National Survey
on
Quantification of Manpower and Financial Resources devoted to R & D in S & T from Higher Education Sector-East Zone

Sponsored by
Department of Science and Technology (DST)
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National Science and Technology Management Information System (NSTMIS)

DEPARTMENT OF ENVIRONMENTAL SCIENCE
GAUHATI UNIVERSITY
GUWAHATI-781014, ASSAM

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Co-Investigators	: *(1) Dr. S. Kalita* *Dept. of Environmental Science* *Gauhati University* *(2) Dr. L. Choudhury* *Dept. of Statistics* *Gauhati University*
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SUPPORTING STAFF

Designation	Number of Posts	Name and Qualification	From	To
Project Assistant	4	Dr. Sanku Dey, M. Sc. (Statistics), Ph. D. Sanjay Das, M. Sc. (Agri) Somikrishi Kataki, M. Sc. (Geology) Kandarpa Deka, M. Sc. (Statistics) Debajit Kumar Chetia, M. Sc., M. Phil (Env. Sc.) Dipanwita Bhattacharyya, M. Sc. (Phy), M. Phil (Env. Sc.)	02.01.1999 01.02.1999 02.01.1999 01.02.1999 15.05.2000 16.03.2000	30.04.2000 01.03.2000 31.07.2001 30.11.2001 31.05.2001 31.05.2001
Programmer	1	Minaz Masud Sarik, B. Sc., PGDCA	02.01.99	Till date
Part-time Office Assistant	1	Bhaben Das, B. Sc.	01.12.99	30.11.2001
Part-time Peon	1	Aditya Kalita	01.12.99	30.11.2001

DEPARTMENT OF ENVIRONMENTAL SCIENCE
GAUHATI UNIVERSITY
GUWAHATI - 781014,ASSAM, INDIA

Prof. D.C. Goswami
Principal Investigator

Quantification of Manpower & Financial Resources Devoted to R & D in S & T from Higher Education Sector - East Zone
(Project Sponsored by DST, Govt. of India, New Delhi)

Co-Investigators:
Dr. S. Kalita
Dr. L. Choudhury

Ref. No: *Date:*

Preface

I have pleasure in presenting here the final report of the project on '***Quantification of Manpower and Financial Resources devoted to Research and Development in Science and Technology from higher education sector***' sponsored by the Department of Science and Technology (DST), Govt. of India through its NSTMIS Division and coordinated for the East Zone by us under the auspices of the Department of Environmental Science, Gauhati University. Our special thanks and gratitude are due to Dr. Laxman Prasad, Head and Dr. G. J. Samathanam, Scientist, NSTMIS Division, DST, for the help and guidance extended to us during the course of the project. Our gratitude and warm appreciations are also due to the Vice Chancellors, Institutional Coordinators, administrators, faculty members, heads of departments and all other benevolent persons who helped us in conducting the survey and providing us with the necessary data and information.

My sincere thanks are due to the team of dedicated project staff and helpful co-investigators but for whose untiring efforts and hardwork the project would not have come to its successful completion.

I am especially grateful to our present Vice chancellor Dr. G. N. Talukdar and the earlier Vice Chancellor Dr. H. L. Duorah who had extended all possible help and guidance in running this national project in an efficient manner. It will be in the fitness of things that I express my sincere thanks to our university officials and members of the staff for extending me a helping hand in all matters related to the project. I trust and believe the efforts made by us in carrying out the east zone component of the national project will be a positive contribution towards achieving the goal set before them by the Department of Science and Technology, Govt. of India..

D.C. Goswami

(D.C. Goswami)

Telephone : (0361) 570728 (O) , 572416 (R) Fax : 0361-570133 e-mail : dcggu@gw1.dot.net.in

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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.

Introduction

Science and technology has since long been recognized in our country as an effective vehicle of economic progress, a potent agent for social change, a sound basis for manpower development and a prime symbol of intellectual achievement and national pride. The efforts made so far to develop science and scientific research in the country is no doubt praiseworthy given the severe constraints it has to contend with because of a sluggish economy and a vast, tradition bound, complex social base. The nation's commitment to foster, promote and sustain the cultivation of science and scientific research in all aspects – pure, applied and educational—is well demonstrated by its adoption of the 'Science Policy Resolution of 1958', followed by the 'Technology Policy Statement of 1983', 'Technology Policy Statement of 1993' and the draft document of 'Science and Technology-2001'. It is estimated that about 50 billion rupees have so far been spent on the development of science in India. With more than 600 research institutes under the control of the state and central governments in addition to over 800 private sector R&D units recognised by the Department of Science and Technology , India is credited with the distinction of having the third largest scientific and technical manpower in the world. The total manpower employed in R&D establishments in the country is estimated to be around 3.35 lakhs with personnel directly engaged in R&D activities numbering around 1.27 lakhs. Women comprise only 8.2 percent of the total R&D personnel. Our national expenditure on science and technology was Rs. 9089 crores in 1996-97 accounting for 0.8 percent of the GNP. Developed countries with higher GNP spend much more e.g. USA- 2.9 %, Japan- 3.0 %, Germany-2.9%, U.K. -2.1%. India's per capita R & D expenditure is $ 2.39 (i.e. Rs. 100 approx.) while it is $ 568 in USA and $ 825 in Japan. Percentage shares of national expenditure on science and technology for different sectors are: Central Govt. sector 66%, State Govt. sector 9.9%, Public sector industry 14.01%. India spends 18% of the total R & D expenditure on basic research, 39% on applied research, 31% on experimental development and the remaining 12 % on supporting activities.

About 77% of the central government expenditure on R&D comes from 12 major scientific agencies. These are: CSIR (Council of Scientific and Industrial Research), DAE (Department of Atomic Energy), DBT (Dept. of Biotechnology), DNES (Dept. of Non - conventional Energy Sources) , DOD (Dept. of Ocean Development), DOE(Dept. of Electronics), DOS (Dept. of Space), DRDO (Defence Research and Development Organisation), DST(Dept. of Science and Technology), ICAR (Indian Council of Agricultural Research), ICMR(Indian Council of Medical Research) and MOEn (Ministry of Environment). Of these, DRDO accounts for 31.7% of the total expenditure. R&D expenditure followed by defense claims 22.1%, Agriculture, fisheries etc. 17.4%, Industries development 13.8%, Space 11.2% and General advancement of knowledge 5.9%. Although the country has made spectacular progress in selected fields like space, atomic energy, agriculture, off-shore engineering, Antarctica expeditions and seabed mining, the overall performance and impact of research and development in science and technology still leaves much to be desired due to a lack of commensurate return from

huge investments of the country's scarce resources – financial, manpower and infrastructure- on this sector. 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 a comprehensive appraisal of performance and status of R & D systems so far developed 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. This division has been doing commendable works in carrying out regular surveys to quantify R & D resources in the S & T sector. The database generated through these exercises is comprehensive, upto-date, reliable and useful. 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. The quantification of R & D manpower in the academic sector proves to be a difficult proposition for a variety of conceptual and other reasons. Here, manpower engaged in research divides his/her time between teaching, research or other activities. Therefore, simple enumeration of the personnel engaged in research may provide erroneous estimates. At the same time, use of statistical sampling techniques is greatly handicapped by the inherent variability in regard to institutional types, disciplines, standards, areas etc. The research output indicators need to be properly defined to make the quantification more meaningful. There is also the need to define full-time equivalence of research personnel. Quantification of financial resources devoted to research in science and technology sector of higher education raises several difficulties at the conceptual and operational levels. Finances for research expenditure in science and technology in the academic sector come from two sources (i) extramural and (ii) intramural. The extramural finances are received by institutions in the form of research grants provided by funding agencies for specific projects. About 63% of research in higher education is supported through extramural funding. It is relatively easy to quantify this area of expenditure as the required information can be obtained both from the institutions as well as the funding agencies. The problem arises mainly in the case of intramural finance. This happens due to several reasons. Proper apportioning of laboratory expenditure incurred on research activities is difficult to quantify as the same laboratory is used for teaching as well as research. Most universities support some research students who are not recipient of any fellowship out of their annual grant in aid and there is no separate laboratory provision for them. Besides, the research being carried out on part-time basis in colleges by their teachers do not come under reckoning when it comes to quantification of expenditure in research and development in the science and technology sector. It was therefore in the firness of things that the NSTMIS division of DST had taken up the initiative to organise a series of Brain Storming Sessions (BSS) on zonal basis across the country to thrash out the contentious issues involved in the assessment of R & D resources devoted to S & T from the academic sector.

The academic sector is one of the major performers of research. There are 237 Universities and 37 deemed universities in the country today with a total faculty strength in science and technology exceeding 30,000. Besides, there are 10,600 colleges in the country some of which have P.G. courses in science and technology with research

facilities. The total enrolment of students in the higher academic sector is around 70.8 lakhs, about 30 percent of which belong to the science and technology streams. The numbers of Master degree holders produced in major science and engineering fields in the year 1996-97 were 33,280 and 4560 respectively, while for the doctorate degree in these two sectors the figures were 4751 and 298 respectively. Estimates based on science citation index indicate that research publications from India comprise only 1.6% of the world total, bulk of which is contributed by the academic sector.

Brain Storming Session (BSS)

In view of 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 has taken up the new initiative on the subject by launching this project on zonal basis. The main objectives of the survey and the methodology to be followed for this were primarily decided in a series of Brain Storming Sessions (BSS) organized by DST on zonal basis across the country. The major contentious issues involved in the assessment of R&D resources devoted to S&T from the academic sector were thrashed out in the brain storming sessions by peer groups of senior professors, academic administrators and finance officials drawn from various Universities and other institutions of higher education together with the scientists from the NSTMIS division of DST, Govt. of India and representatives from funding agencies. The session were held at Thanjavur (Tamil University, October, 1997), Pune (University of Pune, January, 1998), Guwahati (Gauhati University, February, 1998) and Lucknow (Birbal Sahni Institute of Paleobotany, March, 1998).

The east zone BSS was organized at Gauhati University on January 8 and 9, 1998 under the auspices of the Department of Environmental Science. This zone covers the states of Orissa, West Bengal, Bihar, Sikkim, Mizoram, Meghalaya, Manipur, Nagaland, Tripura, Arunachal Pradesh and Assam. There are altogether 44 institutes of higher learning including Universities, deemed Universities and institutes of national importance (e.g. IITs) in this zone, besides a large number of P.G. colleges having R&D facilities in S&T. The invitees to the BSS (East Zone) included academicians, scientists, administrative heads of Universities, Directors of National institutions of learning, representatives of State Education Department, the UGC and few funding agencies. Invitations were initially sent to more than 60 persons. However, the final tally of participants who attended the BSS stood at 49.

The BSS was organized with the following major objectives in view

- To discuss various issues-conceptual, administrative and financial- involved in quantification of manpower and financial resources devoted to R&D in S&T from the academic sector.

- To identify the appropriate R&D output indicators in the higher academic sector.

- To evolve a suitable methodology for survey of manpower and financial resources deployed in R&D of S&T in the academic sector.

The following set of recommendations covering the major areas of the theme of the workshop were adopted in the East Zone BSS at Guwahati:

- in view of the significant need to quantify the R & D resources in S & T of the academic sector, a national level survey based on questionnaires should be carried out on zonal basis viz. East Zone, West Zone, North Zone and South Zone to collect the required data and information.

- the survey should be carried out on project mode through four zonal coordinators- one for each zone.

- the survey should be done on full enumeration or census basis in case of universities, deemed universities and institutes of national importance(e.g. IITs) and on sample basis in case of the P.G. science, engineering and medical colleges.

- a set of well structured questionnaires should be designed to collect information pertaining to R & D manpower and financial resources from individual faculty, academic departments and institutions.

- a nodal person should be identified in each major academic institution having R & D activity to serve as institutional coordinator and he should be paid suitable honorarium for the service rendered.

- provision should be made to organise workshops at state or regional level to train the institutional coordinators and other members of the project team.

- at the initial stage of the survey, a pilot study should be carried out covering selected academic institutions to validate the questionnaires prepared for the purpose,

- the reference period for the proposed survey should be three years viz., 1994-95, 1995-96 and 1996-97.

- while agreeing to the set of research output indicators already proposed by NSTMIS (DST), participants feel that publications in accredited journals and those that are refereed should be given higher weightage.

- life membership of scientific associations and curriculum development in Science and Technology should also be considered as R & D output indicators.

- to assess intramural funding in the academic sector, besides the primary data collected through questionnaires, official reports and documents available with

the institutions, funding agencies and government departments should also be utililised.

- over and above the conventional methods, electronic media (e-mail, fax etc.) should be used in collecting necessary information from different academic institutions, funding agencies and government departments and the database management should be carried out using sophisticated computer system.

