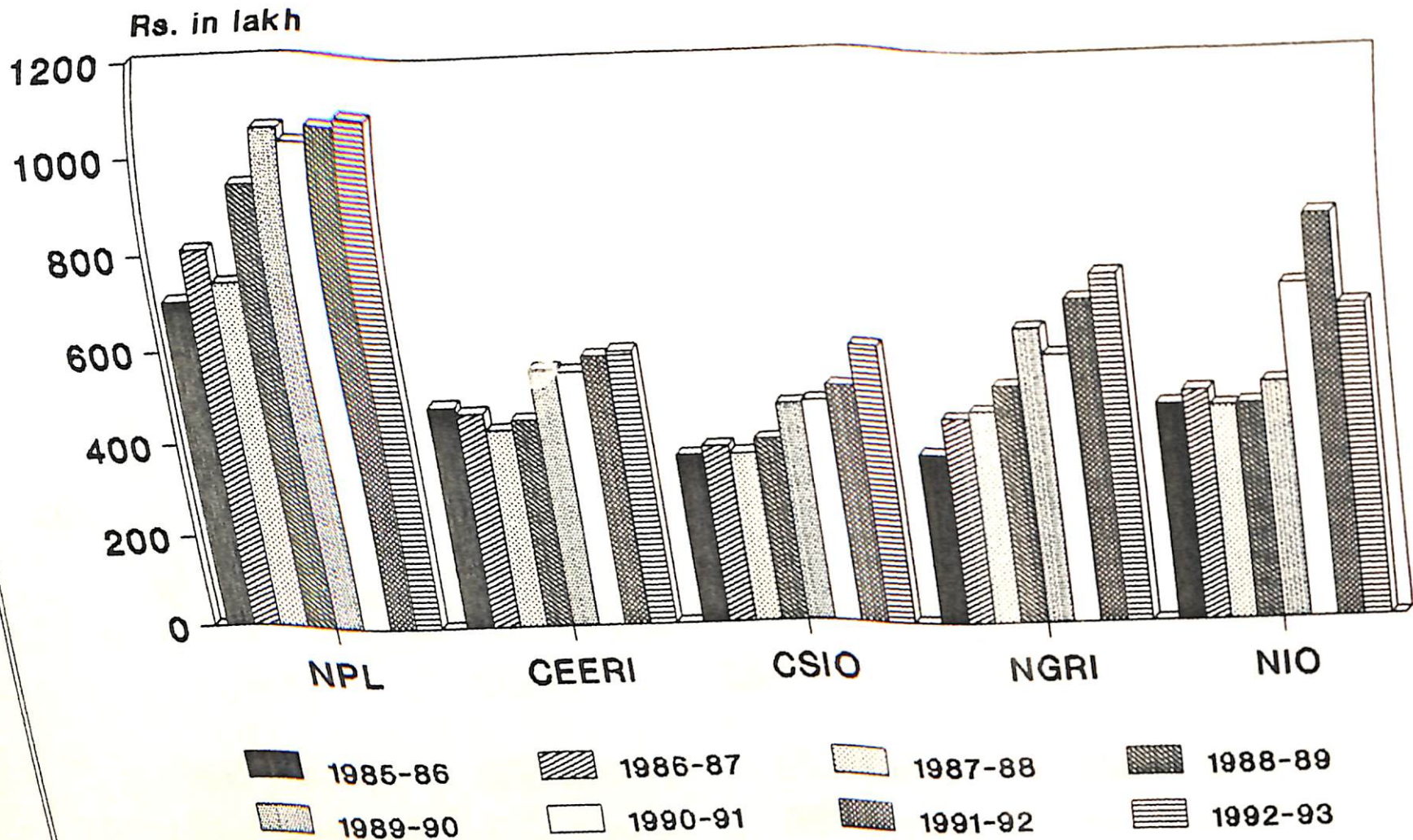
NAME OF THE LABORATORY	SALARIES	INFRA (SAL, CONT, MAIN)	EQUIP-MENT	R&D (CHEM, WKS, EQUIP, BOOKS, MISC.)	GRAND TOTAL
NPL	628.925	765.374	97.223	294.900	1060.274
CEERI	314.343	372.802	114.616	215.818	588.620
CSIO	369.047	420.067	45.074	91.912	511.979
NGRI	438.658	532.777	25.200	168.127	700.904
NIO	286.999	343.458	285.465	521.679	865.137
NCL	371.752	729.420	149.407	360.579	1089.999
CECRI	350.860	403.964	78.894	164.035	567.999
CSMCRI	189.598	228.542	39.587	125.457	353.999
IICT	575.009	691.008	85.393	293.992	985.000
RRL-JOR	298.001	330.200	33.998	84.495	414.695
IIP	350.998	406.498	68.028	159.147	565.645
CLRI	313.600	386.391	62.614	177.597	563.988
CFRI	495.485	557.809	15.004	65.376	623.185
NML	488.648	609.126	64.519	156.168	765.294
CGCRI	321.000	375.499	63.132	131.987	507.486
CMRS	310.306	280.920	50.998	84.370	431.797
NEERI	240.066	519.598	24.197	93.311	374.231
CMERI	462.992	790.710	52.911	115.948	635.546
NAL	673.712	84.604	35.308	380.212	1170.922
SERC-G	59.253	186.749	1.794	129.520	214.124
SERC-M	147.750	54.982	42.400	201.149	387.898
CSIR-C-M	37.455	239.061	8.809	14.518	69.500
RRL-BHUB	183.370	150.059	35.599	136.759	375.820
RRL-TRIV	130.999	327.176	47.564	169.140	319.199
CBRI	283.999	283.207	41.902	98.821	425.997
CRRI	225.603	74.716	36.239	79.540	362.747
RRL-BHO	54.217	501.741	69.546	97.032	171.748
CFTRI	437.999	530.995	20.500	133.247	760.530
CDRI	417.996	310.300	33.379	229.535	402.300
NBRI	271.300	245.325	33.121	92.000	449.395
IICB	193.844	105.997	128.624	204.070	188.666
CFB	68.832	341.146	22.938	82.669	662.343
CCMB	183.000	238.829	17.310	321.197	332.149
ITRC	190.000	223.545	41.847	93.320	310.738
CIMAP	186.217	299.529	44.998	87.193	411.397
RRL-JMU	273.650	138.985	38.936	111.868	311.982
IMT	41.841	50.450	36.452	172.997	142.996
CSIR-PAL	36.550	219.092	17.127	92.546	365.600
PID	185.397	204.973	0.000	146.508	307.571
INSDOC	149.983	90.063		102.598	146.395
NISTADS	66.928			56.332	
TOTAL	11506.18	13993.114	2196.287	8537.669	20530.78

SALARIES VS R&D FOR THE YEAR: 1992-93

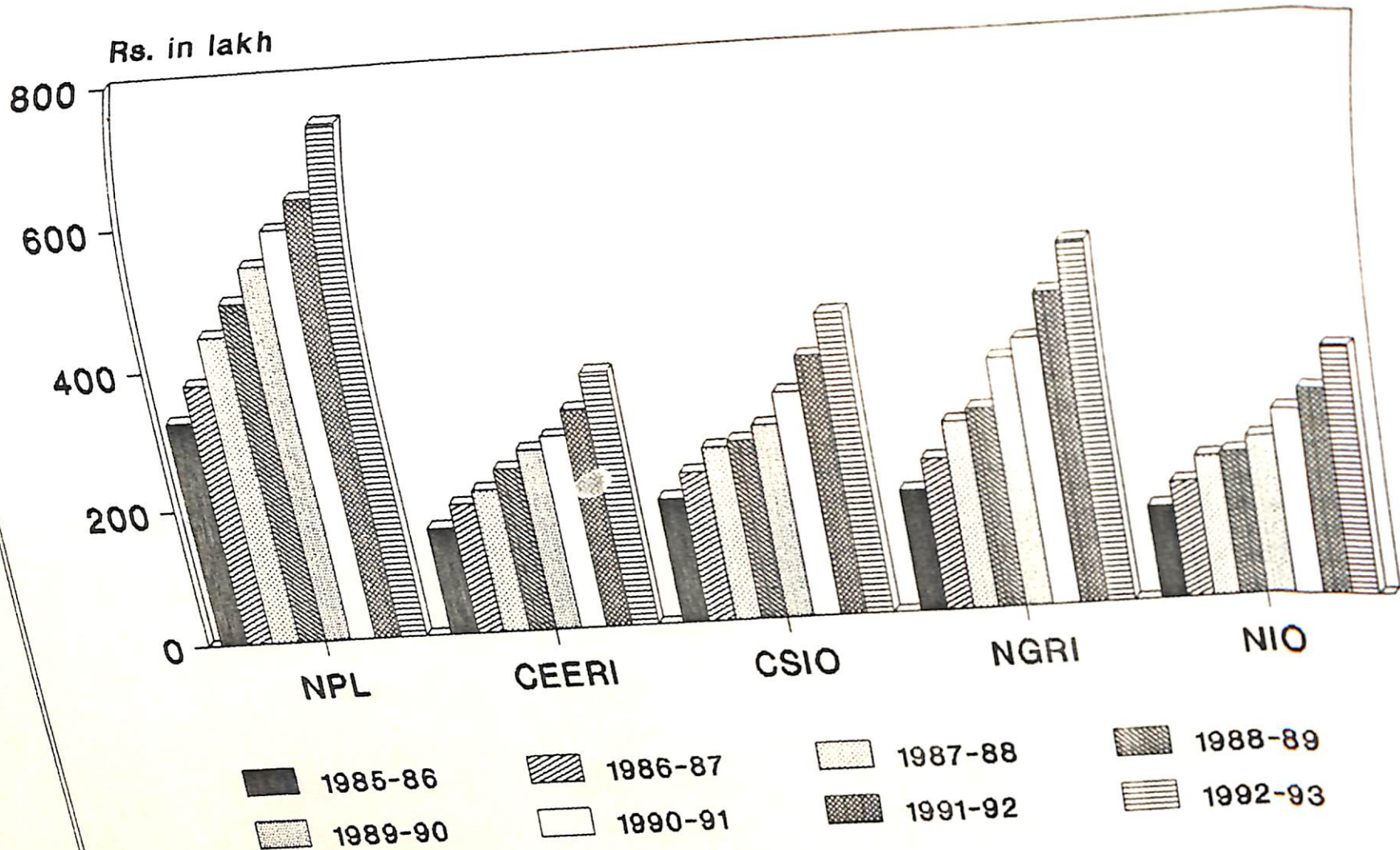
NAME OF THE LABORATORY	SALARIES	INFRA (SAL, CONT, MAIN)	EQUIP- MENT	R&D (CHEM, WKS, EQUIP, BOOKS, MISC.)	GRAND TOTAL
NPL	744.170	882.890	50.290	240.390	1123.280
CEERI	376.490	439.580	71.110	167.260	606.840
CSIO	427.200	499.200	39.990	98.610	597.810
NGRI	502.640	593.900	25.200	159.760	753.660
NID	344.970	394.430	29.430	297.370	691.800
NCL	667.750	815.800	90.000	315.690	1131.490
CECRI	369.310	440.280	52.800	137.100	577.380
CSMCRI	210.240	248.840	29.460	116.720	365.560
IICT	648.260	762.160	80.220	318.620	1080.780
RRL-JOR	339.440	373.200	55.000	136.380	509.580
IIP	399.350	451.350	55.500	156.000	607.350
CLRI	362.060	438.770	63.310	167.430	606.200
CFRI	565.010	630.440	17.450	70.170	700.610
NML	580.550	700.240	60.000	141.250	841.490
CGCRI	355.080	406.060	44.320	102.180	508.240
CMRS	337.690	407.650	30.000	75.480	483.130
NEERI	340.150	362.740	10.960	55.210	417.950
CMERI	574.090	643.790	30.410	142.300	786.090
NAL	773.000	898.000	91.060	376.400	1274.400
SERC-G	72.430	107.530	16.130	43.990	151.520
SERC-M	168.380	206.710	48.720	172.950	379.660
CSIR-C-M	41.770	62.760	0.000	7.510	70.270
RRL-BHUB	215.200	266.250	29.220	104.900	371.150
RRL-TRIV	144.660	164.930	15.820	112.240	277.170
CBRI	366.090	401.620	10.760	70.030	471.650
CRRI	268.920	325.660	15.710	52.210	377.870
RRL-BHO	70.540	101.230	43.270	121.080	222.310
CFTRI	514.990	587.040	21.380	134.050	721.090
CDRI	484.010	603.050	25.000	213.880	816.930
NBRI	307.580	360.580	22.720	106.380	466.960
IICB	229.940	282.850	25.820	178.980	461.830
CFB	78.850	129.360	72.760	84.210	213.570
CCMB	205.830	374.330	19.950	264.750	639.080
IITR	215.580	276.130	19.760	94.390	370.520
CIMAP	204.460	240.130	45.000	88.250	328.380
RRL-JMU	309.510	336.310	35.000	120.000	456.310
IMT	67.520	165.190	38.080	233.920	399.110
CSIR-PAL	41.270	57.270	20.170	117.710	174.980
PID	209.220	238.250	2.290	122.760	361.010
INSDOC	166.650	215.770	0.000	76.570	292.340
NISTADS	81.790	107.790	0.000	52.420	160.210
Total	13403.24	16000.060	1508.720	5847.500	21847.56

Annexure 3.3
Graphs showing Group-wise Comparative expenditure under different Budget heads
for different laboratories (1985-86 to 1992-93)

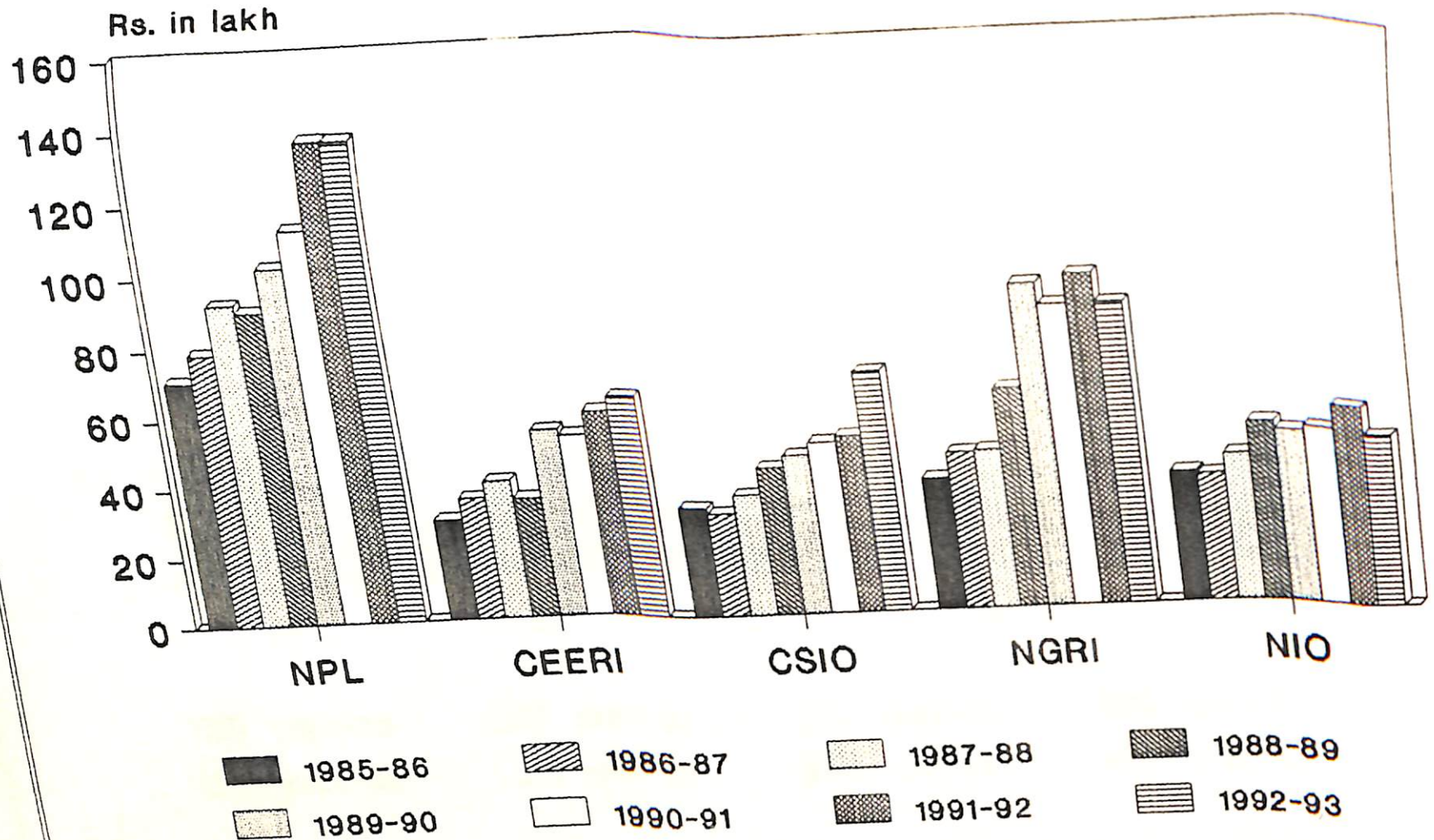
PHYSICAL AND EARTH SCIENCES GROUP TOTAL



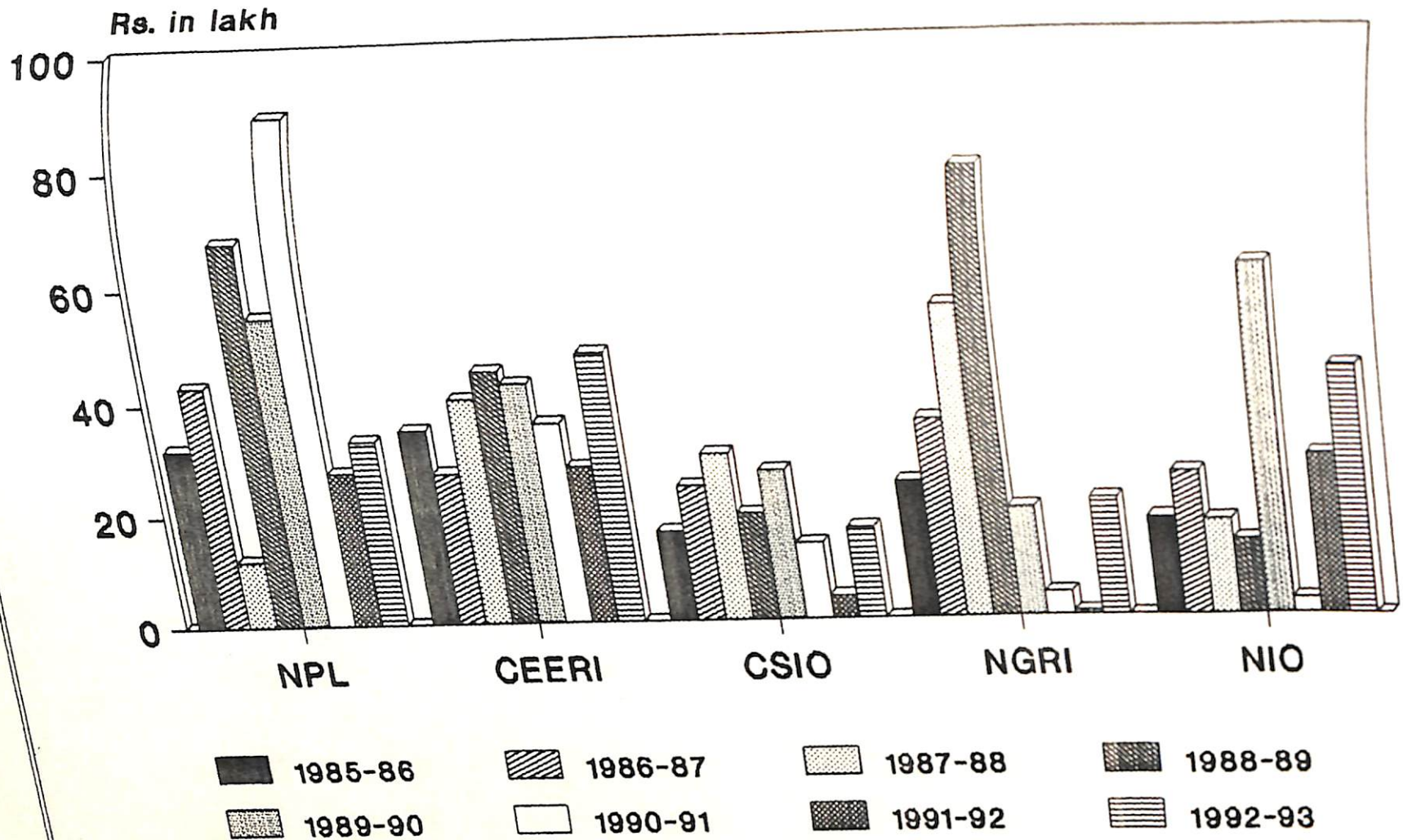
PHYSICAL AND EARTH SCIENCES GROUP SALARIES (P1,2,3)



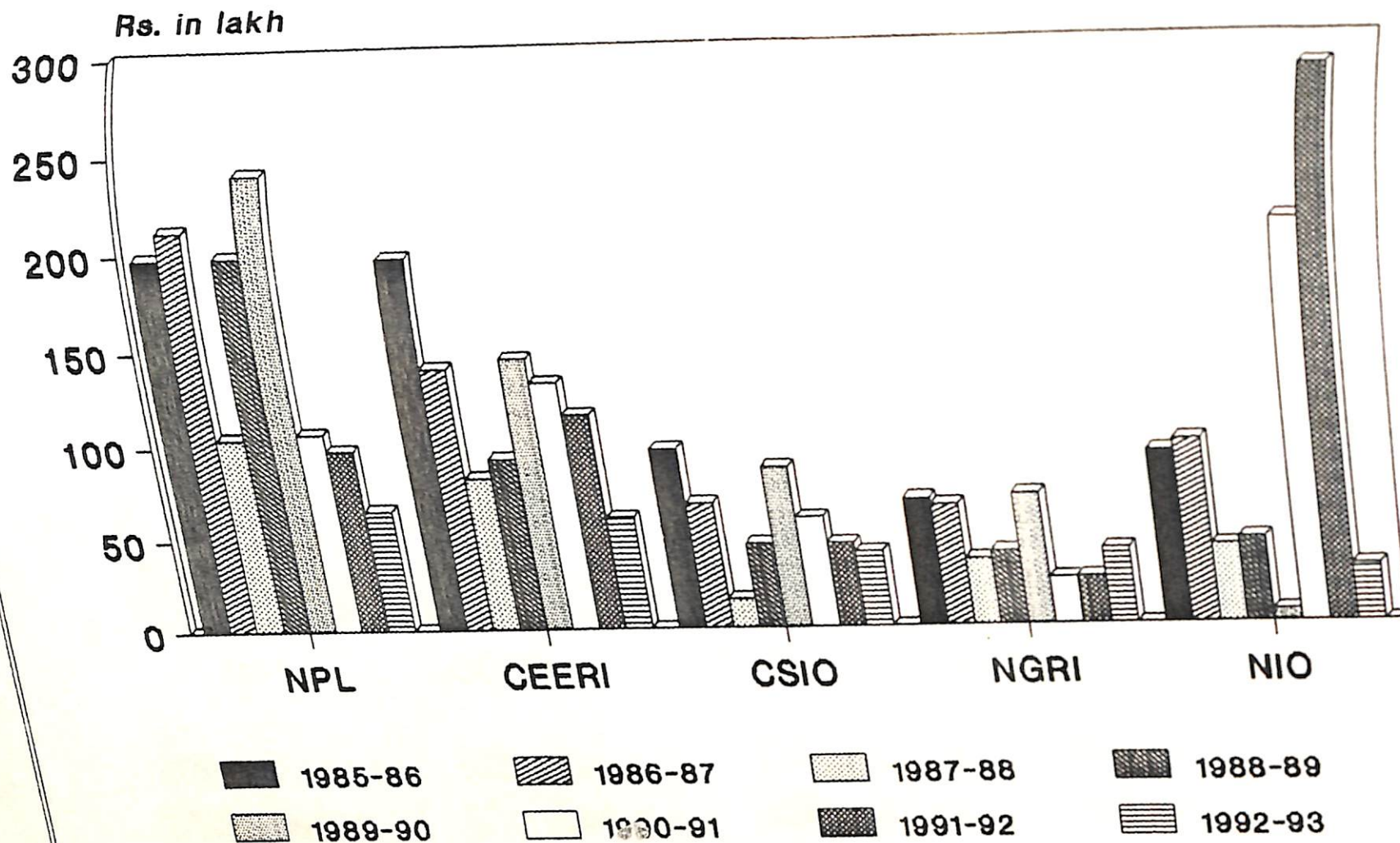
PHYSICAL AND EARTH SCIENCES GROUP CONTINGENCIES & MAINTENANCE



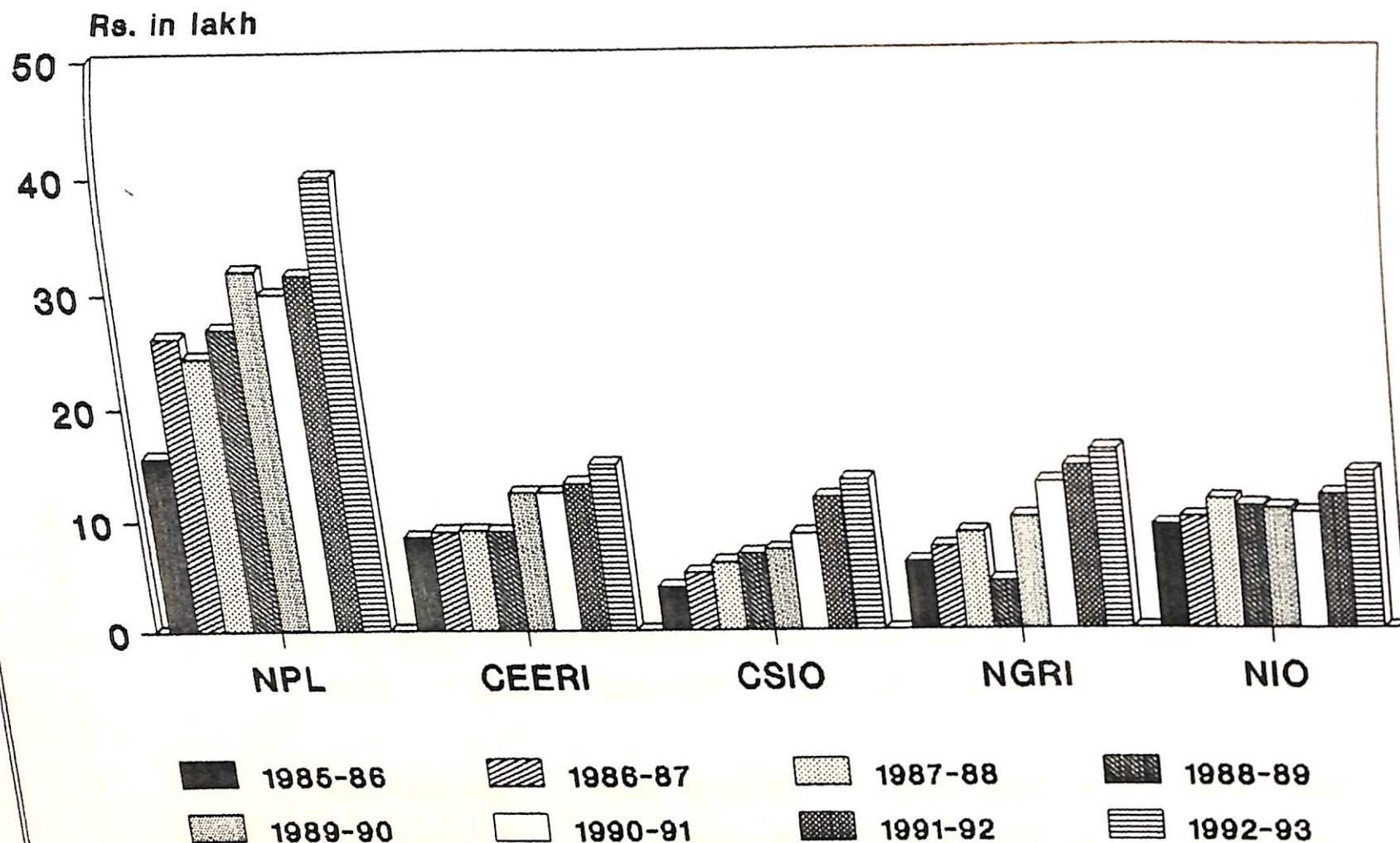
PHYSICAL AND EARTH SCIENCES GROUP WORKS & SERVICES



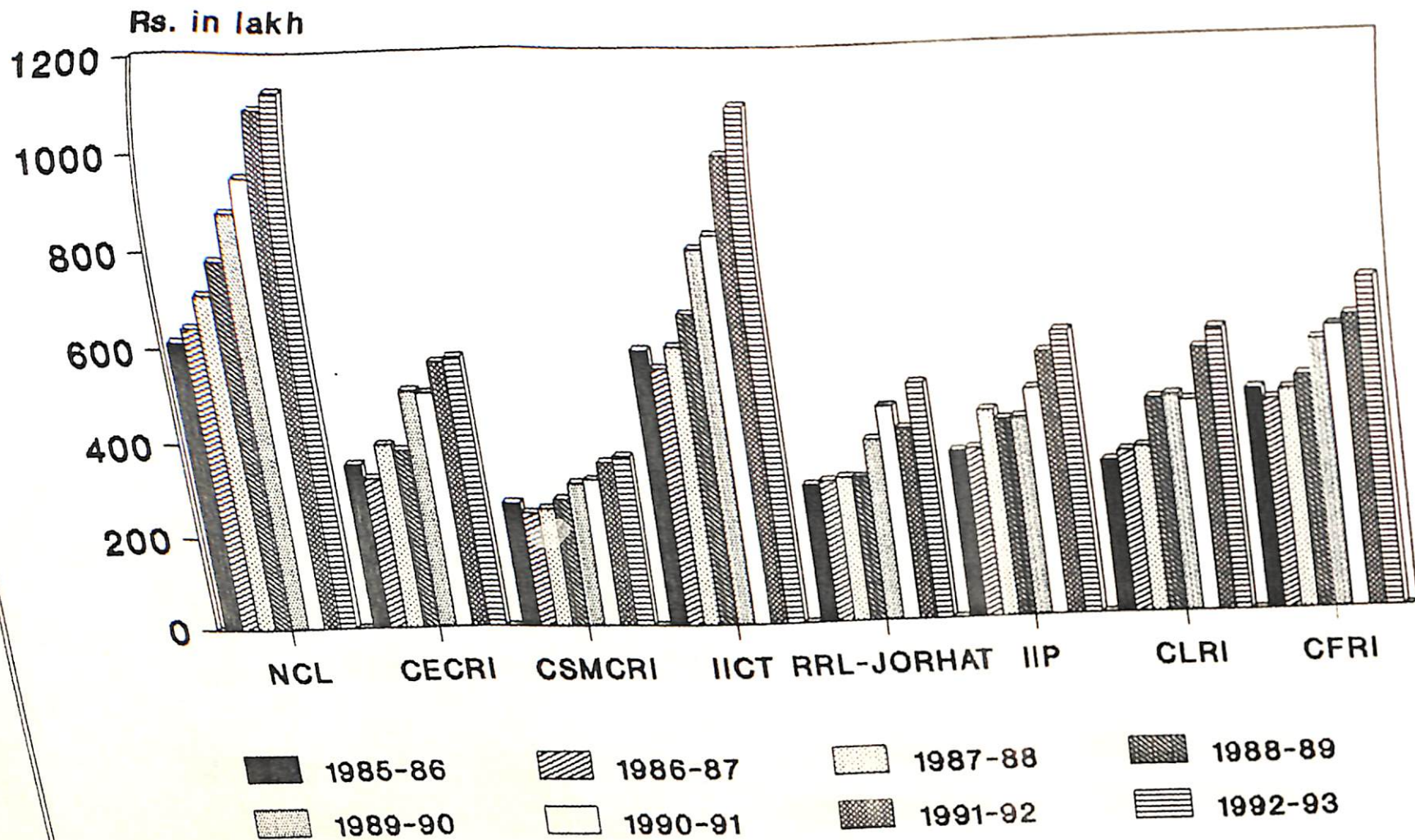
PHYSICAL AND EARTH SCIENCES GROUP EQUIPMENT



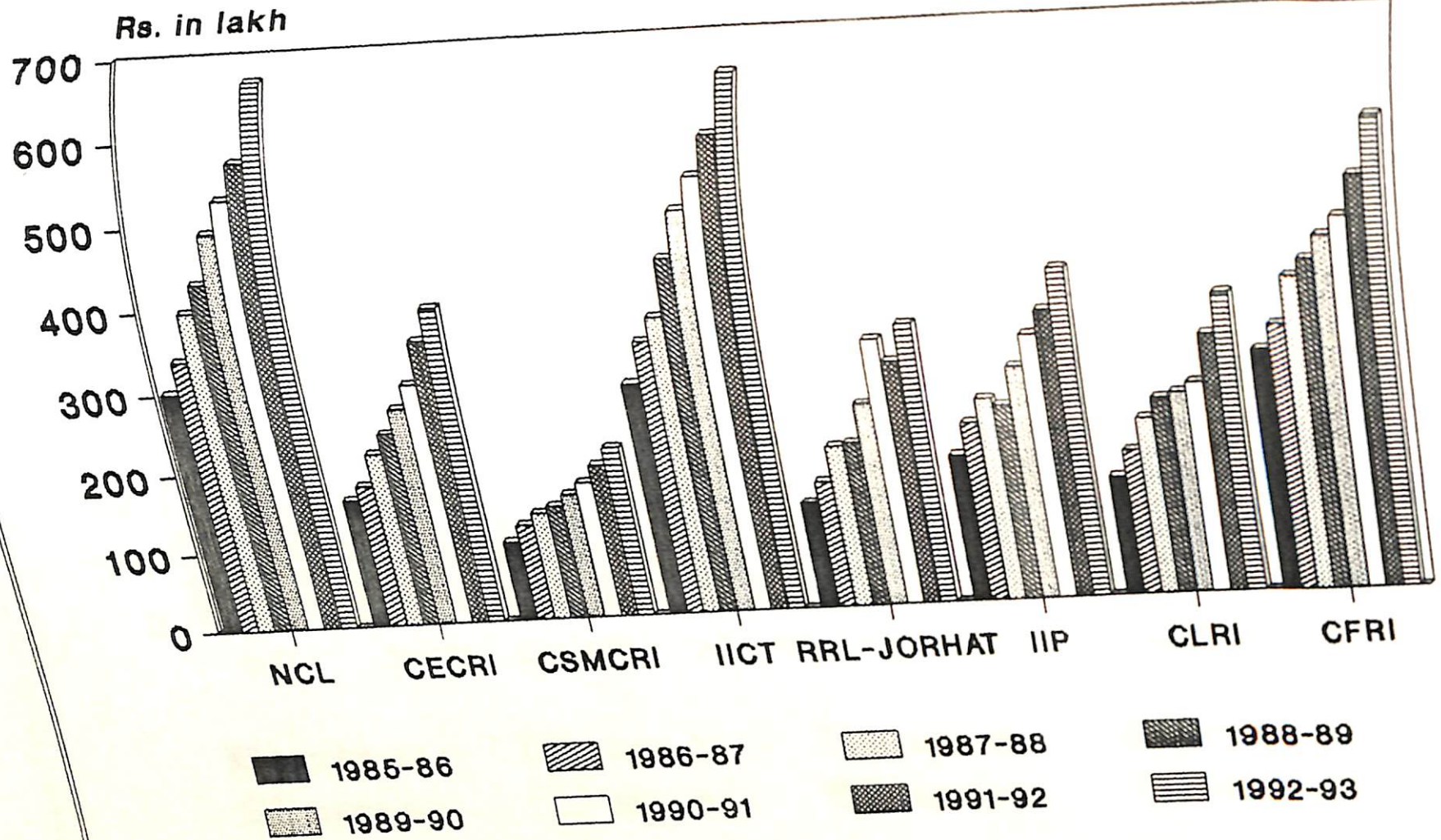
PHYSICAL AND EARTH SCIENCES GROUP LIBRARY BOOKS



