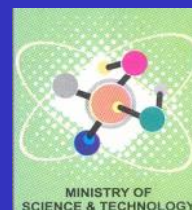




सत्यमेव जयते
Government of India

FUNDING PATTERN OF SPONSORED RESEARCH BY SCIENTIFIC AGENCIES 2000-05

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This document presents an analysis of funding pattern of sponsored (extramural) research supported by 23 Central Government Departments/Agencies.

The projects are classified into eight major subject areas: Agricultural Sciences, Biological Sciences, Chemical Sciences, Earth Sciences, Engineering and Technology, Mathematics, Medical Sciences and Physical Sciences.

The institutions have been classified into 11 categories: universities, deemed universities, science colleges, engineering colleges, medical/pharmacy colleges/hospitals, institutes of national importance, national laboratories, government departments/state S&T councils, Scientific and Industrial Research Organisations, corporate sector companies/research institutions and voluntary organisations

FUNDINGS AT A GLANCE

1990-1995	1995-2000	2000-2005
	Total number of R&D projects	
6791	9134	12523
	Total R&D funding	
Rs. 547.64 crores	Rs.1341.79 crores	Rs. 2198.47 crores
	Average cost of R&D projects	
Rs. 8.06 lakhs	Rs.14.70 lakhs	Rs. 17.55 lakhs
	Number of high cost projects (Rs. 25 lakhs and above)	
315	688	1488
	Number of ultra high cost projects (Rs. 1 crore and above)	
46	88	227
	Number of scientists reached out	
-	8484	9231
	Gender representation among PIs	
-	-	16%
	Coverage of institutions	
1095	1491 located in 426 cities and towns	1773 located in 408 cities and towns

Main sponsors of R&D by numbers of projects

DST (1810), UGC (797), CSIR (792), ICMR (645), ICAR (634), and DBT (440), accounting for about 75% of projects	DST (2237), AICTE (1419), UGC (1058), CSIR (1010) and ICAR (713), accounting for about 71% of projects	DST (3466), UGC (2276), CSIR (1091), DBT (949) and ICMR (917), accounting for about 70% of projects
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Main sponsors of R&D by funding support

DST (Rs.153.32 crores), DBT (Rs.133.64 crores), ICAR (Rs. 36.41 crores), DOE (Rs.29.29 crores) and CSIR (Rs.28.50 crores), accounting for about 70% of total R&D funding.	DST (Rs.298.38 crores), DOC (Rs.199.58 crores), MIT (Rs.198.46 crores) and DBT (Rs.168.06 crores), accounting for about 64% of total R&D funding.	DST (Rs.774.45 crores), DBT (Rs.336.99 crores), MOCIT (Rs.182.19 crores), ICMR (Rs.146.66 crores), accounting for about 66% of total R&D funding.
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1990-1995**1995-2000****2000-2005****Main subject areas-wise distribution of funding support**

<p>Engineering and Technology (28.57%), Biological Sciences (28.43%), Agricultural Sciences (11.70%), Physical Sciences (8.55%), accounting for 77% of total R&D funding.</p>	<p>Engineering and Technology (37.5%), Biological Sciences (15.4%), Earth Sciences (13.5%) and Sciences (10.3%), accounting for 77% of total R&D funding.</p>	<p>Engineering and Technology (29.2%), Medical Sciences (18.4%), Chemical Sciences (13.4%), Biological Sciences (12.6%), accounting for 74% of total R&D funding.</p>
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R&D support coverage by types of institutions

<p>133 universities, 443 colleges, 16 deemed universities, 9 institutes of national importance, 233 national laboratories and 261 registered bodies and others state government department/councils.</p>	<p>154 universities, 682 colleges, 24 deemed universities, 11 institutes of national importance, 274 national laboratories and 346 registered bodies, state government department/councils and corporate sector.</p>	<p>156 universities, 624 science colleges, 186 engineering colleges, 143 medical and pharmacy colleges/hospitals, 45 deemed universities, 9 institutes of national importance, 306 national laboratories, 55 state government departments/S&T councils, 47 Scientific and Industrial Research Organisations (SIRO), 93 corporate sector companies/research institutions and 109 voluntary organisations.</p>
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Share of academic sector