A copy each of the inaugural address by Dr. J. Medhi, Professor Emeritus, Gauhati University, Key note address by Dr. A.N.N. Murthy, Jt. Adviser and Head(NSTMIS), DST, Background note on the BSS by Professor D.C. Goswami, Coordinator, BSS(East Zone) are attached in **Appendix-I**.

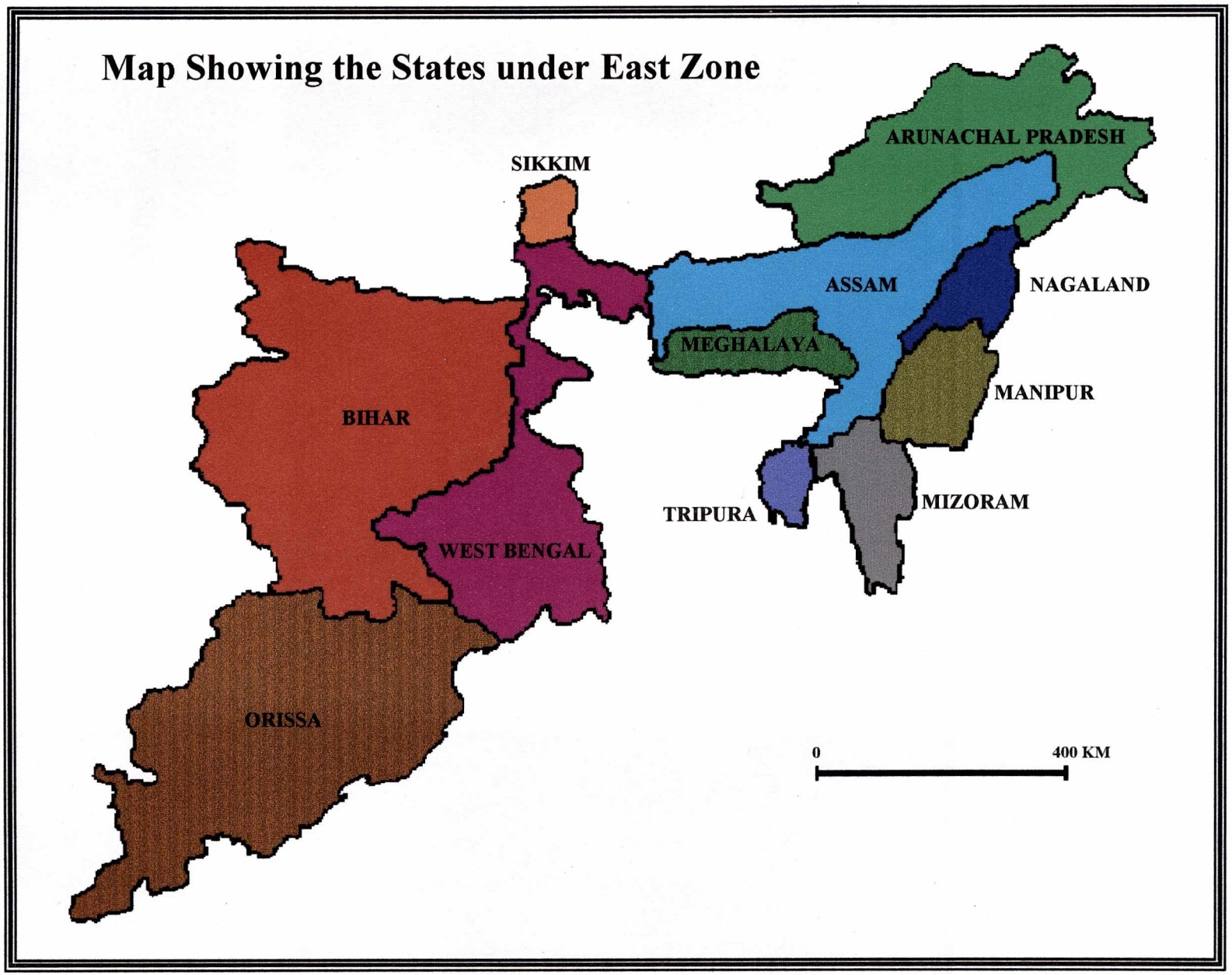
The different phases of the Project and the activities involved therein are discussed as follows:

East Zone Profile

The East Zone comprises eleven states viz. Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, Sikkim, Orissa, Bihar and West Bengal.(**Map 1)** The survey covered 40 Universities, Institutes and P.G. colleges with research facility located in this zone (**Table 1**). 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.

Table 1: Distribution of East Zone Universities/Institutions/PG colleges by field of Science

State	Conventional	Agricultural	Medical	Engineering	Institutes of National Importance	**Total**
Assam	5	2	3	1	1	**12**
Arunachal Pradesh	1					**1**
Nagaland	1					**1**
Manipur	1	1				**2**
Tripura	1					**1**
Meghalaya	1					**1**
Bihar	3	2		2		**7**
Orissa	2	1				**3**
West Bengal	6	2		2	2	**12**
Total	**21**	**8**	**3**	**5**	**3**	**40**


Map Showing the States under East Zone
ARUNACHAL PRADESH
SIKKIM
ASSAM
NAGALAND
MEGHALAYA
MANIPUR
BIHAR
TRIPURA
MIZORAM
WEST BENGAL
ORISSA
0
400 KM

A Local Project Advisory Committee (LAPC) with professor H.L. Duorah, Vice Chancellor of Gauhati University, as chairman, was constituted to provide necessary advice and guidance to the project and to monitor its progress. The list of members of the LPAC is presented in **Appendix-II**. The committee met three times during the period of the project and offered useful recommendations. The dates and vanues of the meetings of coordinators and LPAC are shown in **Table 2**. The minutes containing recommendations of each of the LPAC meetings are presented in **Appendix-III**.

Table 2 : Meetings of Coordinators and LPAC

Sl. No	Date	Purpose of the meeting	Members	Vanue
1	Oct. 28, 1998	Revision of Draft Questionnaire	All Zonal Coordinators, Officers from NSTMIS Div.	Delhi
2	Nov. 16-22, 1998	Secondary Data Collection	Zonal Coordinators, Supporting Staff, DST Officers	Delhi
3	Feb. 8, 1999	LPAC meeting 1	LPAC Members, Supporting Staff, DST Representative	Guwahati
4	May 24-25, 1999	Revision of Pilot Survey work	Zonal Coordinators, DST Representative	Roorkee
5	July 19-24, 1999	Workshop for Programmers from all Zones	Programmers from all Zones	Pune
6	Sept. 10, 1999	LPAC Meeting2	LPAC Members, Supporting Staff, DST Representative	Guwahati
7	June 15-20, 2000	Discussion meeting – Retrieval of Data	Zonal Coordinators, Supporting Staff, DST Officers	Thanjavur
8	July 27, 2001	LPAC Meeting3	LPAC Members, Supporting Staff, DST Representative	Guwahati

Project Objectives and activity plan

The main objective of the project is to develop a comprehensive and reliable database on manpower and financial resources devoted to research in science and technology from higher academic sector. The various activities planned to achieve the core objective of the project are:

- to carry a pilot study on sample basis to validate the questionnaires and data collection procedure.

- to collect information on total census basis through field survey using the validated questionnaires.

- to collect data on sample basis from P.G. colleges producing degrees based on research in S & T.

- to estimate Full-time Research Equivalence (FTE) of R & D manpower – discipline wise, institution wise and level wise.

- to quantify research output indices of academic sector and classify manpower on the basis of performance as well as financial and infrastructural facilities.

- to quantify R&D expenditure in S&T of the academic sector-both extramural and intramural.

- to develop a suitable computer based technique to process data on manpower and financial resources devoted to research in S&T from the academic sector.

- to highlight intrazonal variations in R&D input as well as output resources in S&T of the academic sector.

PHASE I : PREPARATORY WORKS OF THE PROJECT

Selection and appointment of Institutional Coordinators

As suggested in the Brain Storming Session, to facilitate collection of data through the questionnaire survey from various institutes, one senior Professor from each University/institute was identified to act as an Institutional Coordinator, based on the recommendation of the respective institutional head. At the out set, Dr. Laxman Prasad, Head, NSTMIS Division of DST approached the Vice Chancellors of different Universities/Institutions to extend help and cooperation in conducting the national survey and to identify the institutional coordinator. The Principal Investigator of the project also sent an appeal to the institutional heads seeking their participation in the survey. Both these appeals are attached to the questionnaires (**Appendix-IV**).

Preparation and finalisation of the faculty list

The faculty lists for different institutions were prepared initially on the basis of information available in the handbook of Association of Indian Universities. These were then sent to the institutional coordinators for correction and updation. Based on the information provided by them, the lists were finalised.

Preparation of Questionnaires

A draft of questionnaire prepared by Dr. S.R. Jog , Principal Investigator, West Zone was presented in the Brain Storming Session North Zone (March 98) held at Luknow. The same was discussed at length and has been included in the book of the "Proceedings of Brain Storming Session (March 98) Luknow". Subsequent to this, in a meeting of all the zonal coordinators with DST officials in September 1998 the questionnaires were discussed and refined. During this meeting Principal Investigators were requested to consult faculties in their area from different fields of science and finalize the questionnaires. In the Local Project Advisory Committee (LPAC) meetings of all the zones, the draft questionnaires were discussed. Final approved draft of the questionnaires became available in the last week of February 1999. The pilot survey then could take off in the month of March 1999.

Three sets of questionnaires were finally designed based on the discussion at Lukhnow BSS and subsequent meeting of the PIs. The questionnaires as given in **Appendix-IV** are:

Questionnaire I meant for the Institute as a whole seeks information about the institutes status, strength of manpower and details of financial resources and heads of expenditures. Two separate questionnaires were designed for PG colleges with research facilities and Universities/institutes. For medical and engineering faculties too, separate questionnaires were used.
Questionnaire II meant for PG departments. Its purpose was to gather information on infrastrucral facilities available in the department and the level of research performance achieve by the faculty.

Questionnaire III meant for individual faculty members seeks personal information on different aspects pertaining to input and output indicators of research.

PHASE II : PILOT SURVEY

As recommended by the Brain Storming Session as well as the LPAC meetings, a pilot survey was carried out before the actual census survey to validate the methodology and questionnaires. In the case of East Zone, a total of seven Universities/institutes were selected for the pilot survey (**Table 3**). Except the I.I.T., Kharagpur from where no response in regard to questionnaire III relating to the faculty was received, the rest did fairly well (>40% on the average). A meeting of the zonal coordinators were held at the behest of DST in the last week of may 1999 at Rorkee University to review the progress of the pilot survey. The meeting discussed the problems faced during the pilot survey and the questionnaires that were used for it. After thorough deliberation, a final draft of the questionnaires to be used by all the four zones was approved. It was also decided in the meeting to hold a workshop of the programmers from different zones at Pune to trained them on the use of the software prepared by the West Zone which was accepted in an earlier meeting of

zonal coordinators. The workshop was subsequently held at Pune from 17 to 20 July, 1999 where the East Zone programmer also participated.

Table 3 : Lists of University/institutes selected for Pilot Survey

University/Institute	Q. III			Q.II			Q.I		
	Received	Out of	%	Received	Out of	%	Received	Out of	%
Gauhati University, Guwahati	70	120	58.3	10	14	71.4	1	1	100
North Eastern Hill University, Shillong	45	74	60.8	2	10	20	1	1	100
I.I.T, Kharagpur		445			26		1	1	100
Assam Agricultural University, Jorhat	57	100	57	4	18	22.2	1	1	100
Indian School of Mines, Dhanbad.	30	105	28.6	3	14	21.4	1	1	100
Assam Medical College, Dibrugarh	34	119	28.6	6	18	33.3	1	1	100
College of Veterinary Sc., Guwahati	56	100	50.9	8	14	57.1	1	1	100

PHASE III : CENSUS SURVEY

Methodology and Database

Since manpower and financial resources represent the two most vital inputs to research in science and technology these two areas are selected as core themes for investigations in this survey. The methodology followed in quantifying manpower and financial resources devoted to R&D from the academic sector are discussed separately as follows :

Manpower Resources : Quantification of manpower resources engaged in research in science and technology of the academic sector is a difficult task due to certain conceptual and operational difficulties. The manpower engaged in research in the academic institutions divides their time between teaching, research and other activities. Therefore, simple enumeration of the personnel engaged in research may provide erroneous estimates. At the same time, use of statistical sampling techniques is also greatly handicapped by the inherent variability in respect of institutional types, disciplines, standards, areas etc. Research is carried out in most universities through extramural funding of projects by Govt. agencies and undertaken by faculty members, consultancy services provided by the faculty to the industry or other establishments and by the M. Phil. and Ph. D. students engaged in individual research. The research indicator outputs need to be properly defined to make the quantification meaningful. There is also the need to define full-time equivalence (FTE) of research personnel. The problem of

time budgeting vis-à-vis the UGC norms for teachers of different grade is another issue that is quite relevant.