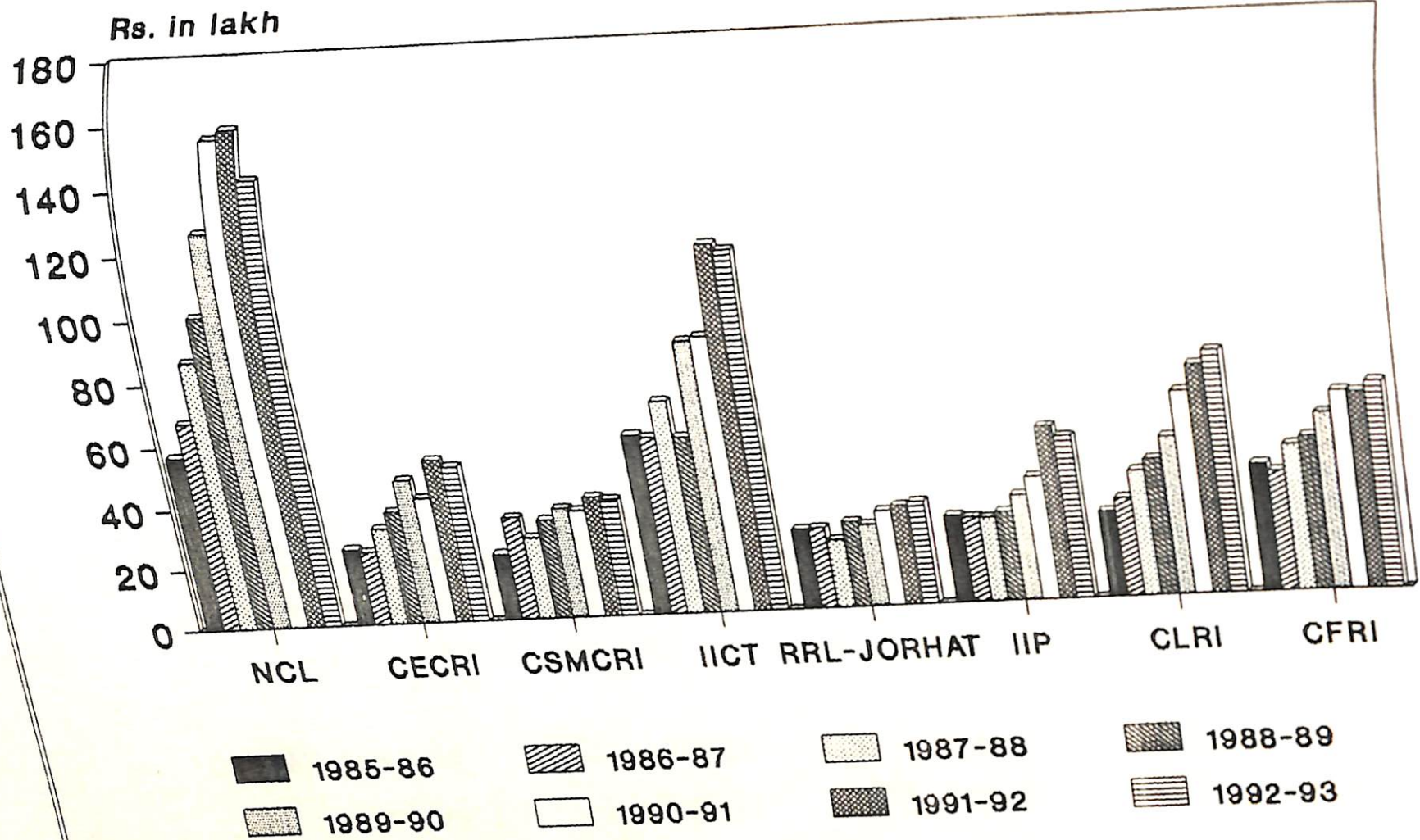
CHEMICAL SCIENCES GROUP TOTAL



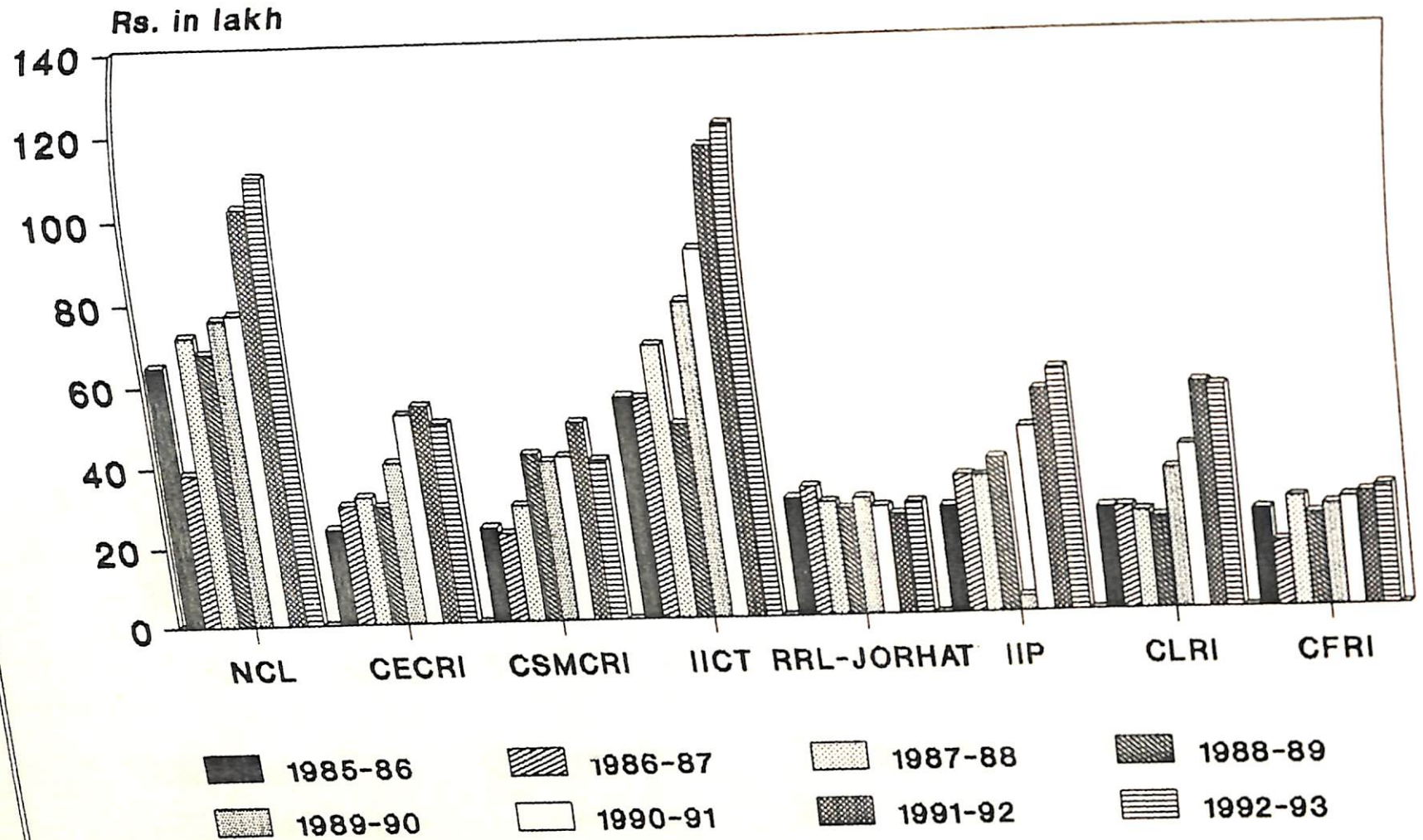
CHEMICAL SCIENCES GROUP SALARIES



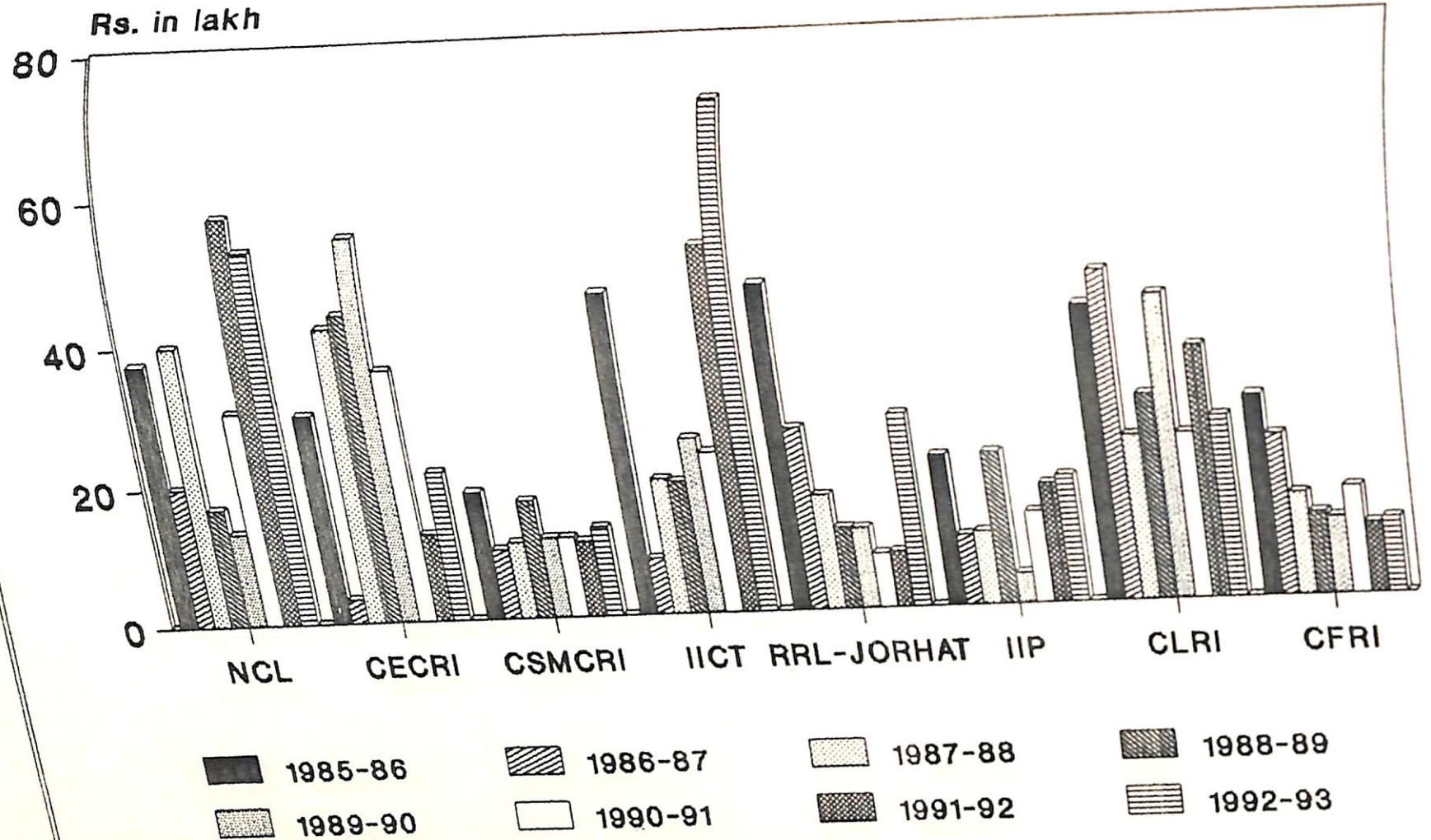
CHEMICAL SCIENCES GROUP CONT & MAINTENANCE



CHEMICAL SCIENCES GROUP CHEMICALS

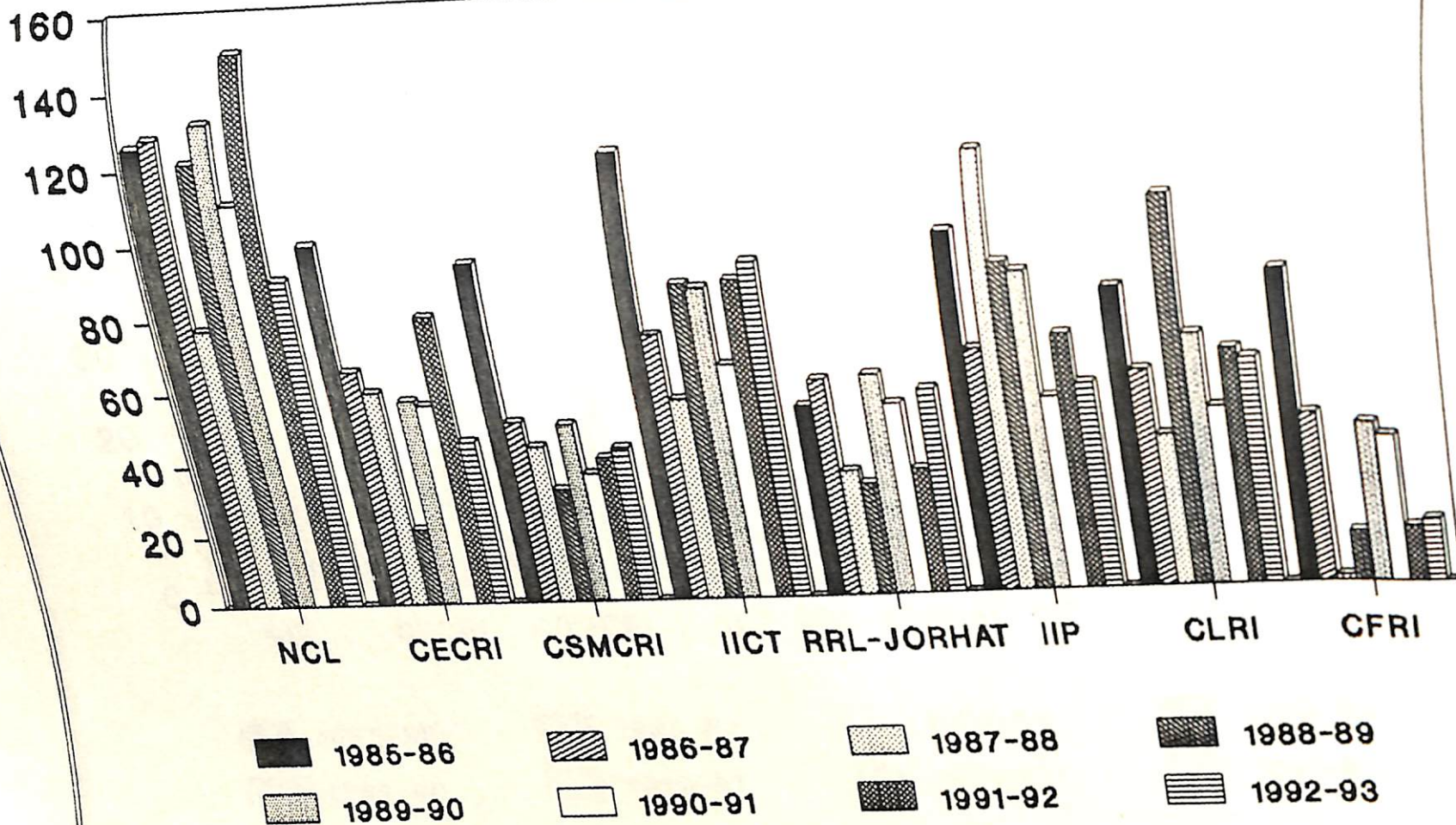


CHEMICAL SCIENCES GROUP WORKS & SERVICES



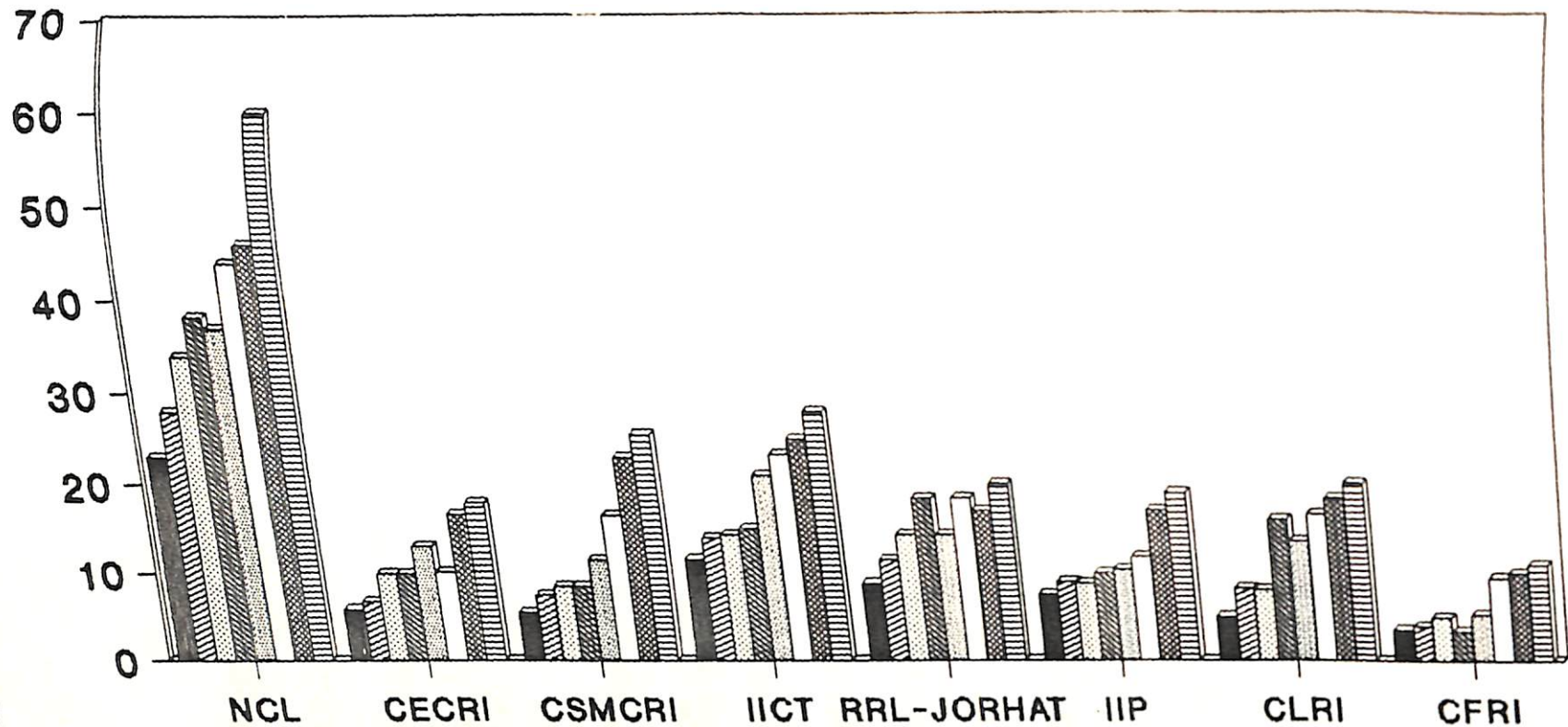
CHEMICAL SCIENCES GROUP EQUIPMENT

Rs. in lakh



CHEMICAL SCIENCES GROUP LIBRARY BOOKS

Rs. in lakh



1985-86

1986-87

1987-88

1988-89

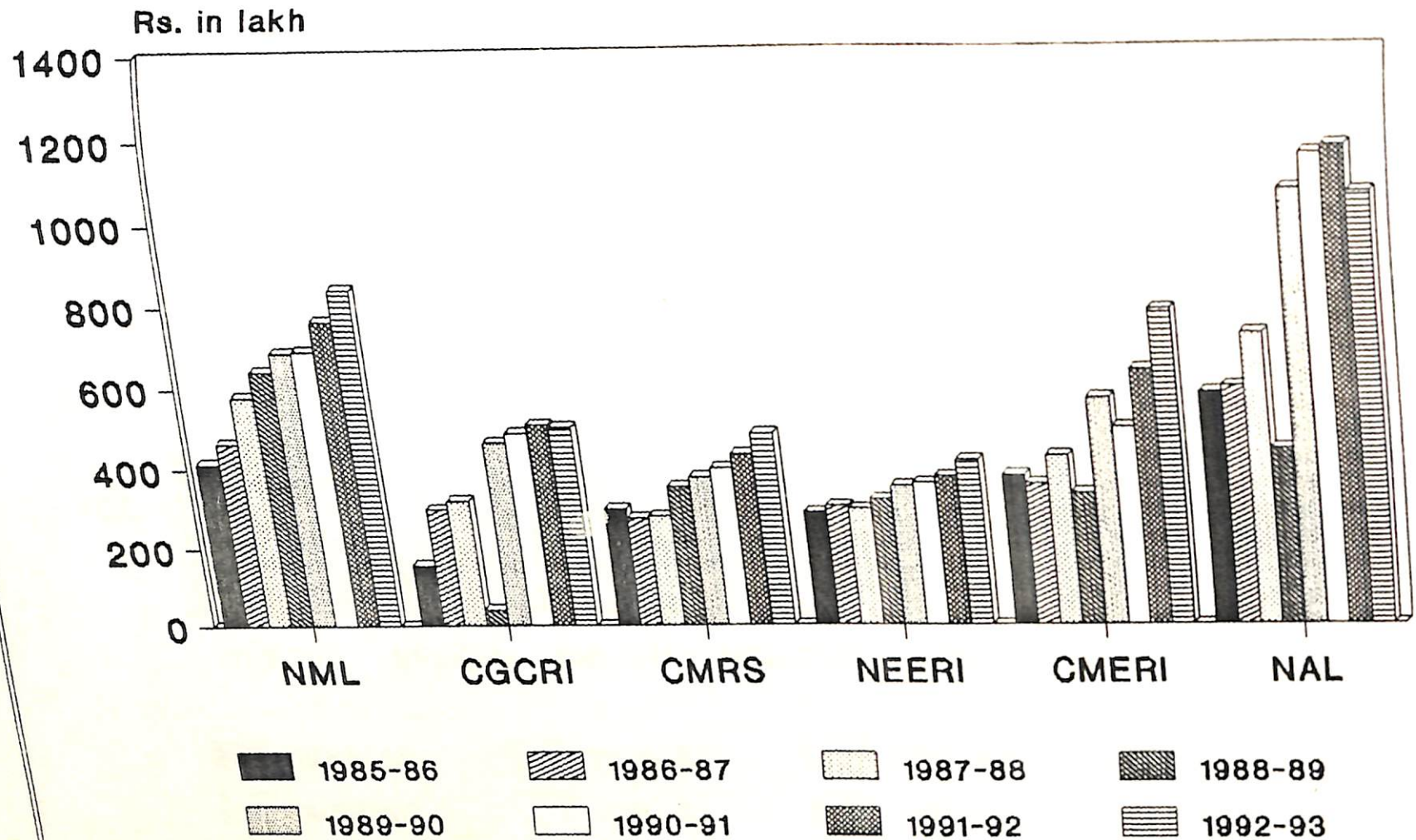
1989-90

1990-91

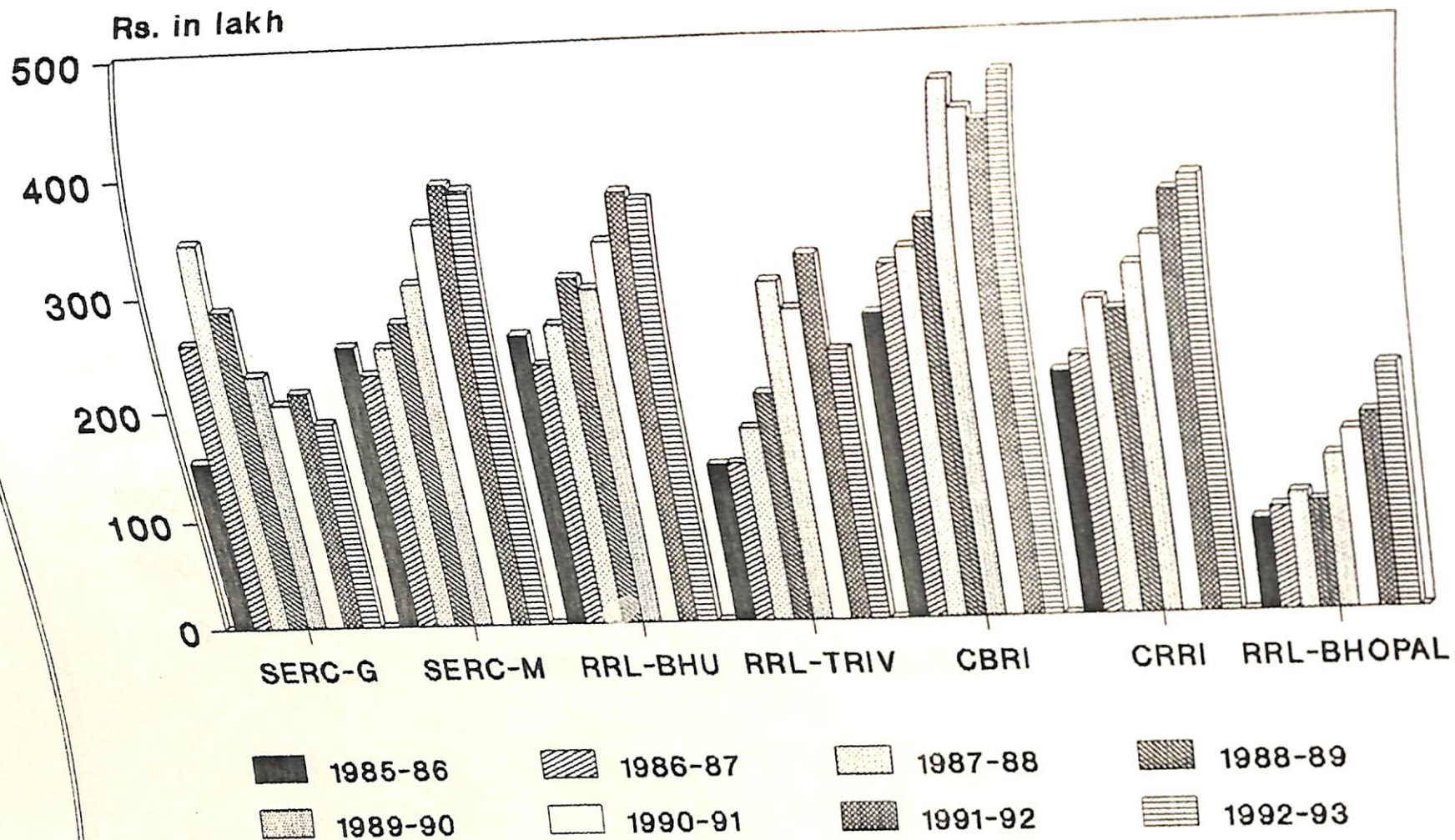
1991-92

1992-93

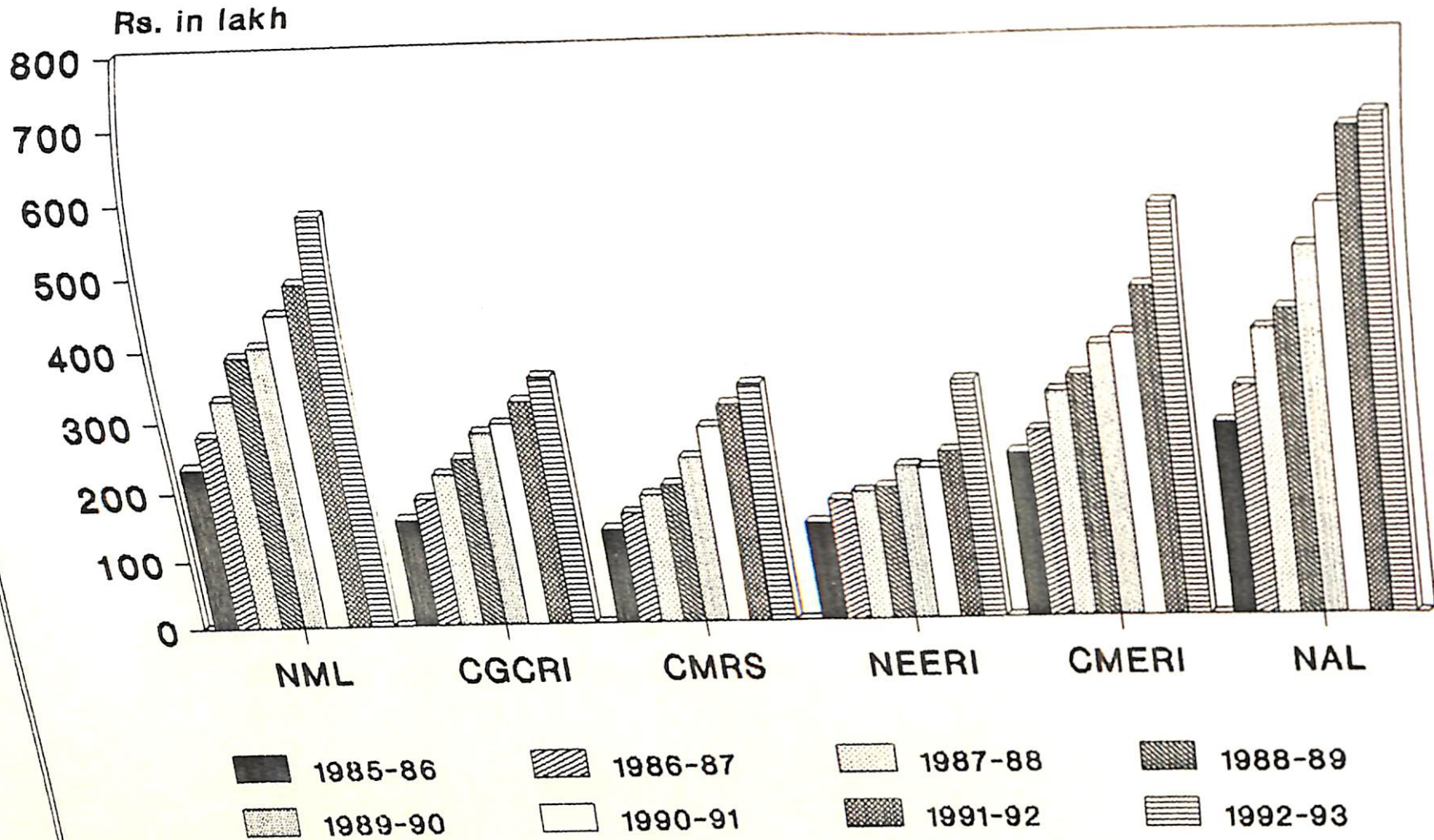
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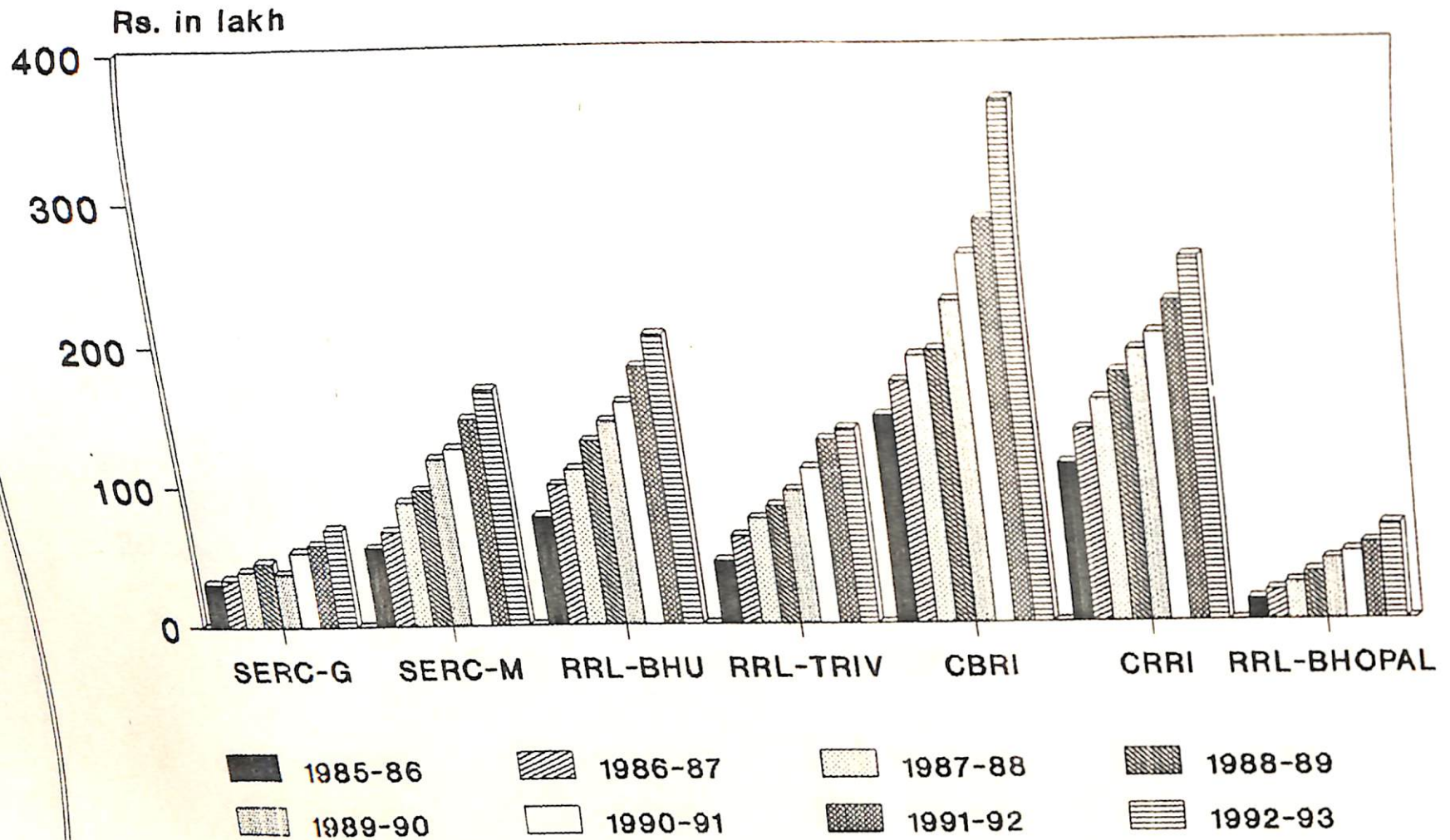
ENGINEERING SCIENCES GROUP TOTAL



