

CHAPTER VI

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HIGHER EDUCATION AND SCIENTIFIC RESEARCH

University Grants Commission (UGC), which was established in 1956, under an Act of Parliament, is expected to coordinate the major responsibility of regulating the standard in higher education sector of the country. It has been monitoring the growth of higher education as well as the establishment of new universities and colleges, so as to ensure that higher education grows in response to the needs of society for trained manpower with appropriate levels of professional training, skills and specializations or general educational attainments.

The introduction of new National Policy on Education (NPE) in 1986 has made the Commission to direct its efforts towards an overall improvement in higher education through appropriate emphasis on: Autonomous Colleges, Redesigning of Courses, State Councils of Higher Education Accreditation and Assessment Councils, Alternative Models of Management in Universities, National Qualifying Test for recruitment of teachers, making Research and Development broad-based, Training Orientation of teachers, Improvement of Efficiency, Youth and Sports and Education for the Minorities Scheduled Castes/ Scheduled Tribes, Handicapped and Women.

The Expenditure on Education by Central and State Governments increased from Rs. 114.4 Crores in 1950-51 to Rs. 9211.86 Crores in 1985-86 to Rs. 114388.82 Crores in 2005-06 and further to Rs. 159237.35 Crores in 2007-08. The State Governments were accounting for 75.3% of the expenditure during 2007-08 (Ref. Table 28). The expenditure on University and the higher education (Revenue account) has increased in absolute terms from Rs. 1106.59 Crores in 1985-86 to Rs. 11013.34 Crores in 2005-06, but its percentage share in the total education expenditure declined from 14.7% in 1985-86 to 11.7% in 2005-06 (Ref. Table 29).

The Higher Education Sector is one of the major performers of research. There is no reliable data available on R&D in Higher Education Sector in the country. The Department of Science and Technology had made efforts during 1998 for quantification of manpower and financial resources devoted to R&D in Science and Technology of Higher Education Sector by launching a national survey executed through 4 zonal centres on sponsored project mode. In 1998-99 for the first time intramural R&D expenditure of Higher Education Sector was quantified from 106 universities and 27 Post Graduate Colleges having R&D to the tune of Rs. 378.56 Crores constituting 2.9% in the national R&D expenditure. Based on the past trend data from 131 universities and 46 colleges has been projected and the R&D expenditure attained a level of Rs. 1254.01 Crores in 2005-06 constituting 4.4% of National R&D expenditure. This amount does not include the expenditure incurred by the State Agricultural Universities and also the Extramural projects funded by Central Departments/Agencies. Such an expenditure has been included under State Sector and Central Sector respectively.

Data on enrolment of students in institutions of higher education can be used as one of the parameters to assess the growth of qualified manpower in the country. The data shown in Table 6.1 reveals that as against the enrolment of 36.05 lakhs students in all faculties in 153 Universities/Deemed Universities with 5816 colleges in the year 1985-86, there were 1.16 Crores students enrolled in as many as 358 universities/deemed universities in 20,667 colleges in 2006-07. The number of universities excluding institutions of national importance, which enjoy university status as on 31st March, 2007 was 358.

Table 6.1

**GROWTH OF UNIVERSITIES/DEEMED
UNIVERSITIES/COLLEGES AND
ENROLMENT**

Year	(Number)			Total Enrolment
	University	Deemed University	Colleges	
1980-81	116	12	4722	2752437
1985-86	136	17	5816	3605029
1990-91	150	29	7346	4924868
1995-96	171	37	9252	6574005
1996-97	172	38	9940	6842598
1997-98	182	39	10678	7260418
1998-99	182	40	11397	7705520
1999-00	189	42	11865	8050607
2000-01	193	47	12806	8399443
2001-02	196	52	15437	8964680
2002-03	200	81	16206	9516773*
2003-04	213	89	16742	9953506**
2004-05	229	96	18120*	10481042**
2005-06	236	101	19348*	11028020**
2006-07	249	109	20677*	11612505**

The figures on enrolment include all faculties such as arts, commerce, humanities etc.