<p>75% of projects and 56% of total R&D funding.</p>	<p>76% of projects and 48% of total R&D funding.</p>	<p>75% of projects and 57% of total R&D funding.</p>
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Share of national laboratories

<p>16% of projects and 34% of total R&D funding.</p>	<p>17% of projects and 43% of total R&D funding.</p>	<p>20% of projects and 34% of total R&D funding.</p>
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Main R&D patrons for academic sector

<p>- DST AICTE, UGC, CSIR and ICAR, accounting for 77% of total projects.</p>	<p>DST, UGC, CSIR, AICTE, ICMR, DOSHE, accounting for 78% of total projects.</p>
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Main R&D patrons for institutes of national importance

<p>- DST, CSIR, ICMR and DRDO, providing 73% of the projects.</p>	<p>DST (605), DOSHE (260), CSIR (216), ICMR (189) and DRDO (127), accounting for more than 83% of the projects</p>
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1990-1995

1995-2000

2000-2005

Main R&D patrons for national laboratories

- DST, DBT, CSIR and ICAR providing 65% of projects. DST (1073), DBT (356), CSIR (347), ICAR (298), ICMR (196) providing 92% of projects.

Most preferred institutions of all the agencies considered together

- IISc Bangalore, IIT Kanpur, IIT Bombay, IIT Delhi, IIT Kharagpur, IIT Madras, BHU and Delhi University. Considering all the agencies together, IISc Bangalore, IIT Kanpur, IIT Kharagpur, IIT Bombay, IIT Delhi, Jadavpur University, BHU and IIT Madras.

Dispersal of projects among institutions

- Extremely narrow; only 5% of 1491 institutions accounted for 50% of projects. Extremely narrow; only 4% of 1773 institutions accounted for 50% of projects.

Dispersal of R&D funding among institutions

- Extremely narrow; only 2% of 1491 institutions accounted for 50% of total R&D funding. Extremely narrow; only 3% of the institutions accounted for 50% of total R&D funding.

Main beneficiary states by quantum of projects

Uttar Pradesh, Delhi, Maharashtra, Tamil Nadu, Karnataka and West Bengal received 65% of the projects. Uttar Pradesh, Maharashtra, Tamil Nadu, West Bengal, Karnataka and Delhi received 65% of the projects. Maharashtra, Uttar Pradesh, Delhi, West Bengal, Tamil Nadu and Karnataka received 64% of the projects.

Main beneficiary states by R&D funding

Delhi, Maharashtra, Uttar Pradesh, Karnataka, Tamil Nadu, West Bengal and Andhra Pradesh, accounting for about 62% of total funding. Maharashtra, Bihar, Karnataka, Delhi, West Bengal and Uttar Pradesh, accounting for about 67% of funding. Delhi, Karnataka, Maharashtra, West Bengal, Tamil Nadu and Uttar Pradesh, accounting for about 67% of total funding.

Share of north-eastern states in sponsored projects

2.1%

3.9%

3.7%

1990-1995

1995-2000

2000-2005

Dispersal of projects among states

Extremely narrow; only 17% of the states accounted for 50% of the projects.

Extremely narrow; only 13% of the states accounted for 50% of the projects.

Extremely narrow; only 16% of the states accounted for 50% of the projects.

Distribution of R&D funding by type of cities

- Four metropolitan cities 26%, 21 state capitals/UTs 22% and rest 401 cities and towns 52%. Four metropolitan cities 31%, 27 state capitals/UTs 32% and the rest 377 cities and towns 37%.

Quantum of R&D funding by type of cities

- Each metropolitan city/state capital, on an average, received Rs.25.9 crores and each city/town in the other category Rs.1.7 crores. Each metropolitan city/state capital, on an average, received Rs.170.3 crores, each state capital Rs. 25.75 crores and each city/town in the other category Rs.2.18 crores

Number of cities getting 50 or more projects

26

31

51

India's contribution to world publications

2.1%. The highest in the area of agriculture (7.0%) and the lowest in medical sciences (1.2%).

2.1%. The highest in the area of agriculture (7.6%) and the lowest in medical sciences (1.2%).

2.3%. The highest in the area of agriculture (7.6%) and the lowest in medical sciences (1.8%).