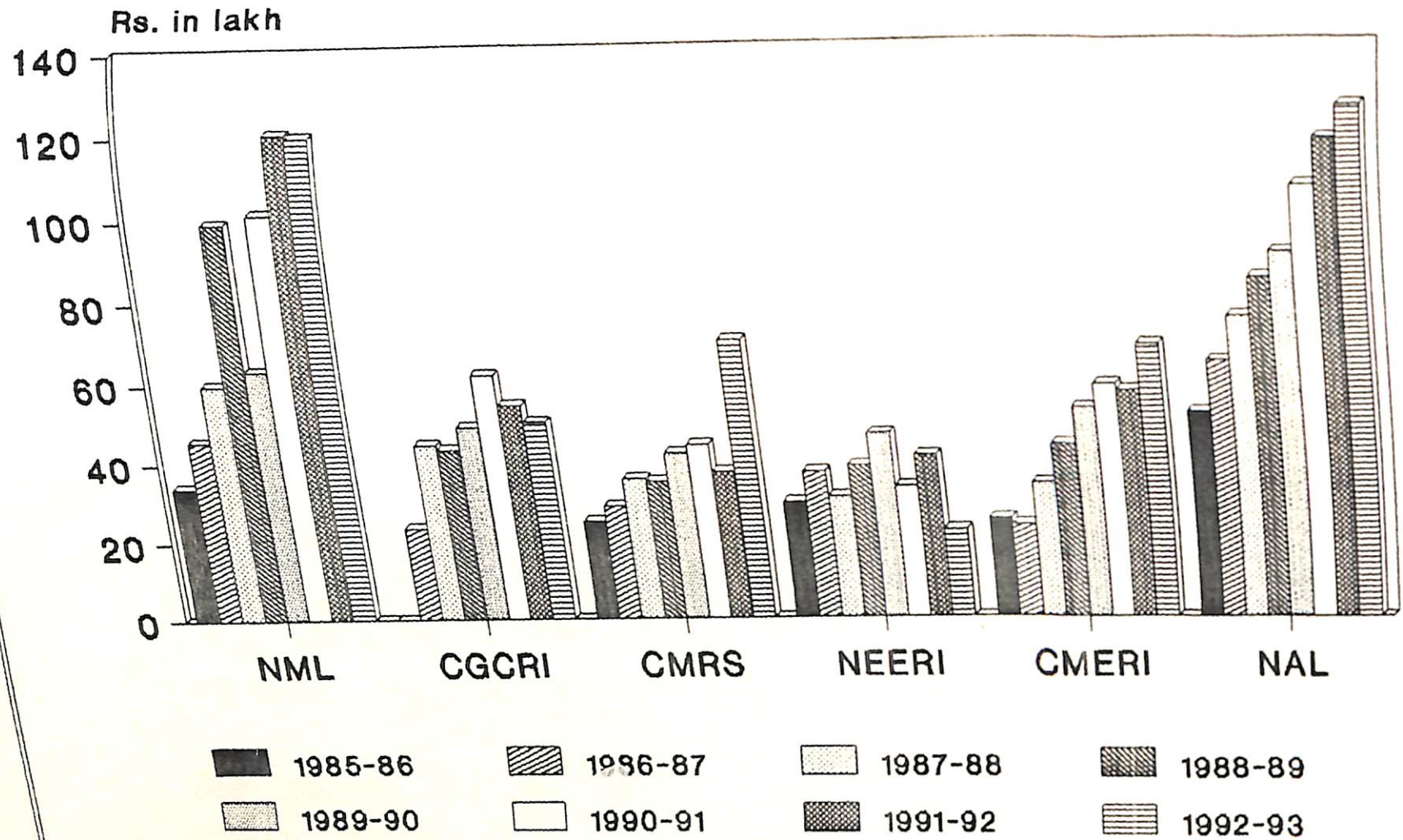
ENGINEERING SCIENCES GROUP SALARIES



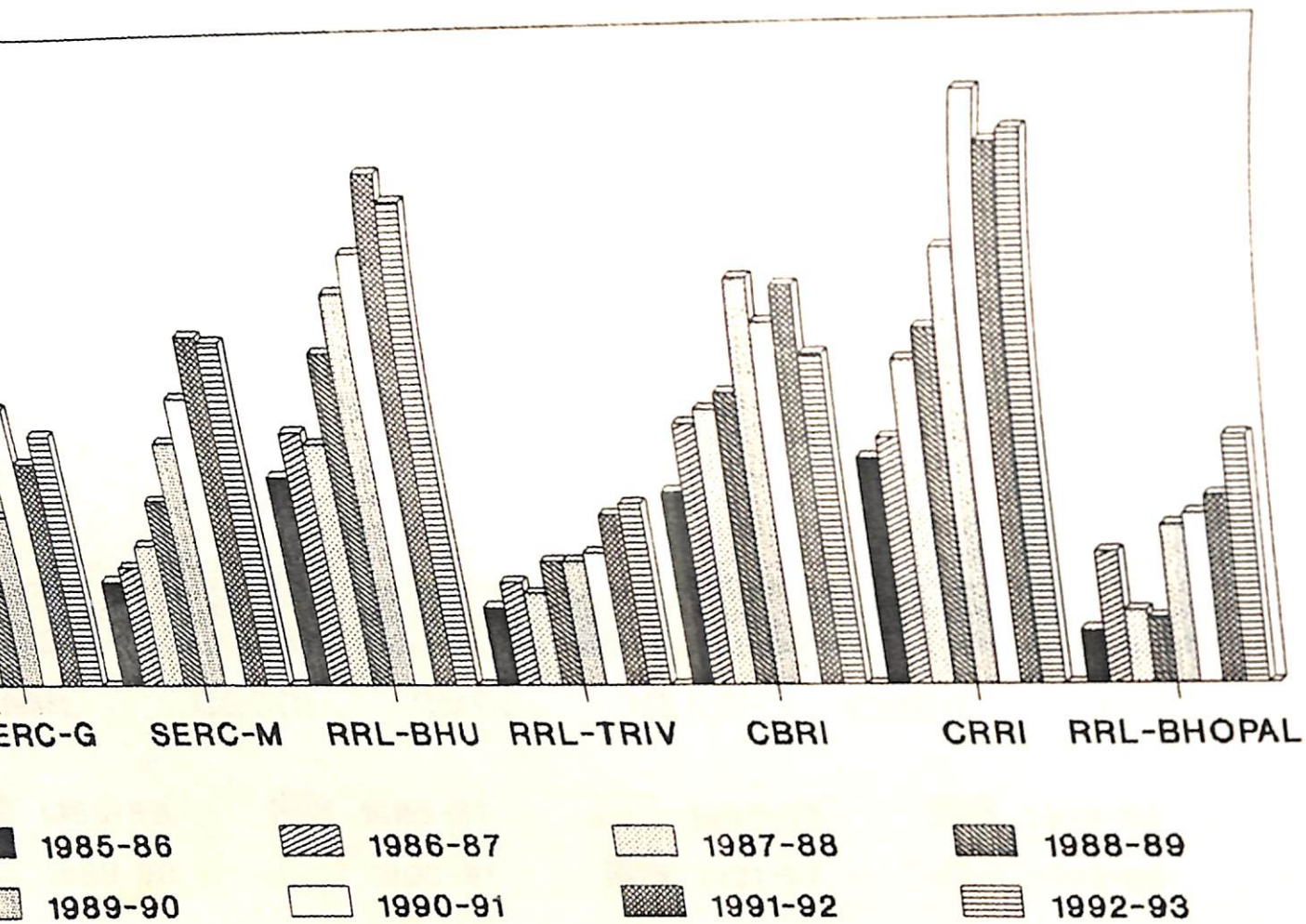
ENGINEERING SCIENCES GROUP SALARIES



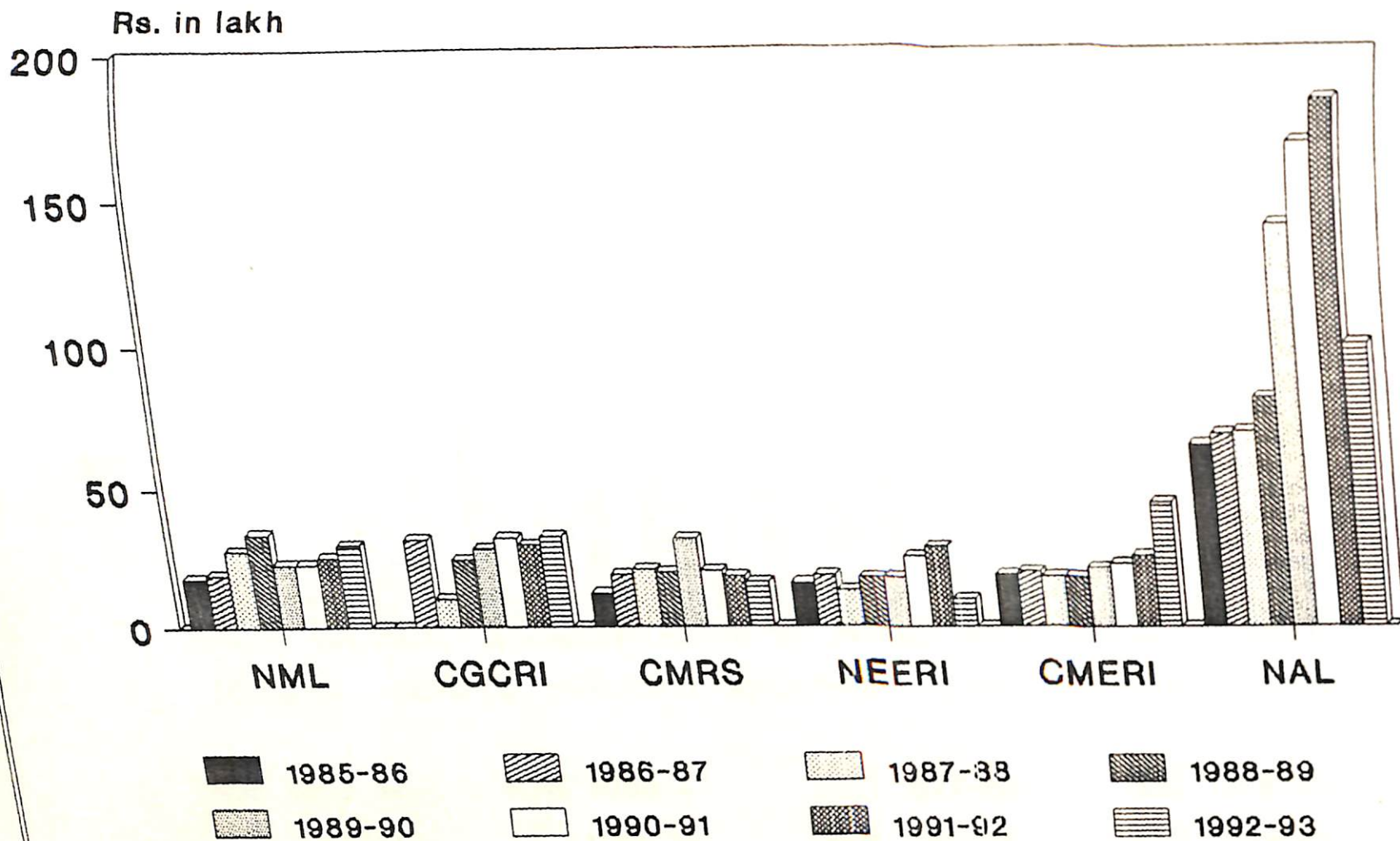
ENGINEERING SCIENCES GROUP CONT & MAINTENANCE



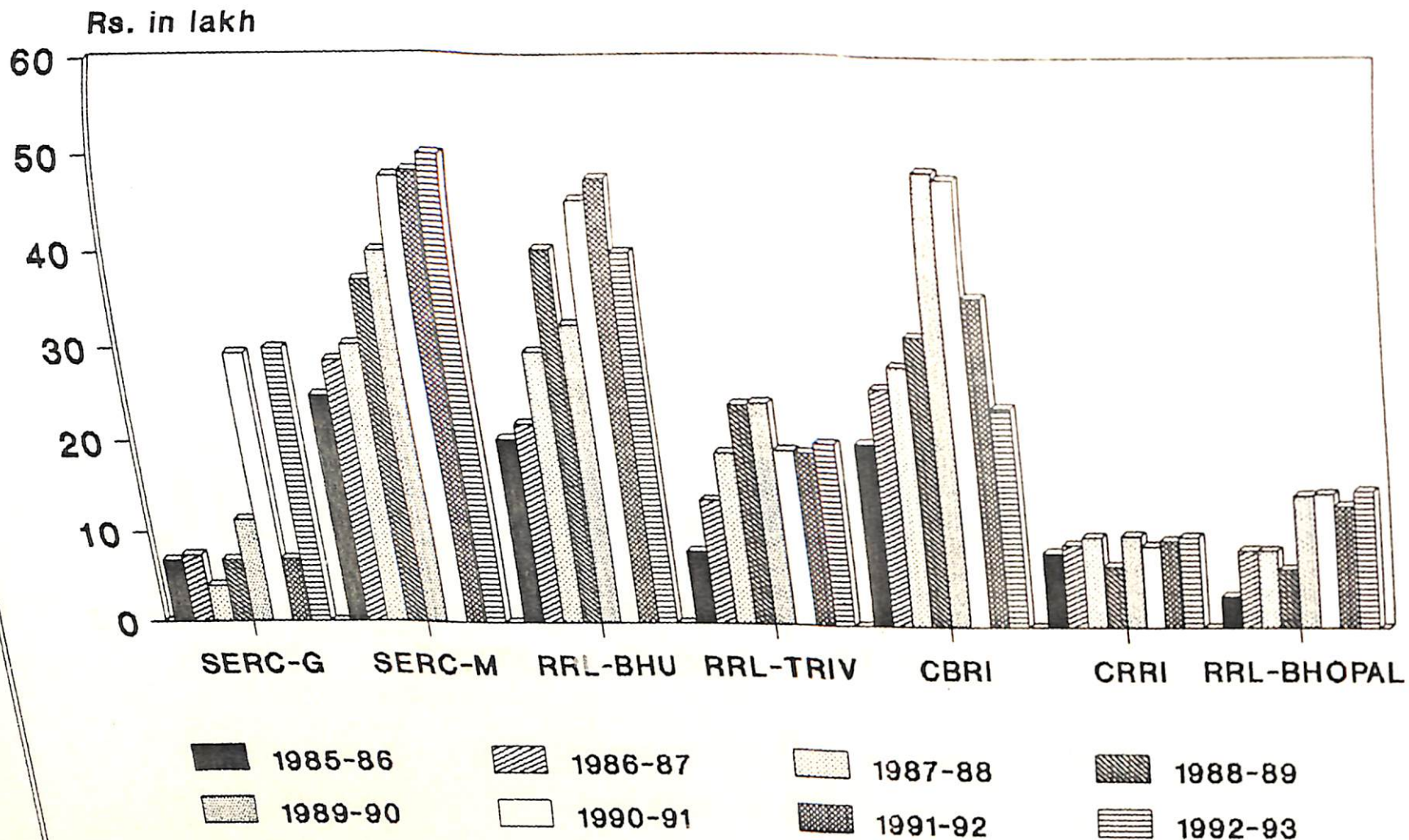
ENGINEERING SCIENCES GROUP CONT. & MAINTENANCE



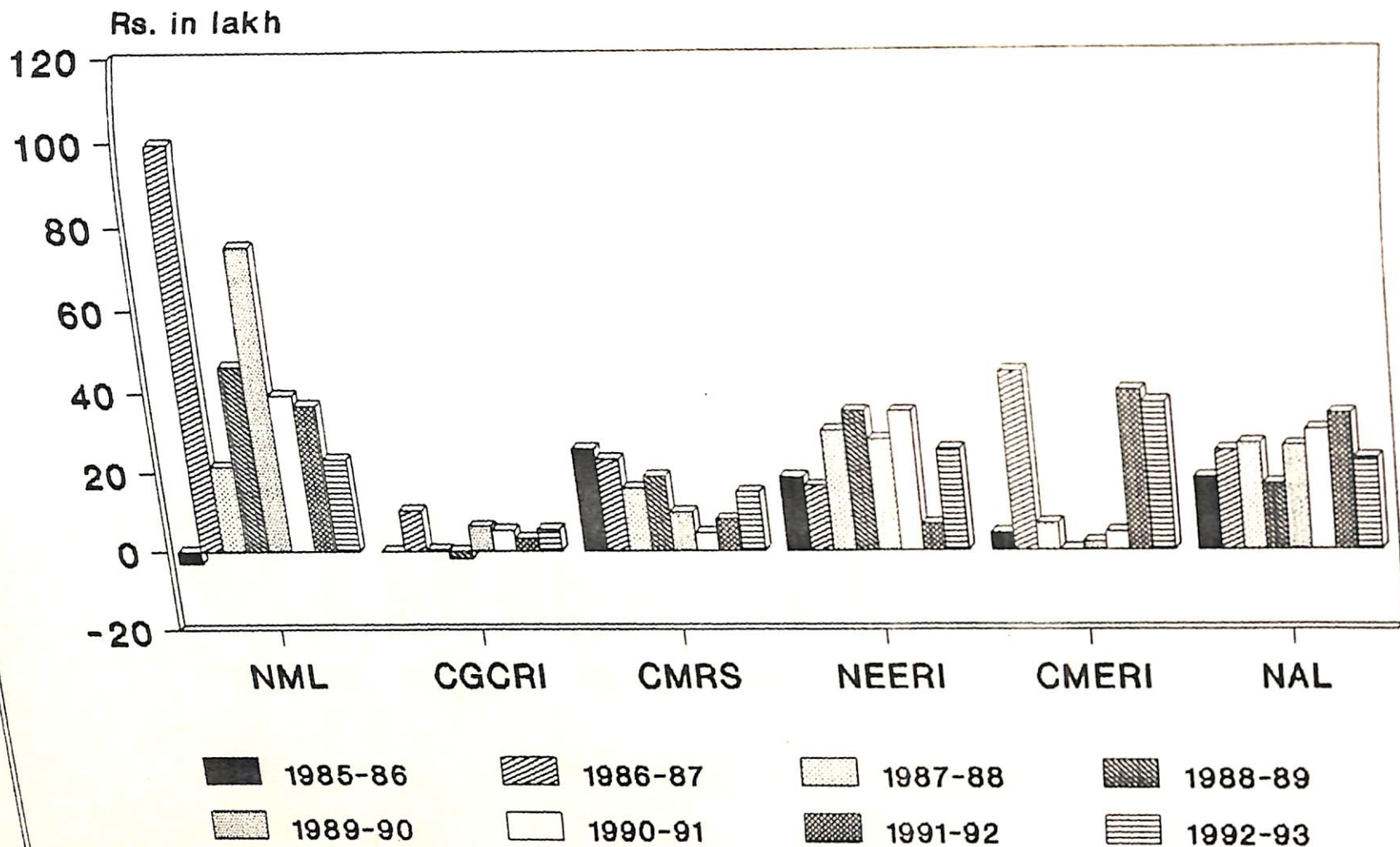
ENGINEERING SCIENCES GROUP CHEMICALS



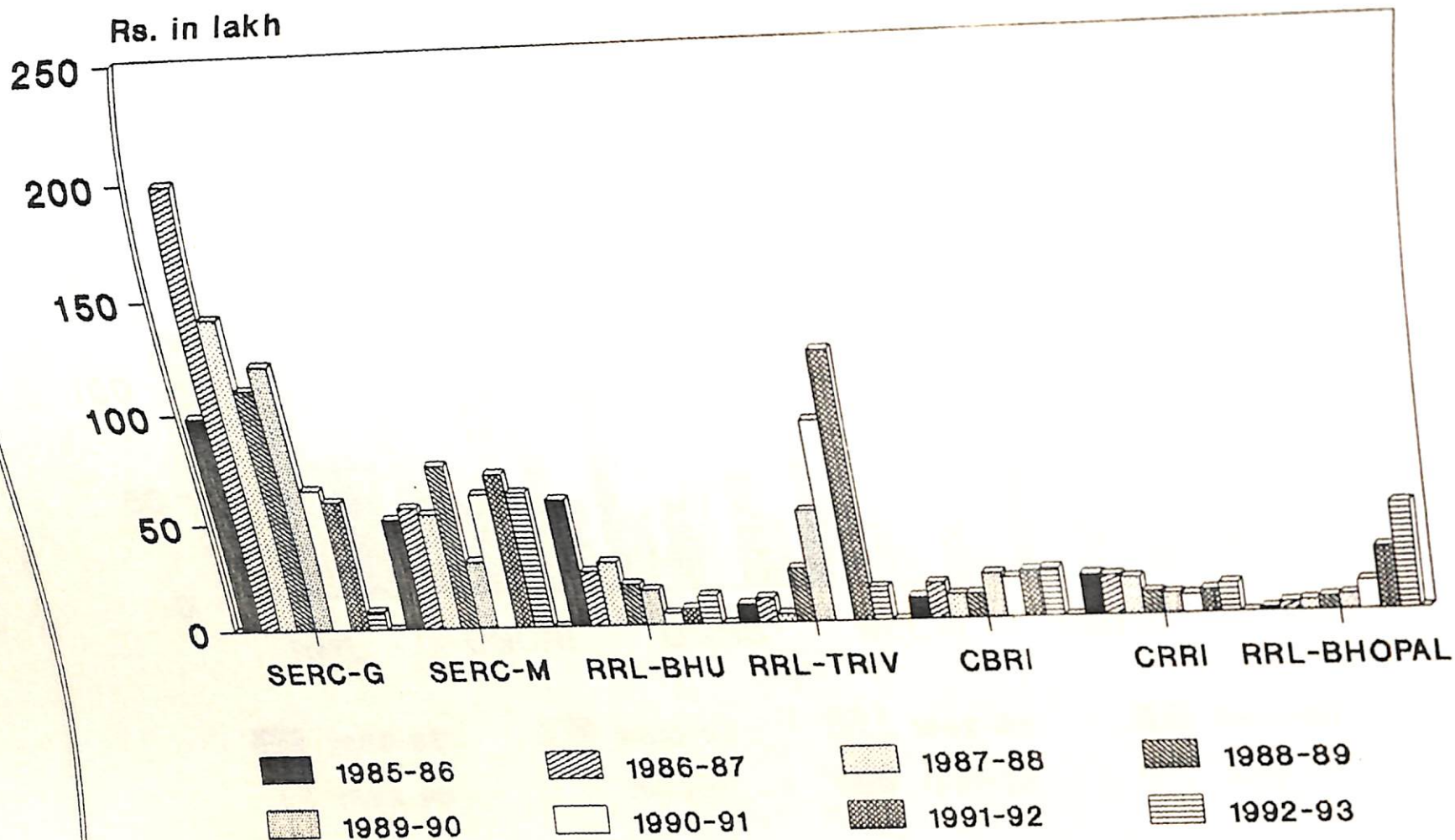
ENGINEERING SCIENCES GROUP CHEMICALS



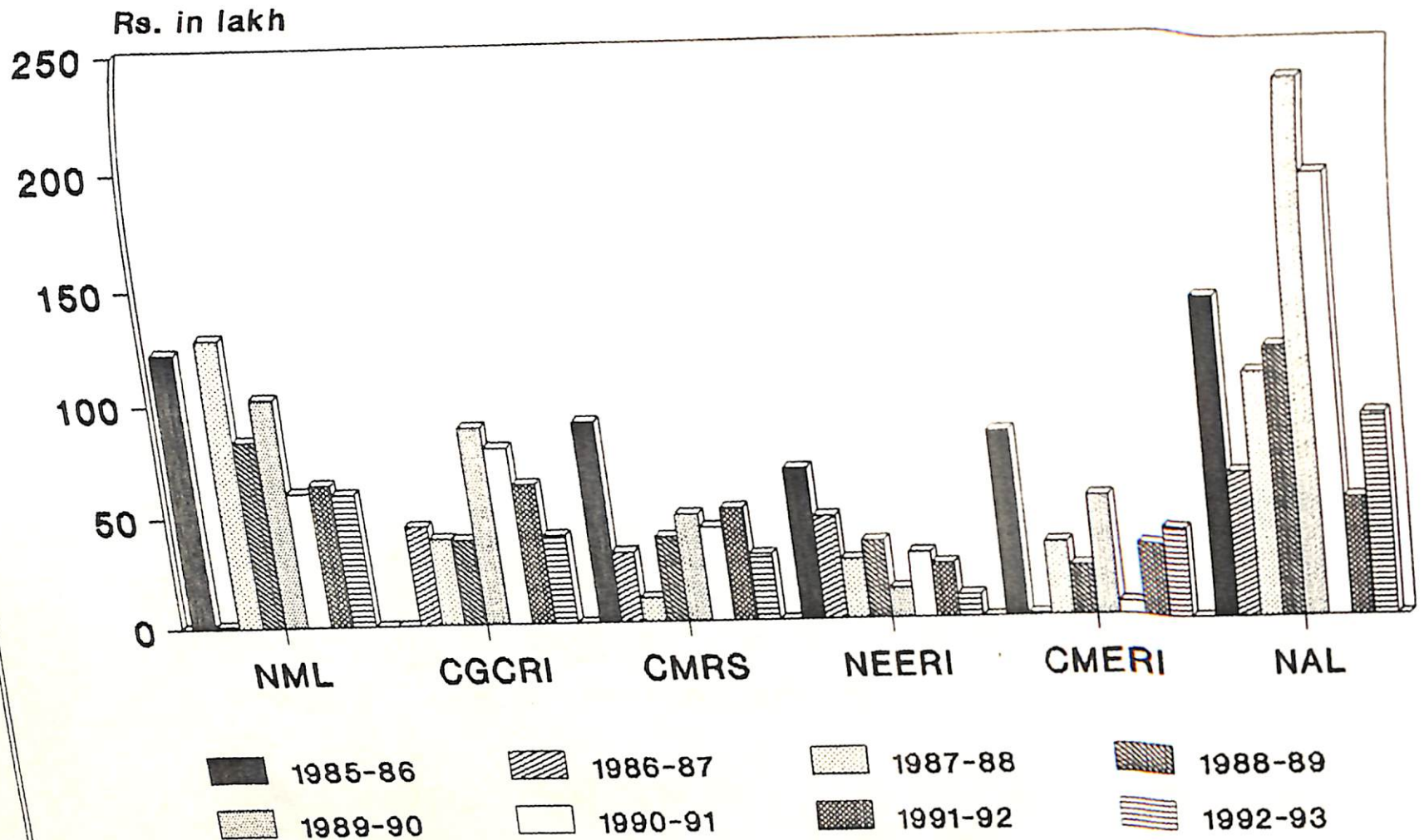
ENGINEERING SCIENCES GROUP WORKS & SERVICES