The sole criterion used in quantifying R&D manpower resources in the survey is the calculation of Full Time Equivalent (FTE) based on the average time spent in research activity. As an example, if a person spend 30% of his time on R&D, then he is counted as 0.3 FTE. Thus, in a department having a faculty strength of, say, 20 and the total time spent on R&D by them averages 30% , then the total FTE of manpower in the department is estimated to be 6(i.e. 30% of 20).

Financial Resources : Quantification of financial resources deployed in research in the science and technology sector of higher education raises several difficulties at the conceptual and operational levels. Finance for research expenditure in science and technology in the academic sector comes from two sources (i) extramural and (ii) intramural. The extramural finances are received by institutions in the form of research grants provided by funding agencies for specific projects. About 63% of research in higher education is supported through extramural funding. It is relatively easy to quantify this area of expenditure as the required information can be obtained both from the institutions as well as the funding agencies. The problem arises mainly in the case of intramural finance. This happens due to several reasons. Proper apportioning of laboratory expenditure incurred on research activities is difficult to quantify as the same laboratory is used for teaching as well as research. Most universities support some research students who are not recipient of any fellowship out of their annual grant in aid and there is no separate laboratory provision for them. Besides, the research being carried out on part-time basis in colleges by their teachers do not come under reckoning when it comes to quantification of expenditure in research and development in the science and technology sector.

Calculation of S&T expenditure of the academic institutes is rather difficult as the institutes in most cases maintain expenditure for the whole institute including non S & T departments. The procedure followed in apportioning the S&T expenditure from the total expenditure involves the following steps. First, the ratio of S&T departments against non-S&T departments in the university/ institutes is applied to the total maintenance budget to calculate a component of S&T expenditure which we will call ST Exp.1. For example, if the ratio of S&T departments against non – S&T departments is 8:24 and the total maintenance budget of the university/ institute is 18 crores , then the value of the component ST Exp.1 works out to be 6 crores. Next, the total amounts spent by S&T departments on various heads like laboratory, salary, maintenance, contingency, seminar and others , obtained from the internal budgets of the departments , are summed up to obtain another component of S&T expenditure which we will call ST Exp.2. Now, the total S&T expenditure for the university is obtained by adding the values of components ST Exp.1 and ST Exp.2. For calculation of total R&D expenditure of the university/ institute, two components are separately estimated based on the following procedure. First, applying the student- scholar ratio against the total of all the budget heads other than salary, an R&D expenditure component is calculated which we will call RD Exp.1. For example, if the student- scholar ratio for a university is 0.15 and total S&T

expenditure other than salary is 6 crores, then applying this ratio the RD Exp.1 works out to be 0.90 crores. Next, another R & D expenditure component is calculated by applying the FTE (Research) percentage to the total salary budget of all the S&T departments. Let this component be called RD Exp.2. If the total salary budget of S&T departments in a university/ institute is, suppose Rs.5 crores and FTE (Research) is 30%, then the component RD Exp.2 works out to be 1.50 crores. Now the total RD expenditure for the university is calculated by adding the two components viz. RD Exp.1 and RD Exp.2. In this example, the R&D expenditure for the university = 0.90 crores +1.50 crores = 2.40 crores.

The Database on financial resources covers the financial year 1997-98 while that of manpower resources covers the years 1995-96, 96-97 and 97-98.

Response Status

For the East Zone as a whole, the status of overall response in regard to Questionnaire I (Institutional response) was in the range of **92.50%**, Questionnaire II (Departmental response) **41.15%** and Questionnaire III (Faculty response) **42.36%** (**Table 4**). The details of the response from individual university/institute are given in **Appendix-V**.The overall response is highest in the engineering faculty, while it is lowest in the medical faculty. The IIT Kharagpur's response in regard to Questionnaire III was extremely low due to general reluctance of the faculty to spare their time for filling in the questionnaires. In the case of Bihar and Orissa, closure and disruption of academic schedules of several major universities due to campus unrest, natural calamities like the cyclone in Orissa coinciding with the survey period had a negative impact on the response profile of the survey. Experiences from the survey indicate that the questionnaires need to be further simplified to evoke better response from the faculty and departmental heads.

Table 4 : Summary of Response Status of Universities and Institutes

Questionnaire	Response Status (East Zone)		
	Distributed	Responded	% Response
Q I	40	37	92.5
Q II	469	193	41.15
Q III	4155	1760	42.36

PHASE IV : ANALYSIS AND RESULTS

The data obtained from the survey through the administered questionnaires and selected secondary sources are analysed applying the software specially developed for the purpose for common use by all the four zones. The tabulation of the data was also done maintaining uniformity of pattern among the zones so as to facilitate eventual compilation of the comprehensive national database from the individuals zonal databases. In the following pages, results based on the analysis of the collected data are presented

under three major categories viz. Financial resources, Manpower resources and output indicators. While bulk of the tabulated data are annexed to the report in the form appendixes, the corresponding graphical presentations are included within the body of the text. This arrangement has to be made to segregate the voluminous data inputs and to allow uninterrupted reading of the text containing interpretation and salient results derived from analysis of data.

Financial Resources

The total outlay of the East Zone comprising forty Universities/Institutes and selected P.G. Colleges is estimated at around Rs. 620 crores (Table A-6.1.1), 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 (Fig. 1). The dataset for this is presented in Table A-6.1.2. The S&T expenditure in the East Zone amounts to around Rs. 500 crores although data for few Universities are missing (Table A-6.1.3). The total expenditure on R&D in the zone is estimated at around Rs. 140 crores (Table A-6.1.4 and Table A-6.1.5). 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%) as illustrated in Fig.2 based on the data on Table A-6.1.6. In this Zone, Applied research claims 37% of the total R&D followed by basic research with 26% (Fig.3 and Table A-6.1.7). Among the major socio-economic objectives involved in R&D expenditure, agriculture, forestry and fishing claim the largest share viz. around 29 percent (Table A-6.1.8). R&D expenditures as percentage of total expenditure and as percentage of S&T expenditure are illustrated in Fig.4 and Fig.5 respectively. In both these figures, the highest percentage is recorded in the case of I.I.T. Kharagpur, which is around 45%.

Manpower Resources

The total R&D personnel in the East Zone is estimated at around 1300 (Table A-6.2.1). However, genderwise breakup could not be provided here as the data on I.I.T-Kharagpur and I.I.T-Guwahati are not available. Time spent by the faculty on different activities and in different fields of science, recorded in Table A-6.2.2, is illustrated in Fig.6a and Fig.6b. It is evident from the above figures that the largest share of time is claimed by teaching activities (45%) where the agricultural sciences account for 52% of the total time spent (Table A-6.2.2). The data on R&D personnel by field of science (Table A-6.2.3) is graphically presented in Fig.7. It shows that engineering sciences claim about 46 percent of the R&D personnel, followed by natural science with 36 percent and agricultural science 18 percent. The Table A-6.2.4 shows genderwise breakup of R&D personnel. However in the absence of the breakup data pertaining to I.I.T-Kharagpur and I.I.T-Guwahati, the data set remains incomplete. A directory list of the eminent R&D personnel (based on guideline provided by DST) is presented in Table A-6.2.5. Here, I.I.T-Kharagpur claims the largest percentage of R&D personnel(around 43.5%).

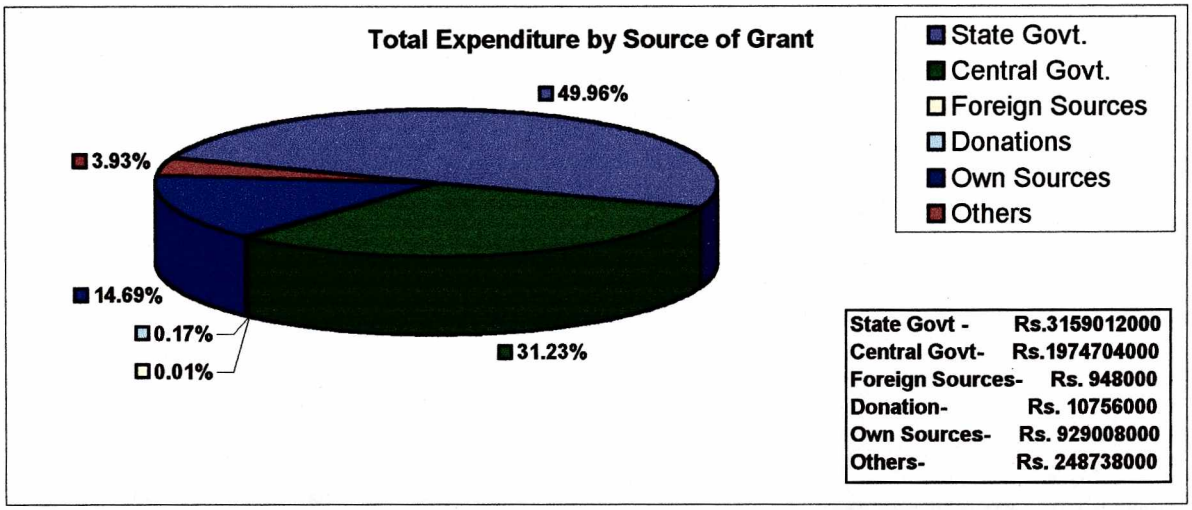


Fig.1

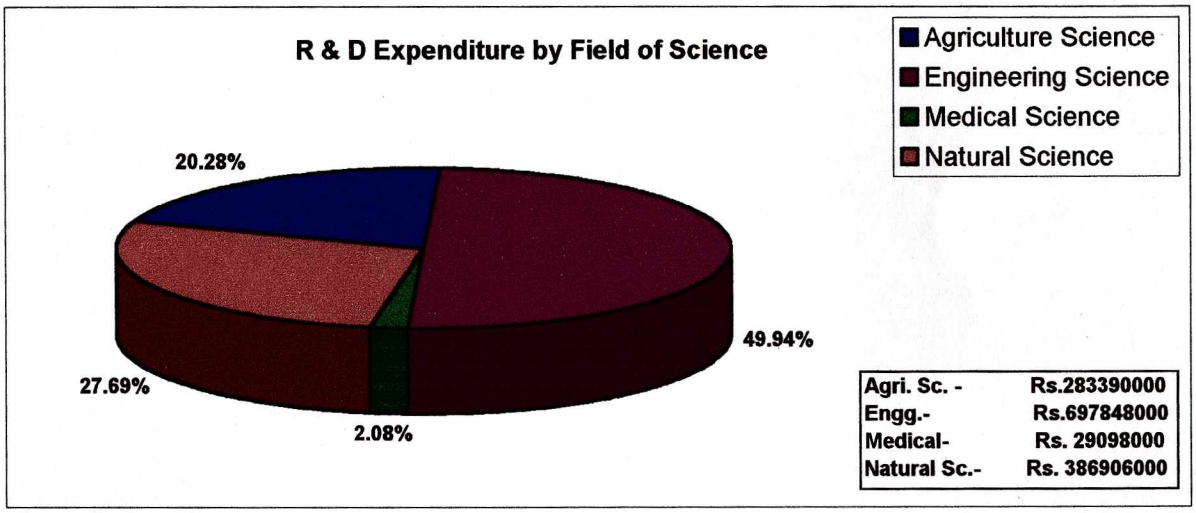


Fig.2

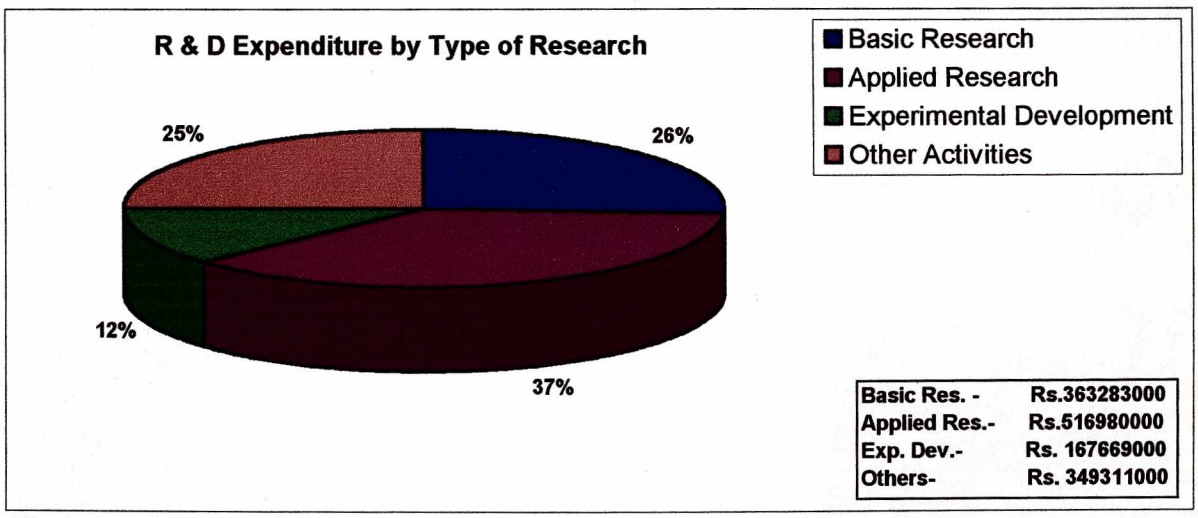


Fig.3

R & D Expenditure as Percentage of Total Expenditure
Percentage
100
90
80
70
60
50
40
30
20
10
-
Universities
Arunachal Univ
AAU
Assam Univ
Bengal Engg College
Bidhan Chandra K V
BIT, Ranchi
Birsa Agri Univ
Burdwan Univ
Calcutta Univ
CAU, Imphal
Dibrugarh Univ
Gauhati Univ
I.I.T., Kharagpur
I.I.T., Guwahati
ISI
ISM
Jadavpur Univ
Kalyani Univ
L.N. M Univ
Manipur Univ
Nagaland Univ
N Bengal Univ
NEHU, Shillong
OUAT
Patna Univ
Rajendra Agri Univ
Ranchi Univ
Sambalpur Univ
Tezpur Univ
Tripura Univ
Utkal Univ
Vidyasagar Univ
WB Univ of A&F Sc.