* Provisional ** Estimated

Table 6.2 shows the growth of enrolment faculty wise in higher education from 1985-86 to 2006-07. Though there was an increase in enrolment in absolute terms, the percentage share of S&T faculties in total did not show much change.

There has been a remarkable growth in the number of women enrolled in the institutions of higher education from 10.67 lakhs in 1985-86 to 44.67 lakhs in 2005-06. Data presented in table 6.3 shows that their percentage share in total enrolment has gone up from 29.6 in 1985-86 to 40.5% in 2005-06. In absolute terms, their number in S&T faculties increased from 2.69 lakhs in 1985-86 to 4.66 lakhs in 1995-96 and further to 12.65 lakhs in 2005-06. Among the women enrolled in S&T faculties 71.2% belonged to pure science, 12.9% to medicine, 14.7% to engineering and technology and 1.2% to agriculture and veterinary sciences during 2005-06.

The data in Table 6.4 reveals that the out-turn of S&T personnel has increased from 1,69,393 in 1979 to 2,35,792 in 1995 and further to 6,09,079 in 2003. The percentage share of outturn in Pure Science, Medicine, Agriculture and Veterinary Science in total

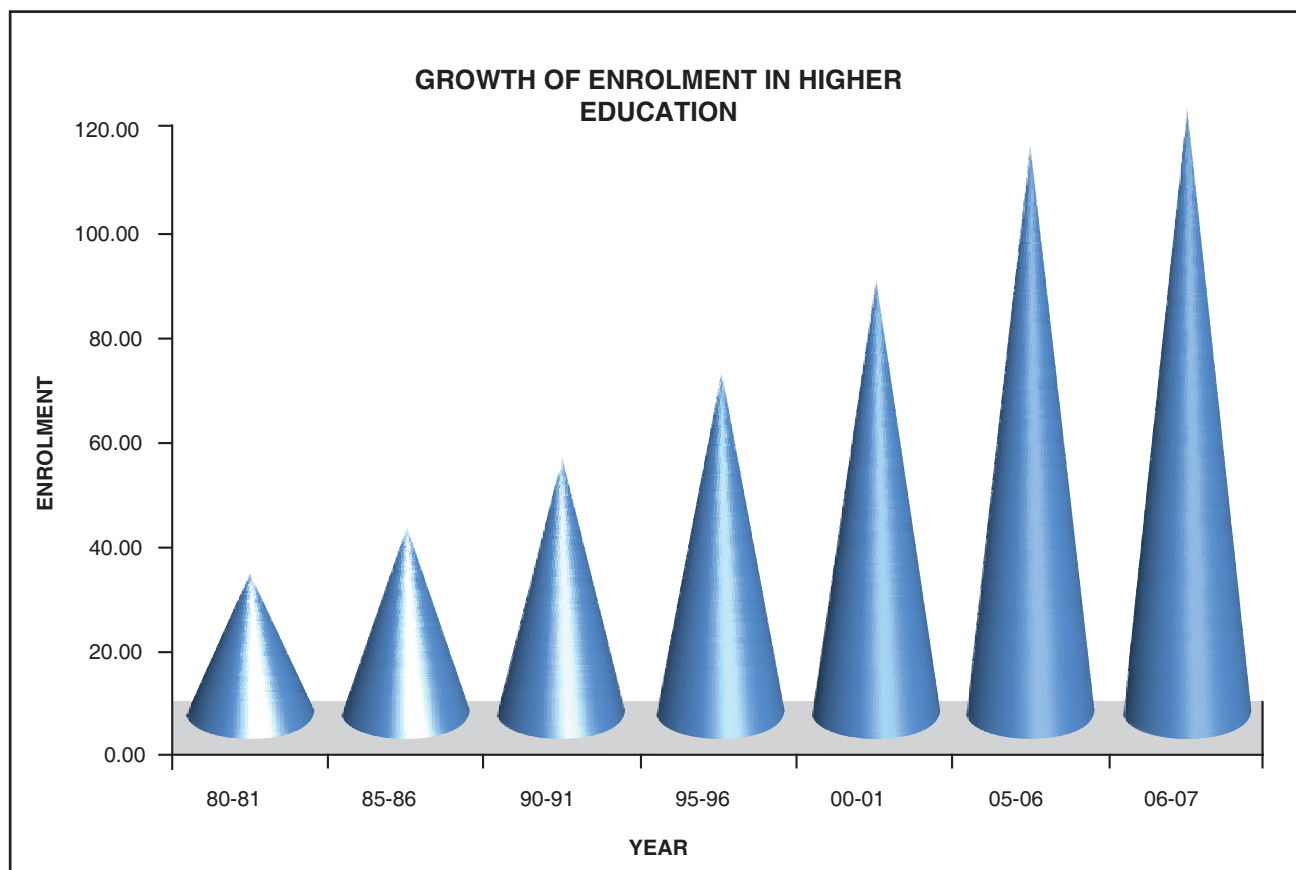


Table 6.2

GROWTH OF ENROLMENT IN HIGHER EDUCATION BY VARIOUS FACULTIES

(Thousands)

Faculty	1985-86		1995-96		2003-04		2004-05		2005-06		2006-07	
	(000)	%	(000)	%	(000)	%	(000)	%	(000)	%	(000)	%
Science	701	19.4	1260	19.6	2035	20.4	2142	20.4	2255	20.5	2375	20.5
Engineering Technology	177	4.9	322	4.9	717	7.2	755	7.2	795	7.2	837	7.2
Medicine	123	3.4	223	3.4	313	3.2	330	3.1	348	3.1	367	3.1
Agriculture	42	1.2	72	1.1	59	0.6	62	0.6	64	0.6	67	0.6
Veterinary Science	9	0.3	19	0.3	15	0.2	16	0.2	17	0.2	17	0.2
Others	2553	70.8	4648	70.7	6815	68.5	7176	68.5	7549	68.4	7949	68.4