ENGINEERING SCIENCES GROUP WORKS & SERVICES

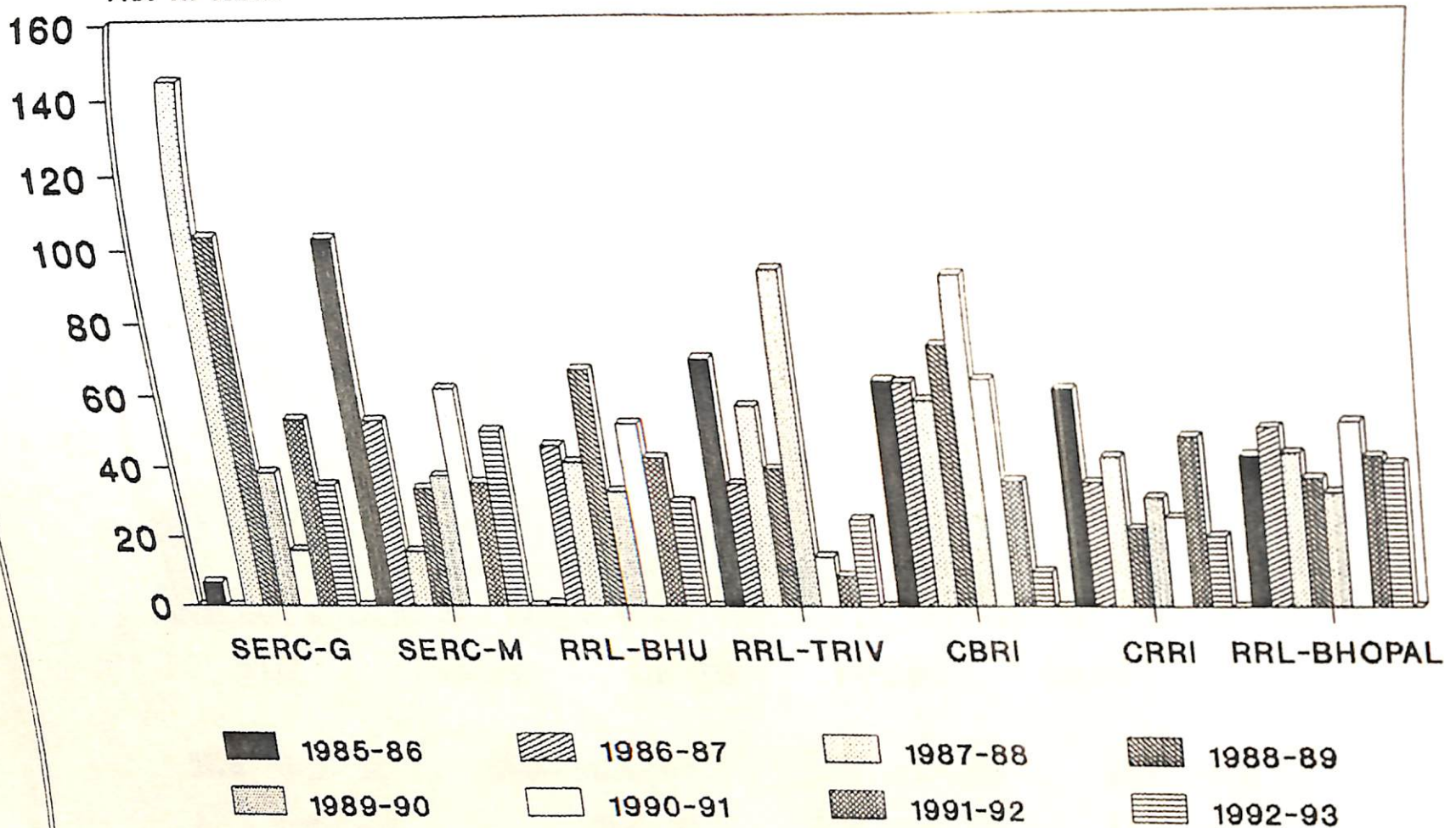


ENGINEERING SCIENCES GROUP EQUIPMENT

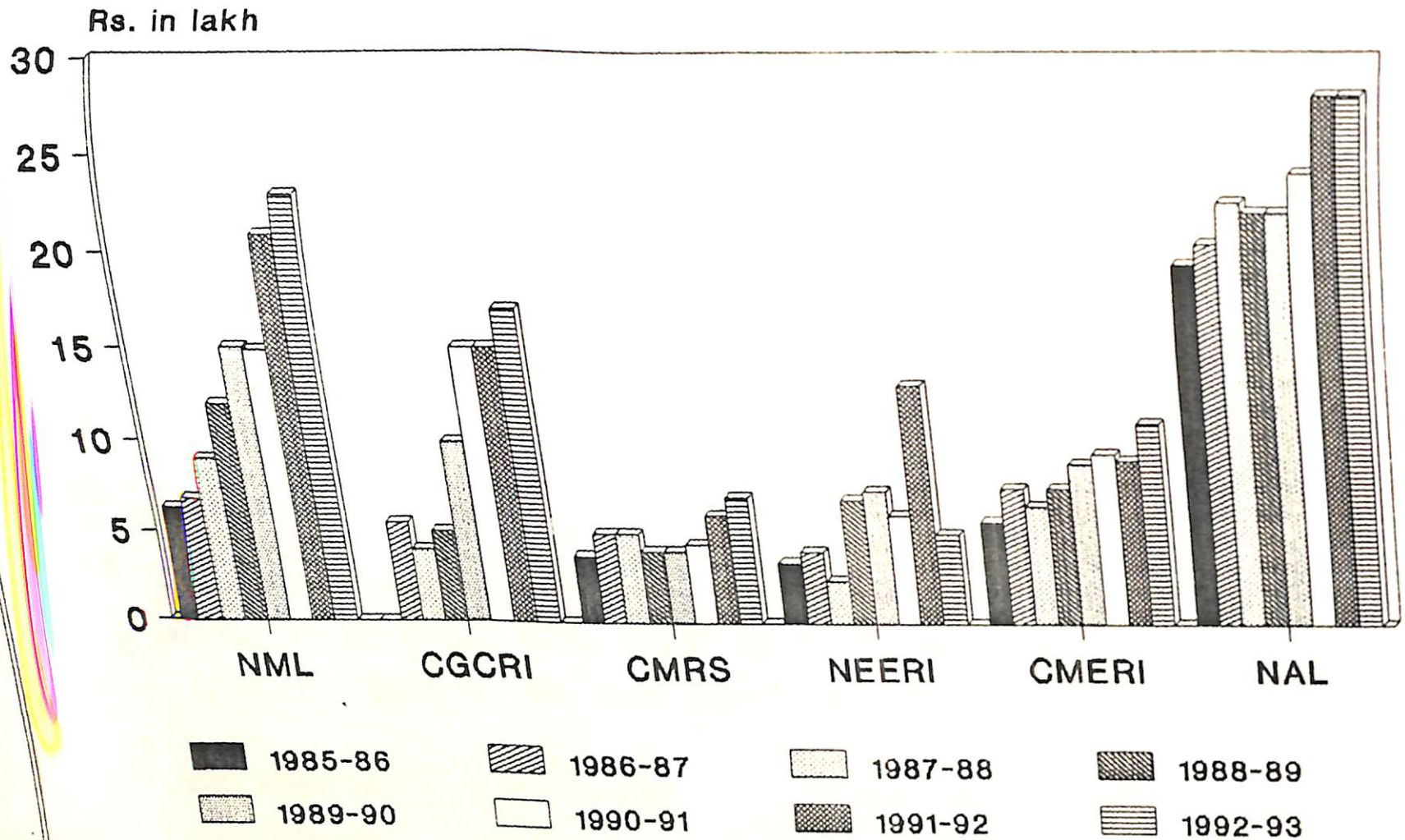


ENGINEERING SCIENCES GROUP EQUIPMENT

Rs. in lakh

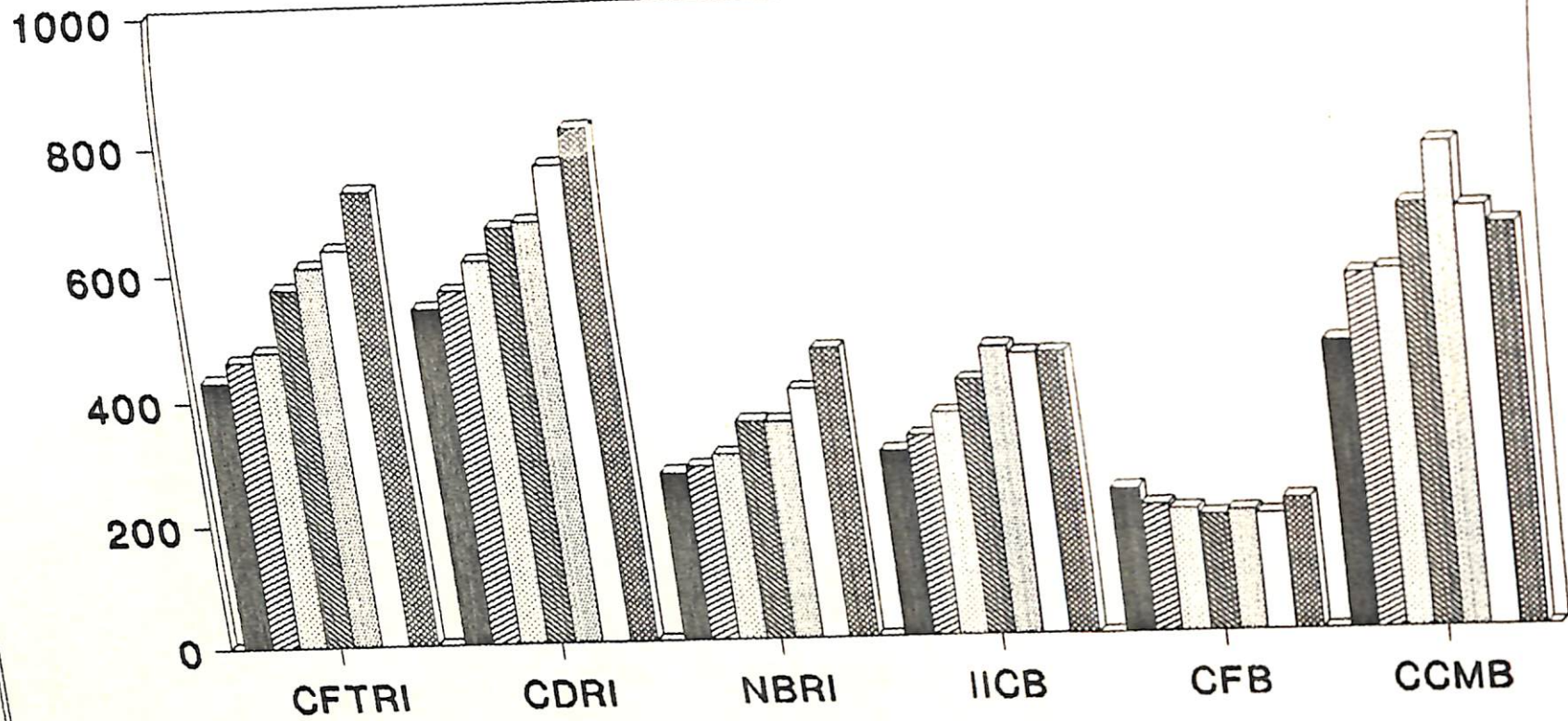


ENGINEERING SCIENCES GROUP LIBRARY BOOKS



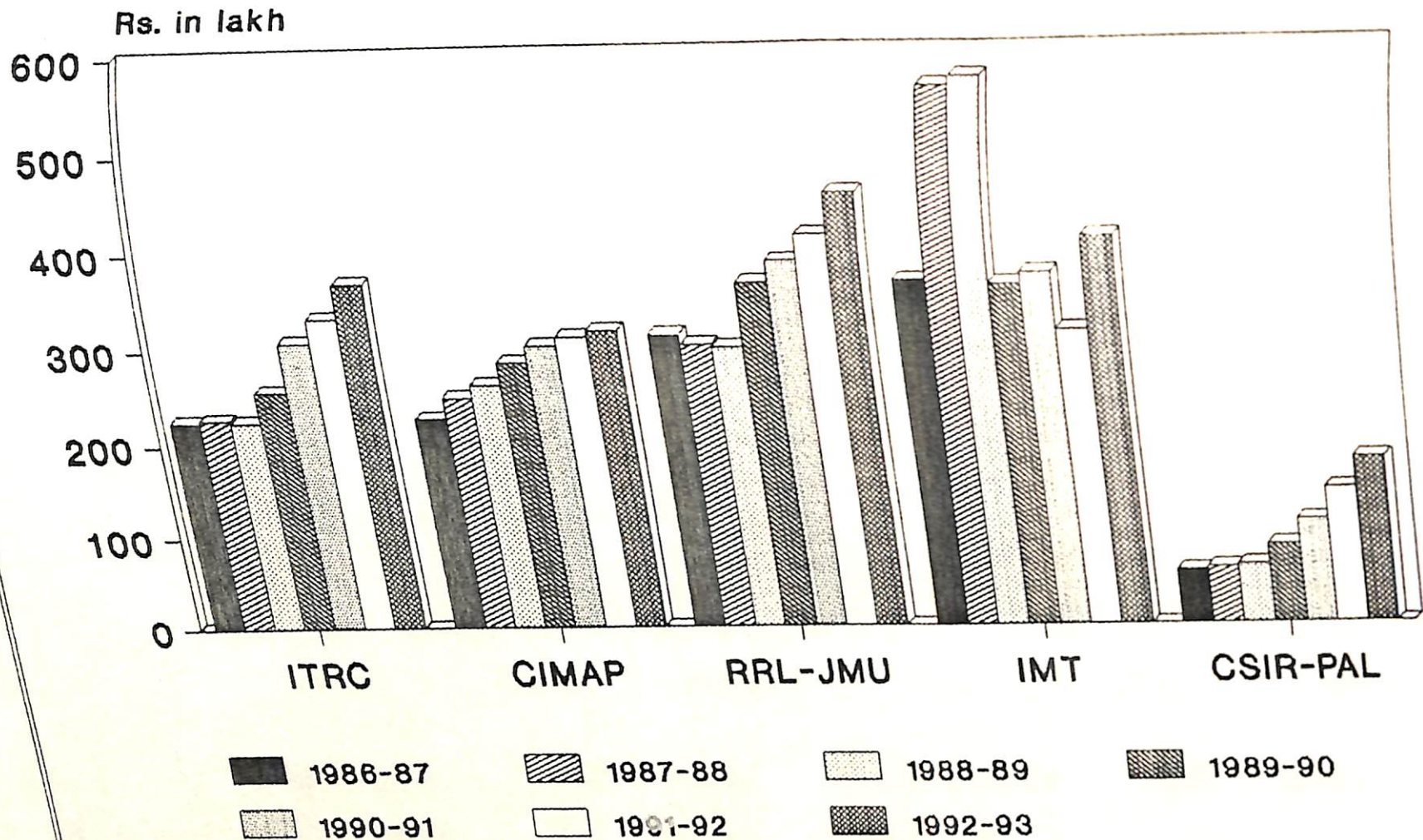
BIOLOGICAL SCIENCES GROUP TOTAL

Rs. in lakh

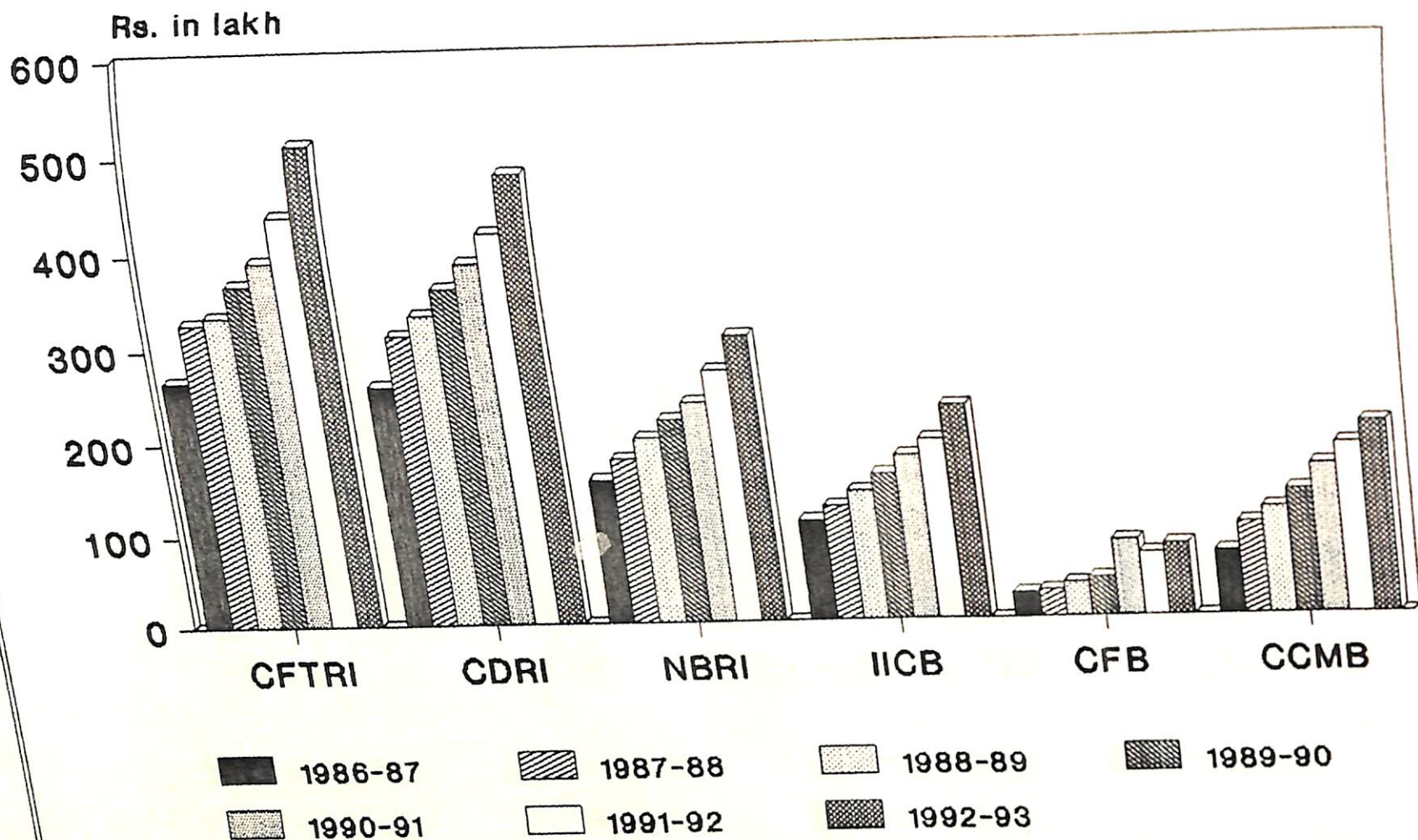


1986-87	1987-88	1988-89	1989-90
1990-91	1991-92	1992-93	

BIOLOGICAL SCIENCES GROUP TOTAL

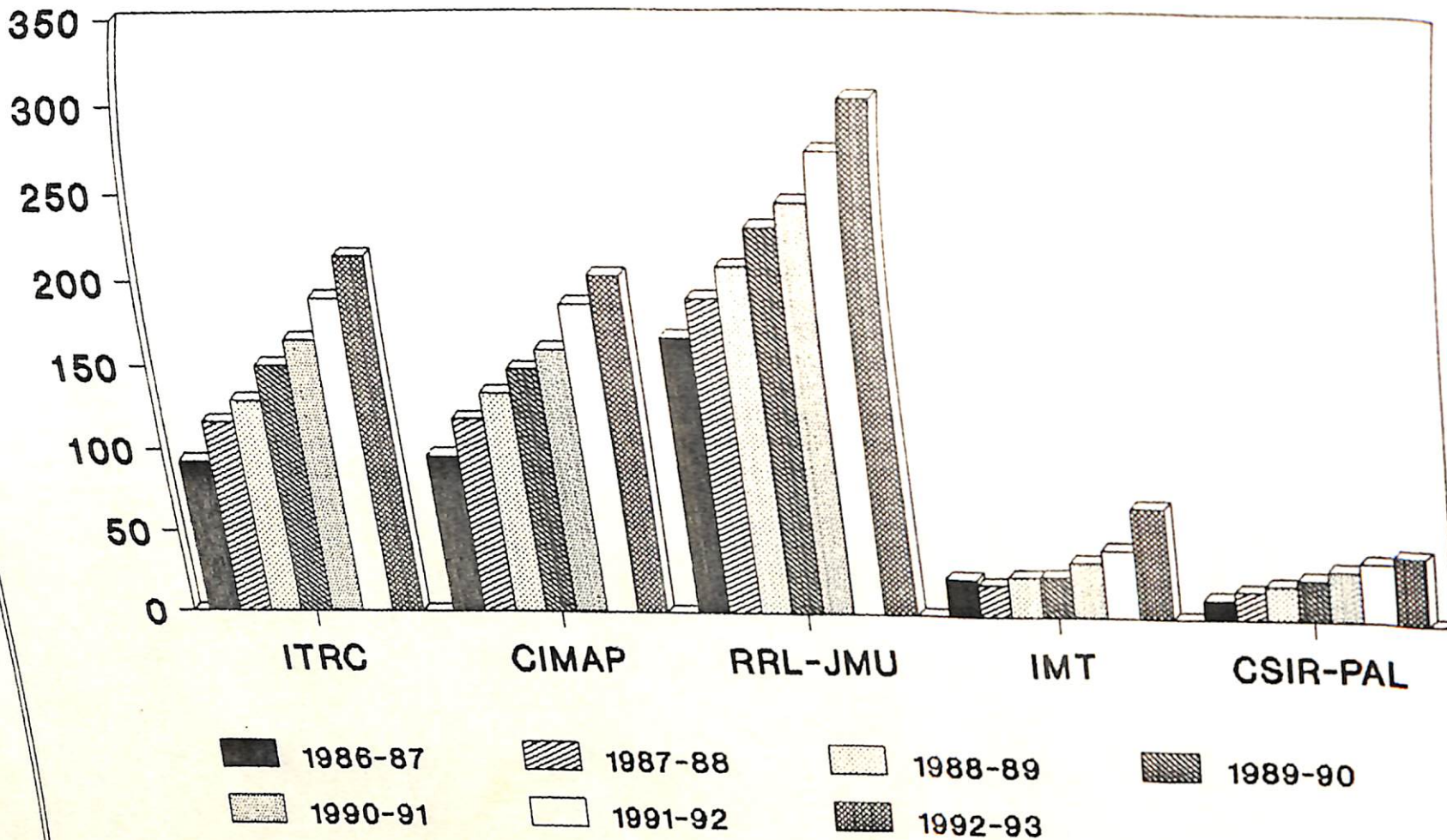


BIOLOGICAL SCIENCES GROUP SALARIES

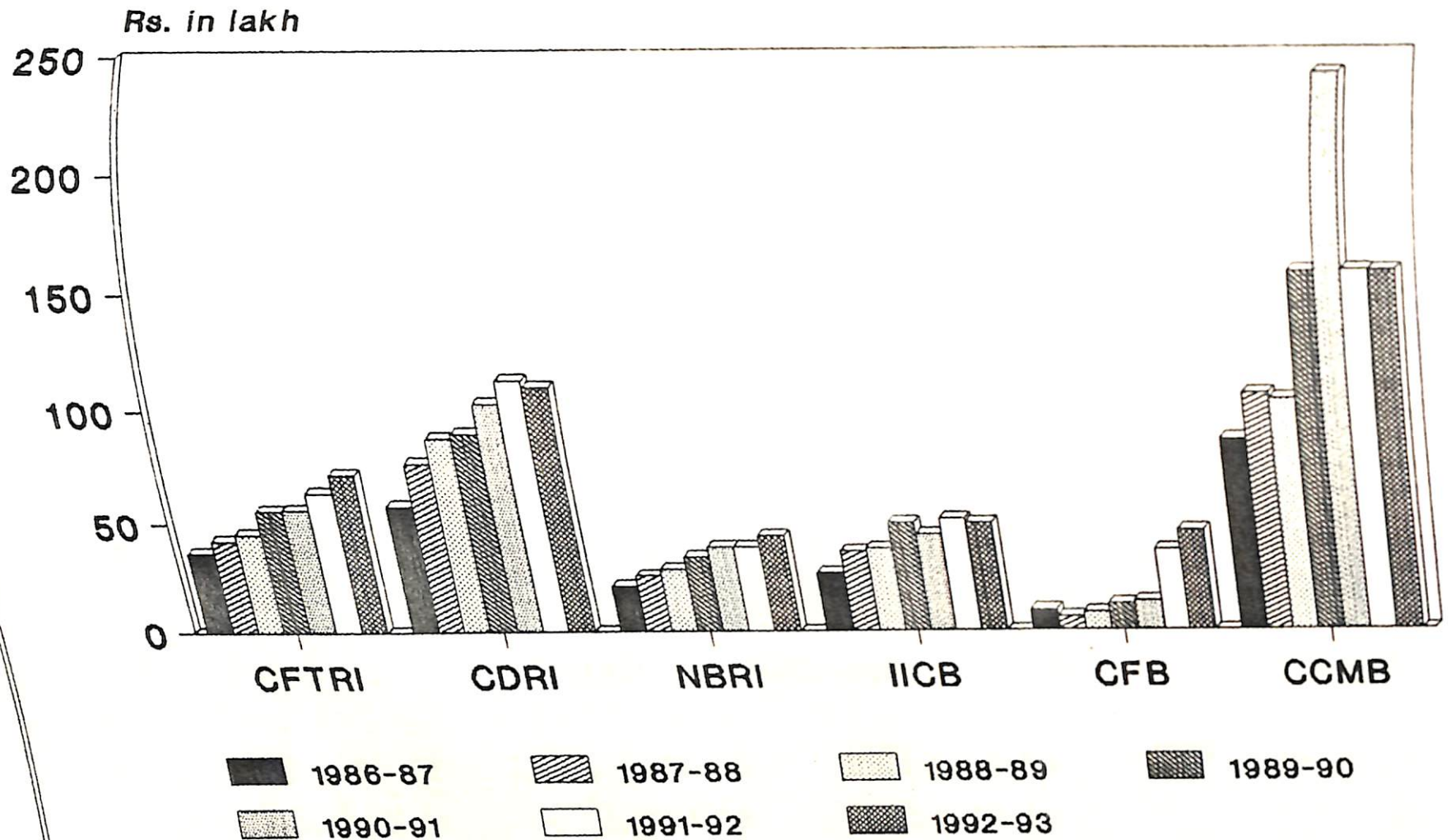


BIOLOGICAL SCIENCES GROUP SALARIES

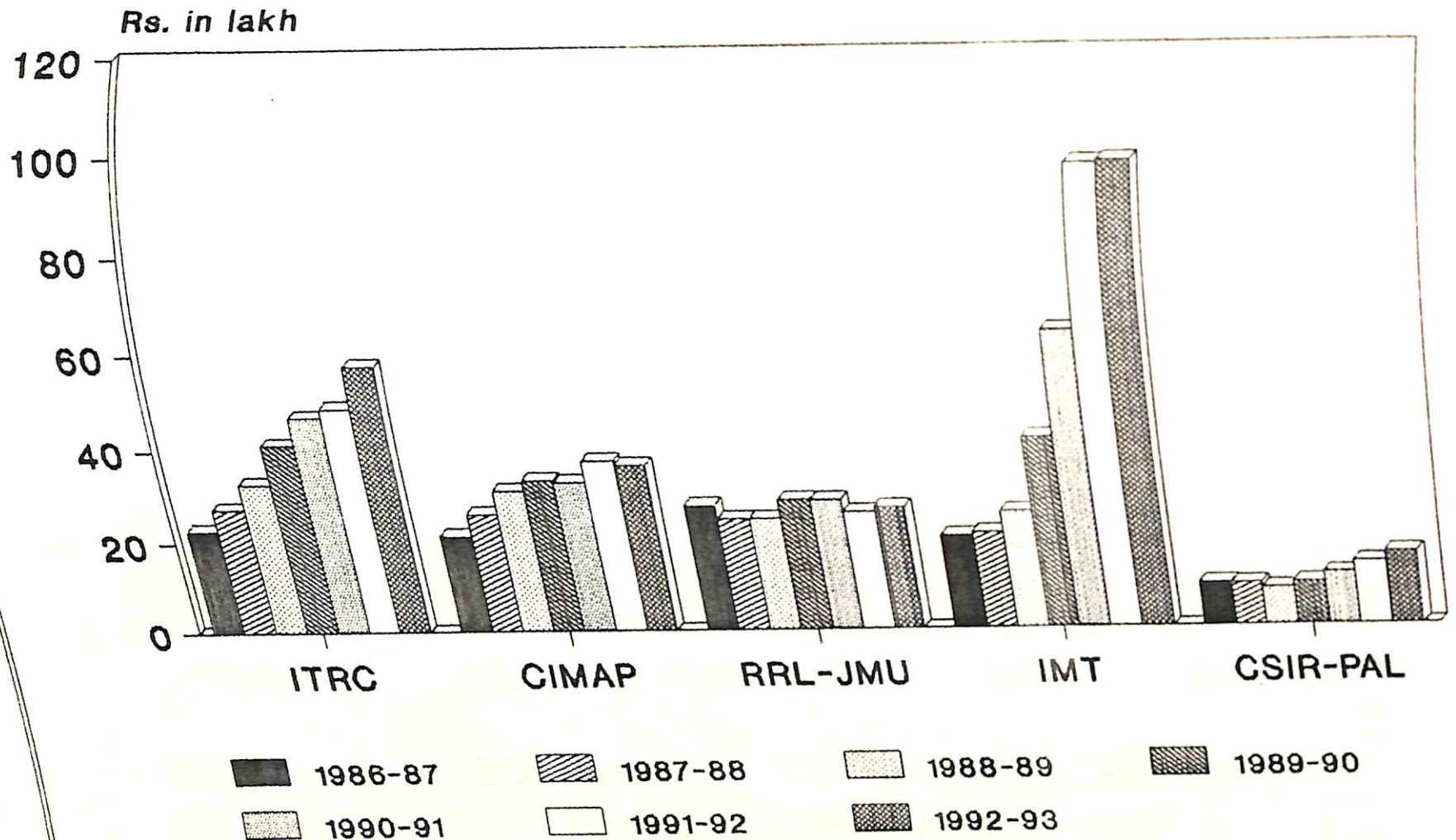
Rs. in lakh



BIOLOGICAL SCIENCES GROUP CONT. & MAINTENANCE

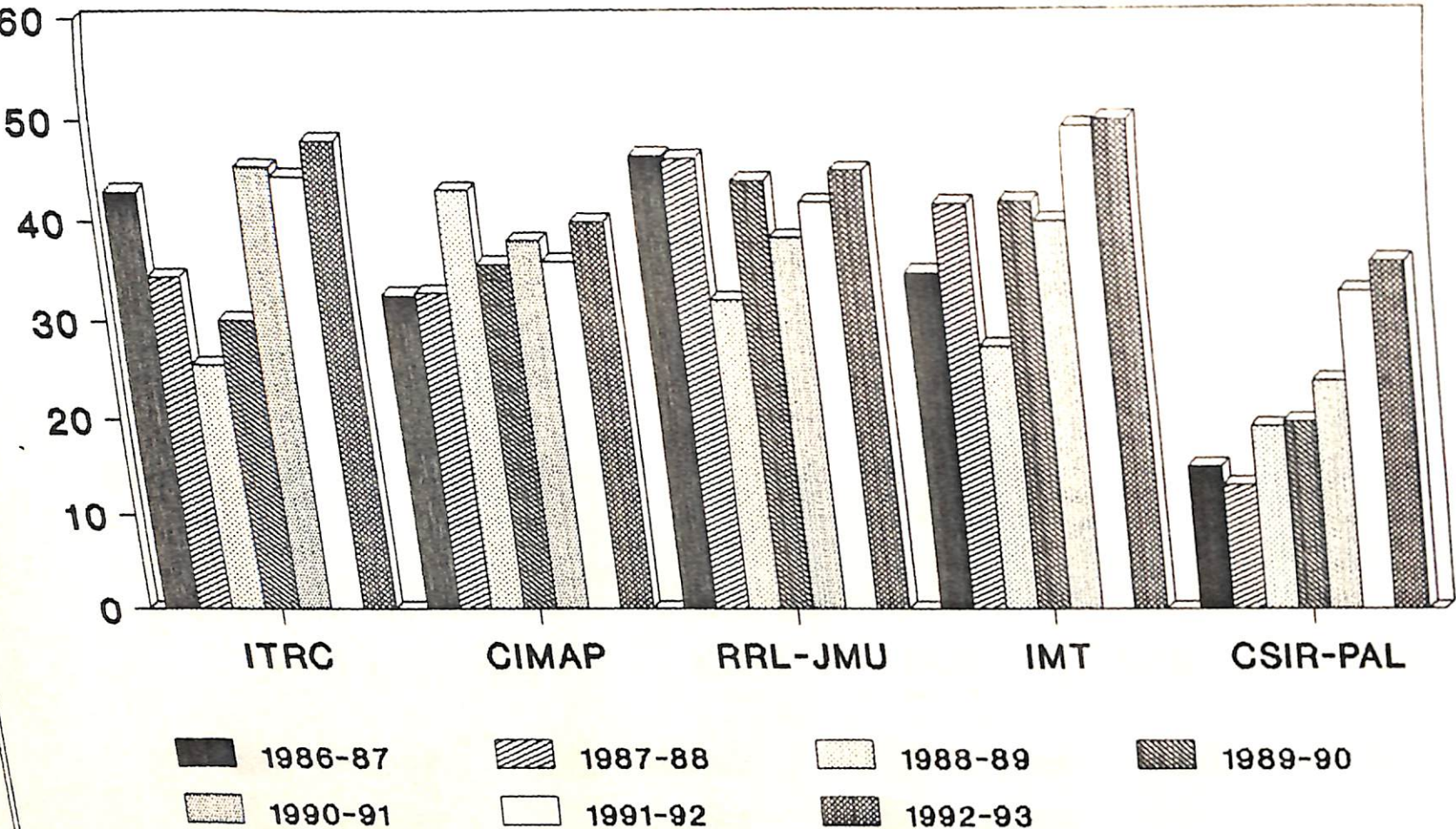


BIOLOGICAL SCIENCES GROUP CONT. & MAINTENANCE

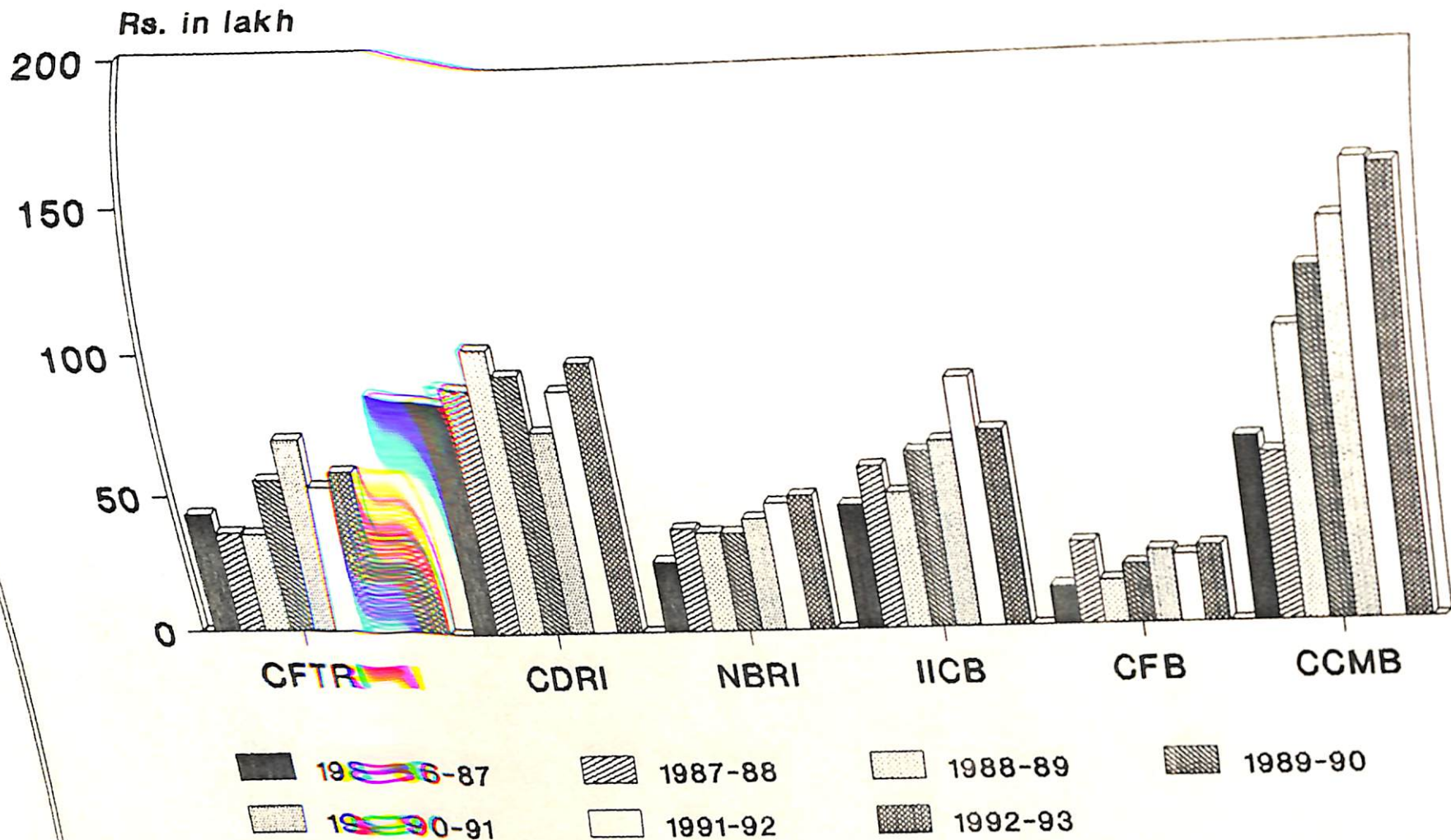


BIOLOGICAL SCIENCES GROUP CHEMICALS

