

ABOUT THE DIRECTORY

INTRODUCTION

National Science & Technology Management Information System (NSTMIS) Division of the Department of Science & Technology (DST) has been maintaining a computerized database on sponsored R&D projects from 1985-86 onwards. The Department has also been compiling information annually on extramural (also called sponsored) R&D projects since 1990-91 in order to exchange information on Research and Development (R&D) projects with different interest groups. This compiled information is published as an annual Directory of Extramural Research and Development projects approved for funding by various agencies during the year.

The task of collecting, compiling, analyzing and publishing the directory for the year 2005-06 was sponsored by the **Department of Science & Technology** to the **Manpower Management Centre (MMC), New Delhi**. The present directory, sixteenth in the series, gives details of 3569 sponsored R&D projects approved during the year 2005-06 by 19 Central Government Ministries/Departments/Agencies.

The following Ministries/Departments/Agencies of the Central Government have furnished the list of projects approved by them:

- All India Council for Technical Education (AICTE)
- Council of Scientific and Industrial Research (CSIR)
- Defence Research and Development Organisation (DRDO)
- Department of Atomic Energy (DAE)
- Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy (AYUSH)
- Department of Bio-Technology (DBT)
- Department of Coal (DOC)
- Department of Ocean Development (DOD)
- Department of Science and Technology (DST)
- Department of Scientific and Industrial Research (DSIR)
- Indian Council of Medical Research (ICMR)
- Indian Space Research Organisation (ISRO)
- Ministry of Communications & Information Technology (MOCIT)
- Ministry of Environment and Forests (MOEF)
- Ministry of Power (MOP)
- Ministry of Social Justice and Empowerment (MOSJE)
- Ministry of Water Resources (MOWR)
- Petroleum Conservation Research Association (PCRA)
- University Grants Commission (UGC)

Central Board of Irrigation and Power (CBIP), India Meteorological Department (IMD) and Steel Authority of India Ltd., (SAIL) reported "Nil" information. Department of Secondary and Higher Education (DOSHE), and Indian Council of Agricultural Research (ICAR) have withdrawn their funding schemes. Ministry of Non-Conventional Energy Sources (now known as Ministry of New & Renewable Energy) did not respond. The addresses of all these agencies are given in **Annexure -1**.

LIMITATIONS

As the listing of projects is based on the inputs received from the responding agencies, it is presumed that the information furnished by them was complete. The project cost refers to the initial approved cost of the project for the initial approved duration of the project. It is quite possible that some of the projects mentioned in this directory may not be R&D projects in the strict sense of the term. Despite these limitations, it is sincerely hoped that this directory will serve as a useful source of information for scientists, technologists, funding agencies, implementing institutions, planners and policy makers.

ORGANISATION OF THE DIRECTORY

The projects are listed in the directory by major subject area-wise. Under each major subject area, the projects are arranged by funding agency-wise and also scheme-wise within funding agency. Under each scheme, the projects are arranged alphabetically as per the title of the project. For each project, the information included is record number, title of the project, name of the funding agency/scheme, name and address of the investigator/institute, approved cost of the project and the duration of the project. The third column of the directory gives the name of funding agency and scheme. For example, this is given as “DAE-BRNS”. Here “DAE” is the name of the funding agency i.e. Department of Atomic Energy and “BRNS” is the acronym used for the name of the scheme under which the project was approved. For explanation of abbreviations/acronym for the agencies and schemes, the readers are advised to see **Table 1 & 2** under the section “**BRIEF ANALYSIS**”. For a quick reference, Index pages on Principal Investigator and Institute etc., are provided in the directory at the end. The addresses of the funding agencies are given at **Annexure-1**. **Annexure-2** gives institute-wise extramural R&D support committed during the year 2005-06. A brief analysis on the pattern of funding during the year 2005-06 is given in the following paragraphs.

BRIEF ANALYSIS

As shown in **Table 1**, 3569 new extramural R&D projects costing Rs. 1163.80 crores were approved by 19 responding agencies during the year 2005-06. Scheme-wise support to these extramural R&D projects by responding agencies is given in **Table 2**.

