

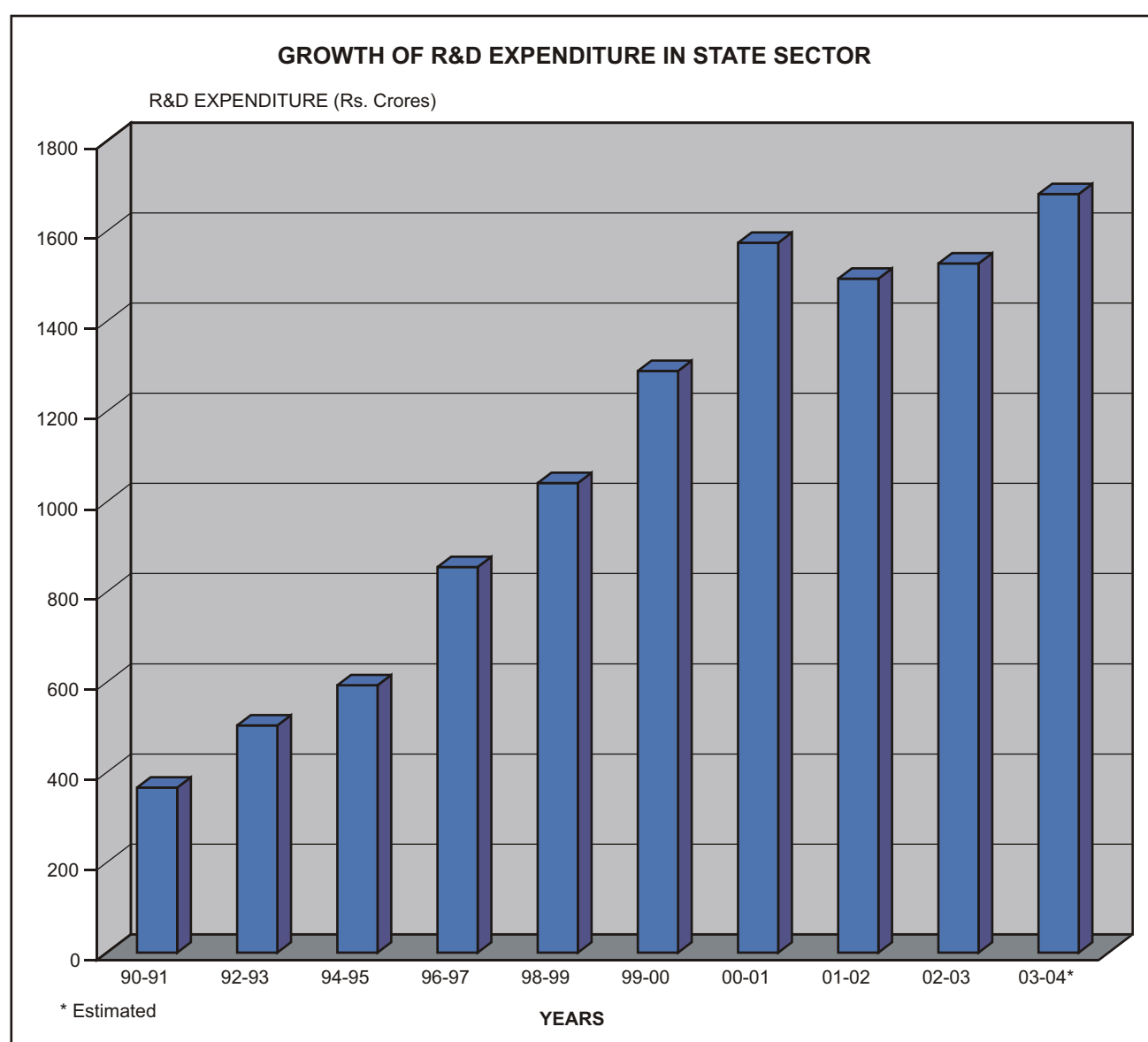
## CHAPTER IV

## RESEARCH AND DEVELOPMENT IN THE STATE SECTOR

The Research and Development (R&D) expenditure incurred by the states has increased from Rs.365.92 crores in 1990-91 to Rs.1574.32 crores in 2000-01 and declined marginally to Rs. 1528.39 crores in 2002-03. The annual growth rate of the R&D expenditure of the states in 2002-03 over 1999-00 was 5.8 %. It is expected to be of the order of Rs.1682.24 crores in 2003-04 and Rs 1851.58 crores in 2004-05. The R&D expenditure by the states accounted for 8.5% of the national R&D expenditure during 2002-03. The R&D expenditure in the states constituted only

0.07% of the GNP at current prices during 2002-03. This share has almost remained the same for the past few years.

Out of the total S&T expenditure of Rs. 1910.64 crores incurred by states during 2002-03, R&D activities comprising of Basic Research, Applied Research and Experimental Development accounted for 80%. The total R&D expenditure incurred by states by type of work for some recent years are presented in Table 4.1.



**Table 4.1****RESEARCH AND DEVELOPMENT  
EXPENDITURE BY TYPE OF WORK**

Percentage of R&D Expenditure by type of work			
Year	Basic Research	Applied Research	Experimental Development
1980-81	10.3	64.4	25.3
1990-91	15.2	58.1	26.7
1996-97	13.4	59.7	26.9
1998-99	12.2	55.6	32.2
1999-00	12.1	55.2	32.7
2000-01	12.2	55.0	32.8
2001-02	12.2	54.9	32.9
2002-03	12.0	54.9	33.1

Basic research varied from 10% to 15%, Experimental Development from 25% to 33% and the rest accounted by Applied research which varied from 55% to 64% for the various years.