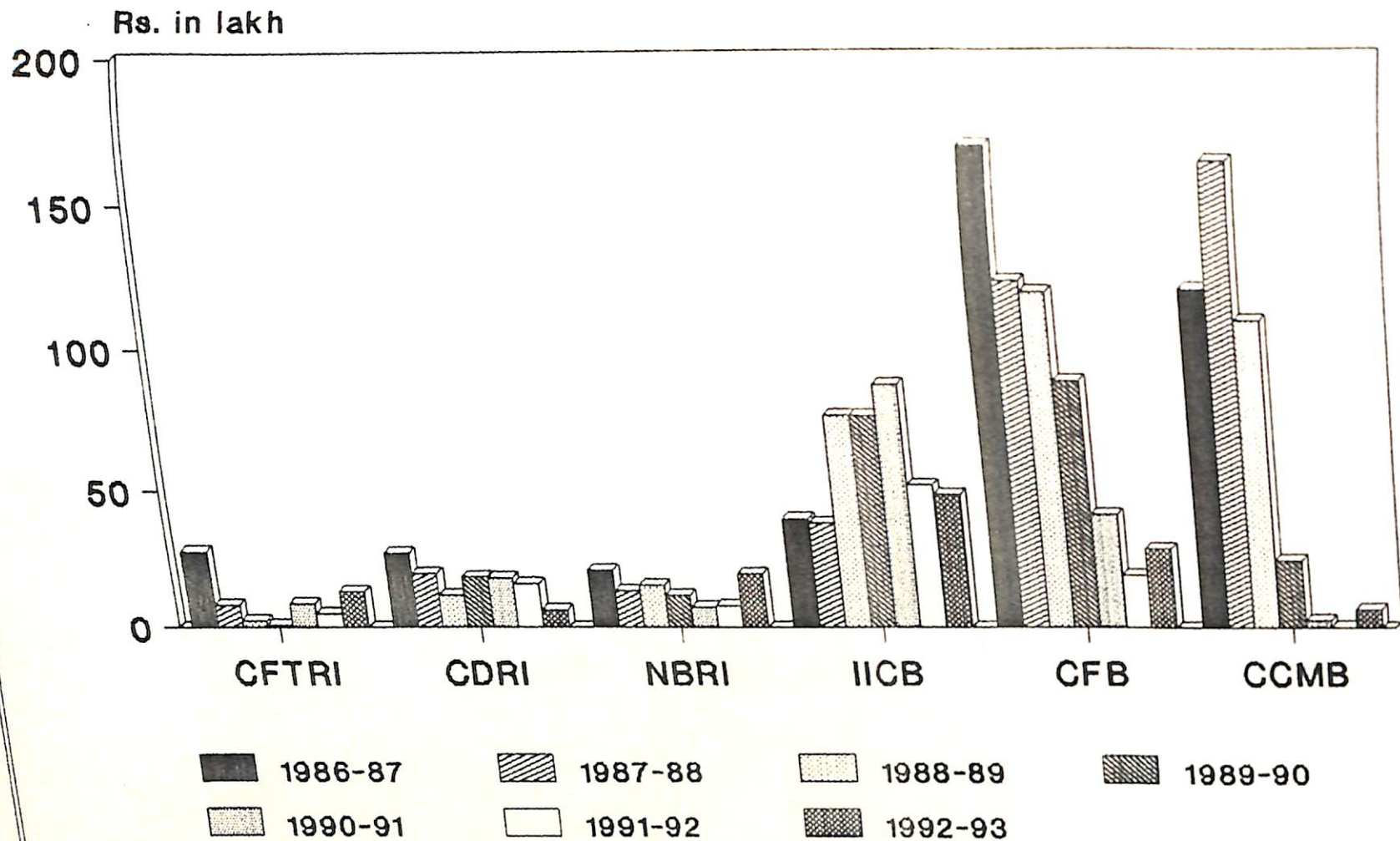
Rs. in lakh



BIOLOGICAL SCIENCES GROUP CHEMICALS

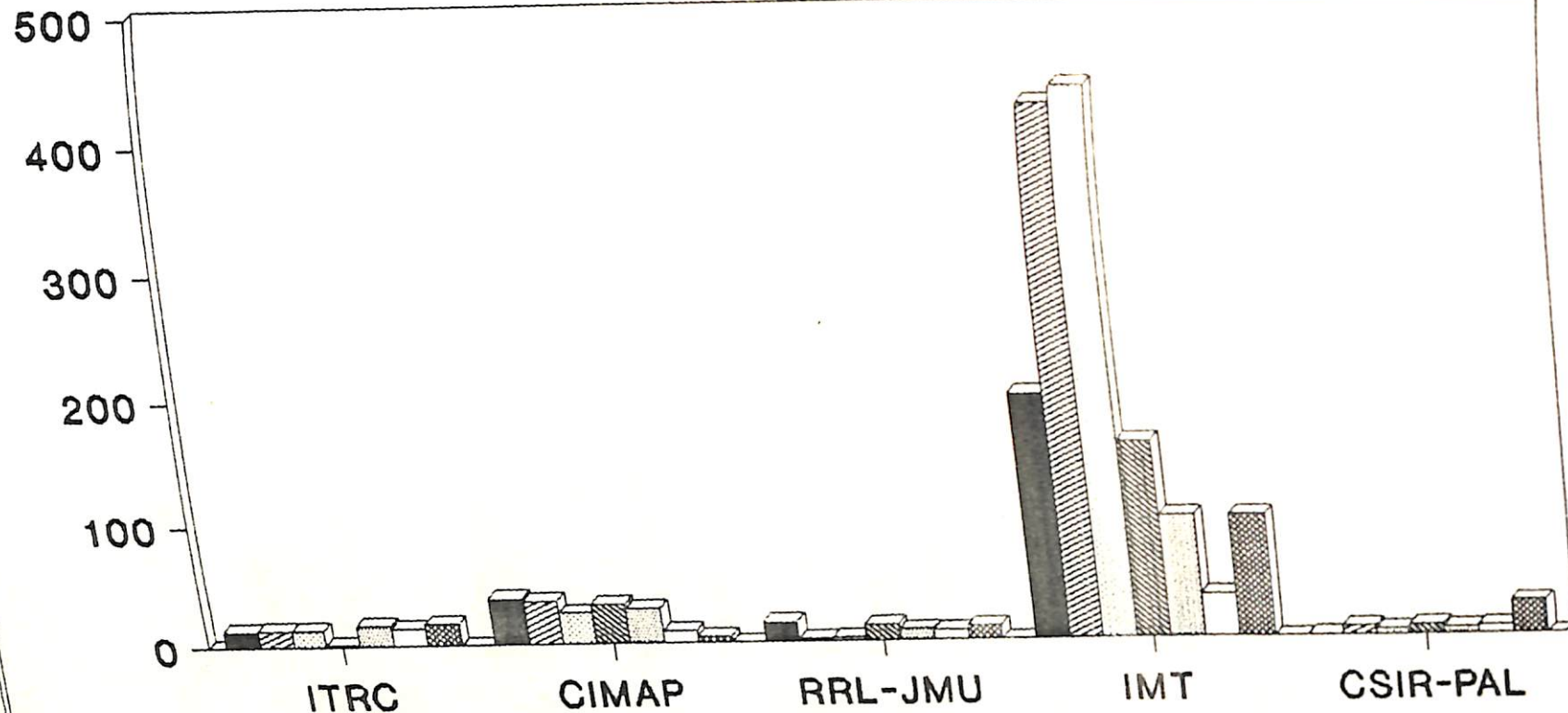


BIOLOGICAL SCIENCES GROUP WORKS & SERVICES



BIOLOGICAL SCIENCES GROUP WORKS & SERVICES

Rs. in lakh



1986-87

1987-88

1988-89

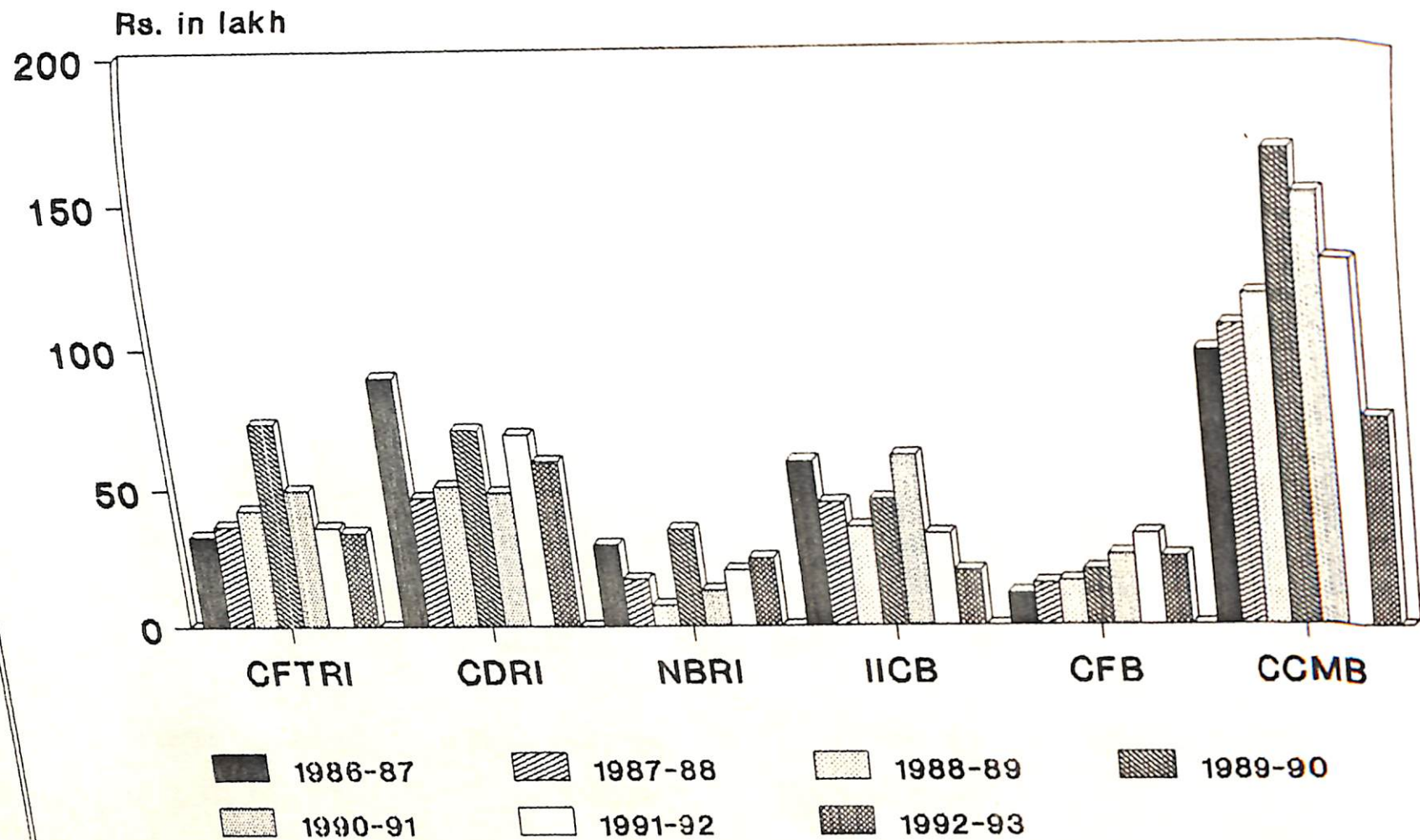
1989-90

1990-91

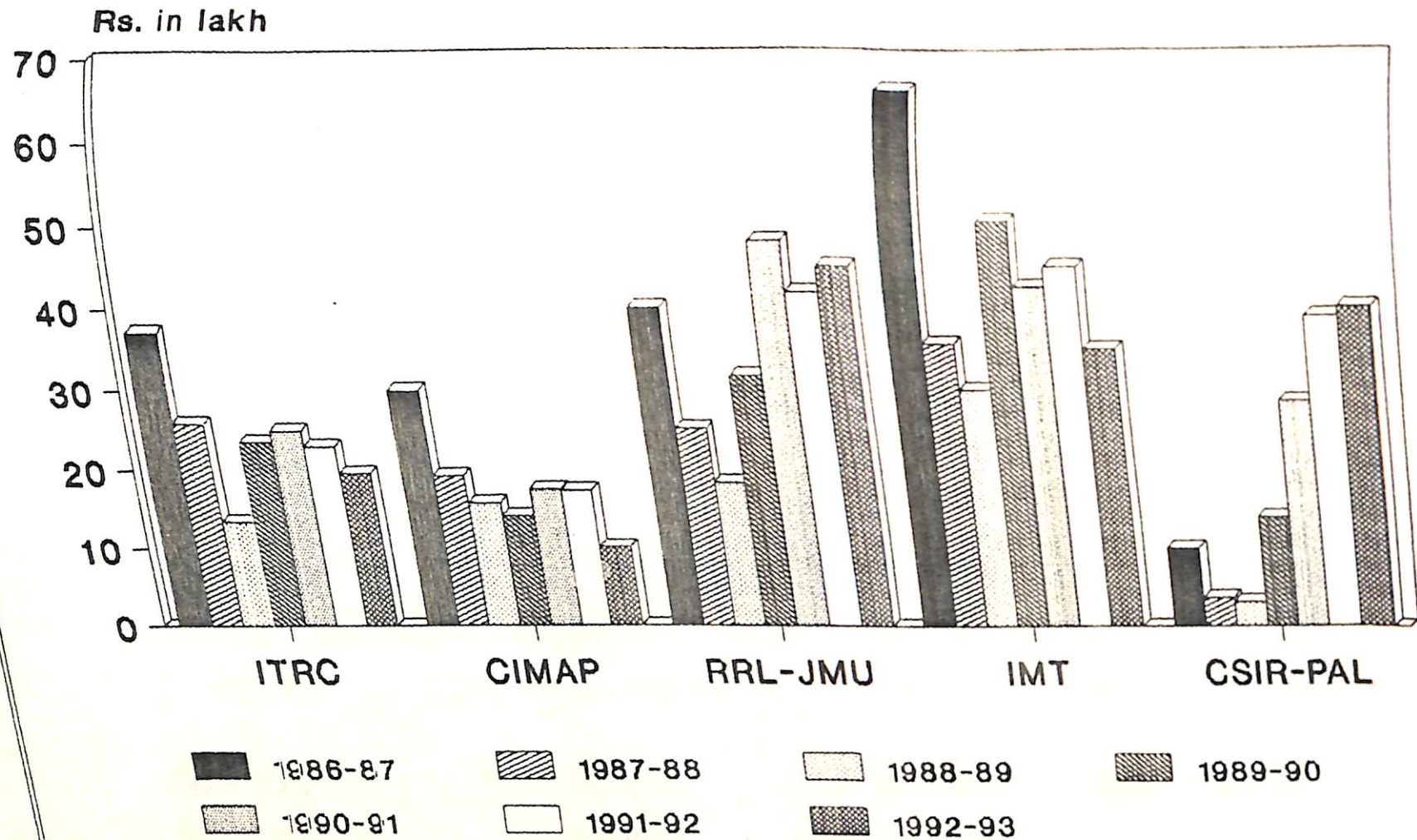
1991-92

1992-93

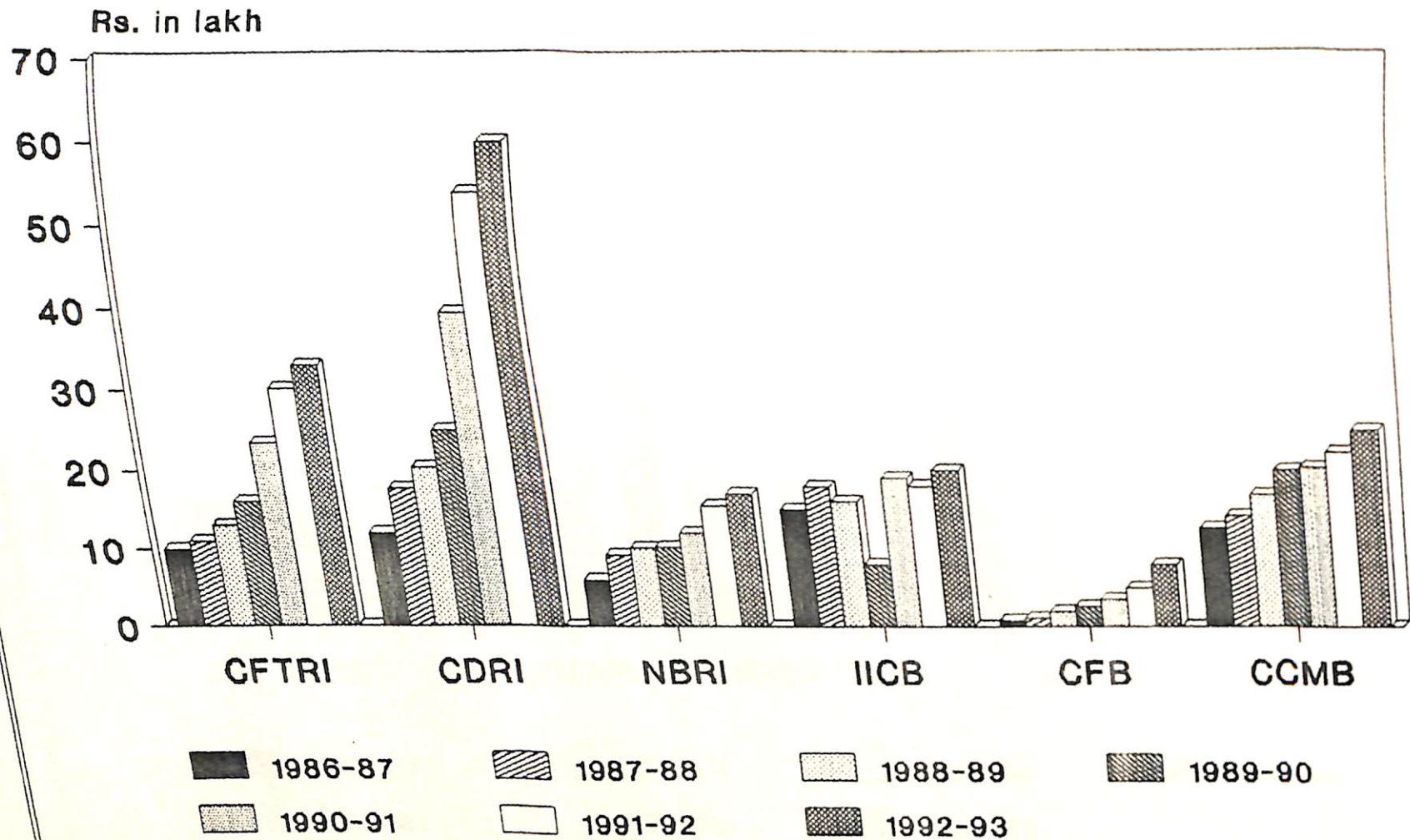
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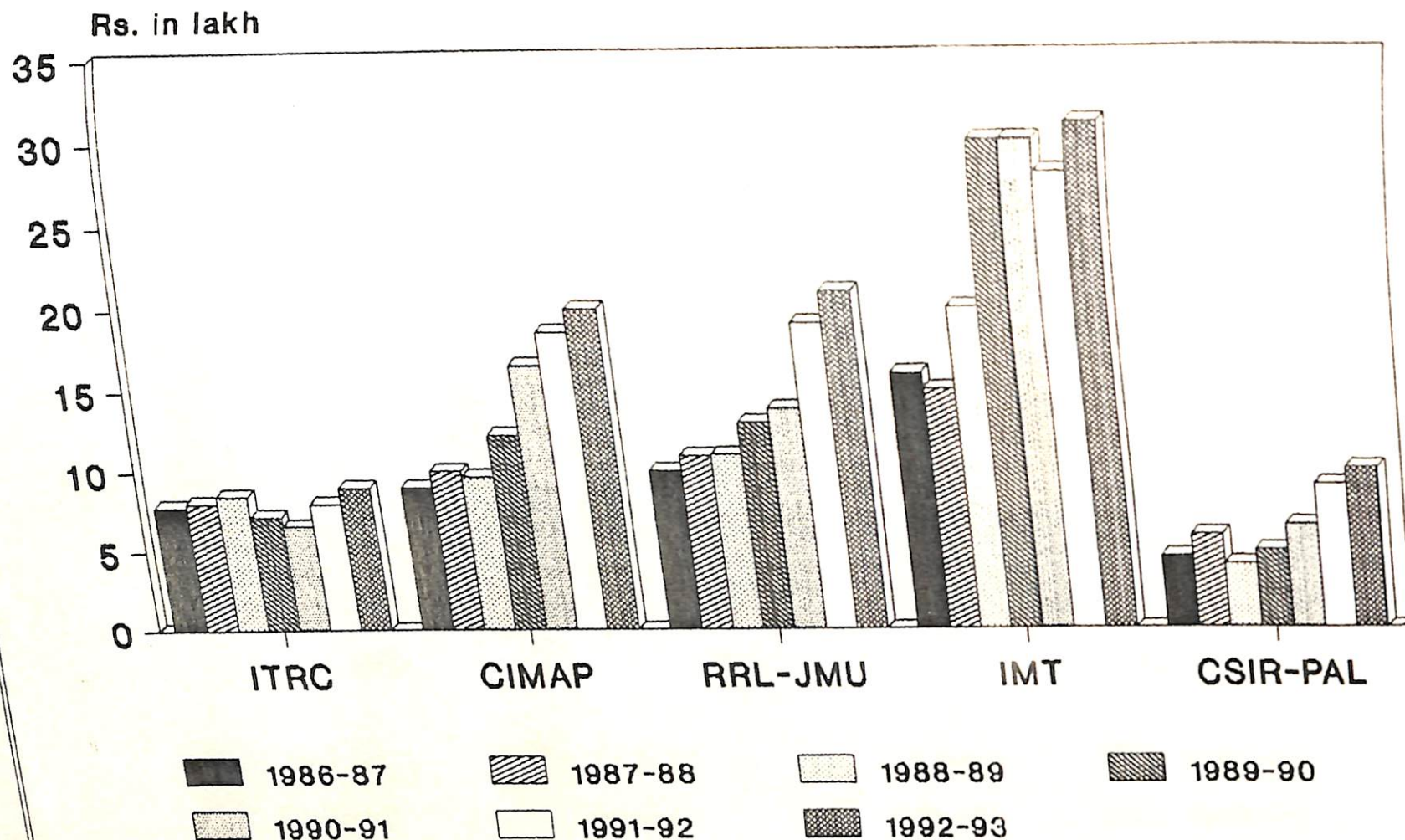
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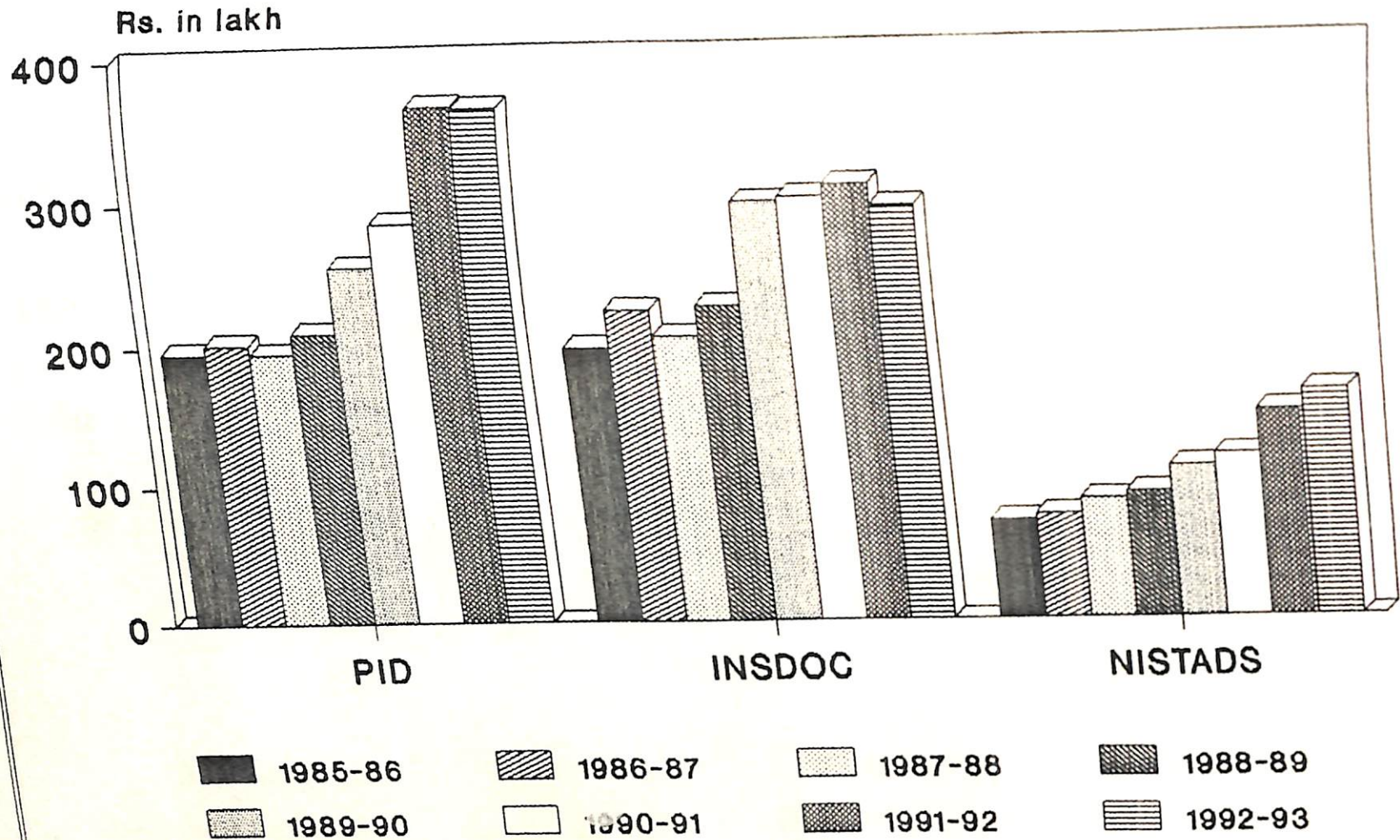
BIOLOGICAL SCIENCES GROUP LIB. BOOKS



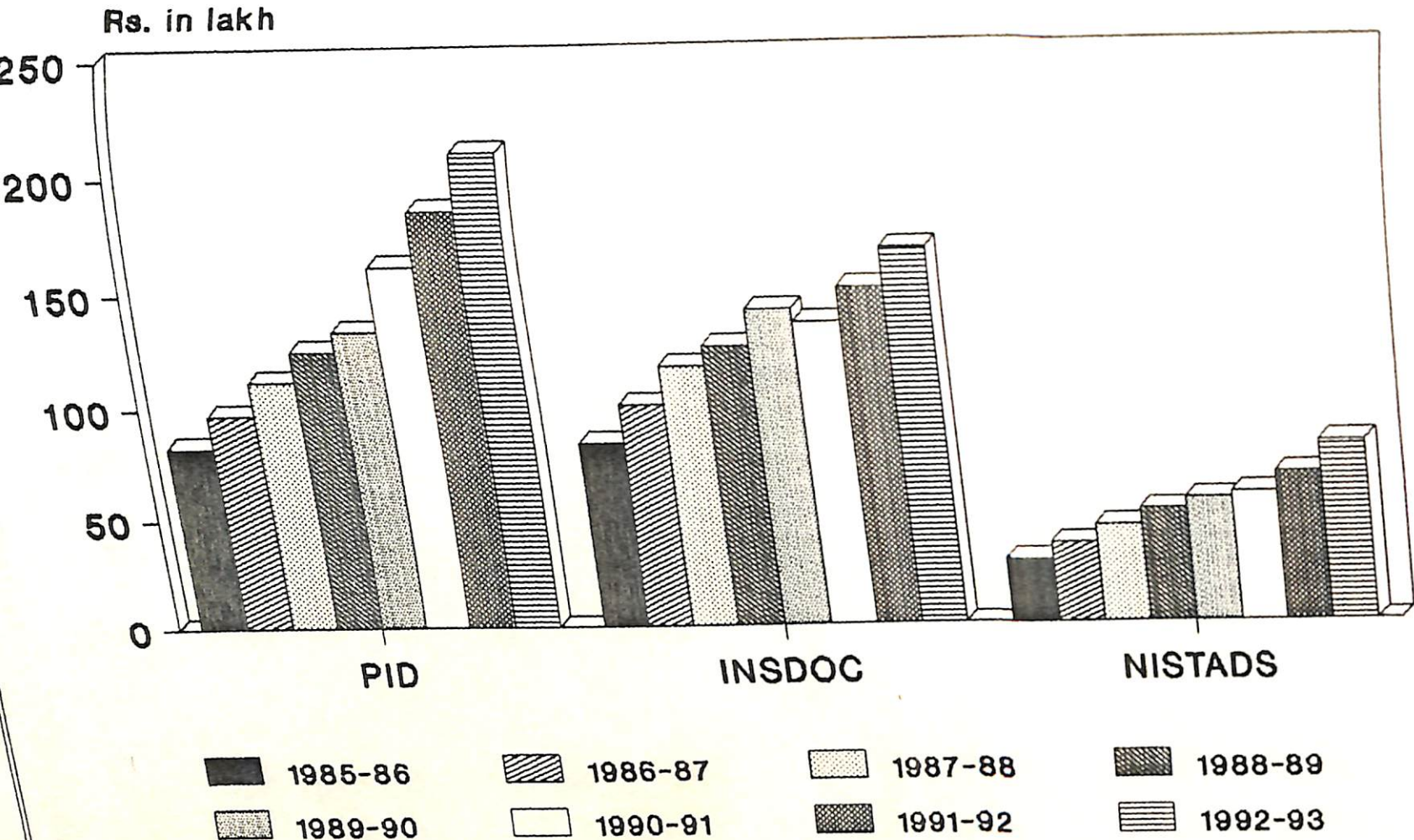
BIOLOGICAL SCIENCES GROUP LIB. BOOKS



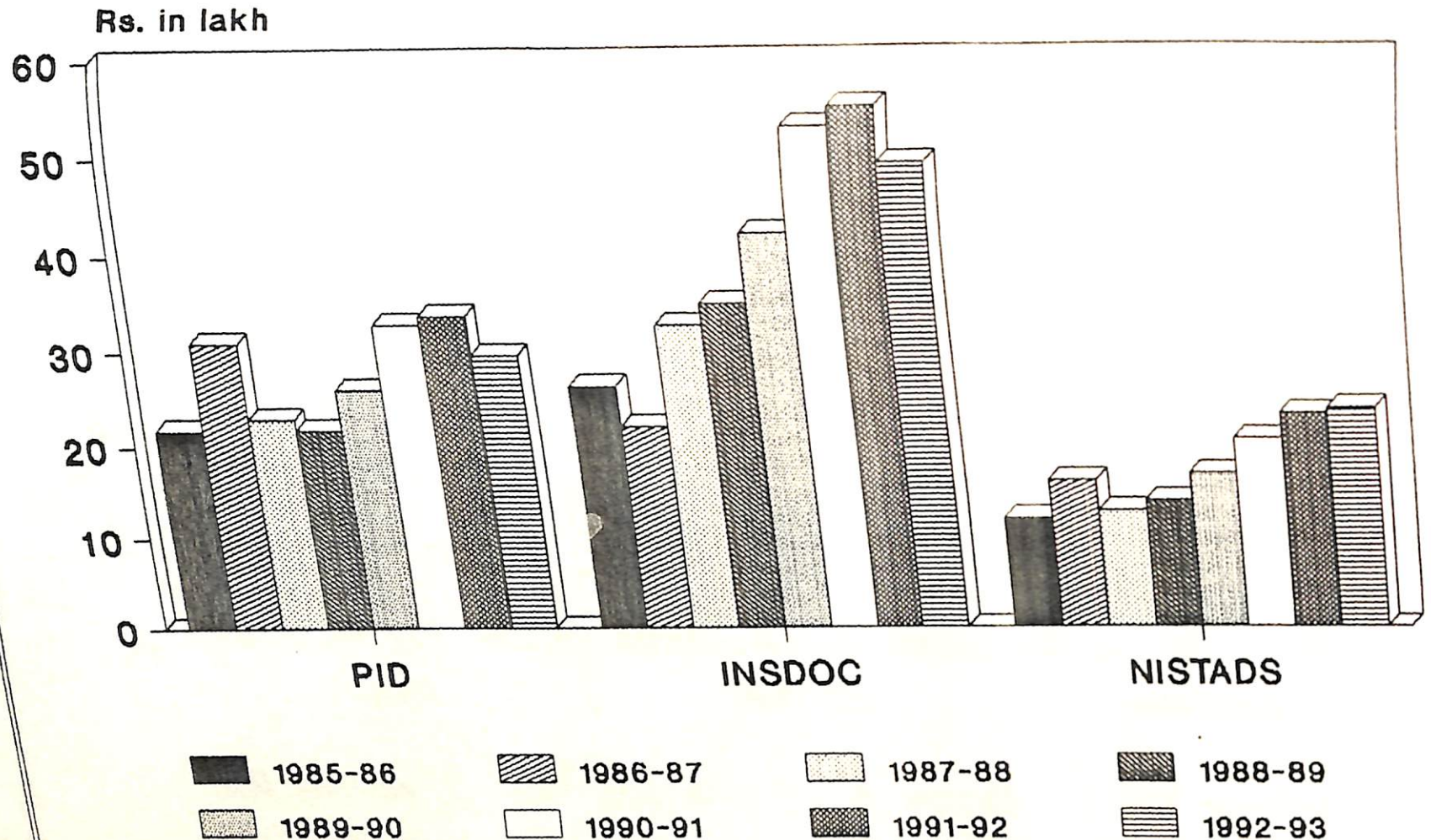
INFORMATION SCIENCES GROUP TOTAL



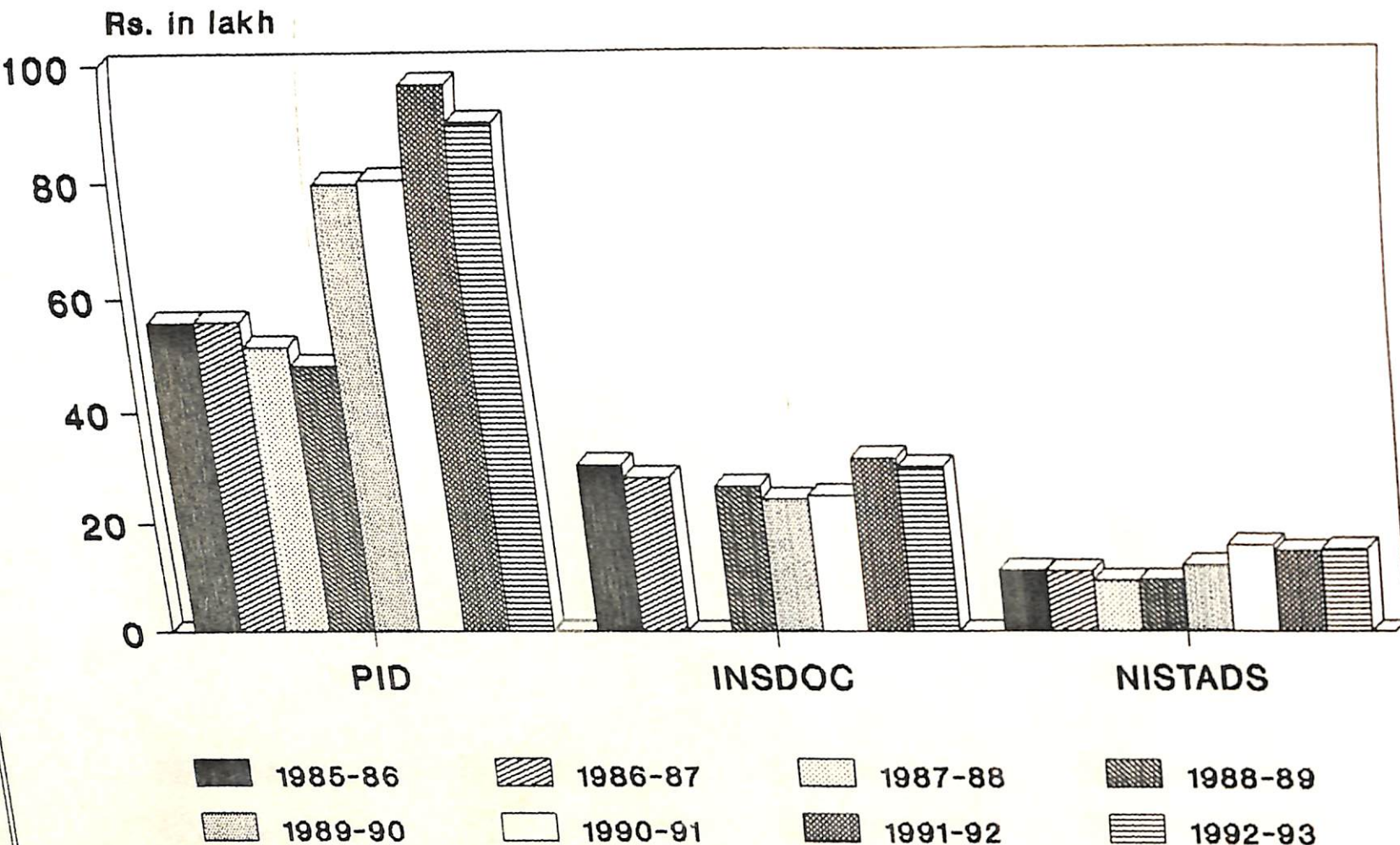
INFORMATION SCIENCES GROUP SALARIES



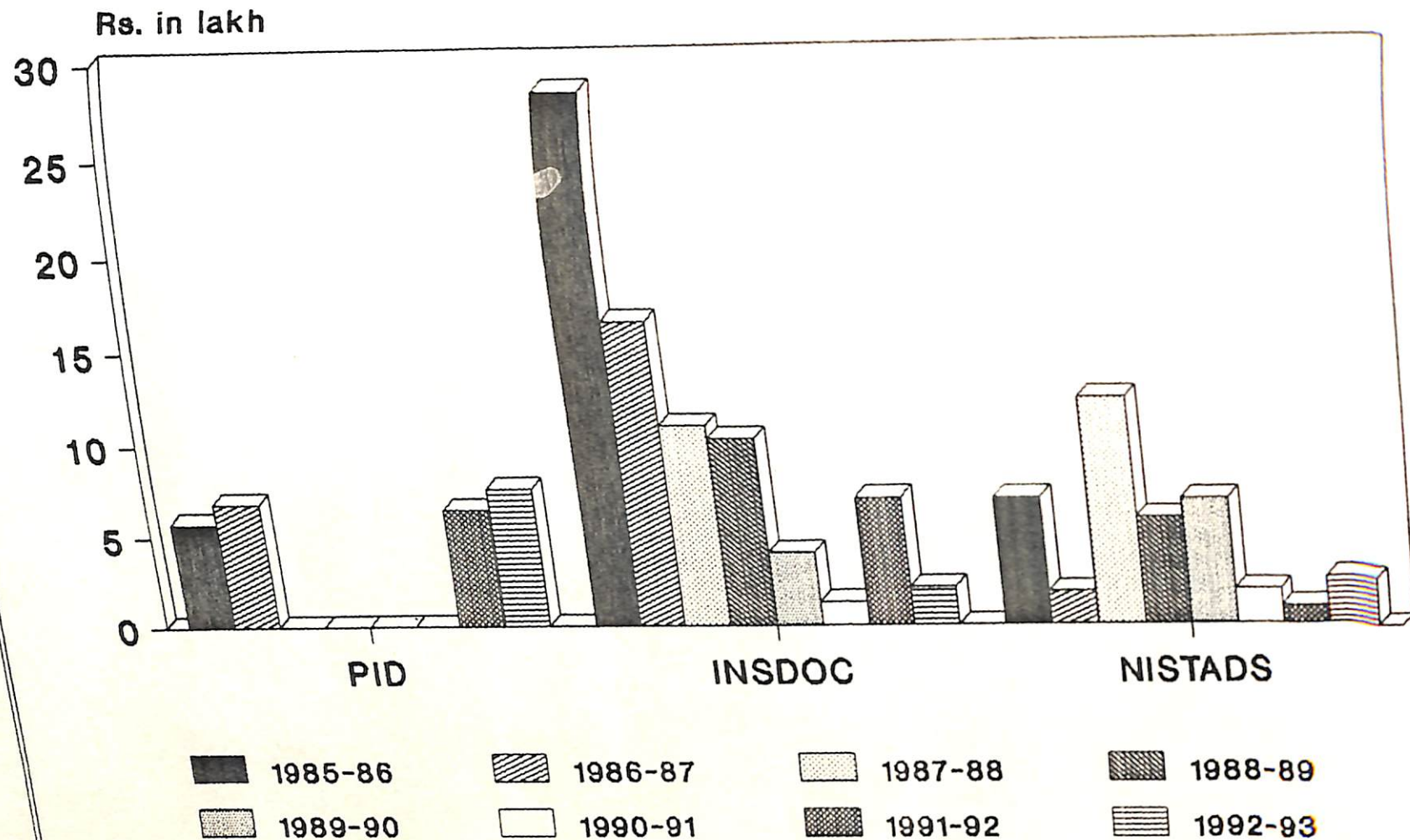
INFORMATION SCIENCES GROUP CONT. & MAINTENANCE