Table 1
Agency-wise Support to Extramural R&D projects approved during 2005-06

S. No.	Department/Ministry/Agency	No. of Projects		Total Approved Cost	
		No.	%age	(Rs. Crores)	%age
1.	All India Council for Technical Education (AICTE)	138	3.87	9.83	0.85
2.	Council of Scientific and Industrial Research (CSIR)	247	6.92	24.21	2.08
3.	Defence Research & Development Organisation (DRDO)	137	3.84	30.37	2.61
4.	Department of Atomic Energy (DAE)	115	3.22	19.51	1.68
5.	Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha & Homoeopathy (AYUSH)	1	0.03	0.15	0.01
6.	Department of Bio-Technology (DBT)	422	11.82	174.73	15.02
7.	Department of Coal (DOC)	11	0.31	21.53	1.85
8.	Department of Ocean Development (DOD)	7	0.20	1.07	0.09
9.	Department of Science and Technology (DST)	1297	36.34	572.11	49.16
10.	Department of Scientific and Industrial Research (DSIR)	9	0.25	8.39	0.72
11.	Indian Council of Medical Research (ICMR)	207	5.80	57.29	4.92
12.	Indian Space Research Organisation (ISRO)	41	1.15	4.35	0.37
13.	Ministry of Communications & Information Technology (MOCIT)	42	1.17	183.85	15.80
14.	Ministry of Environment and Forests (MOEF)	56	1.57	23.12	1.99
15.	Ministry of Power (MOP)	20	0.56	3.53	0.30
16.	Ministry of Social Justice and Empowerment (MOSJE)	5	0.14	0.72	0.06
17.	Ministry of Water Resources (MOWR)	41	1.15	9.79	0.84
18.	Petroleum Conservation Research Association (PCRA)	15	0.42	1.30	0.11
19.	University Grants Commission (UGC)	758	21.24	17.95	1.54
	Total	3569	100	1163.80	100

Note:

1. Despite repeated reminders and visits, data was not provided by the Ministry of Non-Conventional Energy Sources (MNES), now known as Ministry of New & Renewable Energy Sources.
2. Central Board of Irrigation & Power (CBIP), Steel Authority of India Ltd. (SAIL) and India Meteorological Department (IMD) reported “Nil” information..
3. Department of Secondary & Higher Education (DOSHE) & Indian Council of Agricultural Research (ICAR) have withdrawn their funding schemes.

Table 2
Scheme-wise Support to Extramural R & D Projects approved during 2005-06

S. No	Department/Ministry/Agency	Number of Projects	Total Approved Cost (Rs. Crores)
1.	All India Council for Technical Education (AICTE)		
	- Research Programme (RP)	138	9.83
2.	Council of Scientific and Industrial Research (CSIR)		
	- Emeritus Scientist (ES)	28	2.46
	- General Scheme (GS)	209	20.00
	- Sponsored Scheme (SS)	10	1.75
3.	Defence Research and Development Organisation (DRDO)		
	- Aeronautical Research & Development Board (ARDB)	39	3.27
	- Grants-in-aid Scheme(GIA)	68	20.72
	- Life Science Research Board (LSRB)	12	2.19
	- Naval Research Board (NRB)	18	4.19
4.	Department of Atomic Energy (DAE)		
	- Board for Research in Nuclear Sciences (BRNS)	115	19.51
5.	Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha & Homoeopathy (AYUSH)		
	- Extra Mural Research (EMR)	1	0.15
6.	Department of Bio-Technology (DBT)		
	- Research & Development (R&D)	422	174.73
7..	Department of Coal (DOC)		
	- Science & Technology (S&T)	11	21.53
8.	Department of Ocean Development (DOD)		
	- Marine Research Development Fund (MRDF)	7	1.07
9.	Department of Science and Technology (DST)		
	- Deep Continental Studies (DCS)	20	4.38
	- Drugs & Pharmaceutical Research Programme(DPRP)	38	170.60
	- Himalayan Glaciology (HG)	6	1.62
	- International Division (ID)	75	3.92
	- Instrument Development Programme (IDP)	9	1.25
	- Intensification of Research in High Priority Areas (IRHPA)	59	94.47
	- Joint Technology Programme (JTP)	16	17.78
	- Monsoon and Tropical Climate Studies (MONTCLIM)	10	2.50
	- Natural Resources Data Management System (NRDMS)	61	21.36
	- PAC-Earth Science (PAC-ES)	41	1.74
	- Science and Engineering Research Council – Engineering Projects (SERC EP)	87	18.27
	- Science and Engineering Research Council –Fast Track (SERC FT)	207	18.55
	- Science and Engineering Research Council- Nanomaterials Science & Technology Initiative (SERC NSTI)	19	60.29
	- Science and Engineering Research Council- Science (SERC SC)	428	99.35
	- Science and Engineering Research Council- Women Scientists (WOS)	100	12.48
	- Seismicity Programme (SP)	35	17.78
	- Shallow Sub-Surface Programme (SSSP)	17	1.82
	- Severe Thunder Storms Observations & Regional Modelling (STORM)	2	0.72