(-) Information not available in the report, 'Funding Pattern of Sponsored Research by Scientific Agencies - 1990-95'.

1. OVERALL PATTERN

A total of 12523 R&D projects costing Rs. 2198.47 crores were approved by 23 central government departments/agencies during the period 2000-2005. The number of projects sanctioned in a year varied from 2009 to 2749 during this period and the total approved cost varied from Rs.286.71 crores to Rs.570.49 crores (Table 1). There was an increasing trend in both the number of projects and approved cost.

The average cost of an R&D project during 2000-2005 was Rs. 17.55 lakhs, while during the period 1995-2000 this figure was Rs 14.70 lakhs. Thus, the average cost of a project underwent an increase of about 19% over that during 1995-2000.

The R&D support reached out to a total of 9231 scientists as the principal investigators (PIs), spread over a total of 1773 institutions located in 408 cities and towns in the country. These institutions consisted of 156 universities, 624 science colleges, 186 engineering colleges, 143 medical and pharmacy colleges/hospitals, 45 deemed universities, 9 institutes of national importance, 306 national laboratories, 55 state government departments/state S&T councils, 47 Scientific and Industrial Research Organisations (SIRO) (recognised by the Department of Scientific and Industrial Research), 93 corporate sector companies/research institutions and 109 voluntary organisations.

Table 1
Year-wise Extra-Mural R&D support during 2000-2005

Year	Number of projects	Total approved cost (Rs. in crores)
2000-01	2009	286.71
2001-02	2304	444.96
2002-03	2718	448.69
2003-04	2743	447.62
2004-05	2749	570.49
Total	12523	2198.47

2. FUNDING BY SCIENTIFIC AGENCIES

Maximum number of projects (3466) were approved by Department of Science and Technology (DST), followed by University Grants Commission (UGC) (2276), Council of Scientific and Industrial Research (CSIR) (1091), Department of Biotechnology (DBT) (949) and Indian Council of Medical Research (ICMR) (917) (Table 2). These five agencies accounted for about 70% of the total sponsored projects during the period 2000-2005.

Extramural R&D funding support by the Department of Science and Technology was the highest with Rs. 774.45 crores (35.2%), followed by the Department of Biotechnology Rs. 336.99 crores (15.3%), the Ministry of Communication and Information Technology Rs. 182.19 crores (8.3%) and the Indian Council of Medical Research Rs. 146.66 crores (6.7%). These four agencies accounted for about 66% of the total funding.

Table 2

Department/Agency-wise Support to Extra-Mural Research Projects during 2000-2005, 1995-2000 and 1990-95

Department/Agency	2000-2005		1995-2000		1990-1995	
	Number of projects	Total approved cost (Rs. in crores)	Number of projects	Total approved cost (Rs. in crores)	Number of projects	Total approved cost (Rs. in crores)
Councils/Commissions						
All India Council for Technical Education (AICTE)	675	53.13	1419	114.79	-	-
Council of Scientific and Industrial Research (CSIR)	1091	93.36	1010	61.19	792	28.50
Indian Council of Agricultural Research (ICAR)	640	88.01	713	80.67	634	36.41
Indian Council of Medical Research (ICMR)	917	146.66	512	39.98	645	13.07
University Grants Commission (UGC)	2276	67.58	1058	26.86	797	14.19
Departments						
Department of Atomic Energy (DAE)	412	96.41	358	44.17	312	15.37
Department of Ayurveda, Yoga, Siddha and Homeopathy (DAYUSH)	16	2.78	-	-	-	-
Department of Bio-Technology (DBT)	949	336.99	590	168.06	440	133.64
Department of Coal (DOC)	61	40.39	73	199.58	44	20.40
Department of Mines (DOM)	-	-	-	-	3	0.25
Department of Ocean Development (DOD)/ Ministry of Earth Sciences (MOES)	63	20.03	72	11.42	54	23.38
Department of Science and Technology (DST)	3466	774.45	2237	298.38	1810	153.32
Department of Scientific and Industrial Research (DSIR)	63	31.78	37	17.25		
Department of Secondary and Higher Education (MOSHE)*	526	56.62	-	-	261	17.21
Ministries						
Ministry of Communications and Information Technology (MOCIT)**	228	182.19	220	198.46	98	29.29
Ministry of Environment and Forests (MOEN)	262	47.98	210	18.29	211	11.27
Ministry of Food Processing Industries (MFPI)	16	5.53	-	-	-	-
Ministry of Non-Conventional Energy Sources (MNES)	75	17.38	26	4.79	65	8.96
Ministry of Power (MOP)***	55	8.44	-	-	226	12.67