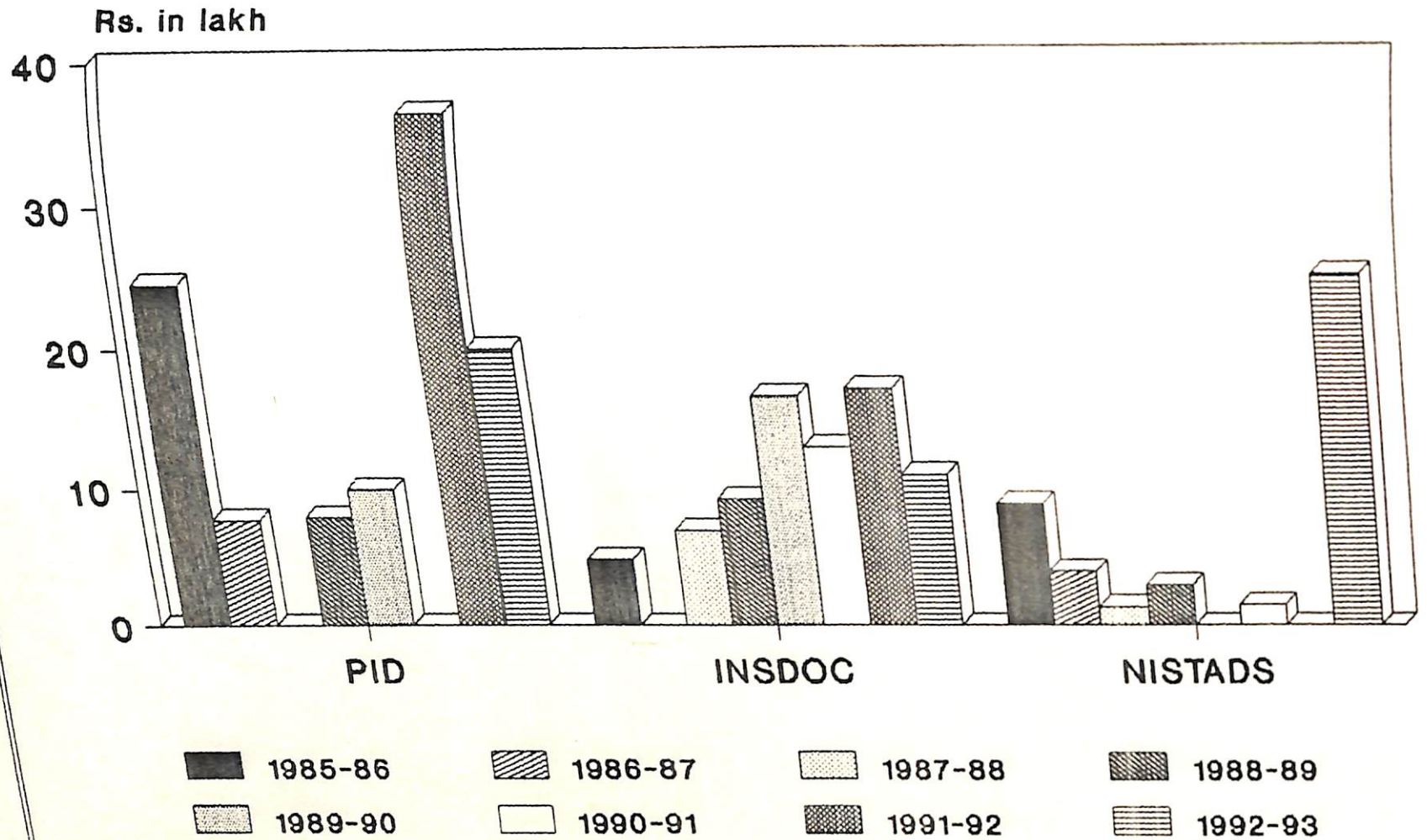
INFORMATION SCIENCES GROUP CHEMICALS



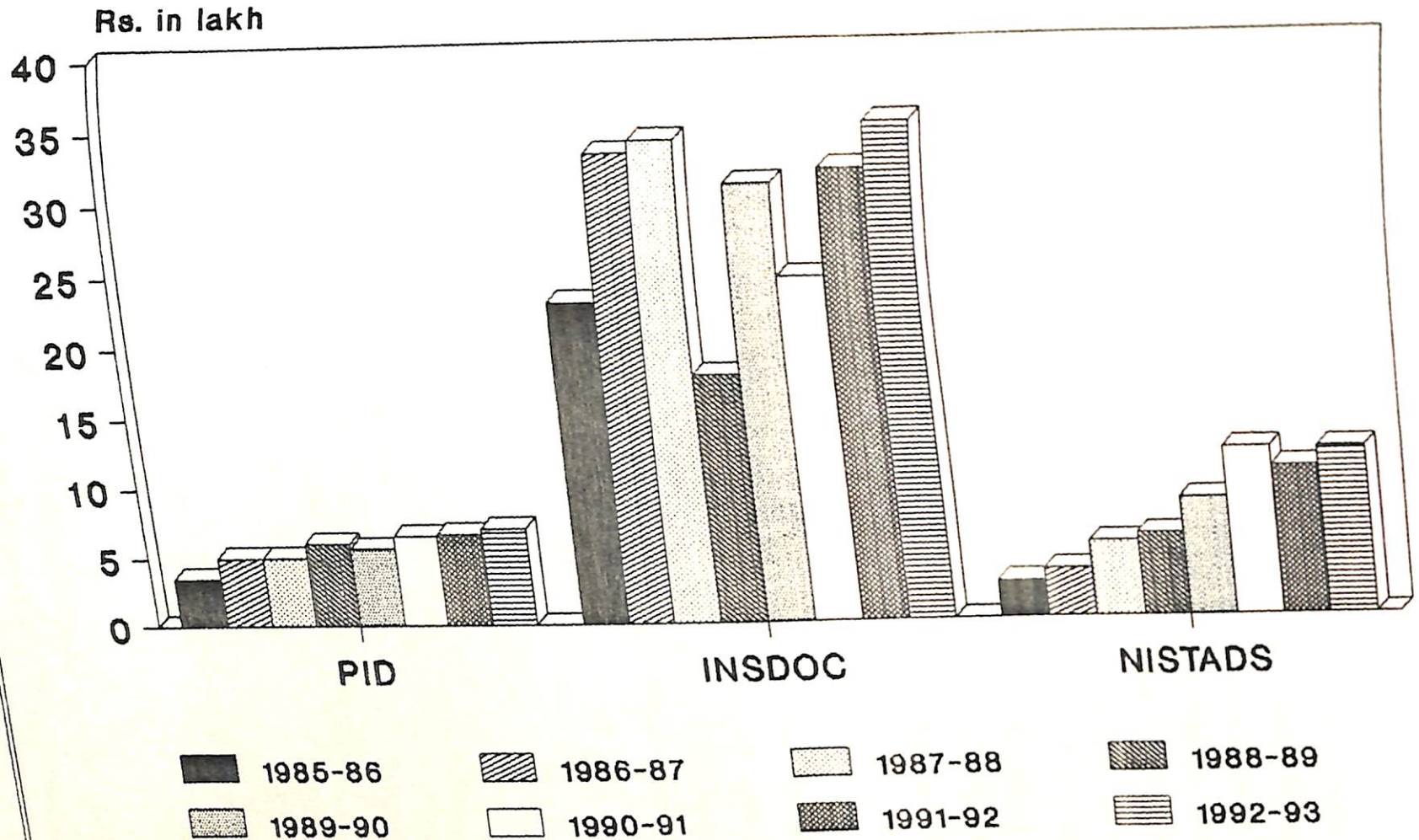
INFORMATION SCIENCES GROUP WORKS & SERVICES



INFORMATION SCIENCES GROUP EQUIPMENT



INFORMATION SCIENCES GROUP LIBRARY BOOKS



CHAPTER - 4: PROBLEMS AND GAPS IN INFORMATION

4.1 INTRODUCTION

The history of data collection system and the various analysis performed on the data received to generate the information required for the various functions of the research planning group have been discussed in Chapters-2 and 3. The complexity of the organization and the diversity of its activities had an effect on the generation of information. There are gaps and problems in information and its generation. Any rational decision making process is dependent on right information at the right time. The requirement of information is not only for the decision making process but also for meeting the demands of several queries from the Parliament, the Planning Commission, etc. Most of the time CSIR HQ. relies on the laboratories to provide the necessary inputs as and when there is a need for such an information.

In this chapter, a brief listing of some of the information demanded/queries asked and some observations on the present information system are presented. Also, the gaps in information and the problems in getting either the basic data or the information in its final form are discussed. This would further strengthen and justify the need for an effective and dynamic information

4.2 SOME OF THE INFORMATION OFTEN DEMANDED/QUERIES ASKED:

* What are the number of research projects and schemes under the categories of Basic Research, Applied Research, institution-wise, year-wise during the last few (e.g. five, ten) years?

* How many of the research projects have been completed on schedule, year-wise ?

Some have not been completed on time and how being completed along with reasons

- * Distribution in terms of Age, Qualifications, Fields of Specialization, Areas of Research etc.
- * Project-wise Manpower deployment.
- * Requirement of Additional Manpower group-wise (in which area or for which activity).
- * Details of facilities available in a Lab and in CSIR as a whole.
- * Details of specialized services offered by the CSIR laboratories.
- * Investment on R & D by CSIR as a whole as well as by individual laboratories.

Where are the answers to many of the queries stated above? Has it been possible to meet such demands easily and successfully from the existing Information System at the CSIR headquarters?

If one carefully studies the queries, it may very well be understood that the Information requested could be classified as "Laboratory Specific" or "Project Specific". In a majority of the queries one requires to integrate data at the CSIR HQ. level. In almost all the laboratories some sort of Information system exists. However, they are neither uniform/standardized nor complete. The system has not so far been custom-designed to meet the requirements of the CSIR headquarters. Laboratories are also enjoying the freedom/autonomy of avoiding provision of data in the prescribed format. Even wherever and whenever the format is followed, the inconvenient part of the questionnaire is not answered.

4.3 SOME OBSERVATIONS ON THE PRESENT SYSTEM :

- * As discussed in Chapter-2, the proforma sent by the Planning Commission used to be reviewed and adopted to suit the CSIR laboratories and the Annual Plan Proforma used to be sent to the laboratories seeking project-wise/ activity-wise plan proposals. The laboratories used to send the

annual plan documents keeping the proforma as the basis. CSIR integrated the laboratory plan proposals and prepared the CSIR draft plan.

- * For the last two decades, laboratories have been submitting their annual plans to CSIR, perhaps, more by way of an annual ritual.
- * CSIR used to analyze these documents and produce laboratory profiles. Besides helping the formulation of a total CSIR Plan, these documents served as a source of information for answering many queries.
- * It must however be noted that the information available in these plan documents was **static information**.

This plan is submitted to the Planning Commission and the resource allocations to CSIR is arrived at based on a detailed discussion. Then the allocations are made to the laboratories. The size of the plan proposals used to be higher (more than double) than the actual allocations made as is evident from Table 4.1. This means there could be several scenarios. **One**, the projections are inflated so that the reduction in the actual allocations has not affected the actual R&D. **Two**, the programmes have been slowed down and resources thinly distributed among all the proposed projects. **Three**, the plan of the laboratory has been critically reviewed either by the internal expert committee or by the Research Council and based upon prioritization a few programmes have been dropped or kept in abeyance or slowed down and due thrust has only been given to the important projects. **Four**, no serious efforts were made to estimate the project costs.

There was never an automatic information flow of actual plans based on the revised/ reduced allocations.

In fact the actual planning system should have been a feed back system taking into account the final allocations made to the laboratories as shown in Fig. 4.1.

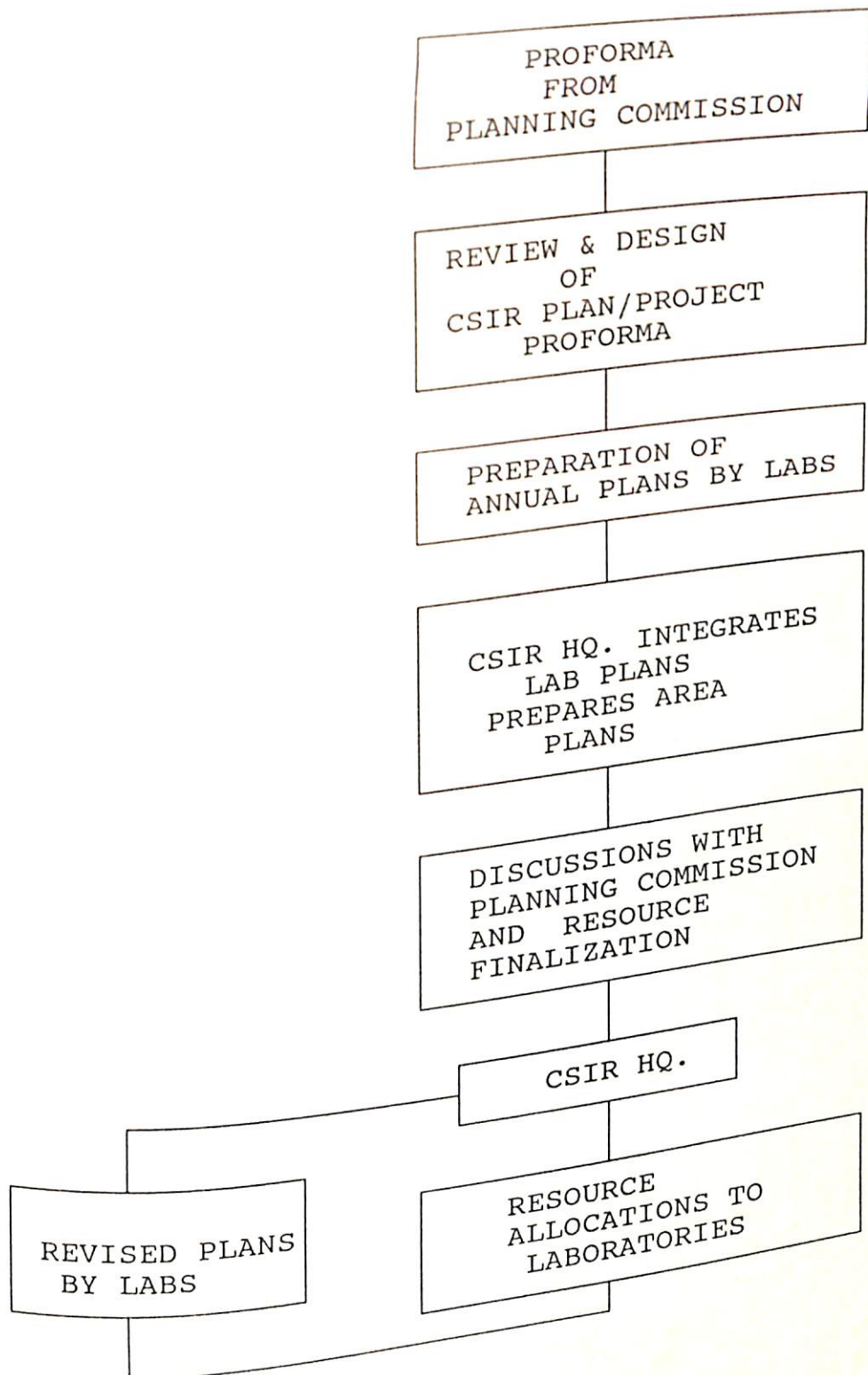
- * The reasons for such wide variations are,
Perhaps, the annual plan proforma underwent changes almost every year.
- * The need for dynamic information flow was never visualized and appreciated both at the CSIR HQ. as well at the laboratory levels.

Table-4.1 indicates the difference in budgeted and sanctioned estimates for a few laboratories during 1993-94.

Table-4.1

NAME OF THE LABORATORY	PROJECTIONS BE 1993-94 (Rs. in Lakh)	ALLOCATIONS SE 1993-94	DIFF. (2-3)	%age of 3 TO 2
1	2	3	4	5
NPL	2158.00	1135.44	1022.56	52.62
CEERI	839.19	583.50	255.69	69.53
CSIO	990.12	636.39	353.73	64.27
NGRI	924.90	693.52	231.38	74.98
NCL	1798.08	1148.54	649.54	63.88
CECRI	1693.97	572.01	1121.96	33.77
CSMCRI	787.45	368.13	419.32	46.75
IICT	1455.00	1164.75	290.25	80.05
RRL-JOR	636.00	478.68	157.32	75.26
IIP	893.75	619.69	274.06	69.34
CFRI	1004.70	778.12	226.58	77.45
NML	1038.50	835.19	203.31	80.42
CGCRI	1145.50	515.00	630.50	44.96
CMRS	612.00	456.16	155.84	74.54
NEERI	649.87	558.19	91.68	85.89
CMERI	1145.80	800.93	344.87	69.90
SERC-GZ	287.65	224.13	63.52	77.92
CSIR-C-M	159.50	67.88	91.62	42.56
RRL-TRIV.	437.00	291.20	145.80	66.64
CBRI	788.00	488.03	299.97	61.93
CRRI	703.00	442.23	260.77	62.91
RRL-BHOP	532.86	181.28	351.58	34.02
NBRI	604.70	475.26	129.44	78.59
CIMAP	488.86	332.16	156.70	67.95
IMT	647.00	304.13	342.87	47.01
NISTADS	229.74	147.97	81.77	64.41

Fig. 4.1 Flow Chart indicating the Preparation of Plan Documents.



- * The first one stems from Frequent changes in Categorization/ classification of activities/ projects.

in 1978-81, these were :

AICP (All India Coordinated Projects)
RDP (Rural Development Projects)
Major Projects
Minor Projects

in 1981-85, these were

NICTP (Nationally Important Coordinated Thrust Area Projects)
MAP (Multi agency Projects)
Major Projects
Minor Projects

The concept of a multi-agency project was totally different from that of Rural Development Projects. Yet the codes used for computerization were the same. This created confusion in Information maintenance and continuity.

- * Again from the Sixth Plan (1981-85) CSIR switched over to **area-approach (from lab-approach)** and frequent changes were made in the area classification as indicated in the Annexure-1.4. CSIR has been following UNESCO classification for R&D areas till then.

There were other reasons too - one of them based on Manpower and project definition.

- * **Manpower Categorization followed till 1987:**

Officers : Scientific, Technical, Non-technical
Establishment : Scientific, Technical, Non-Technical
Class IV : Technical, Non-technical

* Since 1987, the Classification followed are:

Group V : Engineering Staff

Group IV : Scientists (Scientific Officers)

Group III :} Technical Officers, Scientific Establishment,

Group II :} Technical Establishment and Technical

Group I :} Class IV

Administration: Officers, Establishment , Class IV

* Manpower deployment to Projects: One person deployed in more than one project; Some Scientists are deployed in many projects; (sometimes more than Ten at a time)

* No uniform definition or concept of a "Project".

In general it was noted :

* Many a time in order to reduce the number of projects as per the directives from the Policy Making authorities, Projects used to be clubbed and shown as a single Major Project.

* Project-wise costing and budgeting was never done systematically by all laboratories.

* Project allocations were mostly ad hoc in nature. They were for chemicals and specific equipment related to the projects.

* Details of investment made on any project since inception to end were never available. (They were, however, available for sponsored and consultancy projects.)

- * Project costing guidelines were formulated and circulated to all the laboratories but implementation at the laboratory level was never made mandatory.
- * The annual exercise was almost stopped during 1987-90 when a new concept of total allocation was made to each laboratory based on peer evaluation.
- * Many of the project characteristics like Basic Research and Applied Research were overlapping and were not mutually exclusive.
- * Creation and Maintenance of project database having all basic data with facilities for generation of management information at any given time was never visualized. Always there was mix up between data and information and CSIR HQ. desired to have information in the final form, thus perhaps destroying the feel for basic data maintenance at laboratory level. This has resulted in its continuous reclassification, rather than having an additional 'flag' to basic data to generate required information.

4.4 CONCLUSIONS:

Data and Information never reached CSIR HQ. automatically whenever it was modified or generated at the laboratory level. As a result, the existing Information System always depended on the Laboratory System for authenticity of data. This has resulted in a situation wherein it was never possible to answer queries with authenticity without referring to the concerned laboratories.

The preparation of the plan document by the laboratories remained an open loop exercise whereas the actual planning system should have been a feed back system after the final allocations are made. Response from many laboratories was never in time nor strictly in the prescribed format. The component of information received rarely used to be crisp and precise. At CSIR, the time available for integration was forever sub-critical. This has further established the need to develop a suitable information system linking the laboratories and the CSIR HQ. and thereby avoiding repeated reference to the laboratories.

The information system has to incorporate the feedback mechanism so that dependable information on the laboratory activities is available at the CSIR HQ. The situation demands switch over from a "Static System" to a "Dynamic System". The conceptual design of the information system will not be difficult. However, due emphasis has to be given for its implementation. The development of a Model Information System is discussed in the next chapter.

Annexure-4.1 AREA CLASSIFICATION

* During the Sixth Plan (1980-85), the entire R&D activities of the CSIR laboratories have been grouped under 26 areas.

They were:

1. Materials Development
2. Polymer Science
3. Catalysis
4. Corrosion
5. Chemicals
6. Bio-technology
7. Energy
8. Electronics
9. Natural Products
10. Machinery Development
11. Oceanography and allied fields
12. Environmental Research
13. Post-Harvest Technology
14. Health
15. Housing
16. Mining and Metallurgy
17. Aeronautics
18. Standards
19. Instrumentation
20. Civil Engineering
21. Leather
22. Drugs
23. Industrial Toxicology
24. Geological Exploration
25. Information System
26. Miscellaneous

* This again underwent reorganization during the Seventh Plan (1985-90) Period. The seventh plan area classifications were:

1. Inputs to Agriculture (Agrochemicals etc.)
2. Food storage, preservation and processing
3. Water
4. Health, family welfare and nutrition
5. Housing, Town Planning and structure
6. Environment
7. Industrial Toxicology
8. Energy and Power
9. Chemicals (including catalysis & corrosion)
10. Metallurgy
11. mining
12. Special Materials
13. Machinery Development
14. Electronics
15. Computer Software Development
16. Instrumentation
17. Leather
18. Paper and Paper boards
19. Transportation, shipping and railways
20. Aeronautics
21. Standards
22. Electrical Research and Development
23. Oceanography
24. Rural and regional development
25. Information system
26. Basic Science

* The classification was again changed in the original Eighth Plan (1990-95); this was in force during the annual plans 1990-91 and 1991-92.

A. SOCIETAL/TECHNOLOGY MISSIONS

- A1 - DRINKING WATER
- A2 - OILSEEDS
- A3 - IMMUNIZATION
- A4 - NATURAL HAZARD MITIGATION
- A5 - SEPARATION TECHNOLOGY

B. CSIR IN NATIONAL S&T PROGRAMMES

- B1 - CROSS AERONOMY SATELLITE PROGRAMME
- B2 - SUPERCONDUCTIVITY
- B3 - GLOBAL CHANGE
- B4 - LCA
- B5 - NAVODAYA VIDYALAYA CUM SPECIAL BUILDING STRUCTURES
- B6 - POLYMETALLIC NODULES
- B7 - ANTARCTICA
- B8 - PARALLEL COMPUTATION
- B9 - ISLAND DEVELOPMENT
- B10- S&T INPUTS FOR COASTAL ZONE DEVELOPMENT
- B11- RESOURCES AND PARAMETER MAPPING OF THE EEZ OF INDIA
- B12- STANDARDIZATION, METROLOGY AND QUALITY SYSTEM
- B13- AIR SEA INTERACTION

C. CSIR MISSION PROGRAMMES

- C1 - NEW MATERIALS
- C2 - MICROELECTRONICS
- C3 - AGROCHEMICALS
- C4 - CATALYST SCIENCE AND ENGINEERING
- C5 - CORROSION
- C6 - PETROLEUM
- C7 - POLYMER SCIENCE & TECHNOLOGY
- C8 - INDUSTRIAL TOXICOLOGY

C9 - COAL BENEFICIATION, TRANSPORTATION, GASIFICATION
AND UTILIZATION

C10- DRUGS, DIAGNOSTICS & REAGENTS

C11- AROMATIC, ORNAMENTAL AND OTHER ECONOMIC PLANTS

C12- FOOD PROCESSING AND POST HARVEST

C13- LOW COST BUILDING MATERIALS

C14- ADVANCED CERAMICS

C15- RISK AND HAZARD ANALYSIS

C16- EARTHQUAKE HAZARD ASSESSMENT

C17- TECHNOLOGIES FOR RURAL DEVELOPMENT

C19- FERMENTATION TECHNOLOGY

C20- ROAD TRANSPORTATION INFRASTRUCTURE AND SAFETY
SYSTEM

C21- ENERGY SYSTEM DEVELOPMENT

C22- SCIENCE & TECHNOLOGY FOR SOCIETAL DEVELOPMENT

C23- ROBOTICS AND ITS APPLICATIONS

D. NEW MAJOR FACILITIES

D1 - VLBI

D2 - C-MACCS

D3 - SPECIAL PURPOSE AIRCRAFT

D4 - A NEW LOW/HIGH SPEED WIND TUNNEL

D5 - COMPONENT INTEGRITY EVALUATION CENTRE

D6 - R V GAVESHANI II

D7 - NATIONAL INSTRUMENTATION FACILITY FOR BIOLOGY

D8 - MINERAL PHYSICS

E. LABORATORY THRUST PROGRAMMES

NPL1. CHARACTERIZATION OF MATERIALS

NPL2. AMORPHOUS AND CRYSTALLINE SILICON

NPL3. MODERN COMMUNICATION SYSTEM-MEDIA
CHARACTERISATION

- RRL-JOR1. MULTIPHASE REACTORS
- RRL-JOR2. VERTICAL SHAFT KILN (VSK)-IMPROVEMENT
- RRL-JOR3. SPECIALITY PAPERS AND ADDITIVES FOR IMPROVED DRY STRENGTH AND RETENTION OF FINE AND FILLERS
- IIP1. PETROLEUM CONSERVATION, PRODUCT APPLICATIONS AND EMISSION: ENGINE EMISSIONS
- IIP2. DEVELOPMENT OF FUEL EFFICIENT COMBUSTION SYSTEMS
- IIP3. PERFORMANCE EVALUATION PROCEDURES DEVELOPMENT
- IIP4. ALTERNATE SOURCES OF HYDROCARBON
- CLRI1. COLLAGENS : SYNTHESIS AND BIOMATERIALS
- CLRI2. MICROPROCESSOR BASED CONTROL SYSTEM FOR TANNERY WET OPERATIONS AND TREATMENT OF EFFLUENTS
- CLRI3. SURFACE AND MATERIAL SCIENCES FOR LEATHER AND LEATHER PRODUCTS INDUSTRY
- CLRI4. CAD/CAM APPLICATION FOR FOOTWEAR AND GARMENTS, DESIGN AND FABRICATION TECHNIQUES FOR LEATHER
- CFRI1. RESOURCE QUALITY ASSESSMENT OF COALS AND LIGNITES
- CFRI2. PROCESS DEVELOPMENT FOR CONVERSION OF NON-COKING COALS/WASHERY MIDDINGS TO A COKING AGENT BY MODIFIED SOLVENT REFINED COAL (src) TECHNOLOGY
- CFRI3. STUDIES ON THE PRODUCTION OF FORMED COKE AND AGGLOMERATED FUEL FROM NON-COKING COALS FOR METALLURGICAL AND INDUSTRIAL APPLICATIONS
- NML1. BENEFICIATION AND PURIFICATION OF TUNGSTEN ORES OF INDIA
- NML2. PRODUCTION OF NICKEL AND COBALT FROM OVERBURDEN OF CHROMITE ORES

- SERC-GZ1. DESIGN AND ANALYSIS OF HIGH-RISE BUILDINGS
- SERC-GZ2. DESIGN AND ANALYSIS OF LARGE SPAN STRUCTURES
- SERC-GZ3. SOFTWARE DEVELOPMENT FOR SPECIAL APPLICATIONS
- SERC-M1. STRUCTURAL DYNAMICS INCLUDING STUDIES ON VIBRATION, SHOCK AND IMPACT.
- SERC-M2. STEEL STRUCTURES INCLUDING TALL TOWERS, INDUSTRIAL STRUCTURES AND SHIP STRUCTURES.
- SERC-M3. COMPUTER-AIDED DESIGN AND GRAPHICS
- SERC-M4. OFFSHORE STRUCTURES INCLUDING INVESTIGATIONS ON FATIGUE.
- RRL-BHU1. STUDIES ON FERRO-ALLOY MAKING BY ALLUMINO-THERMIT METHOD
- RRL-BHU2. PIPELINE TRANSPORTATION OF SOLIDS
- RRL-BHU3. DEVELOPMENT OF PLASMA REACTOR AND THEIR UTILISATION IN PROCESS METALLURGY & MATERIALS PREPARATION
- RRL-BHU4. EXTRACTION OF NICKEL FROM LATERITIC ORE/CHROMITE OVERBURDEN OF SUKINDA
- RRL-T1. REFERRAL CENTRE FOR RARE EARTHS
- RRL-T2. PHOTOCHEMISTRY
- CBRI-1. HOUSING AND HUMAN SETTLEMENTS
- CBRI-2. DISTRESSED BUILDINGS
- CBRI-3. FIRE SAFETY OF BUILDINGS AND INDUSTRIES
- CBRI-4. STRUCTURE - SOIL INTERACTION STUDIES
- CRRI-1. PAVEMENT DETERIORATION MODELLING
- CRRI-2. URBAN TRANSPORT PLANNING
- CRRI-3. LAND SLIDE HAZARD MITIGATION
- RRL-BHO1. PROCESSING OF LOCAL MINERAL RESOURCES

- CFTRI-1. QUALITY STANDARDS AND FOOD SAFETY
CFTRI-2. TARGETED NUTRITION THROUGH FORMULATIONS OF
FOOD FOR SPECIFIC GROUPS
CFTRI-3. DEVELOPMENT AND MODIFICATION OF TRADITIONAL
FOODS

CDRI1. NATURAL PRODUCTS CHEMISTRY AND BIOLOGICAL
SCREENING

CDRI2. CHEMISTRY AND BIOLOGY OF PEPTIDES

CDRI3. IMMUNOLOGY AND MICROBIAL GENETICS

NBRI1. TAXONOMY AND ETHNOBOTANY

NBRI2. PLANT WEALTH UTILISATION

NBRI3. ENVIRONMENTAL POLLUTION ABATEMENT

NBRI4. PLANT BIOTECHNOLOGY

NBRI5. TREE BIOLOGY

IICB1. CHEMISTRY OF BIOACTIVE SUBSTANCES

IICB2. MOLECULAR BIOLOGY IMMUNOLOGY AND
IMMUNOCHEMISTRY OF PARASITE AND BACTERIA

IICB3. IMMUNOBIOLOGY AND IMMUNOCHEMISTRY

CFB1. HIGH TECH REAGENTS

CCMB1. BIOPHYSICS AND BIOCHEMISTRY

CCMB2. MOLECULAR BIOLOGY

CCMB3. CELL BIOLOGY

CCMB4. EVOLUTIONARY BIOLOGY

ITRC1. SAFETY EVALUATION

CIMAP1. PROCESSING AND CHEMICAL TRANSFORMATION OF
NATURAL PRODUCTS

RRL-J1. ANTI-INFLAMMATORY DRUGS

RRL-J2. MUSHROOM (MORCHELLA species)

RRL-J3. SERICULTURE

- RRL-J4. BORON CHEMICALS
- RRL-J5. SCREENING OF PLANTS FOR NATURAL EDIBLE COLOURS
- IMTECH1. MOLECULAR BIOLOGY AND MICROBIAL GENETICS
- IMTECH2. ANIMAL CELL/TISSUE CULTURE
- IMTECH3. PROTEIN ENGINEERING
- CSIR-PAL1. TEA SCIENCE
- CSIR-PAL2. POST-HARVEST PHYSIOLOGY OF FRUITS
- CSIR-PAL3. PRE-AND POST-HARVEST PHYSIOLOGY FRUITS
- PID1. REVISION OF "WEALTH OF INDIA" SERIES
- PID2. PUBLICATION OF S&T JOURNALS AND SCIENCE
POPULARISATION
- INSDOC1. CREATION AND NETWORKING OF COMPUTERIZED
DATABASES
- INSDOC2. ELECTRONIC IMAGING
- INSDOC3. INFORMATION TECHNOLOGY LABORATORY
- INSDOC4. SERIAL CONTENTS OF MULTI MEDIA (ISCOMM)
- INSDOC5. HUMAN RESOURCES DEVELOPMENT
- NISTADS1. MATHEMATICAL MODELLING
- NISTADS2. SOCIOLOGY OF SCIENCE
- NISTADS3. RESOURCE PLANNING AND UTILISATION FOR
DEVELOPMENT
- NISTADS4. INFORMATION SYSTEM AND SCIENCE AND
TECHNOLOGY
- NISTADS5. TECHNOLOGY AND SOCIETAL CHANGE
- NISTADS6. HISTORY AND PHILOSOPHY OF SCIENCE AND
TECHNOLOGY
-

* These again underwent changes in the actual Eighth Plan

(1992- 97) viz.