Fig.4

R & D Expenditure as Percentage of S & T Expenditure
Percentage
100
90
80
70
60
50
40
30
20
10
0
Universities
Arunachal Univ
AAU
Assam Univ
Bengal Engg College
Bidhan Chandra K V
BIT, Ranchi
Birsa Agri Univ
Burdwan Univ
Calcutta Univ
CAU, Imphal
Dibrugarh Univ
Gauhati Univ
I.I.T., Kharagpur
I.I.T., Guwahati
ISI
ISM
Jadavpur Univ
Kalyani Univ
L.N. M Univ
Manipur Univ
Nagaland Univ
N Bengal Univ
NEHU, Shillong
OUAT
Patna Univ
Rajendra Agri Univ
Ranchi Univ
Sambalpur Univ
Tezpur Univ
Tripura Univ
Utkal Univ
Vidyasagar Univ
WB Univ of A&F Sc.

Fig.5

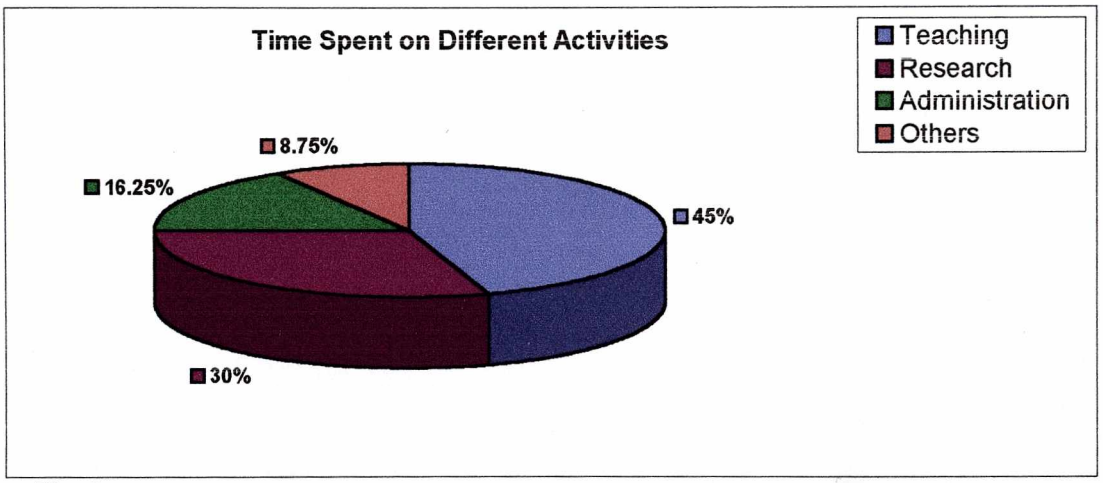


Fig. 6a

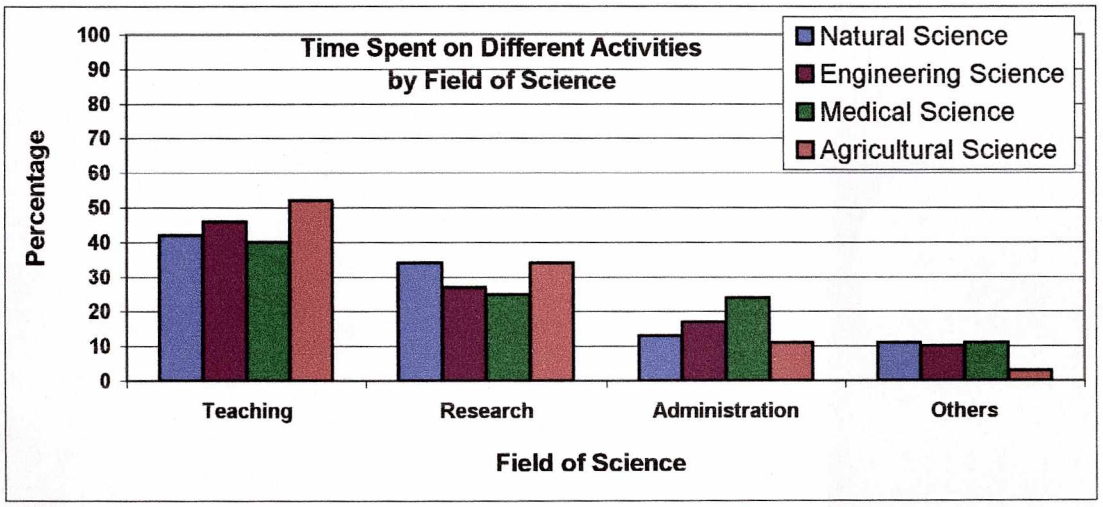


Fig. 6b

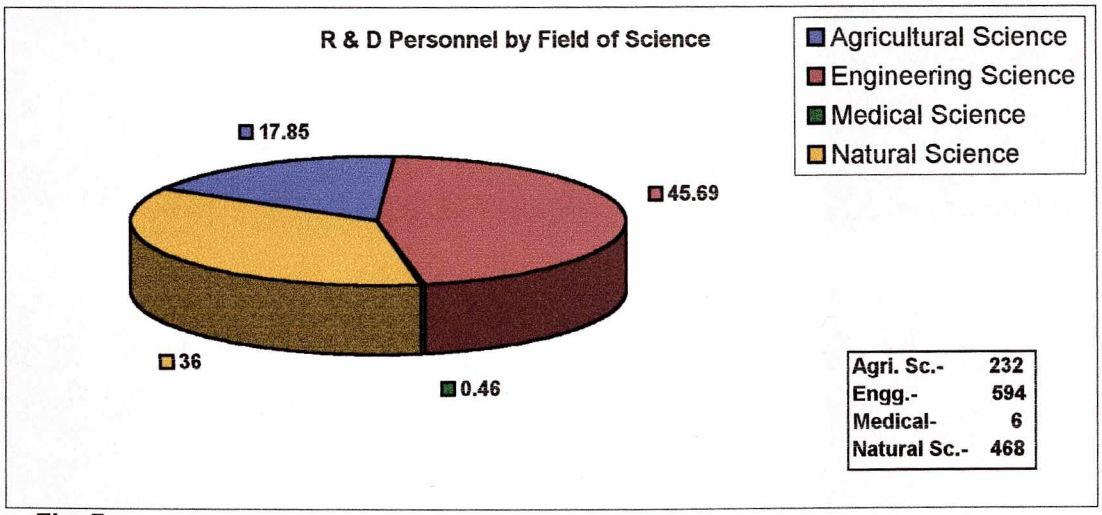


Fig. 7

Output Indicators:

A set of output indicators have been identified through the series of discussions held in the BSS and zonal coordinators meetings prior to the formulation of the questionnaires and their use in the survey. An analysis of these data and their interpretation are presented in the following pages which reflect the quality as well as quantity of R&D activities at the zonal level, institutional level, departmental level and individual faculty level. The number of awards received by the faculty members in different universities/institutes at the national and international level are presented in Table A.6.3.1 while awards received by field of science and by gender are included in Tables A-6.3.2 and Table A.6.3.3. Graphical representations corresponding to the data in these tables are presented in Fig.8, Fig.9 and Fig.10 respectively. The total number of awards received 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 a 46, while the total number of faculty involved in it is around 174 (Table A.6.3.4). The institutionwise break up for the technologies developed and faculty involved is illustrated in Fig.11. The zonal status of technologies developed by field of science and by gender are shown by the datasets in Table A.6.3.5 and TableA.6.3.6 respectively, the graphical representations for which are presented in Fig.12 and Fig.13. 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 (Table A.6.3.8) While engineering sciences claim about 65% of the total patents secured (Table A.6.3.9), males are found to fully dominate (100%)_ in this area (Table A.6.3.10). 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 (TableA.6.3.11) The institutionwise break-up of the research projects completed is shown in Fig.14. 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). These data presented in Table A.6.3.12 are illustrated in the pie-diagram in Fig.15. Women are involved in only 5 percent of the projects completed (Table A.6.3.14 and Fig.16). The total number of fellowship conferred on the R&D personnel of this zone during the study period is estimated at 237 with the faculty involved in it numbering around 137 (Table A.6.3.13). The institutionwise breakup of these data is presented in Fig.17. Due to non availability of inputs from major R&D institutions like I.I.T.s and I.S.I, Calcutta, the database used here is far from being complete. Natural sciences seems to claim the major share (154) of the fellowships (Table A.6.3.15) and the performance of women (Table A.6.3.16) in this area is extremely low (1.3%). These two datasets are graphically presented in Fig.18 and Fig.19. The institutionwise break-up of research guidance in the form of degrees awarded, faculty involved and guidance per year is shown in Fig.20 and Fig.21 and the corresponding dataset is presented in Table A.6.3.17. 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 (Table A.6.3.17 and

Fig.22). Involvement of women in research guidance is found to be extremely low viz. around 0.85 percent (Table A.6.3.18 and Fig.23). The total number of consultancy projects completed in the zone during the period of study is only 193 (table A.6.3.19), 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 institution wise break-up of consultancy projects completed by faculty during the study period is illustrated in Fig.24. The maximum number of consultancy projects are completed in the field of engineering science (Fig.25 and Table A.6.3.20). Only about 6 percent of the women faculty were involved in consultancy projects with a share of 8 percent of the total consultancy projects completed (Fig.26 and Table A.6.3.21). The total number of research publication 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 and Jadavpur University 19% of the total faculty involved in the zone (Table A.6.3.22). The institution wise breakup of research publications is illustrated in Fig.27. The largest percentage of total research publication (more than 50%) is claimed by natural science where about 58% of the faculty are involved (Fig.28 and Table A.6.3.23). Both in terms of percentage of total papers published and percentage of total faculty involved, women account for a meagre 4 % and 8% respectively (Fig.29 and Table A.6.3.24). The total number of books and monographs published in the east zone during the study period is estimated at 779 and the total faculty involved in these publications is around 206 (Table A.6.3.25) The institutionwise break up of the research publication is graphically presented in Fig.30. It shows that Orissa university of Agriculture and Technology records the highest number (179) of research publications accounting for 23% of the zonal total. As shown in table A.6.3.26, natural science claims the maximum number of research publications (about 46%) and faculty involved (about 47%). It is further demonstrated graphically in Fig.31. Women account for only about 10% of the total faculty involved in research publications sharing a mere 4.5% of the total number book and monographs published (Fig.32 and Table A.6.3.27).