Ministry of Social Justice and Empowerment (MOSJE)#	40	3.72	30	3.04	26	2.72
Ministry of Water Resources (MOWR)	32	9.17	12	0.69	38	1.57
Ministry of Urban Affairs and Employment (UBRD)	-	-	-	-	7	0.34
Other specialist agencies						
Defence Research and Development Organisation (DRDO)	447	97.80	364	40.94	260	20.47
Indian Space Research Organisation (ISRO)	195	15.42	116	7.41	52	3.39
Indian Meteorological Department (IMD)			2	0.14	8	0.60
Petroleum Conservation Research Association (PCRA)	18	2.65	-	-	-	-
Steel Authority of India (SAIL)	-	-	-	-	8	0.72
Total	12523	2198.47	9134	1341.79	6791	547.64

* For the period 1990-95, information pertains to Department of Education.

** For 1995-2000, information pertains to Ministry of Information Technology and for 1990 -95 it pertains to Department of Electronics.

*** For 1995-2000 and 1990-95, information pertains to Central Board of Irrigation and Power.

For 1995-2000 and 1990-95, information pertains to Department of Welfare.

Maximum number of R&D projects (3828) were in the cost range of Rs.5 to 10 lakhs constituting 30.6% of the total projects. 2988 projects were of cost below Rs.5 lakhs (23.9%), 2171 projects in Rs.10-15 lakhs range (17.3%), 1355 in Rs.15-20 lakhs range (10.8%), 753 in Rs. 20-25 lakhs (6.0%) and 1488 in Rs. 25 lakhs and above (11.4%) .

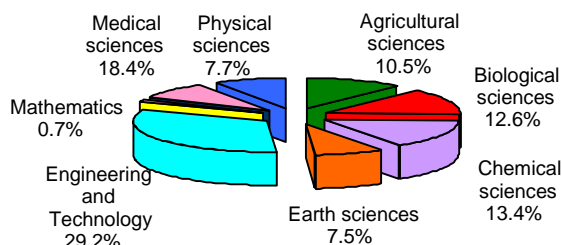
During the period under study, the outreach to the scientists was the highest in the case of DST as the Department provided funding support to as many as 3115 PIs during the five -year period (2000-2005). This agency was followed by UGC (2138 PIs), CSIR (1059 PIs), DBT (870 PIs), ICMR (746 PIs), AICTE (664) and ICAR (606 PIs).

3. FUNDING BY SUBJECT AREAS

Among the subject areas, engineering and technology received maximum support by way of number of projects (22.2%), followed by biological sciences (17.2%) , chemical sciences and medical sciences (both 15.3%). These subject areas together accounted for 70% of the total number of projects. Maximum financial resources were received by engineering and technology (29.2%) followed by medical sciences (18.4%), chemical sciences (13.4%) and biological sciences (12.6%) (Figure 1). These four subject areas together accounted for 74% of the total R&D funding. The extramural support to mathematics was the least (0.7%) .

The average per project cost of an engineering project was the highest (Rs.23.11 lakhs), followed by medical sciences (Rs.21.19 lakhs), agricultural sciences (Rs.18.56 lakhs) and earth sciences (16.74 lakhs). The average cost of a project in the area of mathematics was the least (Rs.4.64 lakhs).

Figure 1
Subject area-wise Distribution of Extramural R&D Support during 2000-2005



4. FUNDING BY TYPES OF INSTITUTIONS

I. Academic Sector: In terms of number of projects, the outreach of the R&D support was the highest in the case of the academic sector (universities/colleges, deemed universities, science, engineering and medical colleges and the institutes of national importance) accounting for about 75% or three-fourth of the total projects; nearly the same as it was during the period 1995-2000. This sector got 57.4% of the funding, witnessing percentage-wise an increase of about 9.6% over the period 1995-2000.