Having dealt with the state sector as a whole, it is perhaps useful to analyse the intensity of R&D activities in different states measured in terms of resources deployed. The state wise percentage distribution of R&D expenditure for the year 2002-03, arranged in descending order is given in Table 4.2

**Table 4.2****PERCENTAGE DISTRIBUTION OF R&D  
EXPENDITURE BY VARIOUS STATES, 2002-03**

State	Percentage
Maharashtra	13.5
Gujarat	10.0
Karnataka	8.0
Punjab	7.5
Andhra Pradesh	6.7
Tamil Nadu	6.5
Haryana	6.1
Kerala	5.7
Uttar Pradesh	4.7
Madhya Pradesh	4.3
Uttaranchal	4.1
Himachal Pradesh	3.8
Assam	3.8
West Bengal	3.6
Orissa	2.4
Rajasthan	2.3
Bihar	2.1
Jharkhand	2.0
Jammu & Kashmir	1.4
Chhattisgarh	1.3
Others	0.2
Total	100.0

A few states accounted for a major share of the total R&D expenditure of the state sector as a whole. More than 50% of the total R&D expenditure of the states was accounted by Maharashtra, Gujarat, Karnataka, Punjab, Andhra Pradesh and Tamil Nadu in that order.

The expenditure incurred by the state governments on R&D has been apportioned into 13 objectives as defined by the UNESCO. Accordingly, the data on R&D expenditure by major objectives for the year 2002-03 are presented in Table 4.3

**Table 4.3****PERCENTAGE DISTRIBUTION OF R&D  
EXPENDITURE BY OBJECTIVES, 2002-03**

Objective	Percentage
Development of Agriculture, Forestry and Fishing	92.8
Development of Health Services	2.1
Promotion of Industrial Development	1.0
Others	4.1
Total	100.0

Development of Agriculture and related areas is the major objective in the state sector incurring 92.8% of the total R&D expenditure during 2002-03.

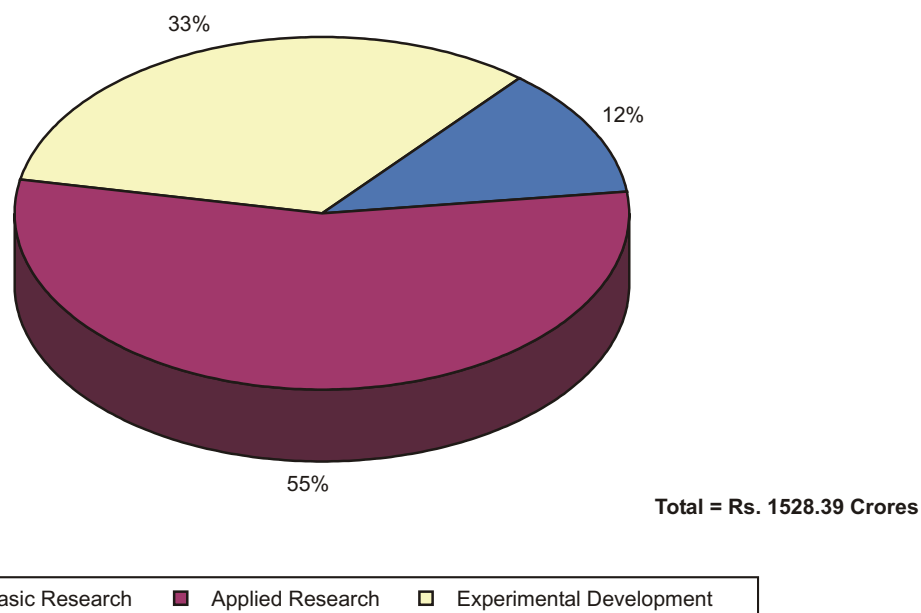
By field of science, the R&D expenditure in state sector is also concentrated in Agricultural Sciences as may be seen from Table 4.4.

**Table 4.4****PERCENTAGE DISTRIBUTION OF R&D  
EXPENDITURE BY FIELD OF SCIENCE, 2002-03**

Field of Science	Percentage
Agricultural Sciences	92.9
Natural Sciences	3.7
Medical Sciences	2.2
Engineering and Technology	1.2
Total	100.0

Another major resource deployed for R&D activities is the manpower employed for such activities. The total personnel employed in the R&D institutions in

### R&D EXPENDITURE BY TYPE OF RESEARCH IN STATE SECTOR, 2002-03



the states was 79,098 as on April 1, 2000. Out of this, about 22.7% (or 17,993 personnel) were employed directly on R&D activities called as R&D personnel. Besides, 22.9% (or 18,156 personnel) of the total were supporting R&D activities called auxiliary personnel

and the rest 54.4% (or 42,949 personnel) were administrative staff. It was noticed that there were 11,642 women personnel employed in the state R&D institutions and out of them 2,262 women were engaged primarily (or directly) on R&D activities.

#### To Sum up, the salient features as under :

- State Sector spent Rs.1528.39 crores on Research and Development activities during 2002-03.
- State Sector accounted for only 8.5% of National R&D expenditure and 0.07% of Gross National Product during 2002-03.
- R&D activities were concentrated in few states only.
- Agriculture was the major field of research in the States.
- There were about 17,993 personnel engaged directly in R&D activities in the State Sector, out of them 2,262 were women.
- Women personnel engaged in R&D activities in the states continued to be very small in number as compared to males and they constitute only about 12.6% of the total R&D personnel in the state R&D establishments.