	- State Science & Technology Programme (SST)	3	0.31
	- Technical System Development Group (TSD)	31	21.58
	- Utilisation of Scientific Expertise of Retired Scientists (USERS)	24	0.83
	- Young Scientists Scheme (YSS)	9	0.51
10.	Department of Scientific and Industrial Research (DSIR)		
	- Technology Development & Demonstration Programme (TDDP)	9	8.39
11.	Indian Council of Medical Research (ICMR)		
	- Ad-hoc (ADHOC)	150	45.47
	- Centre for Advanced Research (CAR)	1	1.81
	- Task Force (TF)	56	10.01
12.	Indian Space Research Organisation (ISRO)		
	- Research Sponsored (RESPOND)	40	3.88
	- Space Science Promotion (SSP)	1	0.47
13.	Ministry of Communications & Information Technology (MOCIT)		
	- Research & Development (R&D)	42	183.85
14.	Ministry of Environment and Forests (MOEF)		
	- Biosphere Reserve (BR)	13	1.34
	- Environment Research Programme (ERP)	7	0.74
	- Ecosystem Research Scheme (ERS)	5	0.42
	- Eastern & Western Ghats (EWG)	15	1.66
	- National Natural Resources Management System (NNRMS)	8	18.17
	- Policy Research Projects (PRP)	2	0.22
	- Wet Lands (WL)	6	0.57
15.	Ministry of Power (MOP)		
	- Research Scheme on Power (RSP)	20	3.53
16.	Ministry of Social Justice and Empowerment (MOSJE)		
	- Science & Technology Mission Mode (S&TM)	5	0.72
17..	Ministry of Water Resources (MOWR)		
	- Research & Development for Water Resources Management (R&D WRM)	41	9.79
18.	Petroleum Conservation Research Association (PCRA)		
	- Research & Development (R&D)	15	1.30
19.	University Grants Commission (UGC)		
	- Major Projects (MJRP)	203	14.54
	- Minor Projects (MNRP)	555	3.41
	Total	3569	1163.80

Funding by Subject Areas

The projects are classified in eight major subject areas as under:

- | | | | |
|----|-----------------------|----|--------------------------|
| a) | Agricultural Sciences | e) | Engineering & Technology |
| b) | Biological Sciences | f) | Mathematics |
| c) | Chemical Sciences | g) | Medical Sciences |
| d) | Earth Sciences | h) | Physical Sciences |

The classification of R&D projects has been done based on the subject area indicated by the agencies and also based on the title of the projects. Some of the projects may be multi-disciplinary in nature but have been classified into one of the subject areas mentioned above, depending on their major thrust. The following **Figure 1** shows number of extramural R&D projects approved in each subject area during the year 2005-06.

SUBJECT AREA WISE NUMBER OF R&D PROJECTS APPROVED DURING THE YEAR 2005-06

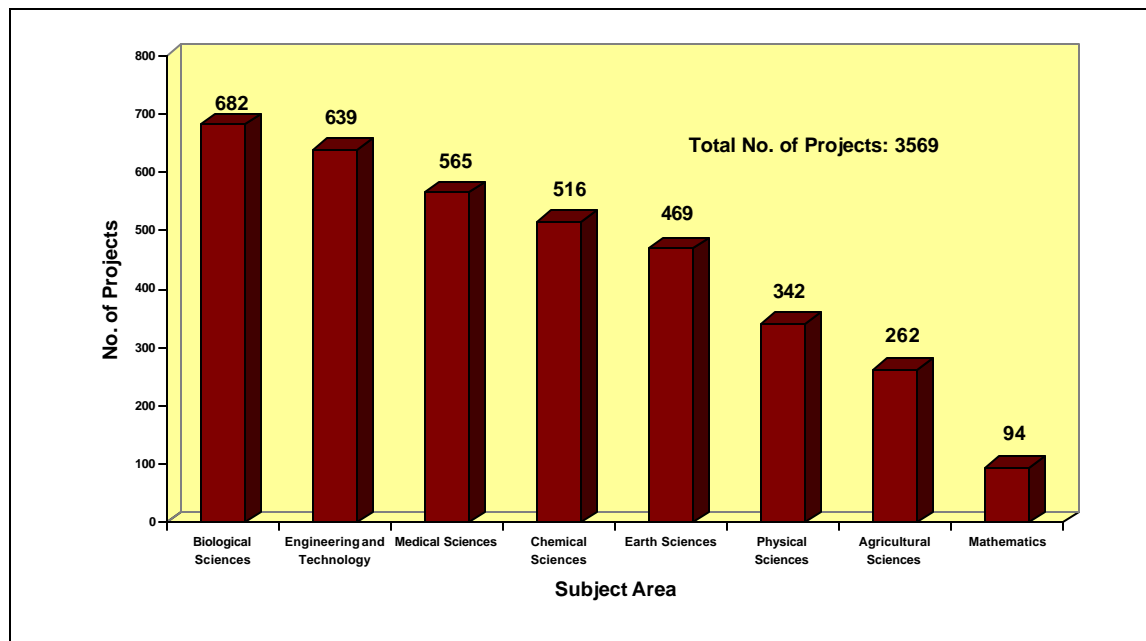


Figure 1

The following **Figure 2** shows subject area-wise pattern of funding during the year 2005-06. **Medical Sciences** area received maximum financial support of 32.04 per cent followed by **Engineering & Technology** at 29.69 per cent. **Earth Sciences** area received financial support of 9.55 per cent followed by **Physical Sciences** at 8.16 per cent. Projects in the area of **Biological Sciences** and **Chemical Sciences** received financial support of 7.19 per cent each. **Agricultural Sciences** area got financial support of 5.60 per cent and the least financial support received was by **Mathematics** at 0.58 per cent.