Total	3605	100	6574	100	9954	100	10481	100	11028	100	11612	100

S&T out-turn has declined during the period 1979 to 2003, whereas during the same period the share of out-turn in engineering and technology has increased. However, it may be observed that in absolute terms,

Table 6.3

FACULTY WISE GROWTH OF WOMEN ENROLMENT IN HIGHER EDUCATION

Faculty	1985-86		1995-96		2003-04		2004-05		2005-06	
	(000)	%	(000)	%	(000)	%	(000)	%	(000)	%
Science	216	6	440	6.8	809	8.1	850	8.1	901	7.7
Engineering & Technology	12	0.3	26	0.4	165	4.7	176	1.7	186	1.6
Medicine	38	1.1	-	-	145	1.5	154	1.5	163	1.4
Agriculture	2	0.1	-	-	10	0.1	11	0.1	11	0.09
Veterinary Science	1	0.03	-	-	3	0.03	3	0.03	4	0.03
Others	798	22.1	1725	26.81	2870	28.8	3040	29	3202	27.6
Total	1067	29.63	2191*	34.01	4002	40.2	4234	40.4	4467	40.5

Note: * Includes Agriculture, Veterinary and Medicine.

The percentages are calculated on total enrolment of the respective years

Table 6.4

OUT-TURN OF S&T PERSONNEL FROM UNIVERSITIES BY FIELD OF SCIENCE AND LEVEL OF QUALIFICATION

(Number)

	Graduate			Post-Graduate			Doctorates			Total		
	1979	1995	2003	1979	1995	2003	1979	1995	2003	1979	1995	2003
Science	99749	139257	334865	17638	23807	75459	2262	3155	4740	119649	166219	415064
										(70.6)	(70.5)	(68.1)
Engineering & Technology	18364	32250	127499	3155	3667	12249	506	546	779	22025	36463	140527
										(13.0)	(15.4)	(23.1)
Medicine	15090	19613	31697	3485*	4634*	7071*	-	-	-	18575	24247	38768
										(11.0)	(10.3)	(6.4)
Agriculture & Veterinary Science	6280	5752	9109	2384	2284	4416	480	827	1195	9144	8863	14720
										(5.4)	(3.8)	(2.4)
Total	139483	196872	503170	26662	34392	99195	3248	4528	6714	169393	235792	609079
	(82.3)	(83.5)	(82.6)	(15.7)	(14.6)	(16.3)	(1.9)	(1.9)	(1.1)	(100)	(100)	(100)