A - INDUSTRY AND ECONOMY ORIENTED PROGRAMMES

B - SOCIETAL PROGRAMMES

C - BASIC RESEARCH

D - RESEARCH SUPPORT AND TECHNICAL SERVICES

A- INDUSTRY AND ECONOMY ORIENTED PROGRAMMES

1. CHEMICALS

Agro Chemicals/Pesticides

Catalysis

Chemicals and Intermediates

Electrochemicals

2. DRUG DIAGNOSTICS AND PHARMACEUTICALS

3. APPLIED BIOLOGY & BIOTECHNOLOGY

4. LEATHER

5. POLYMER SCIENCE & TECHNOLOGY

6. ELECTRONICS & INSTRUMENTATION

7. ENERGY

Energy - Petroleum Refining and processing

Petrochemicals and petroleum

Products

Energy - Coal (Mining, Beneficiation,

Transportation, Gasification and

Utilisation)

Energy - Conservation and Efficient system

8. FOOD PROCESSING AND POST HARVEST TECHNOLOGY

9. CONSTRUCTION TECHNOLOGIES

- Building Materials
- Structural Engineering
- Corrosion Protection

10. TRANSPORTATION

- Transportation Roads
- Transportation Air

11. MINING, MINERAL EXTRACTION & PROCESSING, METALLURGY

12. GLASS & CERAMICS

13. ENGINEERING INDUSTRY

14. ENVIRONMENT & SAFETY

- Environmental Pollution Control Technology
- Environmental Impact Assessment
- Risk & Hazard Studies
- Industrial Toxicology

15. INFORMATION TECHNOLOGY

B- SOCIETAL PROGRAMMES

1. SAFE DRINKING WATER
2. HEALTH CARE
3. FOOD AND NUTRITION
4. NATURAL PLANT PRODUCTS
5. OILS AND FATS
6. HOUSING TECHNIQUES
7. APPROPRIATE TECHNOLOGIES FOR RURAL DEVELOPMENT
8. NON-CONVENTIONAL ENERGY SOURCES
9. NATURAL HAZARDS MITIGATION
10. SCIENCE COMMUNICATION
11. SCIENCE POLICY STUDIES

C- BASIC RESEARCH PROGRAMMES

1. MODERN BIOLOGY

2. CHEMISTRY

Organic Synthesis

Natural Product Chemistry

Electrochemistry

3. EARTH SCIENCES

Geophysics

Ocean Sciences

4. ATMOSPHERIC AND SPACE PHYSICS

5. MATERIAL SCIENCES

6. COMPUTER AIDED STUDIES, EXPERT SYSTEMS AND PARALLEL COMPUTATION

7. AERONAUTICS

D- RESEARCH SUPPORT ACTIVITIES AND TECHNICAL SERVICES

1. SURVEYS

Coal

Mapping of EEZ

Polymetallic Nodules Programme

2. DATA BASES

3. CALIBRATION, STANDARDISATION AND QUALITY SYSTEM AND ANALYTICAL TESTING

Calibration, Standardization and Quality System

Analytical Testing

4. PRODUCT EVALUATION

CHAPTER-5 : DEVELOPMENT OF A MODEL INFORMATION SYSTEM

5.1 INTRODUCTION

From the discussions in the earlier chapters, the complexity of the CSIR as an organization as well as the consequent complexity of the planning, monitoring and evaluation of the R&D in CSIR laboratories can be easily understood. The analysis of the existing data collection process, generation of information and the problems and gaps in information generation form the basis of the development of a model information system.

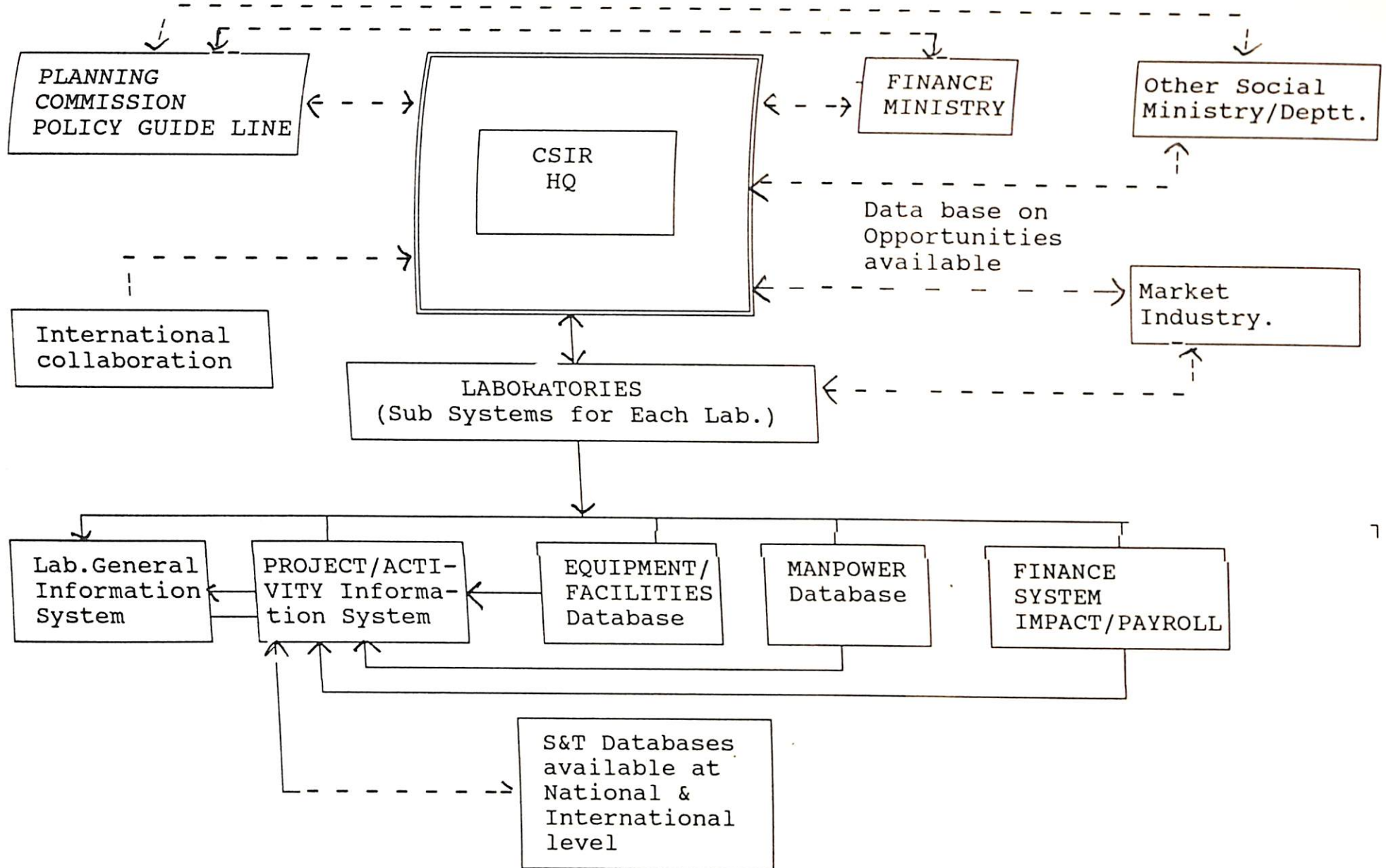
The objective in the development of model information system is to overcome the problems and gaps in the existing system and also to generate the required information at the CSIR HQ. for the various functions of R&D planning, monitoring and evaluation both at the laboratory level and CSIR HQ. level.

The Model Information System consists of the following several subsystems/databases as shown in Fig. 5.1. The dotted lines in the Fig. 5.1 indicates the requirements of linkages with various systems at different levels especially at the national level.

1. Laboratory General Information System
2. Project/Activity Information System
3. Manpower Data Base
4. Equipment/Facilities Data Base
5. Financial Information System
 - Payroll, Social Welfare
 - Accounting
 - Project Costing, Budgeting & Accounting

The elements in the various databases are defined in a manner which would facilitate computerization and provide proper interfaces between the databases. Further necessary care has been taken to avoid duplication of data entry.

Fig 5.1 Model Information System



5-2

7

5.2 DESCRIPTION OF INDIVIDUAL SUBSYSTEMS/DATABASES

In this section systematic presentation of various features and data elements of the various subsystems and databases are described.

5.2.1 LABORATORY GENERAL INFORMATION SYSTEM

This gives an overall information about a laboratory:-

Name of the Lab: Full Name:

Short Name:

Lab Code

Address

Fax

Telex

Telephone:

Year of Establishment

Areas of work:

Facilities available

Services offered

Date/Year of data

Total Staff (as on date)

Number of Scientists (as on date)

Number of R&D Projects (as on date)

Number of Sponsored projects (as on date)

Number of Consultancy Projects (as on date)

Number of Grant-in-aid projects (as on date)

Number of Collaborative projects (as on date)

Number of Externally aided i.e., Foreign aided projects (as on date)

Annual Budget Grant

Annual External Cash Flow (received and spent)

Laboratory Reserves (Generated and utilized)

Target groups

Linkages

Existing Memorandum of Understanding: Number: ,

Organizations

Technologies developed; Commercialized;

Annual Industrial production based on the know-how of the laboratory

Patents filed/sealed

Many of these things are derived from other sub-systems/ databases.

5.2.2 PROJECT/ACTIVITY DATA BASE/ INFORMATION SYSTEM

It was seen that the information required at the CSIR HQ. level has been both "Project Specific" and 'Laboratory Specific'. If one can 'Projectise' each and every activity of a laboratory, there will be no problem. This will be an ideal situation. An integration of project data will provide necessary information. In a practical situation one has to maximize the 'Projectization'. Further, The physical monitoring linked with the financial monitoring is the basis of the project database and the project information system besides projectization and information generation.

A project is defined as "An activity having a set of clearly defined objectives within a definite time-frame". It could be an R&D activity or even creation of any facility.

The parameters relevant for various aspects linked to a 'Project' are depicted in the Fig. 5.2 and the details of data elements/ parameters are discussed in this section.

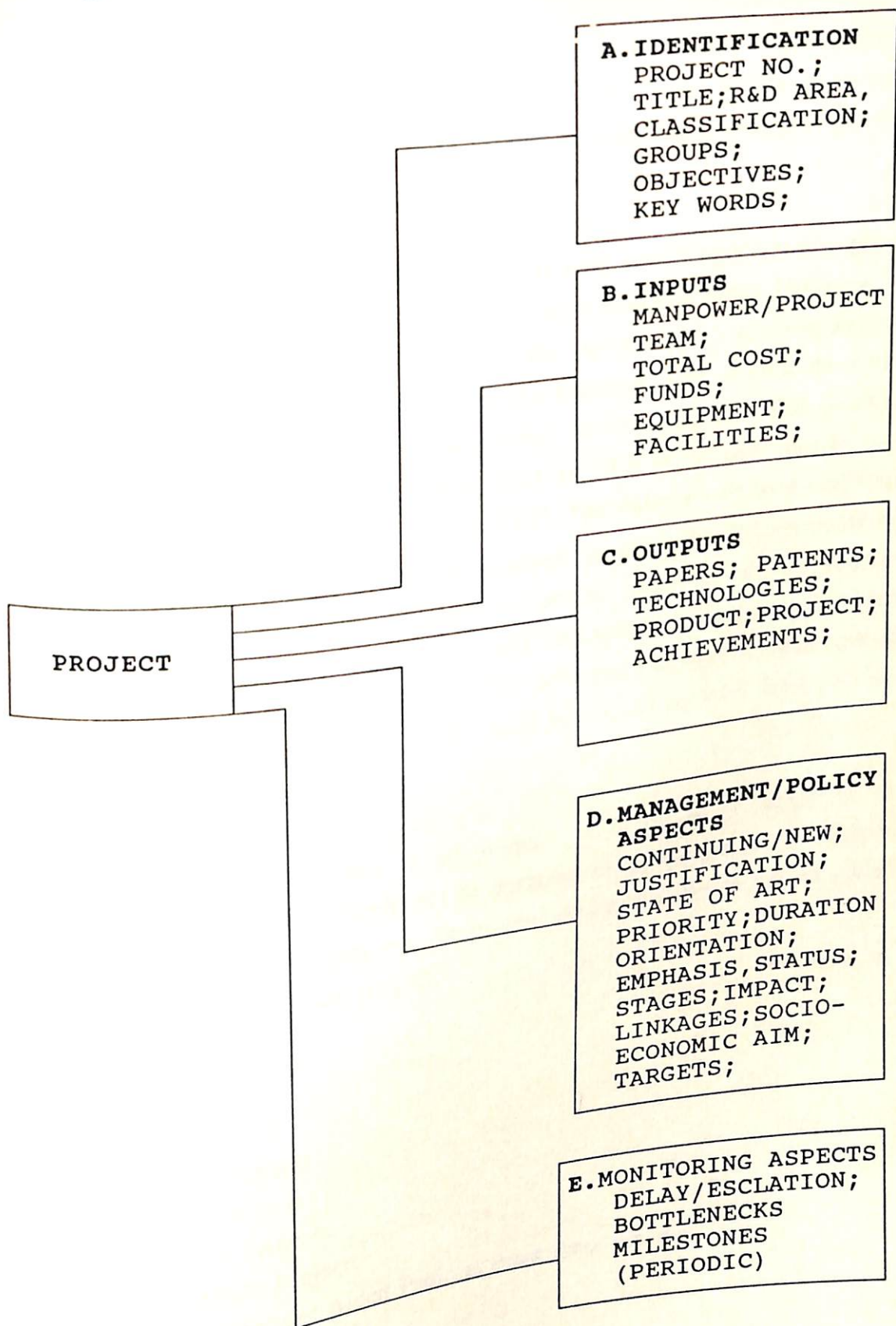
A. PROJECT IDENTIFICATION

* PROJECT NO: Category (3): PROJNO (4): LABCODE (2)

Projects have been categorised into two groups:

In-house R&D Projects: Those projects initiated within the laboratory and requiring direct financial support from CSIR/budget provided to the laboratory. The categories under this Group will be Inter-laboratory projects (ILP), Major Laboratory Projects (MLP), other laboratory projects (OLP), World Bank Projects (WBP), Mission Mode Projects (MMP) and

Fig. 5.2 Various Aspects linked to a Project.



Sponsored research projects: Those projects which do not require direct financial support from CSIR. The categories under this Group will be sponsored projects (SSP), Consultancy Projects (CNP), Grant-in-aid projects (GAP), Collaborative projects (CLP).

Note: Any single project will be categorised as only one category at any given point of time. A project should not appear in more than one place. However, if a project has partial sponsorship under the sponsored, grant-in-aid or Collaborative categories, even though from the planning point of view there has to be only one project, these will be shown as two projects. The inhouse component will be shown as ILP, MMP, MLP or OLP as the case may be and the sponsored component as SSP, GAP or CLP. The linkage will be established through the linkage character. This is essential to meet the requirements of financial management and also to match for proper interface with the finance system "IMPACT". In other words there will be a virtual project to account for the sponsored component in such cases. The software will have to take care of this, so that in the actual counting of the total number of projects these two are treated as one.

The project number has to be unique. If a project is completed or dropped, the same number should not be assigned to any new project. If there is any need to change the category, the present project may be treated as closed and output shown as the new project.

Category: XXX

ILP Inter-Lab Projects

MLP Major Lab Projects

OLP Other Lab Projects

WBP World Bank Projects

MMP Mission Mode Projects

EAP Externally (Foreign) Aided Projects (now these are part

MLP)

TIP S&T Infrastructure/ Technical Infrastructure Project
(now these are part of Overheads or Other Lab.
Projects)

- SSP Sponsored Projects
- CNP Consultancy Projects
- GAP Grant-in-Aid Projects
- CLP Collaborative Projects

Definition of Categories of Projects

Group I : In-house Projects

Inter-laboratory Projects (ILP):

These are the projects where more than one laboratory are participating with clearly identified objectives, targets with definite time-frame for each of the laboratories and to be coordinated by CSIR

Mission Mode Project (MMP)

National Missions and Mission Mode Projects are classified as MMP. These projects need to have clear objectives and well defined targets. The results of the projects should be capable of applications on large scale, preferably leading to operationalization and commercialization. The time scale for various technological targets should be within a Plan period, in the present case, within the 8th Plan period.

Major Laboratory Projects (MLPs):

The criteria for classifying projects under this category will be the level of investment which could be (1) commitments to international agencies/externally aided projects e.g. UNDP, ILTP, Indo-French, Indo-German, Indo-Netherlands, U.S.Aid etc. (2) commitments to national agencies, socio-economic departments through Memorandum of Understanding (MOUs) etc. e.g. DBT, DST, DNES, DOE, DOEF, DRD, Ministries etc. (3) inhouse projects needing higher investment; the range of value of investment may vary from laboratory to laboratory at the discretion of the laboratory management. It is expected the number of these programmes in the laboratory will be selective and limited.

World Bank Projects (WBPs):

Those projects already approved by the World Bank either as 'Grant' or as World Bank 'Loan'.

Other Laboratory Projects (OLPs):

The projects not covered under any of the categories will be classified as 'OLPs'.

Group - II:

Sponsored Projects (SSP):

Projects wholly funded by the client having specific R&D objectives, and well defined expected project output/results, generally culminating in generation of intellectual property. Exception to full funding by sponsor can be made, with the approval of the Competent Authority, for specific nationally relevant projects related to Defence, Social Welfare and the like. Sponsors sharing the project funding and research results.

Consultancy Projects: (CNP)

Consultancy services shall comprise scientific, technical, engineering or other professional advice/assistance based on available knowledge/ expertise of the laboratory. Consultancy shall not normally envisage generation of intellectual property and/ or substantial experimental work.

Consultancy services shall be:

- a) in an area of expertise of the laboratory preferably its thrust areas and only
- b) on institutional basis.

Grant-in-aid Projects: (GAP)

Projects involving grant by way of financial inputs, either in full or in part, assistance in kind e.g. equipment, training etc. to supplement laboratory's efforts in ongoing or new R&D projects or for creating new capabilities/ facilities. Generally the laboratory seeks new requests for grant-in-aid support/ funding from government departments/ agencies or international bodies. Thus grant-in-aid projects are normally for supporting basic or exploratory research, or for maintaining large/nationally important R&D groups, or testing and infrastructural facilities.

Collaborative Projects (CLP):

Projects partially funded by the client, and supplemented by provision of inputs such as expert manpower, production/fabrication of product in bulk for testing/ trials, infrastructural facilities etc. Collaborative projects could be for upscaling/proving of laboratory level knowhow, technology development or generation of intellectual property etc. Like sponsored projects, the expected project output/ results are well defined.

Project number : 9999

The first two '99' to be used for the main project
The next two '99' to be used for the sub-projects
Example: Super Conductivity is the main project having 4 sub-projects in a particular laboratory. Assuming a code for the main project to be 0100 the codes for sub-projects will be;
0101; 0102; 0103; 0104

Codes for the projects under ILP and MMP will be assigned by CSIR.

Lab Code: 99

Each laboratory has been assigned a specific code.
The codes are given in the **Annexure-5.1.**

* **Project Title:**

* **R&D Area:** (Most appropriate code from Annexure-5.2)

* **Internal ID. NO. (Lab. Level):**

Each laboratory is currently following some system of project numbers. This code will provide the link between the proposed system and the one already existing in each laboratory.

* **Objectives**

* **Keywords**

* **Nature**

1. Inhouse
2. Sponsored
3. Consultancy
4. Grant-in-aid
5. Foreign-aided
6. S&T Infrastructure

B. INPUTS

* **Manpower Requirement/Deployment**

Existing Project Team: Employee Code; Employee Name; Designation;
% of Involvement.
Additional requirements: Designation; Number; Area of Specialization

* **Total Cost (Rs. Lakh)**

(Original Cost;
Revised cost)
(Reference Document)

* CSIR Funding

(SE-> Sanctioned Estimates; RE-> Revised Estimates;
BE-> Budget Estimates)

Total commitment

Amount Spent till last year

Salaries & Allowances

Contingencies

Maintenance

Chemicals & Consumables

Works/ Services

Equipment

Other Capital

Amount Current year

Salaries & Allowances

Contingencies

Maintenance

Chemicals & Consumables

Works/ Services

Equipment

Other Capital

(Amount spent and SE will be available from the IMPACT-
Finance system)

Amount RE Current year

Salaries & Allowances

Contingencies

Maintenance

Chemicals & Consumables

Works/ Services

Equipment

Other Capital

C. OUTPUTS

- * Significant Achievements: (Text; Technical Details)
- * Expected outputs (Quantify Wherever possible/applicable)
(Multiple entries; Most likely outputs will be ranked

01)

Rank

(99)

- 01 New Technique
- 02 Improved Techniques
- 03 New Product
- 04 Improved product
- 05 New Process
- 06 Improved process
- 07 Technology package
- 08 Technology end to end total system package
- 09 Demonstration
- 10 Training programmes
- 11 Capability development in emerging areas
- 12 Publication in (reputed) journals
- 13 Technical reports
- 14 Monographs
- 15 Data generation
- 16 Support to R&D programmes of the laboratory
- 17 Support to national and Statutory requirements, certification etc.
- 18 Specialized Information systems/databases
- 19 Any other (specify)

D. MANAGEMENT/ POLICY ASPECTS

Classification Continuing/ New : C/N

Any project started in the earlier five year plan and continuing in the new current five year plan is to be classified as "continuing"; and any project taken up during the current five year plan is to be classified as 'New'.

*** Justification Code XX**

The Justification code is expected to help the decision making in terms of continuation of the existing project; termination or abandonment of the existing project; keeping the project in abeyance; taking up of the new project proposal; and rejecting the new project proposal as per the policies prevalent at that point of time.

01. Part of National Programmes/Missions.
02. Part of the plans/programmes of the Economic sectors identified by the Planning Commission.
03. Part of the Identified Thrust area of the Laboratory.
04. Definite user identification ensured; Market exists.
05. Scope for assistance from International agencies.
06. Scope for Loan from the World bank.
07. Scope for Grant from the World Bank.
08. Project formulated through MOU's with other Departments such as DBT, DOD, DST, DRDO, DOE, DOE&F, DNES, Ministry of Health, ICMR, ICAR, Universities, etc.
09. Statutory requirements (e.g. Testing and analysis, Standards, Surveys etc.) ; these are the mandate of the concerned laboratory.
10. Part of existing approved externally aided project
11. Routine data generation and analysis forming the bulk of the inputs to other major projects.

12. Service facilities for which some other industry agency pays.
13. Partially or fully sponsored and the project can be terminated if the sponsorship is withdrawn.
14. The project has the thrust on EBR generation.
15. Important leads have been observed and if continued the probability of the project yielding results shortly is very high.
16. The achieving the terminal objectives of the project is round the corner (i.e. most probably during the current financial year)
17. Basic work that requires to be done and this lab is the only one of its kind in the country where it could be done.
18. Built around an eminent scientist - Prestige of the Laboratory- Utilization of existing specialized expertise
19. Curiosity research in which the investment from CSIR is negligible.
20. Off shoot of an existing project.

* **Justification (Description)**

The description part of the justification will provide mainly the State of art technical details relevant to the project in terms of R & D in both the national and international scene, progress of R&D in the institute and the need for continuation of R&D or taking up of the new project on the basis of S&T information.

The justification code in conjunction with the technical justification will help the decision making in terms of matching the policy guidelines with the S&T requirements.

* **Priority :** Ranking will be done by RC.
High: A1, A2,, AN
Medium: B1, B2,, BN
Low : C1, C2,, CN

* **Duration/ time schedule**

- a) Planned date of start
- b) Actual date of start
- c) Planned date of completion
- d) Revised date of completion
- e) Actual date of completion/Abandoned (Termination)/Kept in Abeyance
- f) Reasons for termination/ kept in abeyance (If any) applicable

* **Orientation:**

- * Non Oriented Basic (Fundamental) Research
- * Oriented Basic (Fundamental) Research
- * Applied Research
- * Scientific or technological service activity
- * Experimental Development
- * Surveys & Policy Studies

* **Emphasis**

Emphasis Area Code - X999 (Suitable code from Annexure-5.3)

(Multiple entries for the Parameters given below; Most likely will be ranked 01)

PARAMETER

X XX Y/N RANK

a) **Industry Economy Oriented**

* **Technology Development**

- * Product (New)
- * Process (New)
- * Turnkey
- * Pilot Plant
- * Improvement of Product Efficiency
- * Improvement of Process Efficiency
- * Improvement of quality
- * Utilization of By-Product Residues

b) Societal

- * Technologies Related to
Societal Needs
Rural Sector
Weaker Sections
Women
SC/ST
Tribal Areas

c) Basic Research

- * Capability building
- * Technique development
- * To enhance frontiers of knowledge
- * Initiate work in new & emerging areas

d. Research Support Activities and Technical Services

- * Statistical & OR studies
- * Survey/ mapping of indigenous natural resources
(Geological data, Environmental data, Oceanographic data,
Metrological data, Pollution data)
- * Data generation
- * Research Support information
- * Industry support information
- * Assessment of market and market intelligence
- * Calibration

- * Standardization
- * Analytical testing
- * Certification
- * Toxicological evaluation
- * Safety Evaluation
- * Testing of drugs for health
- * Product evaluation

e) Extension & Marketing

- * Promotion and Marketing
- * Demonstration
- * Training
- * Science Popularisation
- * Communication

f) Infrastructure Modernisation/ Strengthening

- * Infrastructure Strengthening
- * Modernization
- * New facilities

* Status of the project

- a) Technical details (Text; Current progress)
- b)
 - 1) At the planning stage
 - 2) Approved
 - 3) Preparatory phase
 - 4) Continuing
 - 5) Kept in abeyance (KIA)
 - 6) Under revision/ revised
 - 7) Slowed down
 - 8) Abandoned/ Terminated
 - 9) Completed

- c. **Approved by**
 DIRECTOR
 Research Council
 Technical Advisory Board
 Advisory Board
 Governing Body
 Society
 DGSIR
 Expenditure Finance Committee

(19 (b) & (c) together with reference date will provide the meaningful information)

- * **DPR availability Y/N**
 (Detailed Project Proposal, Detailed Project Document and Detailed Project Report depending upon the proposal stage, interim stage or after the completion of the project)
 If Yes, Reference to the documents)

- * **Physical Targets or goals**

- * **Stages of work**

(as on 30th June of
 Current Year and as on
 31st march Next year)
 Eg. for 1994-95,
 30-6 -94 and 31-03-95

- 0. Literature Survey
 - i. Laboratory experimental work with a view to optimize different parameters
 - ii. Feasibility of upscaling to bench level
 - iii. Bench scale experimentation at larger scale with a view to optimize different parameters from commercialization point of view
 - iv. Feasibility of taking up pilot plant trials on the basis of techno-economic and market viability

- v. Pilot plant trials/prototypes making/ batch production
- vi. Feasibility report
- vii. User trials/ demonstrations
- viii. Commercial production by entrepreneur with technical assistance of the laboratory

* **Impact**(Quantify Wherever possible/applicable monetary or physical terms)
(Multiple entries with ranking)

1. Usage of Raw materials
 - a) Imported
 - b) Indigenous
 - c) Agricultural Product
 - d) Forest Products
2. Potential for Employment generation in
 - a) Urban area
 - b) Rural area
 - c) Both
3. Market Exists
 - a) In India
 - b) Abroad - Export earnings.
4. Potential for Import substitution/substitution of foreign collaboration.
5. Application for Industry Sector
 - a) Large
 - b) Medium
 - c) Small
 - d) Tiny
 - e) House hold/Cottage
6. Reduction of Production costs
7. Exploitation of natural resources
8. Energy Conservation/Saving of energy
9. Development of S&T capabilities in strategic areas
10. Environmentally Friendly
11. Safety
12. Health Care

13. Productivity
14. Labour Intensive Technology
15. Capital Intensive Technology

- * **Linkages (Multiple Entries)**
- a. Participating labs.
 - b. Participating organisations
 - c. Users
 - d. Other Projects (Project Number)

Nature of Linkages

1. Utilization of Results
2. Funding
3. Sharing of R&D work
4. Exchange of Scientists
5. Utilization of Facilities
6. Utilization of specialized material or techniques
7. Trials and testing
8. Material
9. Visit abroad
10. Additional staff
11. Foreign experts
12. Fellowships
13. Training

* **Users (Target Group)**

- 1(a) Government Departments/Ministries Central
- 1(b) Government agencies State
2. Public sector undertaking
3. Industry
4. International agencies
5. Universities
6. Sister Labs CSIR
7. Other Scientific agencies/Departments

* **Socio-Economic aim**

1. Exploration and assessment of the earth, seas, atmosphere or space
2. Development of agriculture, forestry, or fishing.
3. Promotion of industrial development.
4. Production, conservation and distribution of energy.
5. Development of transport and communication.
6. Development of education services.
7. Development of Health services
8. Rural/Societal development and other socio-economic services.
9. Development of SC/ST/ Tribal people
10. Protection of the environment.
 - a) General advancement of knowledge.
 - b) Defence
 - c) Other aims

E. MONITORING ASPECTS

* **Escalation in months**

* **Bottlenecks**

(Multiple entries; Most critical will be ranked 01)

a. **Technical**

- A1 Unexpected technical problems
- A2 Project redefined
- A3 Accorded lower priority and resources diverted else where
- A4 Related/ linked project behind schedule
- A5 Inadequacy of scientific/ technical expertise
- A6 Inadequacy of cooperation or indifference from collaboration/ sponsor
- A7 Redundancy
- A8 Obsolescence
- A9 Deputation or study leave of project leader
- A10 Project leader resigned or retired
- A11 Other (specify)

b. infrastructural

- B12 Inadequacy of space
- B13 In adequacy of relevant literature with documentation facilities
- B14 Non-availability of equipment
- B15 Equipment failure
- B16 Non-availability of materials/ chemicals
- B17 Inadequacy of supporting technical manpower
- B18 Inadequacy of funds
- B19 Administrative rules/ procedures
- B20 Others (Specify)

* **Yearly Milestones**

* **Quarterly Milestones for the year**

- I. End of June
- II. End of September
- III. End of December
- IV. End of March

(There will be separate module for the milestone details; For each quarter the details required are:

Milestones envisaged;

Reached or not;

If yes Highlights of Progress;

If no, reasons, bottlenecks and the details of shifting of the milestones and the related activities)

5.2.3 MANPOWER DATA BASE

Employee Id.No;

Employee Name;

Age; Date of birth;

Date of Joining;

Qualification;

Field of specialization;
Present designation and effective date;
Area of R&D;
Area of experience;
Grade;

5.2.4 EQUIPMENT/FACILITIES DATA BASE

Existing

Name of the equipment(E)/ Facility (F)
Total Cost (Rs. Lakh)
Year of Purchase
Indigenous/ Imported
Degree of utilization (i.e. utilized for which project(s), or infrastructure with %
of utilization against each project/infrastructure/activity

New

Name of the Equipment(E)/ Facility (F)
Total Cost (Rs. Lakh)
Additional requirement or replacement
Indigenous/ Imported
Required for which project(s)/ Infrastructure activity (project no. or Infra no.)
Justification for the equipment/ Facility
Whether the equipment / facility will help generate Extra-Budgetary
resources(EBR).
If so, amount expected, source and period.
Requirement current year (Rs. Lakh)
Requirement Next year (Rs. Lakh)

(This need to be repeated for the Works and Services)

5.2.5 FINANCIAL INFORMATION SYSTEM

The pay roll software(IMPRESS) has been developed by CSIR and is available with each laboratory. This will be linked with the manpower database. The data on project team and percentage of involvement of members in the project and its linkage with the payroll will help the apportioning of the manpower cost of the project.

The accounting including the project accounting is being taken care of very well in the new computerized system **IMPACT**. The project costing and budgeting will be taken care of in the project database and information system. The project information system will provide the technical details as described above.

New Computerized System- **IMPACT**

CSIR has launched New Computerized System "Integrated Management and Project Accounting (**IMPACT**)" with effect from the Financial Year 1994-95. Specific accounting heads to facilitate Project accounting have been identified. The entire accounting heads have been rationalized and uniform coding of heads of accounts has been evolved. A menu driven software in 'FOXPRO' package, has been developed by a group of people from NISTADS. This has to have an interface with the "**PROJECT DATA BASE**" to achieve the objectives of Project Accounting to its true meaning.

The account heads for various categories are:

- P(10) for ILP Projects
- P(11) for MLP Projects
- P(12) for OLP Projects
- P(13) for WBP Projects
- P(14) for MMP Projects

There is provision for further categorization from P15 to P19, if it is needed. From the planning point of view, considering the demands of various policy making higher echelons, one may have to add a few more specific categories such as externally (foreign) aided projects, S&T infrastructure need to be created to enable planning and budgeting in a realistic manner. Only those S&T infrastructure (for e.g. PME Cell, Testing labs, etc.) which need to be treated as specific cost centres would be classified here. Any specific R&D project or creation of a new facility as a part of S&T information need to be classified as OLP. The project-wise accounting will be available through linkage with the project information system.

In the beginning, cost data with regard to amount spent so far will have to be entered in the Project information system. The software has the provision to update this as and when any transaction takes place.

This linkage will facilitate project-wise "Financial Monitoring" which hitherto was never possible. The progressive expenditure vis-a-vis allocated budget will improve the efficiency of the planning process.