SUBJECT AREA-WISE R&D SUPPORT DURING THE YEAR 2005-06

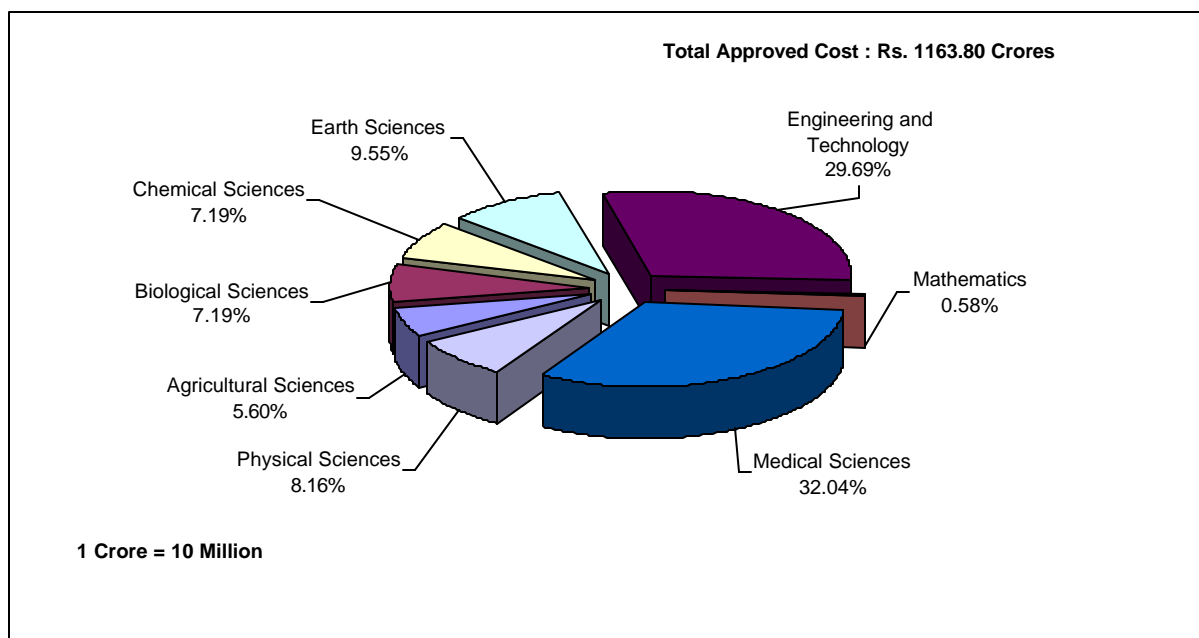


Figure 2

The following **Table 3** gives combined information about the subject area-wise distribution of Extramural R&D projects and their approved cost.

Table 3
Subject Area-Wise Distribution of Extramural R&D Projects and their Approved Cost
During the Year 2005-06

Subject	Number of Projects	Total Approved Cost (Rs. Crores)
Agriculture Sciences	262	65.19
Engineering & Technology	639	345.55
Medical Sciences	565	372.84
NATURAL SCIENCES:		
Biological Sciences	682	83.72
Chemical Sciences	516	83.64
Earth Sciences	469	111.19
Mathematics	94	6.71
Physical Sciences	342	94.96
Total	3569	1163.80

Funding by Types of Institutions

The institutions have been classified into five categories such as:

- A. Universities/Colleges
- B. Deemed Universities
- C. Institutes of National Importance
 - Indian Institute of Technology, All India Institute of Medical Sciences, Indian Statistical Institute, P.G. Institute of Medical Education & Research and Sree Chitra Tirunal Institute for Medical Sciences & Technology
- D. National Research Laboratories
 - Laboratories under CSIR, ICAR, ICMR, DRDO and autonomous institutions under Central Government Ministries/Departments, Central Public Sector Undertakings
- E. Others
 - Institutions which are not covered under A, B, C & D above.

The distribution of Extramural R&D Projects by Types of Institutes with their approved cost is indicated in **Table 4**. The number given in this Table refers to unique institutes where 3569 projects have been implemented.

Table 4
Distribution by Types of Institutes and their Approved Cost
During the Year 2005-06

Types of Institutes	Number of Institutes	Number of Projects	Total Approved Cost	Percentage of Total Approved Cost
Universities/Colleges	565	1927	267.67	23
Deemed Universities	29	214	116.38	10
Institutes of National Importance	12	428	197.85	17
National Laboratories	139	607	349.14	30
Others	245	393	232.76	20
Total:	990	3569	1163.80	100

(Rs. Crores)

The gender-wise distribution of Principal Investigators who took up 3569 Extramural R&D Projects is shown in **Table –5** below.

Table 5
Gender-wise Distribution of Principal Investigators During 2005-06

Gender	Number of PIs	Percentage	Number of Projects	Percentage
Male	2267	78	2854	80
Female	611	21	678	19
Heads*	37	1	37	1
Total	2915	100	3569	100

* Projects released to Heads of Organisations & Institutions

Figure 3 hereunder shows the percentage distribution of number of projects and its approved cost by types of institutions during the year 2005-06. The maximum number i.e. 54% of the projects were sanctioned to Universities/Colleges with financial support of 23%. National Laboratories received 17% of the projects with financial support of 30%. Institutes of National Importance got 12% of projects with financial support of 17%. 6% of the total projects were given to Deemed Universities and 11% to Others category with financial support of 10% and 20% respectively. The total financial support to academic sector i.e. to A, B & C was 50%.