The total number of external examinership enjoyed by the faculty sums to around 813, although the concerned data for the I.I.Ts and I.S.I are not available (Table A.6.3.28). The institution wise breakup of the numbers of external examinership is illustrated in Fig.33. It shows that Jadavpur University records the maximum number of external examinership accounting for about 28 % of the total. The highest percentage of external examinership (63% of the total) is recorded in the field of natural sciences (Fig.34 and Table A.6.3.19). Women could claim only about 8% of the total external examinership enjoyed in the east zone (Fig.35 and Table A.6.3.30). The total number of faculty involved in research evaluation is estimated at 209 (Table A.6.3.31). However, due to non availability of the relevant data from IITs and ISI, Calcutta the figure obtained here may be in the lower side. The maximum number of faculty involved in research evaluation is in the field natural science (109) followed by agriculture science (62), engineering science (33), the corresponding dataset for which is presented in table A.6.3.32 and graphically represented in Fig.36. Involvement of women faculty in research evaluation is only around 3 percent (Fug.37 and Table A.6.3.33). Total number

of faculty involved in editorial responsibilities is estimated at 433 (Table A.6.3.34), the largest share (about 50%) being claimed by natural science (Fig.38 and Table A.6.3.35). Women claim about 10 percent of the total editorial responsibilities in the zone (Fig.39 and Table A.6.3.36). The total participation of faculty in research fora in the zone during 1995-98 amounts to 933 where 684 members of faculty are involved (Table A.6.3.37). The institutionwise break up of the participation in research fora is presented in Fig.40. It shows that Birla Institute of Technology, Ranchi records the highest number of participation in research fora (173 i.e. 18.5% of the total). Natural science claims the largest share (about 45%) of the total number of participation in research fora (Fig.41), followed by agriculture science (23%) and engineering science (29%). The corresponding data set is presented in the Table A.6.3.38. Women participation in research fora is around 11 percent as shown in Fig.42 and Table A.6.3.39. The total membership of professional bodies retained by the faculty from universities/institutes of the eastern zone during 1995-98 is estimated at 1178 and the total number of faculty involved at 822 (Table A.6.3.40). However, because of lack of adequate response from the IITs and ISI, Calcutta, the estimated figures obtained here may be somewhat in the lower side. The Assam Agricultural University records the highest number of membership of professional bodies (221) and of faculty involved (104) in these memberships.

In terms of membership by field of science (Table A.6.3.41), natural science accounts for the largest share (around 39%) of the total membership, followed by agriculture science (29%). Engineering science (27%) and medical science (5%). Women faculty account for only 9 percent of the total membership of the professional bodies availed in east zone (Table A.6.3.42).

The total number of visiting faculty positions secured by the faculty in east zone is estimated at 107 during the period 1995-98 (Table A.6.3.43). However, due to non availability of data from IITs and ISI, Calcutta, the figures mentioned above may be much lower than the actual. The number of visiting of faculty positions held and the number of faculty involved are found to be highest (59% of the total) in the field of natural science (Table A.6.3.44). The share of women in the total visiting faculty positions is around 4 percent (Table A.6.3.45). The total number of faculty involved in managerial responsibilities during the period 1995-98 is estimated at 374 (Table A.6.3.46). However, due to non availability of input from the IITs and ISI, Calcutta, the figure obtained above is undoubtedly lower than the actual. The share of faculty involved in managerial responsibilities (Table A.6.3.47) is highest in the field of natural science (39.3%) followed by agriculture 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 for the east zone (Table A.6.3.48)

A correlation matrix of the major parameters used in this survey to quantify financial resources, manpower resources and output indicators is presented in Table 5. It shows the interrelationship and interdependence between the various parameters in the form of correlation coefficients. For example, total expenditure of various universities/ institutes

are strongly correlated with their corresponding S&T expenditures (corr. Coeff.=0.94) and R&D expenditures (corr. coeff.=0.87). Similarly, S&T expenditures show a strong correlation with R&D expenditures (corr. Coeff.=0.96). Again, awards and fellowships received indicate a fairly good correlation (corr.coeff.=0.65). The parameters on full time equivalence (FTE) also exhibits high positive correlation with few other parameters like S&T expenditure, (corr. coeff. 0.72) and R&D expenditure (corr. coeff.0.74).

Ranking of the universities/institutes covered under east zone is done by estimating a composite score through summation of scores obtained by a set of selected parameters mentioned in the table. These scores for individual parameters are estimated in terms of their location in different quartiles i.e. from quartile 1 to quartile 4. Table 6a shows the ranking of colleges/ institutes in terms of the composite scores arranged in a descending order. A separate ranking is done on the same table for the colleges following the same procedure. 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. In Table 6b ranking of the universities/institutes are shown based on the composite score in a descending order, separately for different states as well as for colleges. A similar procedure is followed to rank the universities/ institutes/colleges according to fields of science as shown in Table 6c. The table clearly indicates that the institutes under engineering sciences earn the highest scores followed by agricultural science and natural science.

Concluding Remarks

The project, having come to completion at the end of the stipulated time frame, leaves a mixed feeling of achievements as well as partial despair – achievement due to a good feeling of completing a project that has inherent complexities and operational difficulties and which defied earlier national level attempts to grapple it and partial despair due largely to lack of adequate response from several institutes of higher education especially the I.I.Ts, the ISI and few Universities and colleges. The most rewarding aspects of the project seem to be the development of an effective methodology for quantification of R & D in S & T from the higher academic sector through a rigorous exercise of Brain Storming Sessions involving well chosen peer groups comprising Vice Chancellors, Academic Administrators, Directors, Principals, Deans, Senior faculty members and representatives of funding agencies along with the Scientists of the NSTMIS Division of DST and also through a series of joint meetings of zonal coordinators and workshops for the programmers. Despite the utmost efforts made by the zonal project team, there remains several vital gaps in the data base mainly due to lack of cooperation from some Universities and Institutions as well as some of institutional coordinators. It is realized from the experiences gathered in course of the survey that the questionnaires need to be further simplified in order to facilitate better response from the potential responders.

In spite of some lacuna and deficiencies remaining in the project, there seems to be no doubt that the project has been a step in the right direction towards quantification of R & D in the academic sector which may prove to be a vital input towards planning and development of science and technology and its applications in this prime sector of great societal relevance.