5.3 INTERFACE WITH OTHER SYSTEMS AT THE NATIONAL LEVEL

The various sub-systems discussed in the earlier section would enable generation of information on the various activities of the laboratories and CSIR as a whole. The planning process requires matching of these with the opportunities and threats available in the national and international levels. The guidelines for plan formulation are formulated in the Planning Commission in close coordination with the Finance ministry with regard to availability of financial resources and implementation of economic measures. Planning Commission also deals with the plan programmes of all the States as well as all the socio-economic ministries and departments. CSIR also participates in these plan discussions at the Planning Commission. There need to be proper interface with these systems for effective planning of R&D so that efforts could be maximized through collaborative and complementary R&D rather than duplicating efforts.

In the present day context with the liberalized industrial and trade policies, the marketability of R&D also plays an important role in deciding the project portfolio of different laboratories.

CSIR is having bi-lateral agreements with several countries and international agencies for undertaking R&D activities in the laboratories.

All these need to be interfaced and integrated for generating the required information which would help the planning process in CSIR. Most of these systems need to be interfaced to decide the project activities at the lab. level.

5.4 CONCLUSIONS

The integrated management and project accounting system IMPACT has been launched from 1 April 1994. One of the main problems so far has been the maintenance of project-wise accounting. Since IMPACT is expected to implement project accounting through specific accounting codes and proper methodology for voucher level checks the laboratories are expected to follow the project accounting. Project-wise accounting without project-wise allocations, budgeting and costing has no meaning. The project database and information system would cater to these needs specifically on the financial aspects. Further these are only related to the financial management linked to the projects. The physical monitoring linked with the financial monitoring is the basis of the project database and the project information system besides projectization and information generation.

Since the proposed format for project parameters are arrived at based on the past experience, the present need and also on the formats used internationally for the "Research in Progress" database, there is a general consensus among the PME heads of the laboratories that providing data in the designed format will not be difficult. In fact some of the laboratories have filled up the proforma without cost data.

These laboratory data bases need to be updated periodically, period depending upon the occurrence of any event i.e., if there is any change in any data element. The floppies will be sent to CSIR HQ. These will be merged to

have an integrated consolidated project information system at CSIR. From the CSIR HQ. system one will be able to generate need based information based on queries on any single data element or combination of data elements. Various reports will also be generated from this information system.

In order to have a meaningful information one has to consider time as one major parameter, to facilitate maintenance of historic data as well as to maintain continuity of data.

Ideally, at a later stage, when the distributed systems, viz the systems at various laboratories, stabilize, it will be worthwhile to connect them through networks. Perhaps INSDOC could be associated to take up this activity of networking the laboratory database/ information system with the central system at the CSIR HQ. through their 'SIRNET'.

The implementation of the system requires policy guidelines in terms of making projectization mandatory at the laboratory level. The micro-level information at the laboratory level could always be integrated to generate selective or macro information at CSIR HQ. level. The importance of detailed project profile and the project costing data have to be impressed upon the bench level scientists.

The advantages of the proposed system and the scope for future work will be discussed in the final Chapter i.e. Chapter-6

Annexure- 5.1: LAB-CODES

LAB CODE	LAB NAME
----------	----------

01	CBRI, ROORKEE
02	CBT, DELHI
03	CCMB, HYDERABAD
04	CDRI, LUCKNOW
05	CECRI, KARAIKUDI
06	CEERI, PILANI
07	CFRI, DHANBAD
08	CFTRI, MYSORE
09	CGCRI, CALCUTTA
10	CIMAP, LUCKNOW
11	CLRI, MADRAS
12	CMERI, DURGAPUR
13	CMRS, DHANBAD
14	CRRI, NEW DELHI
15	CSIO, CHANDIGARH
16.	CSMCRI, BHAVNAGAR
17	IICB, CALCUTTA
18	IICT, HYDERABAD
19	IIP, DEHRADUN
20	IMTECH, CHANDIGARH
21	INSDOC, NEW DELHI
22	ITRC, LUCKNOW
23	MADRAS COMPLEX
24	NAL, BANGALORE
25	NBRI, LUCKNOW

LAB CODE LAB NAME

26 NCL, PUNE
27 NEERI, NAGPUR
28 NGRI, HYDERABAD
29 NIO, GOA
30 NISTADS, NEW DELHI
31 NML, JAMSHEDPUR
32 NPL, NEW DELHI
33 PALAMPUR COMPLEX
34 PID, NEW DELHI
35 RRL, BHOPAL
36 RRL, BHUBANESWAR
37 RRL, JAMMU
38 RRL, JORHAT
39 RRL, THIRUVENENTHAPURAM
40 SERC, GHAZIABAD
41 SERC, MADRAS

ANNEXURE 5.2

R & D AREAS

0100 PHYSICS AND STANDARDS

- 0101 STANDARDS-PRIMARY STANDARDS
- 0102 RADIO AND ATMOSPHERIC PHYSICS
- 0103 CRYOGENICS-LOW TEMPERATURE PHYSICS
- 0104 HIGH PRESSURE PHYSICS-MATERIAL SYNTHESIS
- 0105 OPTICS
- 0106 LASER SCIENCE AND TECHNOLOGY
- 0107 PHYSICS OF SOLAR ENERGY CONVERSION -
SOLAR THERMAL, PHOTOVOLTAICS

0200 ELECTRONICS AND ELECTRONIC MATERIALS

- 0201 MATERIALS ELECTRONIC & ELECTRICAL DEVICES
- 0202 PASSIVE COMPONENTS
- 0203 ELECTRON TUBES
- 0204 SEMICONDUCTOR DEVICES DISCRETE
- 0205 HYBRID DEVICES
- 0206 INTEGRATED DEVICES
- 0207 POWER ELECTRONICS
- 0208 ELECTRONIC PROCESS CONTROL SYSTEMS
- 0209 MINING ELECTRONICS
- 0210 COMMUNICATION ELECTRONICS

0300 INSTRUMENTATION

- 0301 INDUSTRIAL INSTRUMENTATION
(Optical and Ion beam based)
- 0302 INSTRUMENTATION - MEDICAL
- 0303 INSTRUMENTATION - ENVIRONMENTAL
- 0304 INSTRUMENTATION - AGRICULTURAL
- 0305 INSTRUMENTATION - SPACE
- 0306 INSTRUMENTATION - SPECIAL DEFENCE NEED

- 0307 INSTRUMENTATION - GEOPHYSICS
- 0308 INSTRUMENTATION - MARINE
- 0309 INSTRUMENTATION - NUCLEAR ENERGY
- 0310 INSTRUMENTATION - LSI, VLSI INDUSTRY
(Micro electronics)

0400 ENERGY

(Non-conventional: Solar Biomass, Wind, Geothermal)

- 0401 SOLAR THERMAL*
- 0402 PHOTOVOLTAICS*
- 0403 BIOMASS
- 0404 BIOGAS
- 0405 WIND
- 0406 ELECTROCHEMICAL-(BATTERIES, FUEL CELLS etc.)
- 0407 OCEAN** - Tidal, wave, OTEC
- 0408 HYDROGEN ENERGY

* Cross reference to Physics,

** Cross reference to Ocean
science and technology

0500 GEOPHYSICS

- 0501 LITHOSPHERIC (Geophysics)
- 0502 EXPLORATION (Geophysics)
- 0503 ENVIRONMENT (Geophysics)
- 0504 GEOHYDROLOGY - GROUND WATER
- 0505 GEOCHRONOLOGY & GEOCHEMISTRY
- 0506 GEOTHERMICS - GEOTHERMAL ENERGY
(Geophysical Investigations)
- 0507 INTERNAL STRUCTURE OF EARTH
- 0508 THEORITICAL GEOPHYSICS INCLUDING MODELLING

0600 OCEAN SCIENCE AND TECHNOLOGY

- 0601 ENVIRONMENT - POLLUTION AND THEIR CONTROL (OCEAN

- 0602 PHYSICAL OCEANOGRAPHY
- 0603 BIOLOGICAL OCEANOGRAPHY
- 0604 CHEMICAL OCEANOGRAPHY
- 0605 OCEAN ENGINEERING
- 0606 COASTAL STUDIES
- 0607 GEOLOGICAL OCEANOGRAPHY

0700 CHEMICALS (Organic/Inorganic, Petrochemicals)

- 0701 AGROCHEMICALS AND PESTICIDES
- 0702 ORGANIC CHEMICALS AND INTERMEDIATES
- 0703 INORGANIC CHEMICALS
- 0704 FERTILIZERS
- 0705 INDUSTRIAL AND PETROCHEMICALS
- 0706 SPECIALITY CHEMICALS
- 0707 STARCH/CARBOHYDRATE CHEMISTRY
- 0708 MARINE CHEMICALS

0800 PETROLEUM

- 0801 EXPLORATION AND EXPLOITATION OF PETROLEUM PRODUCTS
- 0802 RHEOLOGY AND TRANSPORTATION CHEMICALS
- 0803 PROCESSING AND APPLICATIONS RESEARCH-PETROLEUM
- 0804 OIL FIELD CHEMICALS
- 0805 SINGLE CELL PROTEINS
- 0806 CONSERVATION OF PETROLEUM PRODUCTS
- 0807 TRIBOLOGICAL STUDIES - Related to Petroleum

0900 POLYMER SCIENCE AND ENGINEERING

- 0901 MATERIALS DEVELOPMENT (Polymers)
- 0902 POLYMER REACTION ENGINEERING
- 0903 PHEOLOGY, PROCESS AND APPLICATIONS RESEARCH

1000 NATURAL PRODUCTS CHEMISTRY

1001 PHYTOCHEMISTRY/CHEMISTRY OF NATURAL PRODUCTS

1002 PROCESS CHEMISTRY FOR ESSENTIAL OILS
AND USEFUL INGREDIENTS

1003 SCREENING OF NATURAL PRODUCTS FOR
APPLICATIONS OTHER THAN DRUGS

1100 CATALYSIS

1200 COAL

1201 RESOURCES QUALITY ASSESSMENT OF COAL

1202 COAL PREPARATION

1203 PIPELINE TRANSPORT OF COAL

1204 COAL CARBONIZATION (HTC & LTC)

1205 COAL GASIFICATION

1206 COAL CONVERSION TO LIQUID FUELS & CHEMICALS

1207 COAL COMBUSTION

1208 COAL FOR IRON & STEEL MAKING

1209 COAL/TAR CHEMICALS

1300 OILS AND FATS

1400 ELECTROCHEMISTRY

1500 CORROSION

1600 POST HARVEST TECHNOLOGY

1601 APPLIED NUTRITION

1602 PROTEIN TECHNOLOGY

1603 RICE AND PULSE TECHNOLOGY

1604 SENSORY EVALUATION

1605 MEAT, FISH & POULTRY TECHNOLOGY

1606 PLANTATION PRODUCTS

- 1607 FLOUR MILLING AND BAKING TECHNOLOGY
- 1608 PACKAGING TECHNOLOGY
- 1609 LIPIDS TECHNOLOGY
- 1610 FRUITS & VEGETABLE TECHNOLOGY
- 1611 INFESTATION CONTROL & STORAGE
- 1612 PROCESS DEVELOPMENT (P.H. TECHNOLOGY)
- 1613 FOOD SCIENCE

1700 LEATHER

- 1701 LEATHER GOODS
- 1702 FOOT WEAR
- 1703 FINISHED LEATHERS
- 1704 BYE PRODUCTS (LEATHER)
- 1705 FURS/SUEDES
- 1706 TANNING/TANNING AGENTS

1800 NATURAL PRODUCTS (Cultivation and processing etc.)

- 1801 MEDICINAL AND AROMATIC PLANTS
(Also Indicate Sub-area of activities like Agronomy,
Plant Breeding, Pathology and Physiology)
- 1802 ECONOMIC PLANTS
(Also Indicate Sub-area of activities like Agronomy,
Plant Breeding, Pathology and Physiology)
- 1803 ORNAMENTAL PLANTS
(Also Indicate Sub-area of activities like Agronomy,
Plant Breeding, Pathology and Physiology)

1804 ALGAE

- 1805 BOTANY AND PHARMACOGNOSY INCLUDING ECONOMIC
SURVEY
- 1806 EXPLOITATION OF USAR SOIL PHYTO CHEMISTRY

1900 INDUSTRIAL TOXICOLOGY

- 1901 DYE TOXICITY

- 1902 METAL TOXICITY
- 1903 INDUSTRIAL AND ENVIRONMENTAL CARCINOGENESIS*
- 1904 PESTICIDES AND AGROCHEMICALS TOXICOLOGY
- 1905 TOXICITY OF PETROCHEMICALS
- 1906 TOXICITY OF PLASTICS & POLYMERS
- 1907 INDUSTRIAL DUSTS AND CHEMICALS*
- 1908 ECOTOXICOLOGY*
- 1909 EPIDEMIOLOGY AND ENVIRONMENTAL MONITORING*
- 1910 PHYTO TOXICOLOGY
- 1911 INHALATION TOXICOLOGY
- 1912 COSMETICS TOXICOLOGY
- 1913 PHOTOTOXICOLOGY
- 1914 NEURO TOXICOLOGY
- 1915 RADIATION BIOLOGY
- 1916 OCCUPATIONAL HEALTH STUDIES

- 2000 APPLIED BIOLOGY
(IMMUNOLOGY AND DIAGNOSTICS)

- 2001 REPRODUCTIVE BIOLOGY
- 2002 MARINE BIOLOGY
- 2003 POLAR BIOLOGY
- 2004 BIOLOGICAL CONTROL OF INSECTS
- 2005 BIOCHEMICAL STUDIES ON MALARIA, FILARIASIS ETC.
- 2006 DIAGNOSTICS/DIAGNOSTIC KITS
- 2007 NEUROBIOLOGY
- 2008 INBORN ERRORS IN METABOLISM

- 2100 **BIO-TECHNOLOGY**
- 2101 GENE CLONING/ GENETIC ENGINEERING
- 2102 PLANT TISSUE CULTURE
- 2103 ANIMAL TISSUE CULTURE
- 2104 FERMENTATION TECHNOLOGY
- 2105 ENZYME ENGINEERING
- 2106 IMMUNOLOGY/MEMBRANE BIOLOGY

2107 HEALTH

2108 ENZYMES FOR GENETIC ENGINEERING

2109 VACCINES

2110 MONOCLONAL ANTIBODIES

2111 DRUG DELIVERY SYSTEM

2200 CELLULAR AND MOLECULAR BIOLOGY

2300 DRUGS AND PHARMACEUTICALS

2301 TECHNOLOGY DEVELOPMENT FOR KNOWN AND DRUG
INTERMEDIATES

2302 NEW DRUG FOR ANTIFERTILITY

2303 NEW DRUG FOR MALARIA

2304 NEW DRUG FOR AMOEBIASIS

2305 NEW DRUG FOR VIRAL INFECTION

2306 NEW DRUG FOR FILARIASIS AND OTHER HELMINTHIC
DISEASES

2307 NEW DRUG FOR LEPROSY

2308 NEW DRUG FOR CANCER

2309 NEW DRUG FOR OTHER DISEASES

2310 ANTIGENS

2311 SCREENING FOR DRUGS FROM NATURAL SOURCES
INCLUDING OCEAN

2400 BUILDING, HOUSING, CIVIL ENGINEERING,
ROAD AND STRUCTURAL ENGINEERING

2401 CIVIL ENGINEERING

2402 STRUCTURAL ENGINEERING

2403 HOUSING AND BUILDING

2404 ROADS AND PAVEMENTS

2405 BUILDING MATERIALS

2406 BRIDGES AND UNDERGROUND STRUCTURES

2500 ELECTRICAL ENGINEERING

2600 MECHANICAL ENGINEERING & MACHINERY DEVELOPMENT

2601 MACHINERY DEVELOPMENT/EQUIPMENT DEVELOPMENT

(Food, Agriculture, Leather, Road, Mines, Industry)

2602 MECHANICAL ENGINEERING (Design and development)

2603 TRIBOLOGY

2604 POWER PLANTS

2605 DYNAMICS AND VIBRATIONS

2606 HEAT TREATMENT AND CONTROL

2607 AUTOMATION AND CONTROL

2700 AERONAUTICS

2701 AERODYNAMICS AND FLUID MECHANICS

2702 PROPULSION

2703 SYSTEMS ENGINEERING

2704 STRUCTURES AND MATERIALS

2800 METALLURGY

2801 ORE BENEFICIATION

2802 IRON AND STEEL MAKING

2803 ALLOY/MATERIAL DEVELOPMENT

2804 SPECIAL MATERIALS

2805 POWDER METALLURGY

2806 FERRO ALLOYS

2807 CREEP

2808 FOUNDRY TECHNOLOGY

2809 BEHAVIOUR OF MATERIALS

2810 METAL FAILURE ANALYSIS

2900 MINING

2901 GEOMECHANICS AND MINING METHODS

2902 MINE ENVIRONMENT SAFETY AND HEALTH

3000 ENVIRONMENTAL TECHNOLOGY

3001 AIR POLLUTION

3002 WATER AND WASTE WATER POLLUTION

3003 SOLID WASTE

3004 INDUSTRIAL POLLUTION

3005 ENVIRONMENTAL MICROBIOLOGY

3006 MINING ENVIRONMENT

3007 RECLAMATION AND REUSE OF WASTE PRODUCTS

3100 GLASS AND CERAMICS

3101 GLASS

3102 CERAMICS

3103 REFRACTORIES FOR METALLURGICAL PURPOSES

3104 REFRACTORIES FOR OTHER INDUSTRIAL USES

3105 COMPOSITE MATERIALS

3106 FIBRE OPTICS

3107 LOW COST BUILDING MATERIALS

3200 INFORMATION SCIENCE

3201 LIBRARY AND DOCUMENTATION

3202 PUBLICATION, PRINTING, INFORMATION SCIENCE AND
TRANSLATION

3203 PME, TECHNO ECONOMIC AND MARKET SURVEYS, FEASIBILITY
STUDIES

3204 INDUSTRIALISATION, EXTENSION SERVICES & PUBLICITY

3205 MUSEUM & EXHIBITION

3206 RESEARCH SCIENCE POLICY & PLANNING STUDIES
(Including Technological forecasting, Information policy
Regional studies)

3207 MANAGEMENT INFORMATION SYSTEM

3208 EDUCATION AND TRAINING

3300 COMPUTER AIDED STUDIES

(Annexure 5.2 Continued)

3400 RURAL DEVELOPMENT

3401 DEVELOPMENT OF TECHNOLOGY APPROPRIATE FOR RURAL
AREAS

3402 EXTENSION OF DEVELOPED TECHNOLOGY

3403 TECHNOLOGY PROFILES, TECHNO ECONOMIC FEASIBILITY
STUDIES

3404 IMPLEMENTATION OF PILOT PROJECTS

3405 SURVEY

ANNEXURE-5.3 EMPHASIS - AREA

INDUSTRY AND ECONOMY ORIENTED PROGRAMMES

	I010
CHEMICALS	I011
Agro Chemicals/Pesticides	I012
Catalysis	I013
Chemicals and Intermediates	I014
Electrochemicals	I020
DRUG DIAGNOSTICS AND PHARMACEUTICALS	I030
APPLIED BIOLOGY & BIOTECHNOLOGY	I040
LEATHER	I050
POLYMER SCIENCE & TECHNOLOGY	I060
ELECTRONICS & INSTRUMENTATION	I070
ENERGY	I071
Energy - Petroleum Refining and processing Petrochemicals and petroleum Products	I072
Energy - Coal (Mining, Beneficiation, Transportation, Gasification and Utilisation)	I073
Energy - Conservation and Efficient system	I080
FOOD PROCESSING AND POST HARVEST TECHNOLOGY	I090
CONSTRUCTION TECHNOLOGIES	I091
Building Materials	I092
Structural Engineering	I093
Corrosion Protection	I100
TRANSPORTATION	I101
Transportation Roads	I102
Transportation Air	I110
MINING, MINERAL EXTRACTION & PROCESSING, METALLURGY	

GLASS & CERAMICS	I120
ENGINEERING INDUSTRY	I130
ENVIRONMENT & SAFETY	I140
Environmental Pollution Control Technology	I141
Environmental Impact Assessment	I142
Risk & Hazard Studies	I143
Industrial Toxicology	I144
INFORMATION TECHNOLOGY	I150
SOCIETAL PROGRAMMES	S000
SAFE DRINKING WATER	S010
HEALTH CARE	S020
FOOD AND NUTRITION	S030
NATURAL PLANT PRODUCTS	S040
OILS AND FATS	S050
HOUSING TECHNIQUES	S060
APPROPRIATE TECHNOLOGIES FOR RURAL DEVELOPMENT	S070
NON-CONVENTIONAL ENERGY SOURCES	S080
NATURAL HAZARDS MITIGATION	S090
SCIENCE COMMUNICATION	S100
SCIENCE POLICY STUDIES	S110
BASIC RESEARCH PROGRAMMES	B000
MODERN BIOLOGY	B010
CHEMISTRY	B020
Organic Synthesis	B021
Natural Product Chemistry	B022
Electrochemistry	B023
EARTH SCIENCES	B030
Geophysics	B031
Ocean Sciences	B032

ATMOSPHERIC AND SPACE PHYSICS	B040
MATERIAL SCIENCES	B050
COMPUTER AIDED STUDIES, EXPERT SYSTEMS AND PARALLEL COMPUTATION	B060
AERONAUTICS	B070
RESEARCH SUPPORT ACTIVITIES AND TECHNICAL SERVICES	R000
SURVEYS	R010
Coal	R011
Mapping of EEZ	R012
Polymetallic Nodules Programme	R013
DATA BASES	R020
CALIBRATION, STANDARDISATION AND QUALITY SYSTEM AND ANALYTICAL TESTING	R030
Calibration, Standardization and Quality System	R031
Analytical Testing	R032
PRODUCT EVALUATION	R040

CHAPTER 6: SUMMARY AND CONCLUSIONS

6.1 INTRODUCTION

If one looks back, it is evident that for the last over two decades CSIR has been attempting to establish an Information System for planning and monitoring of R&D. The main problem had been the generation of information at the laboratory level and timely transmission of the same to the CSIR. CSIR was gradually establishing the information system through the methodology of formulating Annual Plan documents and the subsequent analysis of the data and preparation of a detailed profile for each laboratory. The main problem has been the non existence of the feed back system and continuous flow of information and also the non availability of the data on project costs. At a time when it was necessary to make a quantum jump to dynamic information system from the static information gathering in the form of annual plan documents, the Planning process in CSIR had a setback with the discontinuance of the Annual Plan data collection. In other words from a position of take off, the system was forced to go dormant and start all over again.

The principle problem has been, in reality the project formulation at the laboratory level. Perhaps, most of the laboratories are working on the problem solving mode rather than the project mode as for as the in-house projects are concerned. One of the reasons has been the stress on the generation of more extra-budgetary resources without any specific guidelines on how to go about that. The laboratories are having freedom to choose their project portfolios,; it could be sponsored or it could be consultancy assignments or of any other categories.

From the decision as well as information generation point of view, appreciation of the creation and maintenance of project data base maximizing all possible data elements related to a project is the need of the hour.

After a careful and detailed analysis of the data collection process followed by CSIR over the last two decades, the various analysis made to help the decision making in CSIR HQ. the gaps in information and the problems faced in meeting the information requirements at CSIR and also the questionnaire followed at the

International level for the data base on research in progress", a model information system has been proposed and outlined in Chapter-5. This model information system is amenable to computerization having proper interfaces with various sub-systems/databases.

This system will be effective if implemented properly. The databases need to be maintained and updated at the laboratory level and the updated information need be passed on to the CSIR HQ. till such time the laboratory databases are linked through networks.

So far plan formulation involved collection of Plan documents every year with massive information on all projects. Consolidation of information received from the laboratories and forming the overall CSIR Plan involved a huge exercise. It needed plenty of time but in reality the time available used to be very short and many times one had to rely upon the past data.

CSIR prepares the plan areawise and not laboratory wise. The collection and compilation of area-wise information from the laboratory plan documents was never an easy task within the limited time. The maintenance and dynamic updating of computerized information system will help generation of area-wise plan automatically with authentic data. This would easily integrate all the laboratory information. This would also help projectwise projection of physical as well as financial targets within any area. One can also generate areawise physical and financial information. Projectwise financial information will help better resource management and justify demands. It enlarges the scope for getting more funds from Planning Commission as well as from other socio economic ministries. Emphasis has also been made on project budgeting and costing.

The availability of Projectwise information may facilitate projectwise resource allocation. The resource allocation models are presented in the next section.

6.2 RESOURCE ALLOCATION MODEL

If one looks critically into the data on the projections, allocations and utilization it will be clear that there has been no uniform system of resource management. In most of the cases, the allocations had been almost half of the projections made.

Under the present policies, the existing manpower need to be provided with salaries, some minimum expenditure on contingencies like electricity, telephones, stationery etc and chemicals and apparatus to keep up the minimum activity level. Irrespective of whether there is any R&D or not some base line expenditure will be there.

6.2.1 Present System of Allocation

1. Minimum Requirements:
 - Salaries
 - Contingencies
 - Maintenance
 - Books/Journals - Committed subscription
 - Chemicals-day to day routine requirements
2. Specific need based requirement
 - Equipments/ Books, Journals, Special Chemicals
 - Not specifically related to any project.
3. Other items like
 - Furniture, Vehicles, Office equipment (Fax, Xerox, Electronic Typewriter etc), Models & Exhibits, Workshop Machinery etc.
4. Allocation for special projects viz - Global change, Antarctic research, Surface Engineering, Photochemistry-
Again generally not linked with specific tasks but based on the perceptions of project coordinators.

6.2.2 Proposed System

There could be three situations

- A) Where all the activities are projectized and the allocations are made on project- wise requirements.
i.e. Projectization of all activities.
Allocation projectwise

Total requirements = SUM of (Project Budget)

Projects : P1, P2,, PN
Resource

Requirements: PR1, PR2,, PRN

From CSIR : PR1C, PR2C,, PRNC

From Lab.
reserves : PR1LR, PR2LR,, PRNLR

From EBR : PR1E, PR2E,, PRNE

Requirements for

P1 : PR1C + PR1LR + PR1E

P2 : PR2C + PR2LR + PR2E and so on

Total budget requirements PR :

$\text{Sum}(\text{PR}_{iC} + \text{PR}_{iLR} + \text{PR}_{iE})$ Where i ranges from 1 to N

For any given project

PR_{iC} may be nil; or

PR_{iLR} may be nil; or

both may be nil; or

PR_{iE} may be nil.

Because of the Manpower policies, one has to ensure that the salary requirements for the existing staff are met without any problem .

- B) In the event of all the activities not being projectized, one may have to extrapolate the requirements of overheads or supporting activities. The trend data on the ratio of R&D vs Infrastructure (supporting activities) would help the extrapolation.

$$\text{Total requirements} = \text{Requirements for Projects} + \text{Overheads based on past trends}$$

- C) **Allocations based on baseline expenditure and for a few Specific projects.**

i) MR - Minimum requirements/base line expenditure.
(Recurring expenditure)

ii) P - Requirements of few selected projects *
| New manpower - if required.
| Equipment
| Others

* Allocation to be done for total project costs for these projects

$$P_i = \text{Spl. allocation} + \text{Part of MR (say MR}_i)$$

iii) Thus, Total = MR + P_i - MR_i + Bonus (Depending upon the Performance)

6.3 GENERAL OBSERVATIONS AND CONCLUSIONS

* CSIR has been changing the classification quite often depending upon the need of the hour. The emphasis was more in getting information from the laboratories rather than generating information at the CSIR Headquarters from the laboratory data base. Maintenance of databases at the laboratory level catering to the needs of CSIR HQ. at different points of time for different purposes was perhaps never considered necessary from the headquarters point of view. This has resulted in dependency on the laboratories almost all the time for any information. This in turn has resulted in a situation wherein the laboratories started creating information as and when asked for rather than generating information from the existing data bases, or maintenance of databases. Most of the time CSIR HQ. felt that there was inconsistency in various information provided at different points of time.

Because of the change in classification, the continuity of data was also lost. For eg. till 1981, rural development projects were given a code '2' for computer analysis. This classification was changed and CSIR decided to drop Rural Development Projects (RDP) and instead introduced 'Multi Agency Projects' (MAP). These projects were conceptually very much different from RDPs. However the same computer code '2' was retained for MAPs. This created some sort confusion both in continuation of data and information generation.

* In the proposed system care has been taken to allocate unique codes for project numbers, employee ID, and various other classifications. The basic categorization will remain unchanged. One may add additional categories. If a project is reclassified from MLP or OLP to ILP, MMP the original project could be treated as closed and the new project could be considered with new number as the output of the closed project with provisions for **Parent-Child relationships**.

CSIR has been allocating resources for the purchase of equipment during the last two months (viz Feb. & March) of every financial year. Infact way back in 1980, the then DGSIR desired to prepare a priority list of equipment and to approve them at the beginning of the year so that allocations can be made as and when the resources were available at the CSIR Headquarters. However, this has not been followed mainly because the laboratories have been changing their demands quite frequently. The proposals are never evaluated in totality taking into account the total projects both inhouse sponsored R&D and foreign aided. Irrespective of the percentage of external projects both national and international, it has been the practice for the laboratories to expect 100% or maximum requirements from CSIR. The proposed system has provisions for getting complete information. However, there need to be a policy guideline for evolving criteria for resource allocations from the Government Grant.

* The Research Councils of the laboratories are expected to evaluate the projects and recommend their continuation, termination with regard to continuing projects and taking up or not going ahead with regards to the new proposals. Besides providing directions to R&D, RCs are expected to approve the Plan documents of the laboratories including the resource requirements. In general, there have been situations when there has been no one to one correlation between the laboratory plan documents submitted to CSIR and the plan proposals discussed in the RCs. The analyses of RC agenda items for a few laboratories over the years even indicate that the entire activities of the laboratories are not discussed in details.

If the proposed information system is implemented the project details maintained in the laboratories could be made accessible to the RC and these could be updated with the RC's decisions. This updated version will be available to the CSIR HQ. adding further to the authenticity of data as well as to the planning process.

In some laboratories, the S&T information of the project proposals is critically discussed and project proposals are formulated/finalized through these discussing in Divisional expert Committees. Then these are discussed in the RCs. This ensures validity of the S&T information and also will provide proper direction to R&D. The project information generated through this process will be most dependable. This practice is commended for being followed by in other laboratories.

* In R&D one should not expect support on past trends. The policy making and decision making authorities have several times categorically assured support to result oriented projects . This again demands projectization of R&D activities and the proposed system takes care of such requirements. This would help formulate really a few major coordinated network programmes integrating the efforts of expertise and facilities available in all the laboratories. The laboratories could complement the other rather than duplicate and compete with each other. Infact for network programmes, one may need to coordinate and cooperate with other agencies as well.

* The bench level scientists need to be trained on project costing. The general guidelines for project costing need to be followed by all the laboratories. The implementation would involve creation of data base to start with and then the work load will only be on updating wherevver there is any change. The laboratories continue to enjoy the freedom and flexibility in choosing their project portfolio and in project management.

The highlights of advantages of the proposed model information system are presented in Table: 6.1

Table 6.1 HIGHLIGHTS OF PROPOSED SYSTEM

Activities	Present System	Proposed System
Plan Formulation	<ul style="list-style-type: none"> * Static - annual plan document * Time consuming * Non-availability of authentic and dependable information * Perception of few people at the CSIR HQ. * Areawise/ Projectwise Information vague * No linkage with other systems viz. Finance, Manpower, Equipment * Project formulation/ linkage with RC's decisions 	<ul style="list-style-type: none"> * Dynamic - Continuous updating - Periodic or after any event * Envisaged computerized module for integration of laboratory data. Hence time factor will not be a constraint. * Authentic/ dependable information at any point of time. Most of the time no need to approach the laboratories * Factual data from the laboratories * Clarity and details available on area/project * Envisages linkage with other systems * Helps project selection by RC; with the available information RC could decide on continuation, dropping , slowing down of the existing project or taking up the new proposal

(Table 6.1 Continued.)

Activities	Present System	Proposed System
Resource Allocation	* Labwise overall allocation based on past trends on conventional budget heads No projectwise allocation	* Would enable decision on allocation based on projectwise requirements * Takes care of total requirement including external funds, laboratory reserves * Could help justify demands with more rationality
Answer to Queries	Dependence on the laboratories and time consuming;	Helps generate dependable information from the data base; avoids frequent reference to labs
Monitoring of Achievements	Overall lab achievements Specific project linked data absent	Project linked monitoring possible; could be integrated to get overall laboratory achievements. Areawise monitoring possible. Complete freedom and flexibility to the laboratories; No change
Project Portfolio/ Project Management	Complete freedom and flexibility to the laboratories	Complete freedom and flexibility to the laboratories; No change

6.4 SCOPE FOR FUTURE WORK

* CSIR participates in the plan discussions of the State S&T plans and plans of various socio-economic departments held in the Planning Commission every year. Such interactions will help better collaboration with these departments and organizations. CSIR could possibly think of creating and maintaining a data base on opportunities available in the national scene for collaboration. A proper link of such a data base with the proposed project data base integrated at CSIR would be of greater consequence in the R&D planning.

* Coordination among the various Technical Divisions, Administration and Finance at the CSIR Headquarters will perhaps improve the situation. Similar information is being sought from the laboratories by various Divisions.

At present Planning Division interacts with PME cells in the laboratories, Technology Utilization Division (TUD) interacts with Technical Information and Liaison Group (TIL), Finance with finance and Administration with administration. In the absence of computerized data bases on different aspects and lack of coordination among the various functionaries both at the CSIR HQ. and at the laboratories, the variation in the information and the duplication of efforts are unavoidable. The computerized system will remove the variation in information and will help avoid duplication.

* When one thinks of planning of R&D, it may not be surprising to note the interesting feature of its definite interface or linkage with the other functional activities such as Finance, viz Costing, Budgeting, Resource allocation and Accounting, Technology utilization - Technology Transfer, Marketing, Sponsored Research, Consultancy, etc.

The present day policy guidelines provide emphasis on Marketing of technologies, products, services and generation of extra budgetary government budgetary support, it becomes very important involvement at the planning

stage. The information system for the technology utilization should also become a part of the total information system.

Further, the opportunities at the international level are also important and should be looked into at the stage of deciding project portfolios at the laboratory level.

- * Human resource development activities deals with award of junior research fellowships, senior research fellowships, research associateships, pool officerships , research schemes etc. These also should be the mainstream R&D activities and thus properly linked with the information system.
- * The vital information required for decision making and other purposes will be available through proper implementation of the system. Thus there is a need to have an integrated approach to planning and information system development linking various technical and other divisions at the CSIR HQ > level and at the laboratory level.
- * The next phase of the information system development has to recognize the importance of electronic networking technology. The information system at the CSIR HQ. level and the laboratory level need to be linked through suitable network for automatic and easy information transfer between different levels.

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