156 universities were granted 4025 projects of total worth of Rs. 520.47 crores accounting for 32.1% of the projects and 23.7% of the total funding support, while 45 deemed universities were gainers of 837 projects with aggregate cost of Rs. 198.92 crores, representing 6.7 % of the projects and 9.0% of the total R&D funding.

624 science colleges were granted 1533 projects of cost Rs. 64.43 crores, accounting for 12.2% of the projects and 2.9% of the total funding support. 186 engineering colleges in the country received funding support of Rs. 78.36 crores for 848 extramural R&D projects, accounting for 6.8% of the projects and 3.6% of the funding. 143 medical colleges and hospitals received 512 projects of worth Rs. 90.03 crores or 4.1% of the projects and 4.1% of the funding.

The nine institutes of national importance received Rs. 310.08 crores or about 14% of the total R&D funding, witnessing an overwhelming increase of as high as 136% over the funding of Rs. 131.26 crores in 1995-2000. Among these institutions, IIT Kharagpur gained the largest grant of Rs. 58.51 crores, followed by IIT Kanpur (Rs. 49.31 crores), IIT Bombay (Rs. 44.01 crores) and AIIMS ((Rs. 42.81 crores),

II. National Laboratories: 306 national laboratories including the central government institutions of the scientific agencies/ministries received 2471 projects of worth Rs. 757.45 crores or 19.7% of the total projects and 34.4% of the total R&D funding. This group of institutions witnessed an increase of about 33% over the funding of Rs. 569.71 crores in 1995-2000, but its share of total five-year funding decreased by 8.1%.

III. State Government Departments/S&T Councils: 164 R&D projects of aggregate cost of Rs. 31.81 crores were sanctioned to 55 government departments including state S&T councils during 2000-2005. They accounted for 1.3% of the projects and 1.4 % of the total funding.

IV. Scientific & Industrial Research Organisations (SIROs): 47 Scientific and Industrial Research Organisations (SIROs) received funding support of Rs. 37.39 crores for 132 extramural R&D projects during 2000-2005, accounting for 1.1% of the projects and 1.7% of the total funding.

V. Corporate Sector: 93 corporate sector companies received research grants of worth Rs. 79.66 crores for 149 projects during 2000-2005, accounting for 1.2% of the projects and 3.6% of the total funding.

VI. Voluntary Sector: The country's voluntary sector was represented by 109 organisations (including professional bodies, schools and individuals) in the extra-mural project database. This sector received support for 174 projects of cost Rs. 29.87 crores, accounting for 1.4% of the projects and also 1.4% of the funding.

Average Funding per Institution: The average funding per institution for the five-year period under study was the highest in the case of institutes of national importance - Rs.34.45 crores, which means each of these institutions, on an average, obtained a research grant of Rs. 6.89 crores in a year. In the case of engineering colleges, medical colleges, state government organisations, SIROs, corporate sector and voluntary sector, the average funding per institution during the five-year period was in the range of Rs. 27 - 86 lakhs. The value of this parameter was the lowest in the case of science colleges - Rs. 10 lakhs or Rs.2 lakhs per institution per year.

Dispersal of Projects and Funding among Institutions : Considering all the agencies together, the parameter *project dispersal ratio* was estimated to be 0.04. It means that only 4% of the institutions accounted for 50% of the total projects sanctioned. Therefore, the dispersal of projects among the institutions which received the R&D support was extremely low (the value of this parameter will be 1 in the ideal case where the projects are equally distributed among the institutions). The *funding dispersal ratio* also registered a low value of 0.03, indicating that only 3% of the institutions accounted for 50% of the funding. Therefore, the dispersal of funding among the institutions too was extremely narrow.

5. REGION-WISE DISTRIBUTION OF PROJECTS

State-wise Distribution

About 64% of the projects were received by the institutions located in six states viz. Maharashtra, Uttar Pradesh, Delhi, West Bengal, Tamil Nadu and Karnataka (Table 3).