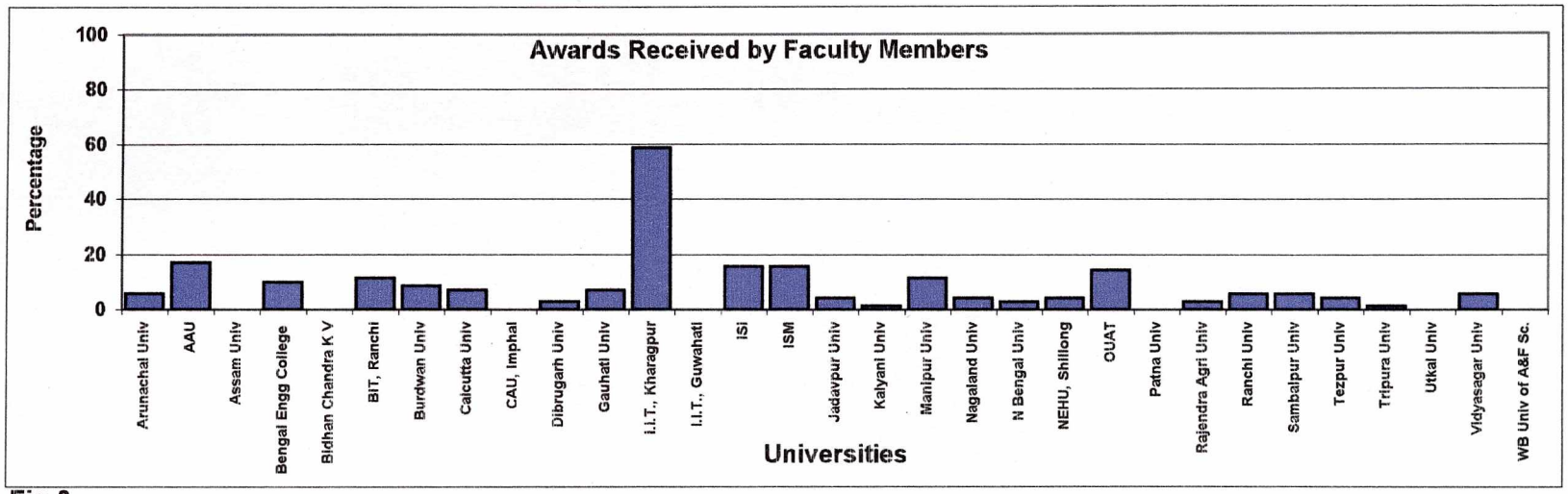


Fig.8

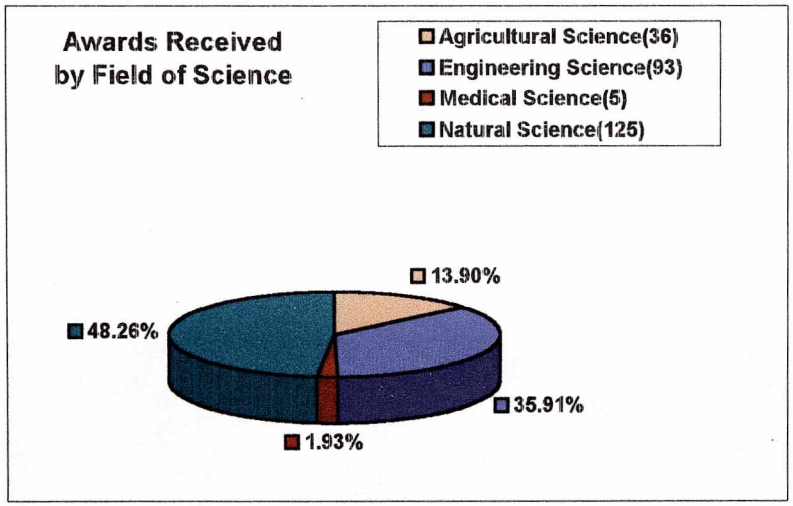


Fig.9

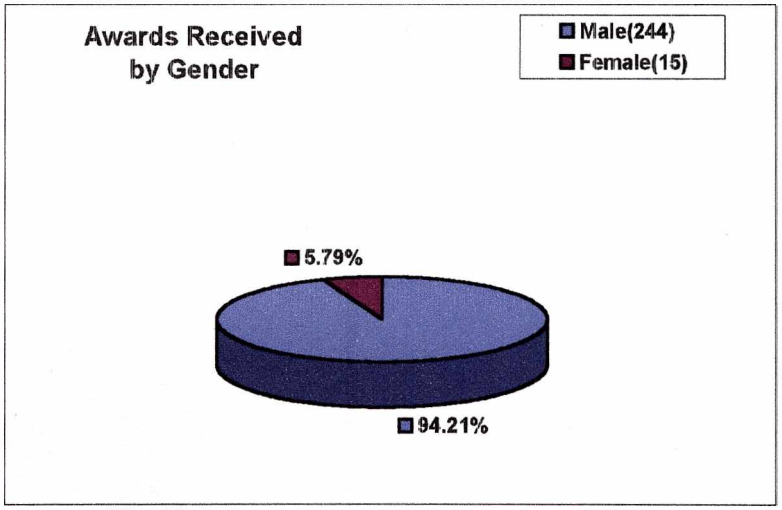


Fig.10

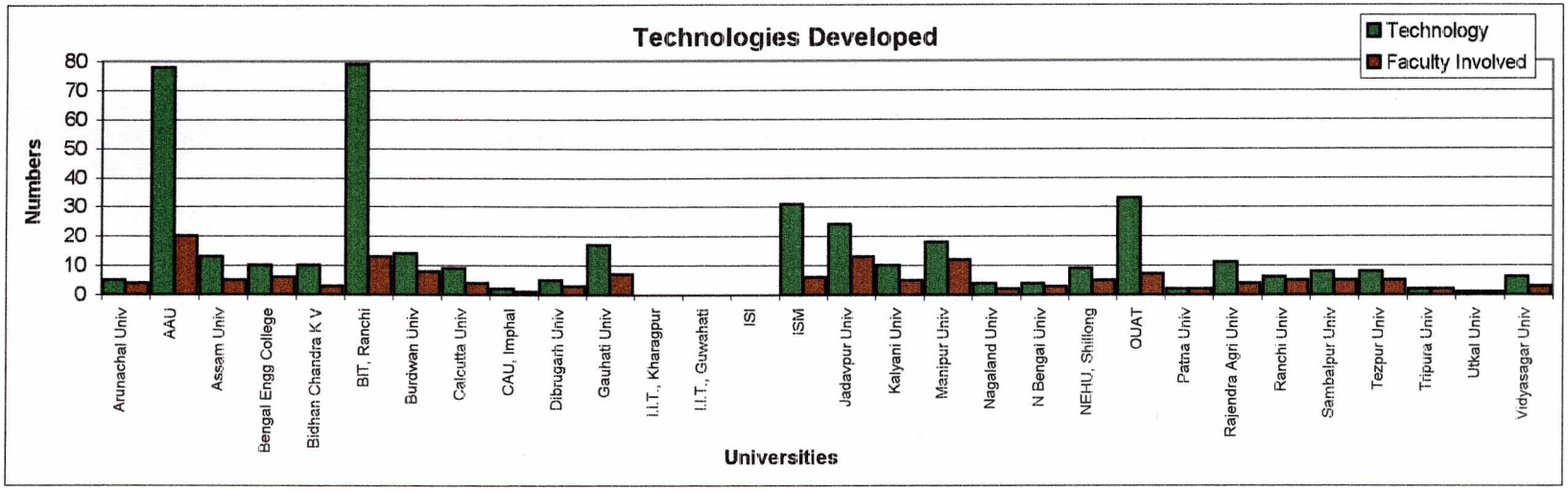


Fig.11

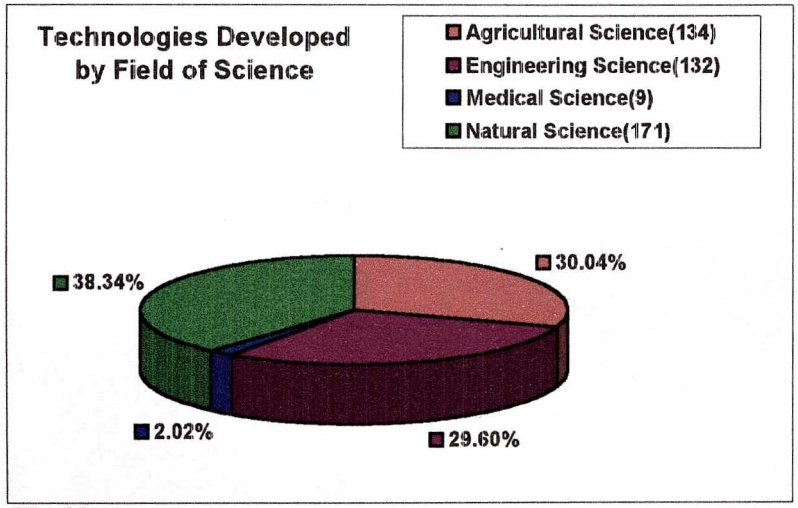


Fig.12

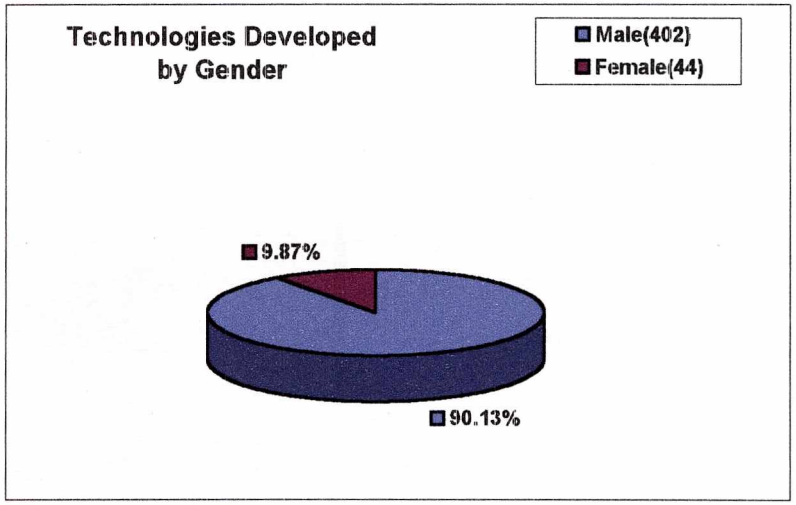


Fig.13

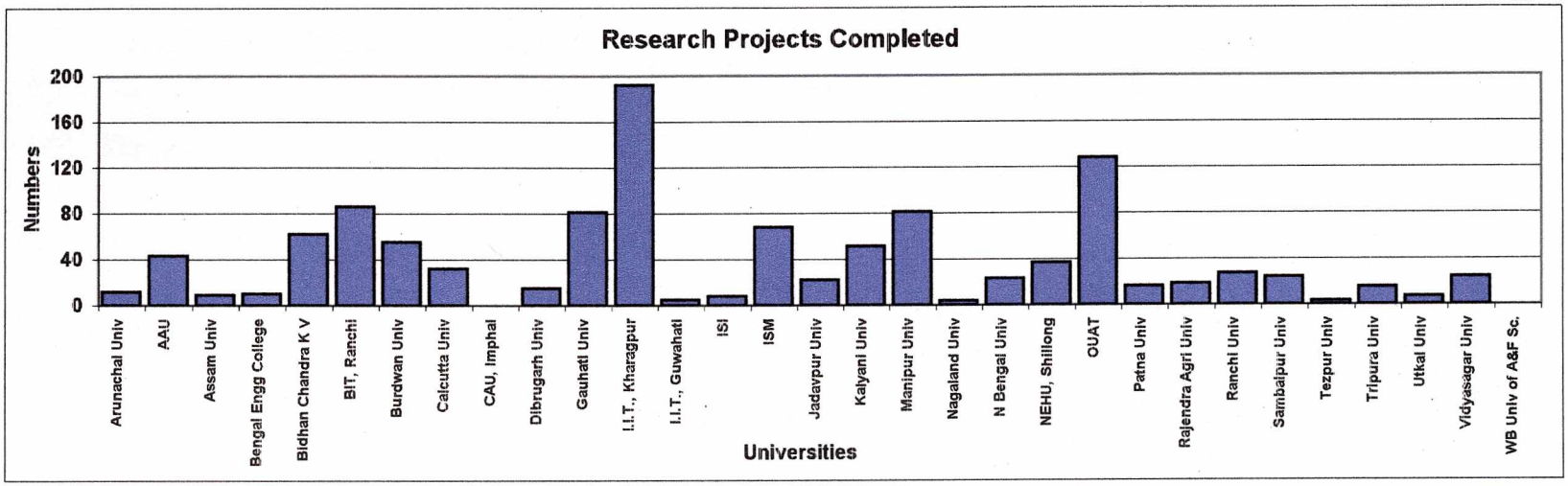


Fig.14

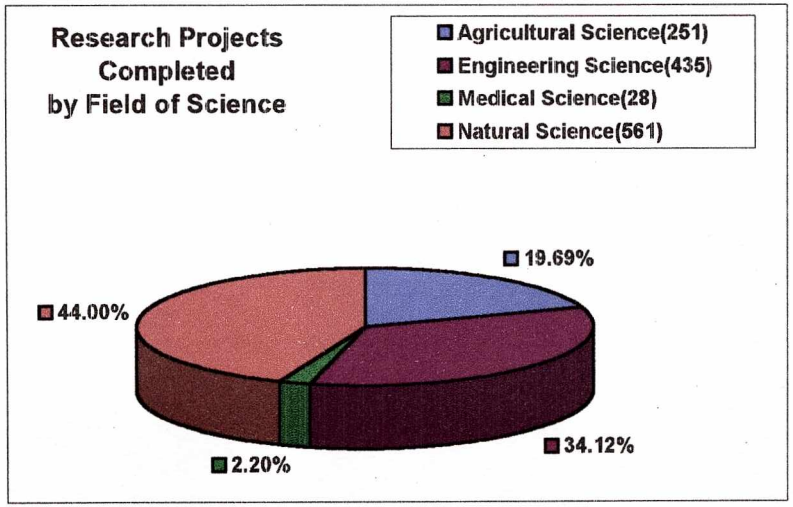


Fig.15

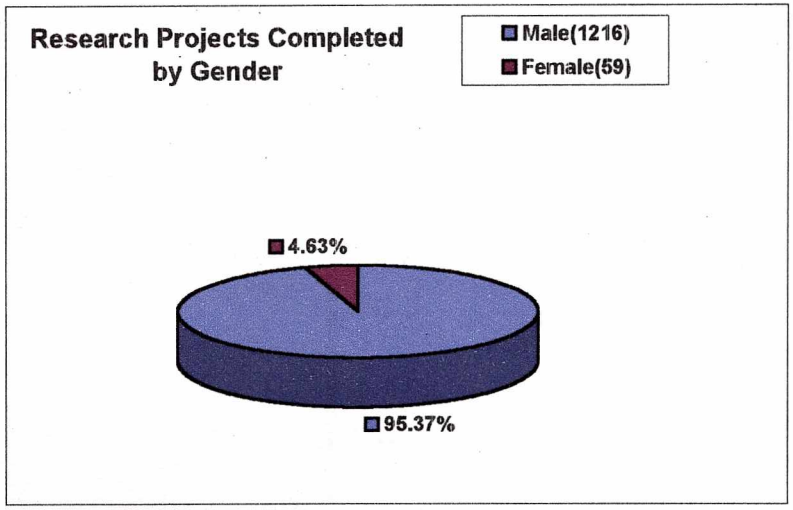