* MD/MS include doctorates in medical science

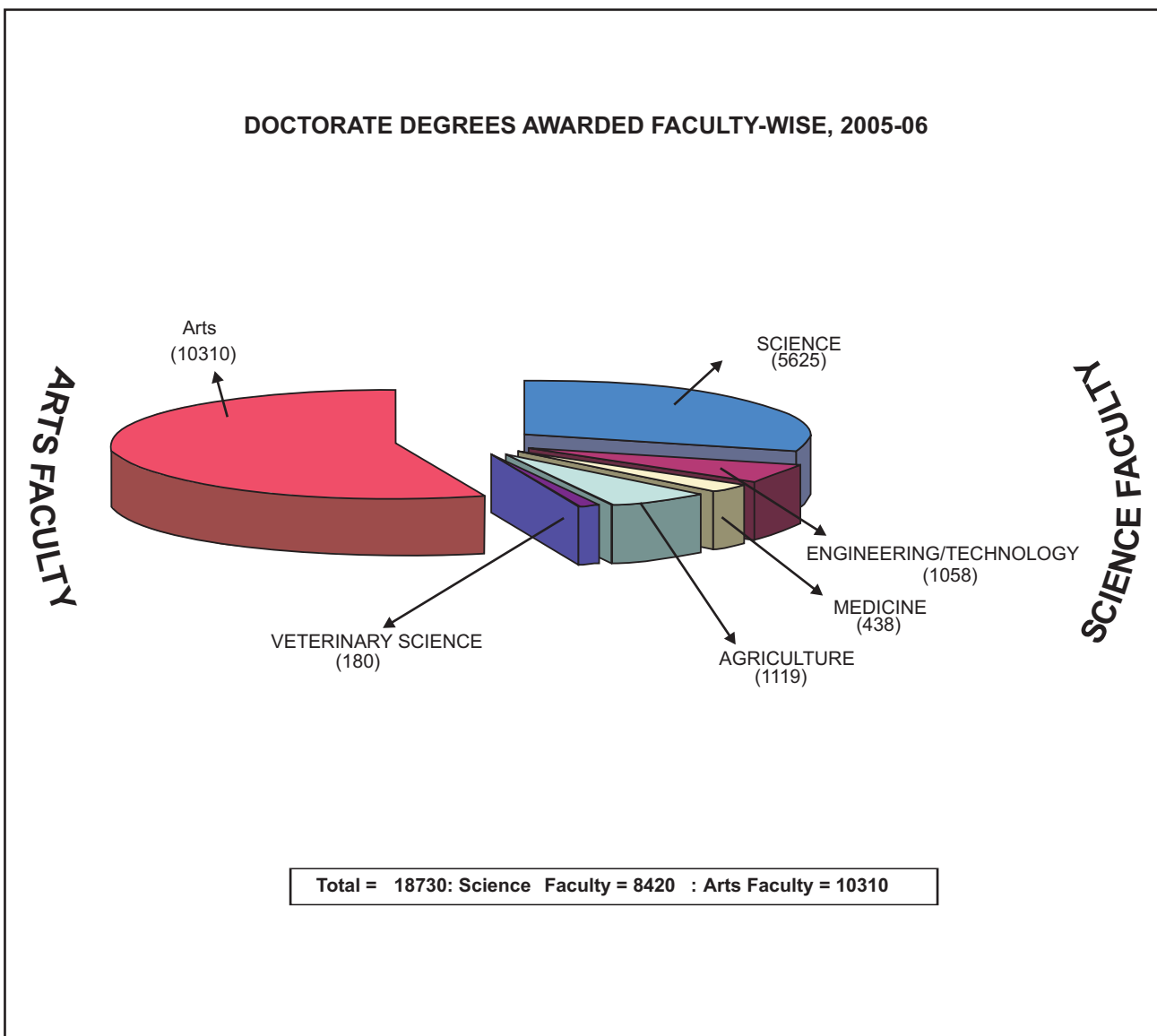
there is an increase in out-turn in all the disciplines and levels of qualification during 1979-2003. Graduate degree holders formed the single largest group with 82.6% of the total out-turn of S&T personnel. Out of them 66.5% were pure science graduates during the year 2003 (Ref. Table 25).