R&D PROJECTS BY TYPES OF INSTITUTES DURING THE YEAR 2005-06

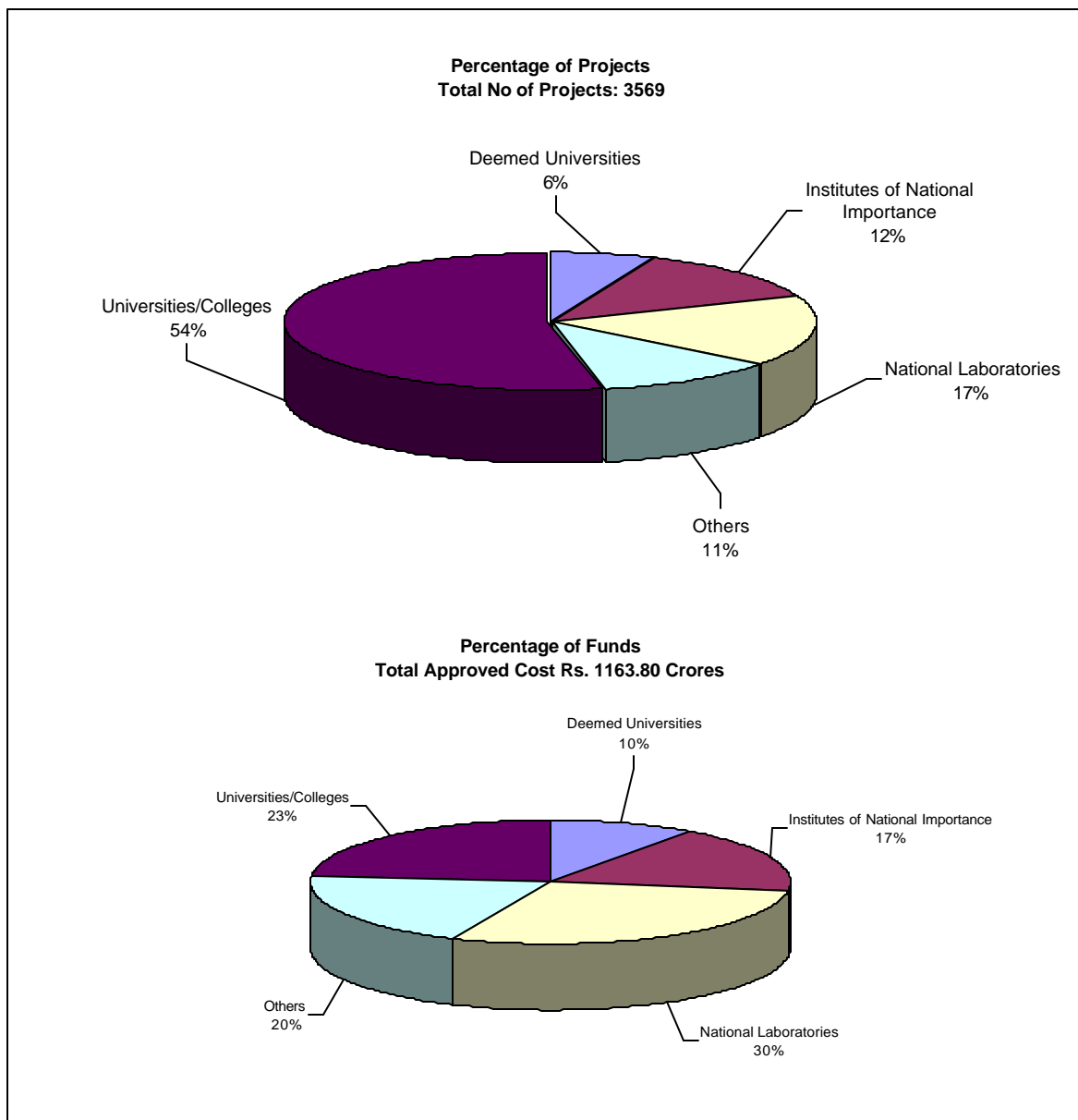


Figure 3

Agency-wise Funding

Figure 4 shows the pattern of funding by various funding agencies. As may be seen the maximum funding of Rs. 572.11 crores (49%) has been by the Department of Science & Technology (DST) for extramural R&D projects. The next in order comes the support from the Ministry of Communications & Information Technology i.e. Rs. 183.85 crores (16%) and Rs. 174.73 crores (15%) by the Department of Biotechnology (DBT). The funding done by Indian Council of Medical Research (ICMR) is to the extent of Rs. 57.29 crores (4.9%) and the lowest funding is of Rs. 0.15 crores (0.01%) by the Department of AYUSH.