Fig.16

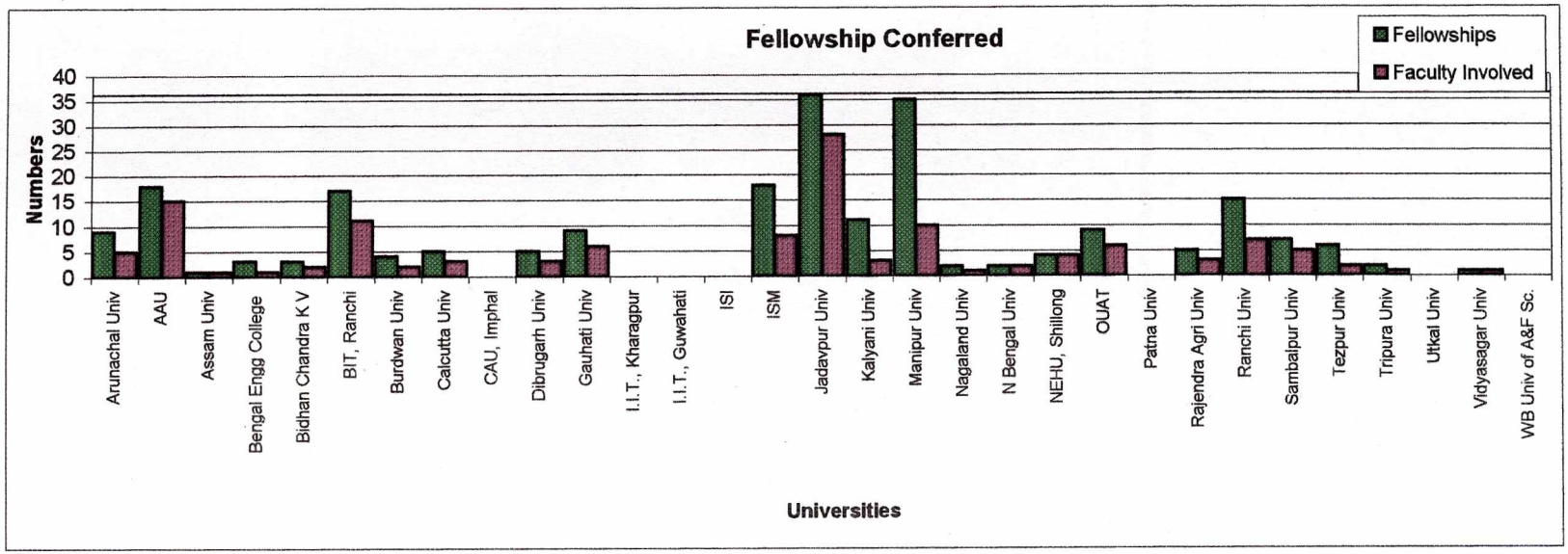


Fig.17

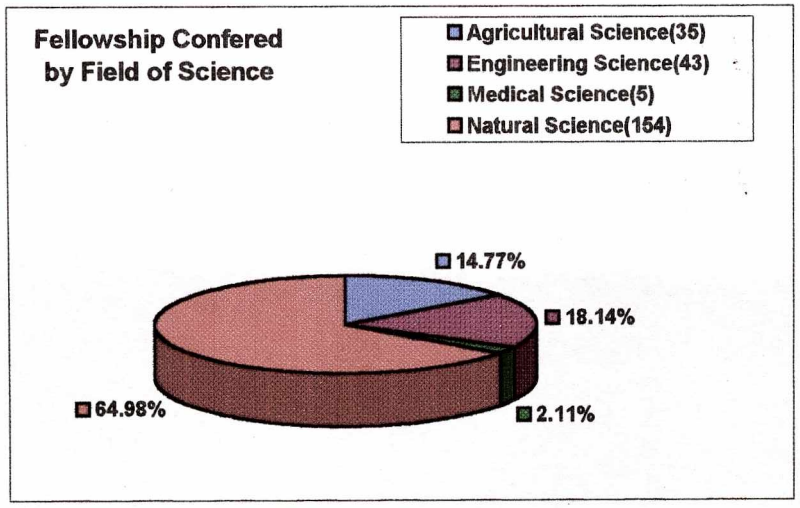


Fig.18

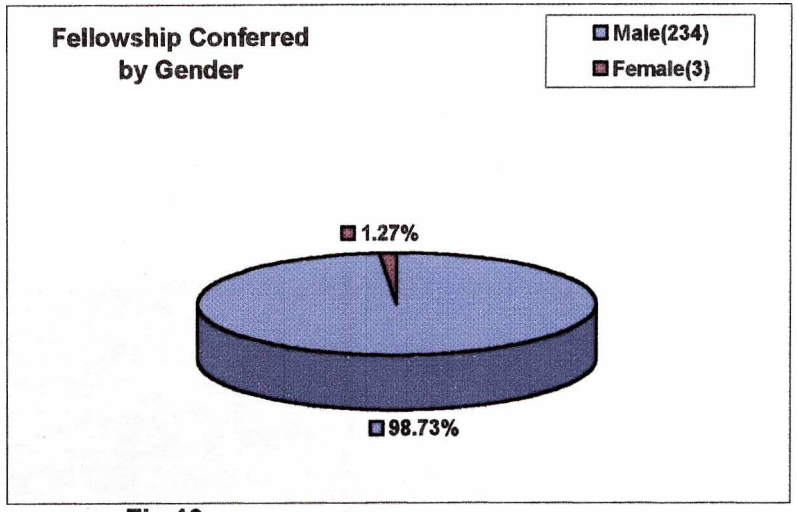


Fig.19

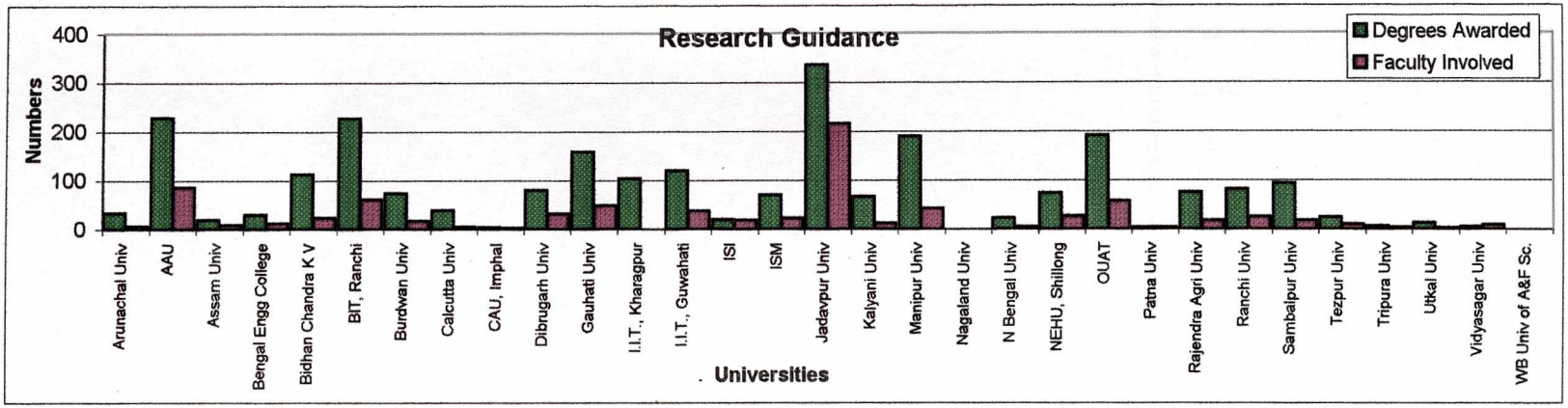


Fig.20

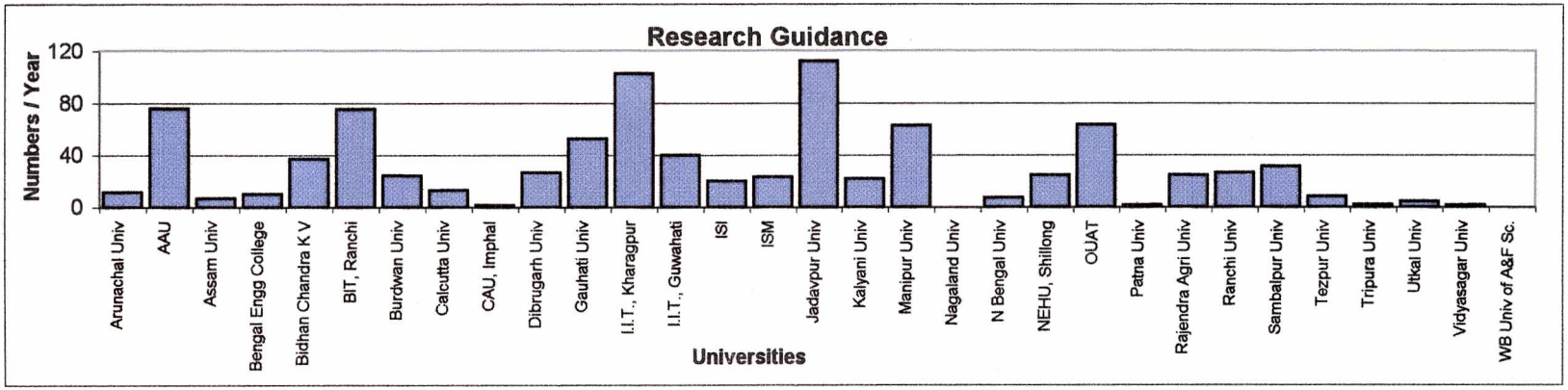


Fig.21

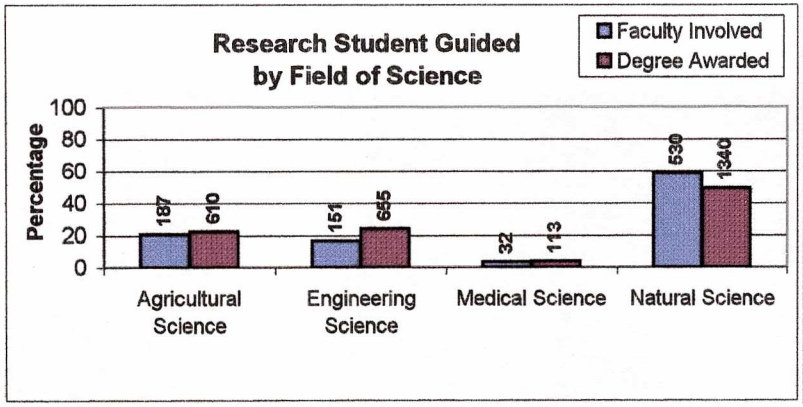


Fig.22

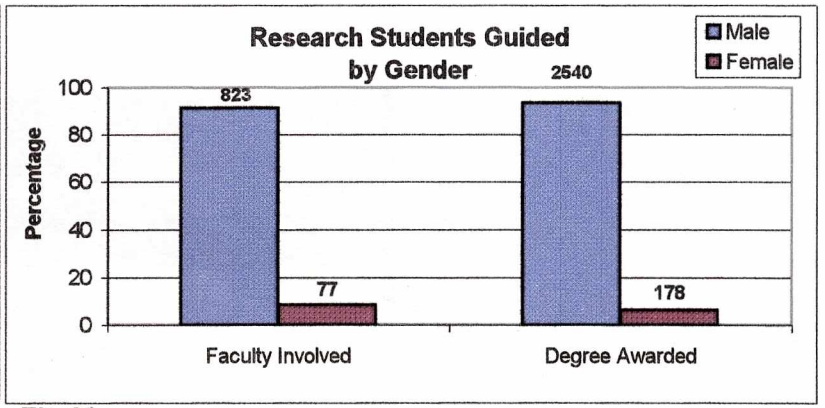


Fig.23

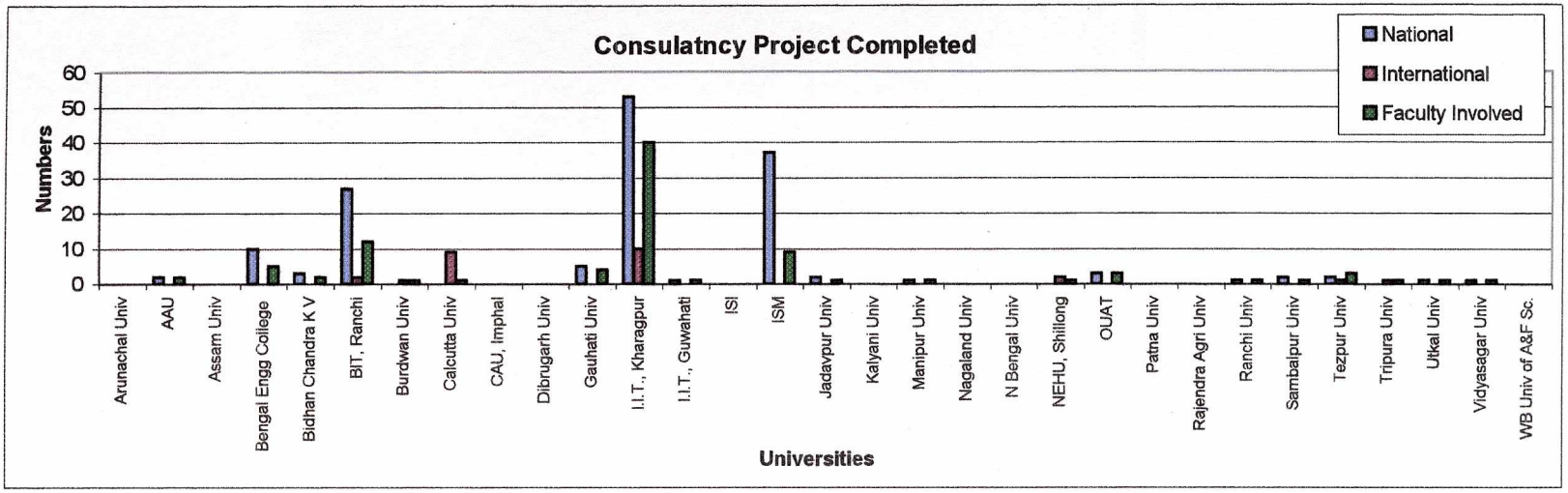


Fig.24

