

# THE INDIAN INSTITUTE OF SCIENCE AS A TECHNOLOGY SOURCE -- A PROFILE ON SOME RECENT ACTIVITIES

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## ABSTRACT

*The Centre for Scientific and Industrial Consultancy (CSIC), established in 1975 at the Indian Institute of Science (IISc) Bangalore, strives to promote Institute-industry interaction through consultancy projects and transfer technology. This study of CSIC projects in the past 5 years (1985-86 to 1989-90) was undertaken to analyse the nature of tasks undertaken in these projects, as well as to examine the categories of clients who have availed such consultancy services. The study revealed that system design and analysis, process design and development, and testing and evaluation were amongst the major tasks undertaken in CSIC projects. Amongst the CSIC clientele, governmental agencies, engineering industries, and health/pharmaceutical organisations accounted for a major share of the projects executed by CSIC. Engineering industries and entrepreneurs can look to the IISc as a major source of technology for their developmental needs.*

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## INTRODUCTION

The Indian Institute of Science (IISc) has since its inception in 1909, encouraged and promoted interactions between its faculty members and industrialists/ entrepreneurs. These interactions have ranged from informal discussions and advice, on the one hand, to formal projects, involving design, development and transfer of technology on the other. The Centre for Scientific and Industrial Consultancy (CSIC) was formally established in 1975, in order to further enhance, qualitatively and quantitatively, the nature of

Institute industry linkages. The Centre strives to undertake major consultancy projects of national significance involving scientific and technological challenges, with the ultimate goal of technology transfer for industrial development.

The Institute has witnessed significant growth of consultancy and technology transfer activities since the 80's. The range of tasks undertaken and the categories of clients served have grown several fold, especially in the last five years.

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## OBJECTIVES: -

This paper presents a critical study of the recent activities of CSIC, from 1985-86. The broad aspects of the study are as follows.

- (1) the range and nature of the professional services rendered to various client organisations in terms of the specialised tasks performed; and
- (2) the diverse groups and categories of clients who have availed the consultancy/technology transfer services offered by IISC.

It is hoped that a careful review and analysis of the Institute's contributions by way of consultancy/technology transfer in the last 5 years, would provide useful clues to prospective clients/entrepreneurs about what IISC can offer as a technology source for their industrial development in the future.

## Methodology :

The study commenced with a formal preliminary review of all the CSIC projects undertaken from 1985-86 to 1989-90. Based on this review, the major professional tasks undertaken (or in other words, the services provided) were categorised into ten groups, ranging from product/process design and development, system design and analysis, and software development, on the technical advice, testing and evaluation, diagnostics, manpower development, and finally, technology transfer.

Similarly, twelve categories of clients were identified, including electrical, electronics, engineering and chemical industries, as well as health/pharmaceuticals, defence, space, power, water supply and government undertakings.

The data was analysed both in terms of the number as well as the value, of the CSIC

projects undertaken each year during the period under review, for all the categories of tasks undertaken (service provided) as well as the clients served.

## Results :

### TASK-WISE ANALYSIS

The consolidated distribution of the major tasks undertaken, is given in Figure 1. Table I gives the relative distribution of the various tasks performed in the execution of projects during 1985 to 1990.

System design and analysis tasks constituted the largest major activity, accounting for over 20 percent of the number of CSIC projects and for over 25 percent of the total value of the projects undertaken. The services rendered in this category included the conceptual design and theoretical analysis of a wide variety of systems, such as power distribution, water supply, mechanical design, structural integrity, etc. Next in importance were the process design and development activities, especially for chemical and pharmaceutical industries, which accounted for about 6 percent of the project volume and over 25 percent of the total value.

Testing and evaluation were also major activities, especially for small-scale engineering industries and entrepreneurs, and their share of the total CSIC projects was over 32 percent by volume and almost 15 percent by relative value. Software development accounted for about 5 percent volume-wise and almost 14 percent value-wise of all the CSIC projects in the last 5 years. Technical advice and guidance were provided to several clients on their ongoing R&D, manufacturing and quality control activities, and these tasks featured in 17 percent of the projects accounting for almost 10 percent of the total value.

The remaining tasks of product design and development, technology transfer, diag-

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nostics, manpower development and other miscellaneous activities (e.g. calibration, monitoring, demonstration, etc.) together accounted for less than 19 percent of the total value of the CSIC projects.

### **Client-wise analysis**

The relative clientele groupings for all the projects undertaken during the last 5 years is shown in Table II. The same information is given in consolidated form in figure 2. Government organisations were amongst the major clients for CSIC projects, as the projects for these clients represented about 9 percent of the total volume-wise and over 15 percent value-wise. This clientele category included the mines, nuclear organisations, as well as public service organisations, such as public works department, etc. Next in importance were engineering industries and healthy/pharmaceuticals industries each accounted for over 12 percent of the total value of projects. The former accounted for over 16 percent of the projects (number-wise) whereas the projects to the latter represented over 2 percent of the total number of projects.