R&D SUPPORT BY CENTRAL S&T AGENCIES DURING THE YEAR 2005-06

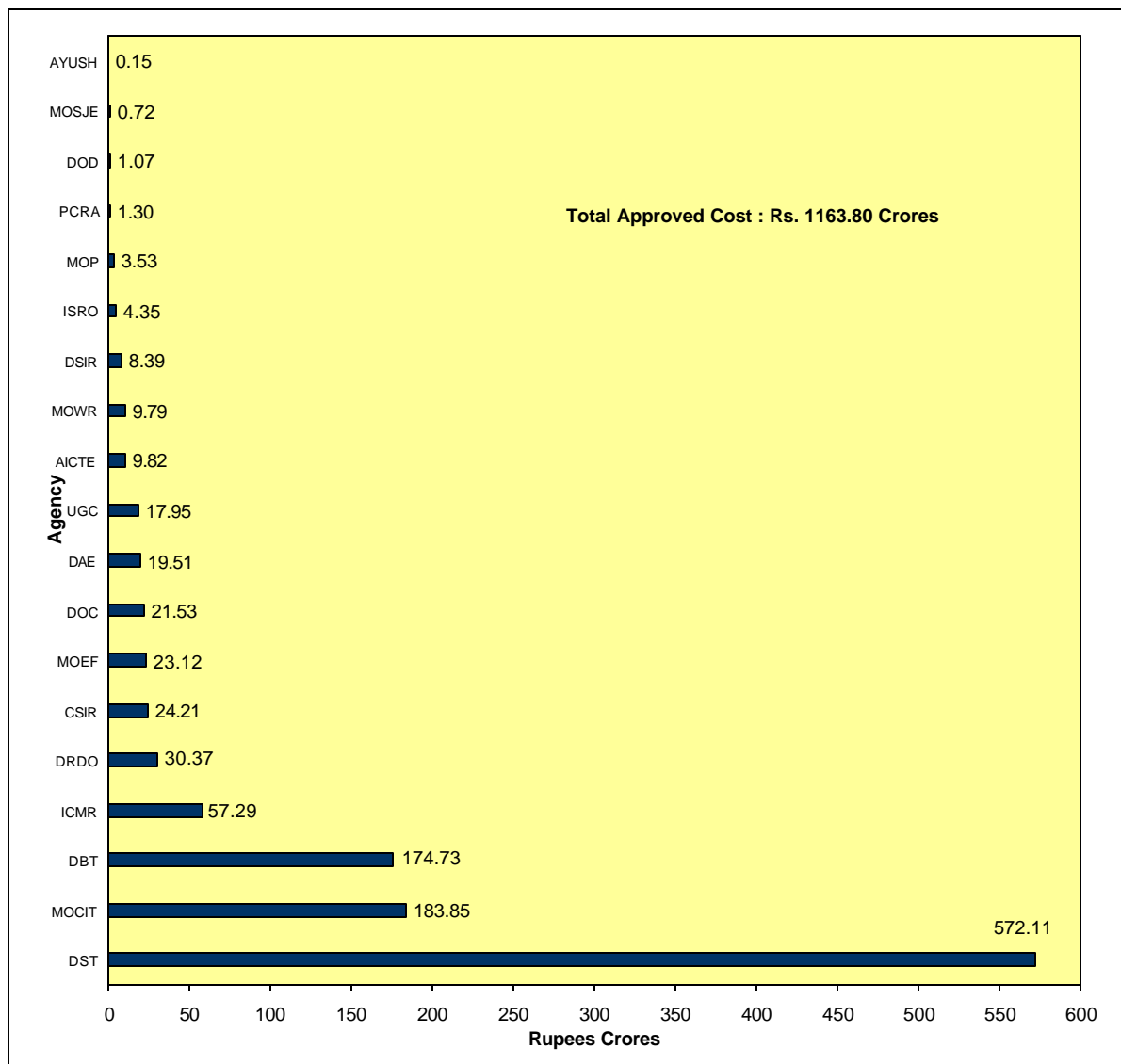


Figure 4

As per **Figure 5** the analysis indicate that the majority of projects i.e. 839 were in the cost range of Rs. 5 to 10 lakhs. 680 projects were in the cost range of Rs. 10 to 15 lakhs and 590 projects were in the cost of above Rs. 25 lakhs. 514 projects were of less than Rs. 1 lakh and 352 projects were between the cost range of Rs. 1 to 5 lakhs. There were 303 projects costing between Rs. 20 to 25 lakhs and 291 projects were between the cost of Rs.15 to 20 lakhs.

