

## EXECUTIVE SUMMARY

In view of the increasing need for data and information on scientific and technological research in the country for planning, policy formulation and decision making purposes, there has been a growing urge for development of a comprehensive database on the performance and status of R & D systems operating in the country. In this regard considerable efforts have been made over the last few decades to build up an effective information system and database on science and technology statistics of the country with the Department of Science and Technology as the nodal agency and its National Science and Technology Management Information System (NSTMIS) division as the implementing arm. However, when it comes to academic sector, the attempts made so far have not been able to achieve the desired level of success due to lack of good response and prevalence of several complexities unique to this sector.

Keeping in view the overriding need and pressing urgency to develop a comprehensive and reliable database on research and development in science and technology, the DST, Govt. of India had taken up a new initiative on the subject by launching a national survey on project made on zonal basis. The main objectives of the survey and the methodology followed for this were primarily decided in a series of Brain Storming Sessions (BSS) organized by DST on zonal basis across the country.

The survey covered 40 Universities, Institutes and P.G. colleges with research facility located in this zone. As decided in the Brain Storming Session, a total census survey was carried out for the Universities while the colleges were selected on sample basis covering various fields of science.

The total outlay of the East Zone comprising forty Universities/Institutes and selected P.G. Colleges is estimated at around Rs. 620 crores , although data for few Universities could not be included here due to lack of adequate response. The state governments account for about 50% of the grant received by these institutions while the contribution by the central government is around 31%, from own resources 15% and the rest by the other sources. The S&T expenditure in the East Zone amounts to around Rs. 500 crores although data for few Universities are missing. The total expenditure on R&D in the zone is estimated at around Rs. 140 crores. Engineering Science accounts for as much as 50% of total R&D expenditure followed by Natural Science (28%), Agricultural Science (20%) and Medical Science (2%). Applied research claims 37% of the total R&D followed by basic research with 26%. R&D expenditure in agriculture, forestry and fishing claim the largest share viz. around 29 percent. R&D expenditures as percentage of total expenditure and as percentage of S&T expenditure is highest in the case of I.I.T. Kharagpur, which is around 45%.

The total R&D personnel in the East Zone is estimated at around 1300. The largest share of time spent by the faculty is claimed by teaching activities (45%) where the agricultural sciences account for 52% of the total time spent. Engineering sciences claim about 46 percent of the R&D personnel, followed by natural science with 36 percent and agricultural science 18 percent. The I.I.T-Kharagpur claims the largest percentage of R&D personnel(around 43.5%).

The total number of awards received by the faculty was 259 with natural sciences claiming half of it and male persons accounting for as high as 94 percent. The total number of technologies

developed in the zone is estimated at 46, while the total number of faculty involved in it is around 174. The above figures indicate that the highest percentage of technologies developed is claimed by agriculture and engineering sciences, while males are responsible for the development of about 90% of the technologies. Although the total number of patents secured by the R&D institutes in this zone is estimated at 14, the figure may be grossly inadequate in the absence of inputs from several major institutes like the two I.I.T.s and I.S.I, Calcutta. The total number of research projects completed in the zone during the period under review is estimated at 1275 with I.I.T. Kharagpur claiming the maximum number of 192 projects. The highest number of projects are done in the field of Natural Science (561) followed by Engineering Science (435), Agriculture (251) and Medical Science(28). Women are involved in only 5 percent of the projects completed. The total number of fellowship conferred on the R&D personnel of this zone during the study period is estimated at 237. The number of faculty involved in research guidance is highest in Natural science (about 60%) where about 50% of the total numbers of degrees are awarded. Involvement of women in research guidance is found to be extremely low viz. around 0.85 percent. The total number of consultancy projects completed in the zone during the period of study is only 193, the bulk of which are done by the engineering and technology institutes like the I.I.T, Kharagpur (63), Indian School of Mines (37), B.I.T., Ranchi (29), Bengal Engineering College (10). The maximum number of consultancy projects are completed in the field of engineering science. Only about 6 percent of the women faculty were involved in consultancy projects. The total number of research publications in the East zone during the period 1995-98 is estimated at 5392 and the total number of faculty involved in these publications is 1215 with I.I.T. Kharagpur accounting for the highest figure of around 20% of the total publications closely followed by Jadavpur University with 19%. The largest percentage of total research publication ( more than 50%) is claimed by natural science where about 58% of the faculty are involved. Both in terms of percentage of total papers published and percentage of total faculty involved, women account for a meagre 4 % and 8% respectively. The Orissa University of Agriculture and Technology records the highest number (179) of research publications accounting for 23% of the zonal total. Natural science claims the maximum number of research publications (about 46%) and faculty involved (about 47%). Women account for only about 10% of the total faculty involved in research publications sharing a mere 4.5% of the total number of books and monographs published. The total participation of faculty in research fora in the zone during 1995-98 amounts to 933 where 684 members of faculty are involved. Women participation in research fora is around 11 percent. The share of faculty involved in managerial responsibilities is highest in the field of natural science (39.3%) followed by agricultural science (28.8%), engineering science (28.4%) and medical science (3.5%). The female faculty involved in managerial responsibilities accounts for only 9 percent of the total.

Ranking of the universities/institutes covered under East zone is done by estimating a composite score through summation of scores obtained in regard to a set of selected parameters. These scores for individual parameters are estimated in terms of their location in different quartiles i.e. from quartile 1 to quartile 4. While Birla Institute of Technology, Ranchi tops the list of universities/institutes with a score of 80.56, REC Durgapur leads the colleges with a composite score of 58.33. The institutes under engineering sciences have earned the highest scores followed by agricultural science and natural science.