Doctorate degree holders are highly qualified personnel of education system. Analysis of data of Ph.D degree recipients during 2005-06 reveals that 45% of them were from S&T faculties and the rest 55.0% from other non S&T faculties. Pure science alone shared 30.0% of total doctorates to whom Ph.D degrees were awarded during 2005-06 (Table 6.5).

Table 6.5
FACULTY WISE NUMBER OF DOCTORATE DEGREE AWARDED, 2005-06

Faculty	Doctorates	Percentage
Science	5625	30.0
Engineering & Technology	1058	5.7
Medicine	438	2.3
Agriculture	1119	6.0
Veterinary Science	180	1.0
Others*	10310	55.0
Total	18730	100

*Others includes Music, Fine Arts, Library Science Physical Education etc.



Teaching staff in higher education plays a vital role for training better manpower. UGC is making all efforts to keep the standard of teaching staff up-to-date in knowledge, technical know-how, skill by providing requisite facilities and incentives through Faculty Improvement Programme and other schemes. As given in Table 6.6 out of the total 5.04 lakhs of teaching staff serving in higher education sector, 16.1% were in university departments/colleges and 83.9% in affiliated colleges. Percentage share of Professors in the total strength of teaching staff was only 8.2% and

that of Readers/Senior Lecturers, Lecturers and Tutors/Demonstrators were 41.2%, 47.7% and 2.9% respectively. As envisaged in NPE (1986), the University Grants Commission has been strengthening various facilities of educational institutions by way of increased infrastructure facilities such as class rooms, libraries, laboratories, hostels, staff quarters, teacher hostels and other inputs like technical and research support and resources for purchase of equipments, books and journals etc.

Table 6.6

TEACHING STAFF POSITIONED IN HIGHER EDUCATION SECTOR, 2003-04

Organisations	Professors	Readers/ Sr. Lecturers	Lecturers	Tutors/ Demonstrators*	Total
Univ. Deptts./ Univ. Colleges Affiliated** Colleges	17064	38098	23919	1945	81026
Total	41258 (8.20%)	208080 (14.20%)	240898 (47.90%)	14576 (2.90%)	504812 (100%)

* Includes Principals and Senior Teachers who are equivalent to professors.

** Estimated

Note: Figures in parentheses indicate the percentage of the cadres in total staff.

To sum up, the salient features are as under:

- ❖ There were 358 universities/deemed universities, 13 institutes of National importance and 20,677 colleges during 2006-07 to impart higher education in the country.
- ❖ Expenditure on University and other Higher Education (Revenue account) was Rs.11013.34 Crores during 2005-06.
- ❖ 116.12 lakhs students were enrolled for higher education out of which 31.6% were in S&T faculties during 2006-07.
- ❖ Women enrolment in S&T faculty was 11.5% in total enrolment of 110.28 lakhs during 2005-06.
- ❖ Higher Education sector spent Rs.1254.01 Crores on R&D activities with a share of 4.4% in the national R&D expenditure for the year 2005-06.
- ❖ Out turn of S&T personnel increased from 1,69,393 in 1979 to 2,35,792 in 1995 and further to 6,09,079 in 2003. The percentage share of out-turn of engineering and technology increased by 10.1% during the period 1979-03.
- ❖ Out of 18730 Ph.D. degrees awarded during 2005-06, 5625 doctorates were from pure science. Total SET Doctorates were 8420.
- ❖ During 2006-07 there were 5.04 lakhs teaching staff in all faculties in higher education sector, 8.2% of them were in the grade of Professor.