DISTRIBUTION OF R&D PROJECTS BY APPROVED COST DURING 2005-06

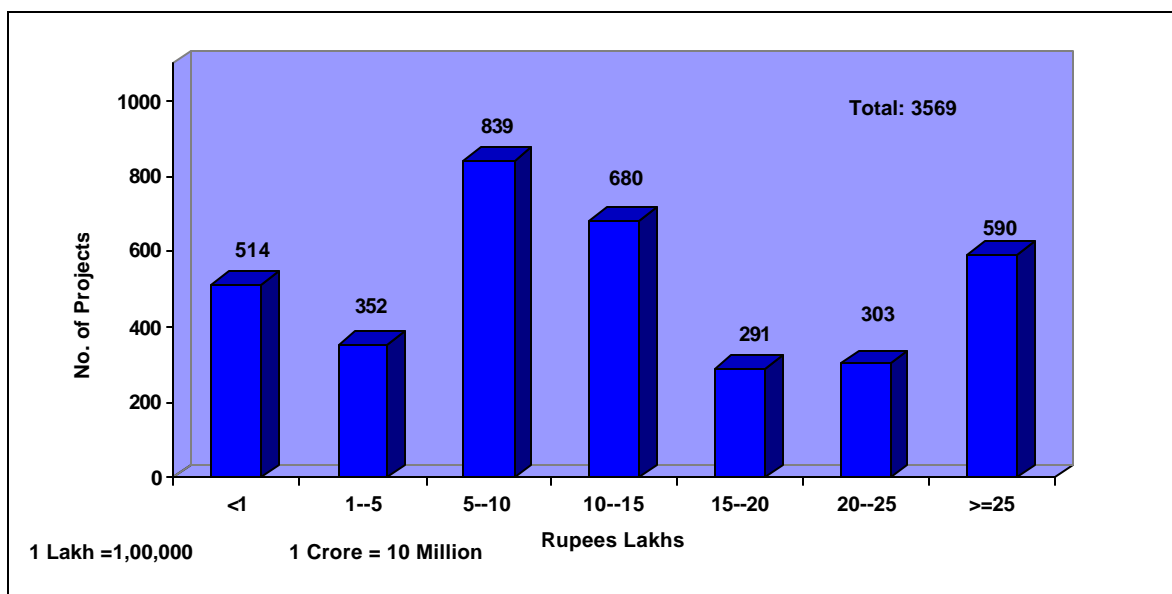


Figure 5

Agency-wise distribution of 590 large projects costing equal to and over Rs. 25 lakhs each is given in **Figure-6**. Out of this, maximum number of projects i.e. 445 were funded by two agencies i.e. 230 by the Department of Biotechnology (DBT) and 215 by the Department of Science & Technology (DST). This was followed by 30 projects sanctioned by the Ministry of Communications & Information Technology (MOCIT), 29 by the Indian Council of Medical Research (ICMR) and 24 by Defence Research & Development Organization, 17 by the Department of Atomic Energy and 13 by the Ministry of Water Resources (MOWR). The remaining 32 projects were approved by other agencies.

AGENCY-WISE DISTRIBUTION OF R&D PROJECTS COSTING Rs. 25 LAKHS & ABOVE (2005-06)

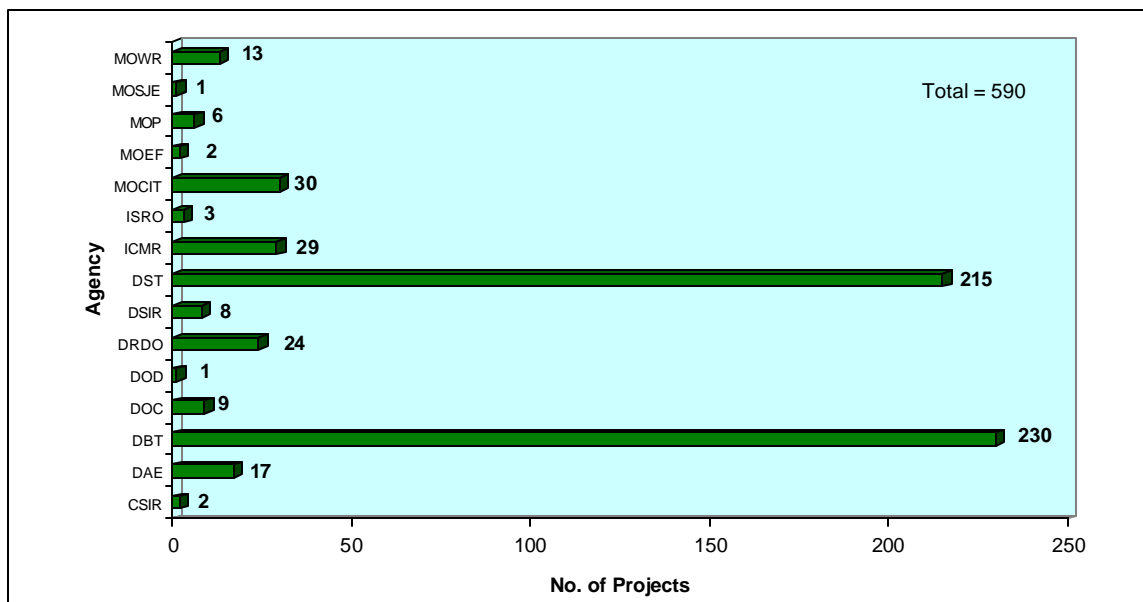


Figure 6

Figure 7 indicates that there were 122 projects costing Rs. 1 crore & above which were funded by 8 agencies during 2005-06. Majority (66.4%) of these projects were funded by the Department of Science & Technology.