CSIC projects to the water supply, drainage and irrigation organisations constituted about 9 percent (number-wise) and

over 11 percent (value-wise) of the total projects. Like-wise, defence oriented projects accounted for over 7 percent of the total number, and over 11 percent of the total value of all projects undertaken. Projects undertaken for electronics/telecommunications industries represented about 8 percent of the total number, and over 9 percent of the total value of all CSIC projects during the last 5 years.

Projects for the remaining client groups, chemicals viz: chemical industries, power supply organisations, electrical equipment industries, educational and research organisations, entrepreneurs/consultants and space department, together, constitute about half the total number of CSIC projects, but represent less than 30 percent of the total value of all the projects.

### **CONCLUSION**

Judging from the major professional services rendered and the tasks undertaken, as well as the categories of clients who have benefitted from CSIC projects in the recent past, it may be safely concluded that engineering industries and entrepreneurs can look towards the Indian Institute of Science as a significant technology source, especially for system design, process, evaluation,

**TABLE - I**

Number and relative values of major tasks undertaken  
in consultancy projects during 1985-86 to 1989-90

Sr. No	Task Description	Volume of Number	Projects Percentage	Relative value by cost Percentage
1.	Systems design and analysis	103	20.4	25.8
2.	Process design and development	32	6.3	25.8
3.	Testing and evaluation	163	32.3	14.7
4.	Software development	26	5.1	13.7
5.	Technical advice and guidance	86	17.0	9.5
6.	Product designs and development	25	4.9	4.8
7.	Technology transfer	12	2.4	2.2
8.	Diagnostics and proof checking	24	4.7	1.6
9.	Manpower development	7	1.4	0.5
10.	Others (monitoring-calibration)	28	5.5	1.9

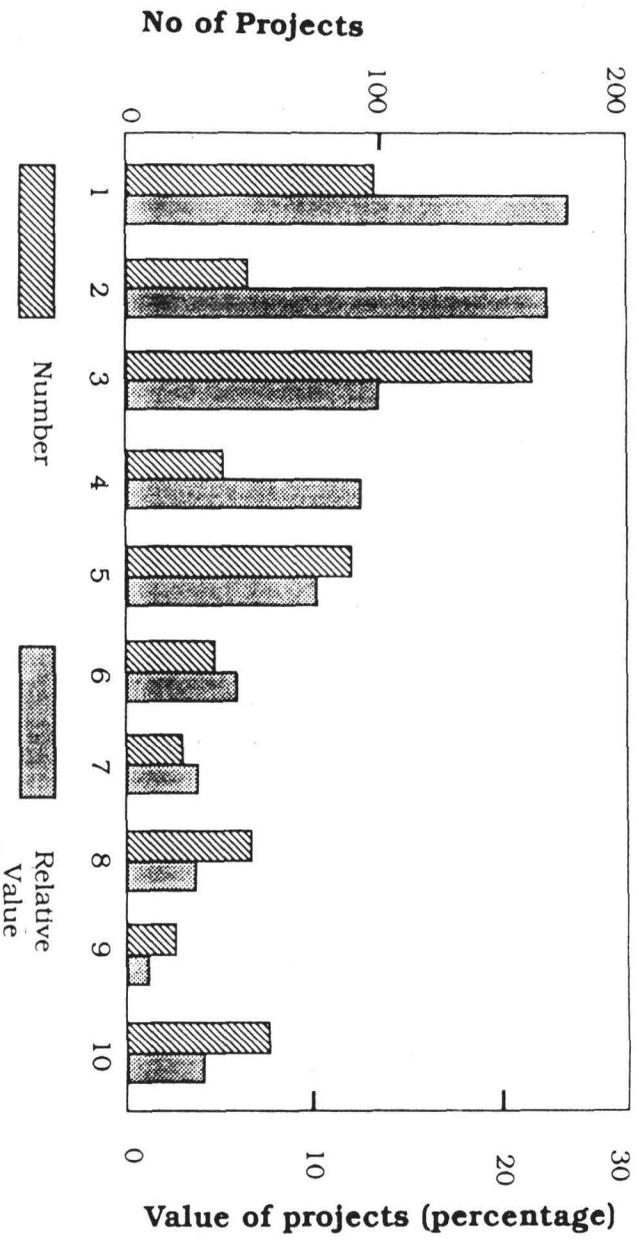


Figure 1. Distribution of tasks undertaken in consultancy projects :

**Task Categories**

1. Systems design and analysis
2. Process design and development
3. Testing and evaluation
4. Software development
5. Technical advice and guidance
6. Product design and development
7. Technology transfer
8. Diagnostics and proof checking
9. Manpower development
10. Others (monitoring, calibration)

**TABLE - II**

Clientele groupings by number and relative values  
in consultancy projects during 1985-86 to 1989-90