Table 3

State/UT-wise Distribution of Number of R&D Projects and Funding during 2000 -2005, 1995-2000 and 1990-95

State/UT	2000-2005		1995-2000		1990-1995	
	Total number of projects	Total approved cost (Rs.in crores)	Total number of projects	Total approved cost (Rs.in crores)	Total number of projects	Total approved cost (Rs.in crores)
Andaman & Nicobar	15	3.59	23	3.40	0.21	3
Andhra Pradesh	808	183.18	678	98.10	46.37	502
Arunachal Pradesh	54	6.35	23	1.58	0.52	5
Assam	274	33.65	189	13.64	3.07	56
Bihar	50	6.58	245	190.20	14.85	137
Chandigarh	306	58.11	197	24.63	14.60	174
Chhatisgarh*	42	5.28	-	-	-	-
Daman & Diu	-	-	-	-	0.001	1
Delhi	1311	304.99	901	137.16	69.21	761
Goa	62	5.42	63	8.38	5.10	36
Gujarat	326	50.99	236	25.61	17.21	177
Haryana	192	21.89	95	17.48	7.46	107
Himachal Pradesh	138	20.96	85	9.40	3.15	69
Jammu & Kashmir	89	12.69	40	4.23	1.69	32
Jharkhand*	165	52.91	-	-	-	-
Karnataka	1166	265.48	932	139.23	58.59	683
Kerala	460	80.01	317	38.00	23.36	260
Madhya Pradesh	219	34.10	260	26.80	20.50	240
Maharashtra	1544	242.59	979	198.51	60.95	742
Manipur	46	4.62	55	3.65	1.09	24
Meghalaya	33	4.49	47	3.82	3.77	43
Mizoram	14	1.64	3	0.19	0.27	7
Nagaland	16	1.87	4	0.17	0.00	
Orissa	188	22.14	166	17.65	11.23	145
Pondicherry	80	12.24	49	3.79	0.88	23
Punjab	249	28.27	162	20.20	7.21	127
Rajasthan	229	33.03	240	24.20	10.59	176
Sikkim	9	1.45	23	4.47	0.03	1
Tamil Nadu	1253	210.41	965	88.14	58.28	718
Tripura	16	2.21	16	0.93	0.39	10
Uttar Pradesh	1377	192.53	1192	114.07	59.87	930
Uttarakhand*	485	69.55	-	-	-	-
West Bengal	1308	225.25	947	124.02	47.19	602
Total	12523	2198.47	9134	1341.79	547.64	6791

*These states were constituted during the period 2000 -2005.

Six states – Delhi (Rs 304.99 crores), Karnataka (Rs. 265.48 crores), Maharashtra (Rs. 242.59 crores), West Bengal (Rs. 225.25 crores), Tamil Nadu (Rs. 210.41 crores) and Uttar Pradesh (Rs. 192.53 crores) accounted for about 67% of the total R&D funding during 2000-2005.

City-wise Distribution: During the period 2000-2005, the R&D funding was dispersed among the institutions located in 408 cities/towns in the country. Among these locations, the institutions based in four metropolitan cities received about 31% of the total funding, those in 27 state capitals/UTs about 32% and the rest in other 377 cities and towns gained about 37% of the total funding support.

Project Funding for North-Eastern Region: During 2000-2005, the north-eastern region consisting of eight states (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura) accounted for only 3.7% of the projects and 2.6% of the total funding of Rs. 2198.47 crores. This period witnessed a slight decrease in the percentage of projects allocated to this region over that in 1995 -2000 (3.9%).

State Funding Dispersal Ratio: Five states – Delhi Karnataka, Maharashtra, West Bengal and Tamil Nadu accounted 57% of the total funding of Rs. 2198.47 crores. The parameter, the *state funding dispersal ratio* was estimated to be 0.16. This means the dispersal of project funding among the states during the period 2000 -2005 was extremely low.

6. OUTPUT INDICATORS

During the period 2000-2005, India's contribution to the world science in terms of number of research papers was merely 2.3% (virtually the same as in 1990 -95 and 1995-2000). By volume, the number of papers published from India in the area of chemical sciences was the highest, followed by agricultural sciences and biological sciences. Among different subject areas, Indian contribution to the world publications was the highest in the area of agricultural sciences (7.6%) and the lowest in medical sciences (1.8%). As compared to the period 1995-2000, the country's contribution in the area of agricultural sciences and mathematics remained the same during 2000-2005, while in medical sciences it increased merely from 1.2% to 1.8%. In rest of the subject areas, this increase was only marginal; in the range of 0.1-0.3%.