AGENCY-WISE DISTRIBUTION OF R&D PROJECTS COSTING Rs. 1 CRORE & ABOVE (2005-06)

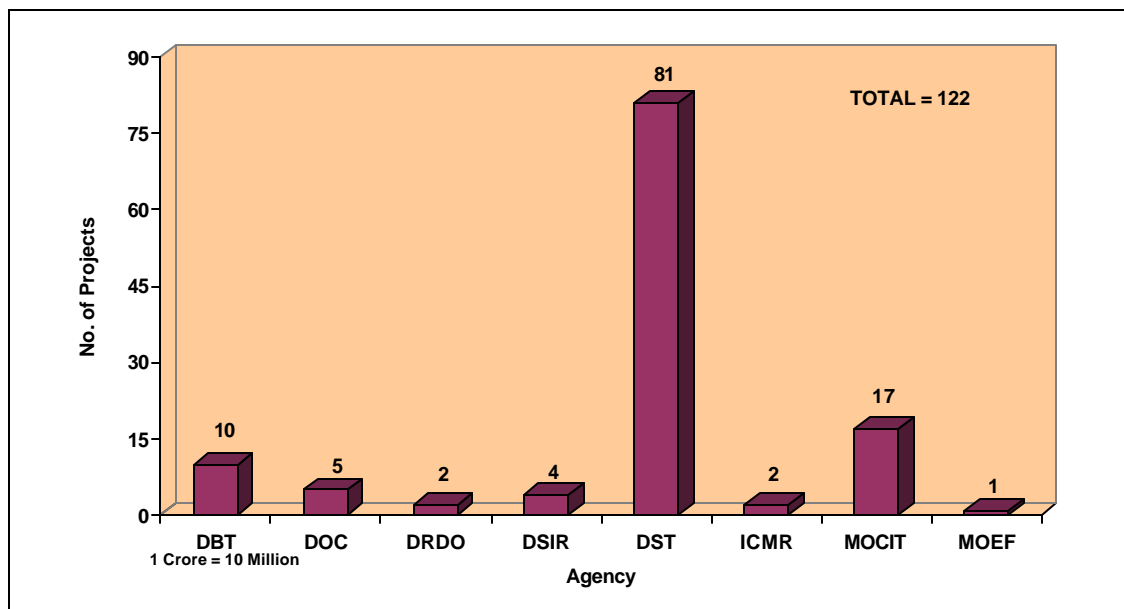


Figure 7

It may be seen from **Figure 8** that there were 78 projects each costing Rupees two crores and above funded by eight agencies. The maximum number of high cost projects i.e. 53 were funded by Department of Science & Technology:

AGENCY-WISE DISTRIBUTION OF R&D PROJECTS COSTING Rs. 2 CRORES & ABOVE (2005-06)

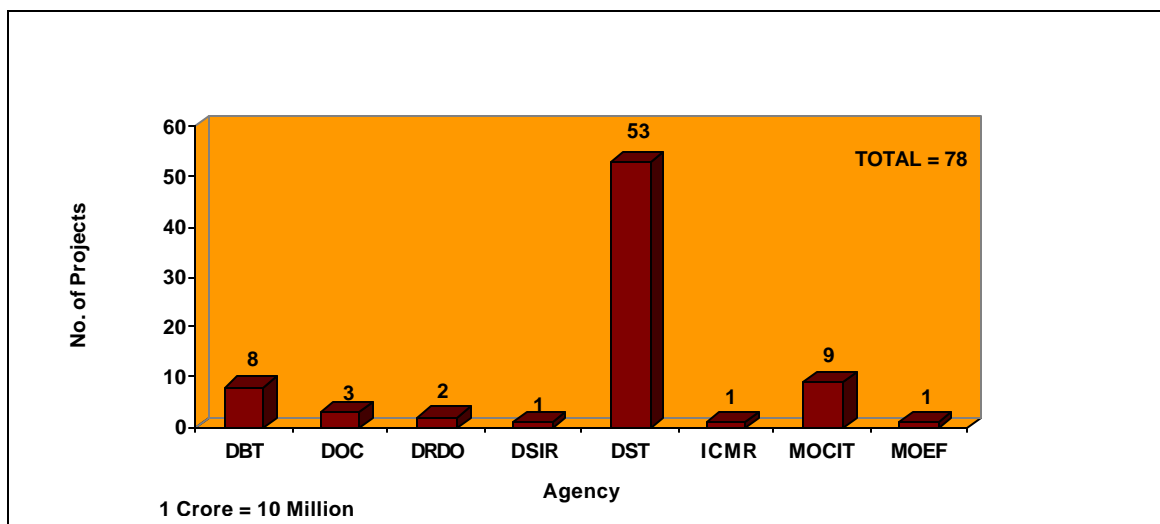


Figure 8