Sr. No.	Client Group	Volume of Number	Projects Percentage	Relative value by cost percentage
1.	Government services (mines, bauks, etc.)	44	8.7	15.2
2.	Engineering industries	84	16.6	12.4
3.	Health, pharmaceuticals industries	12	2.4	12.4
4.	Water supply and irrigation departments	44	8.7	11.3
5.	Defence organisations	36	7.1	11.2
6.	Electronics/telecommunication industries	39	7.7	9.1
7.	Chemicals and ceramics industries	33	6.5	6.0
8.	Power supply departments	34	6.7	5.8
9.	Electrical equipment industries	51	10.1	4.9
10.	Educational and research Organisations	28	5.5	4.6
11.	Entrepreneurs, consultants, individuals	85	16.8	4.4
12.	Space organisations	16	3.2	2.7

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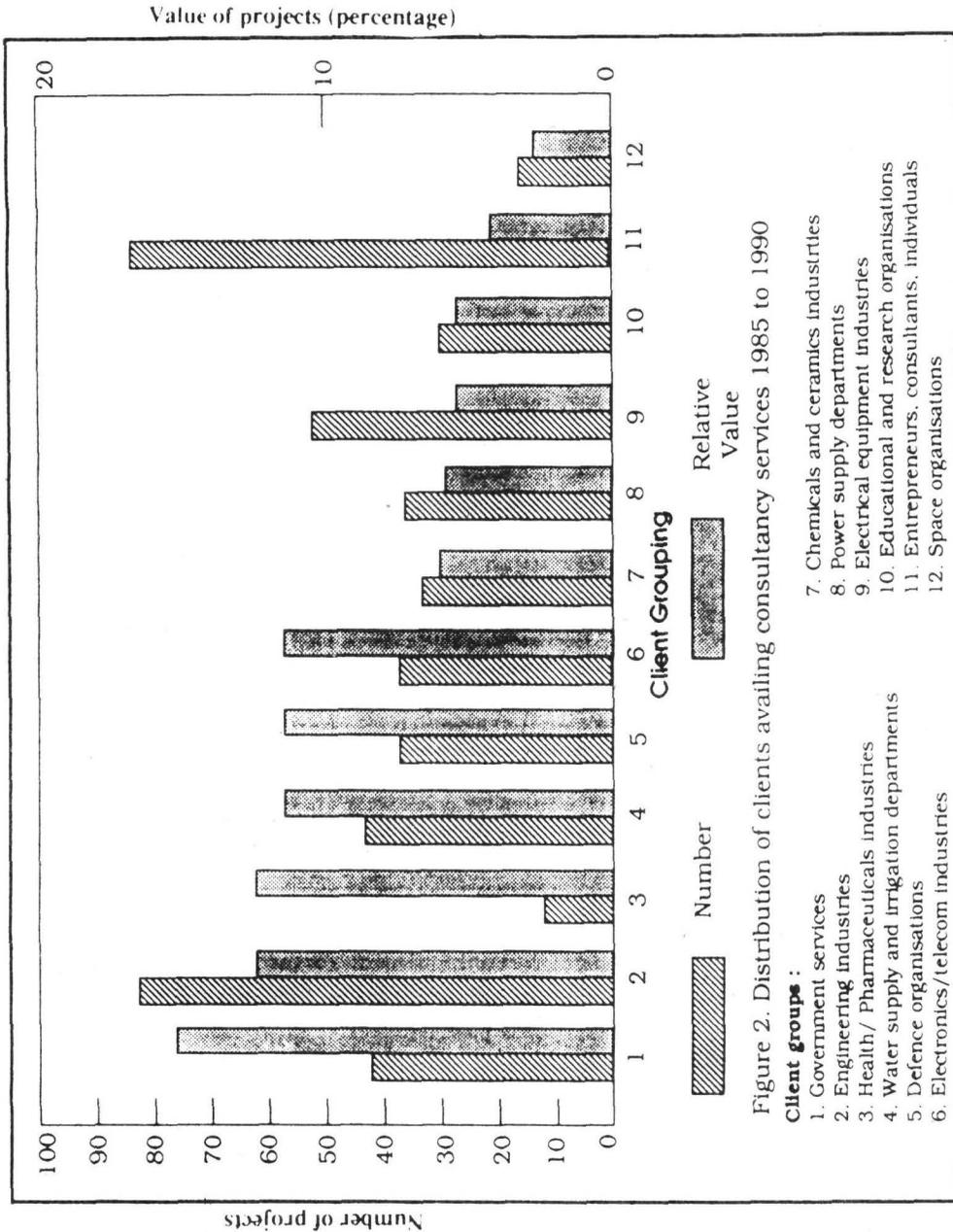


Figure 2. Distribution of clients availing consultancy services 1985 to 1990

**Client groups :**

- 1. Government services
- 2. Engineering industries
- 3. Health/ Pharmaceuticals industries
- 4. Water supply and irrigation departments
- 5. Defence organisations
- 6. Electronics/telecom industries
- 7. Chemicals and ceramics industries
- 8. Power supply departments
- 9. Electrical equipment industries
- 10. Educational and research organisations
- 11. Entrepreneurs, consultants, individuals
- 12. Space organisations