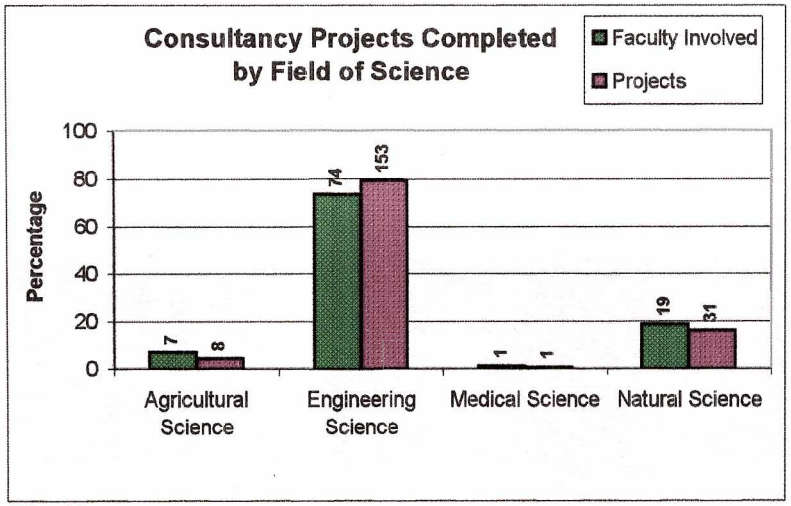


Fig.25

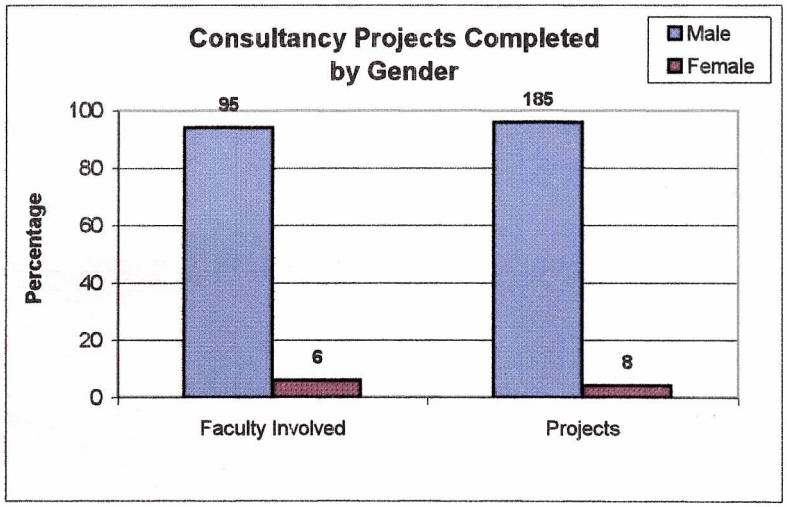


Fig.26

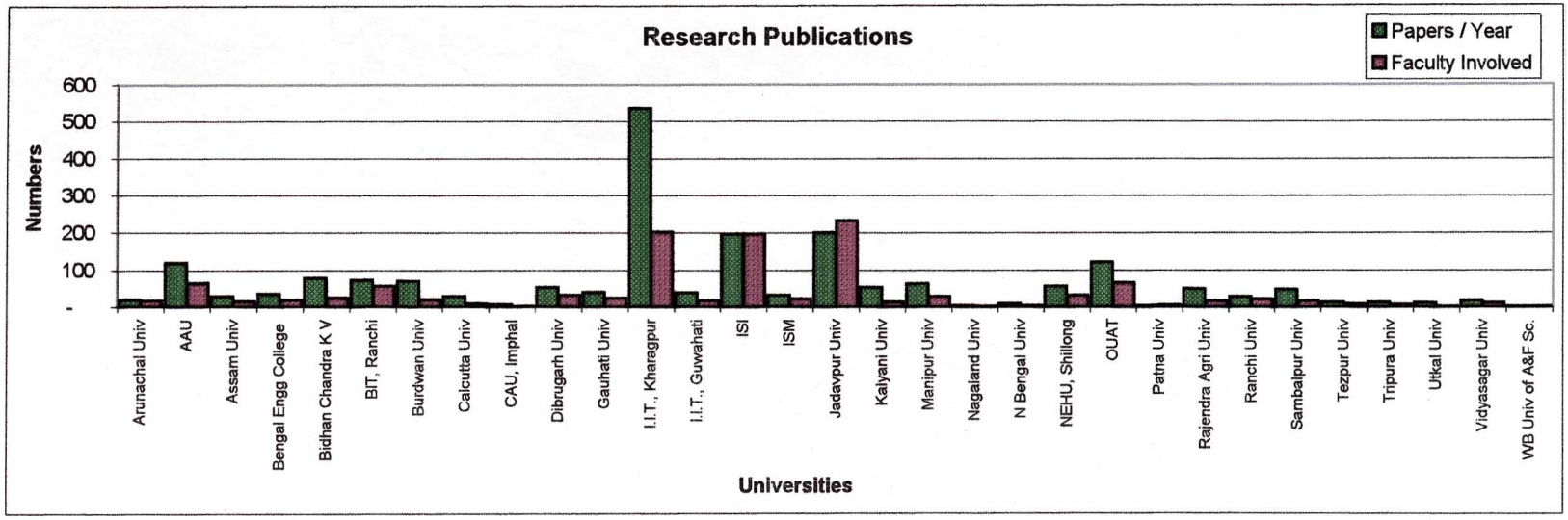


Fig.27

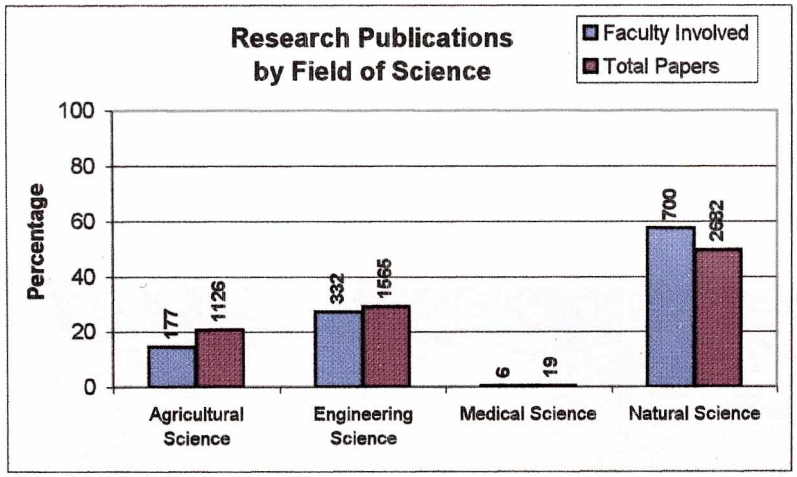


Fig.28

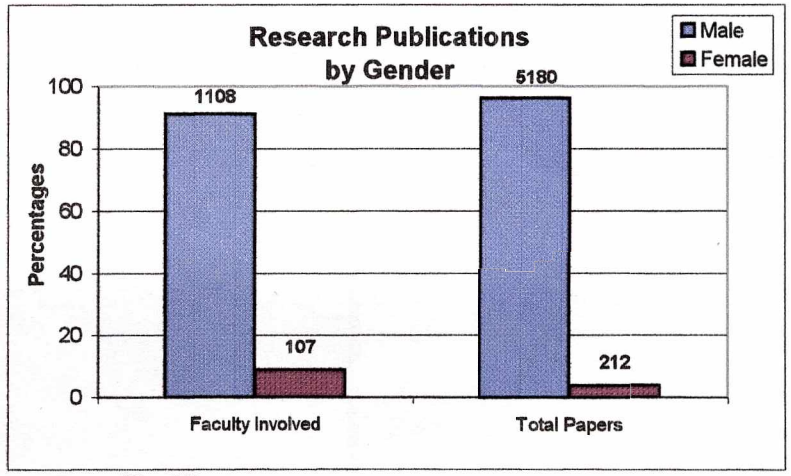


Fig.29

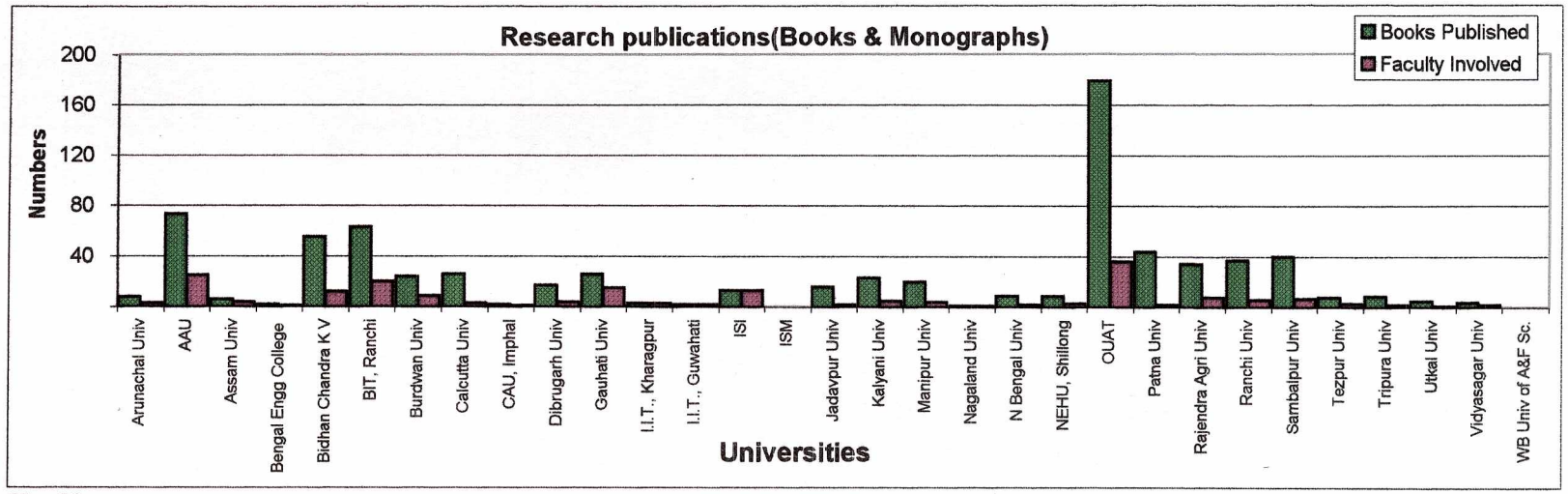


Fig.30

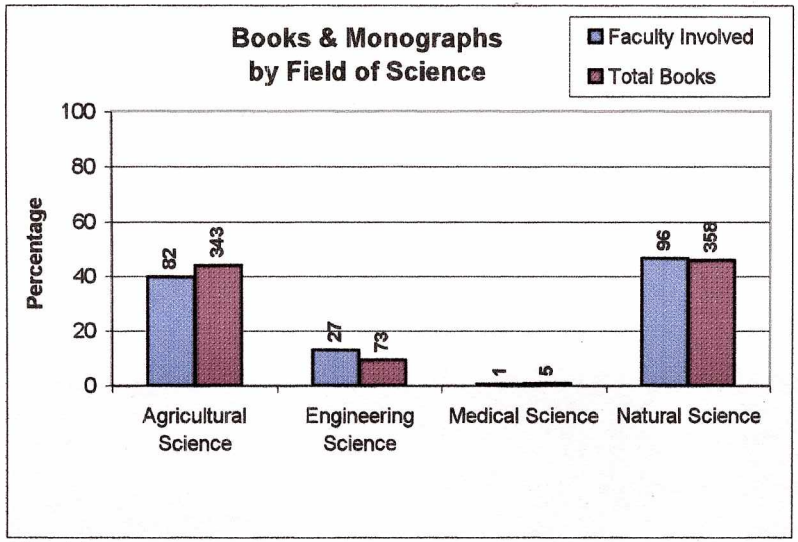


Fig.31

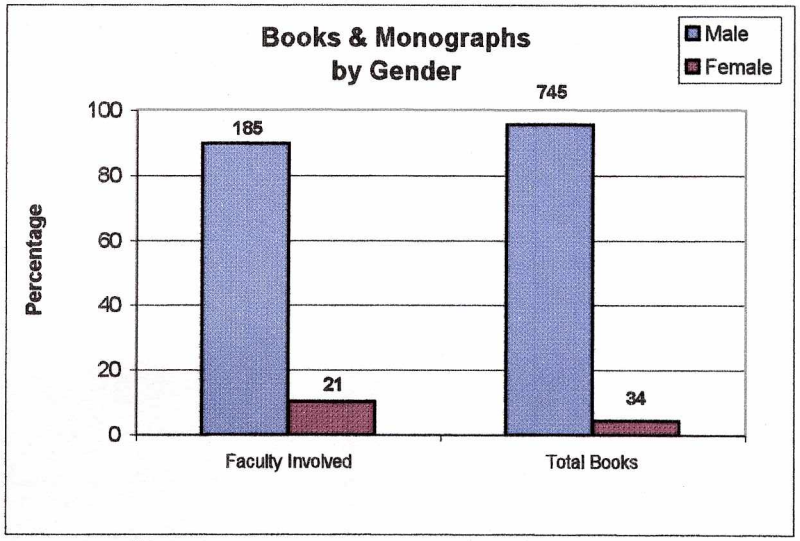


Fig.32

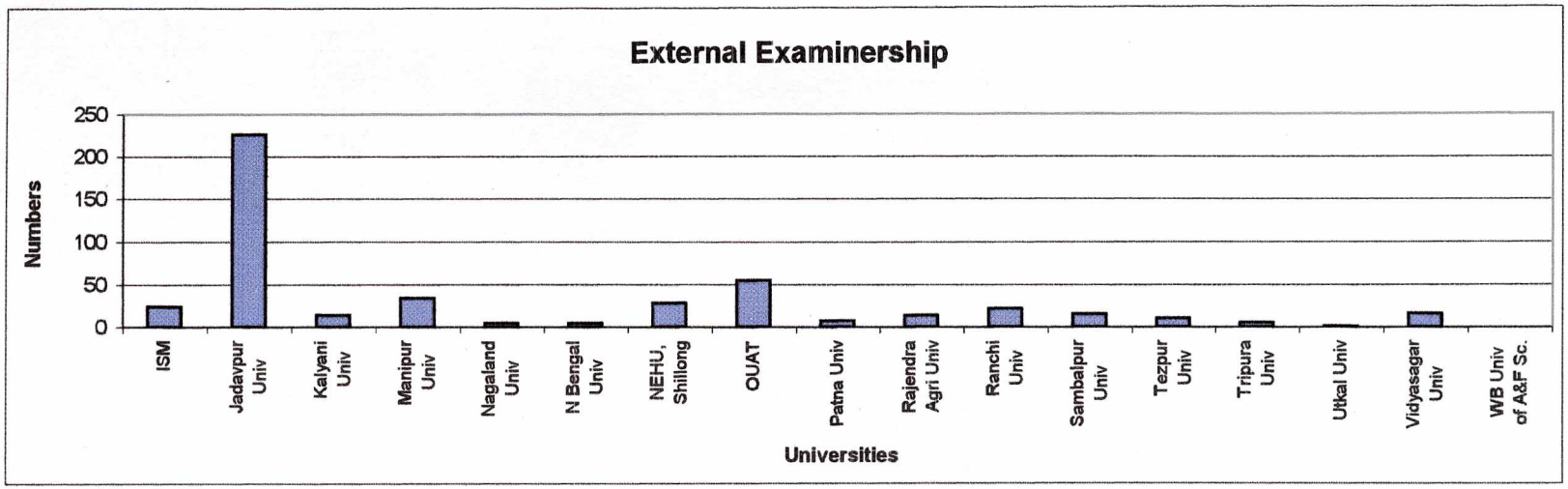


Fig.33

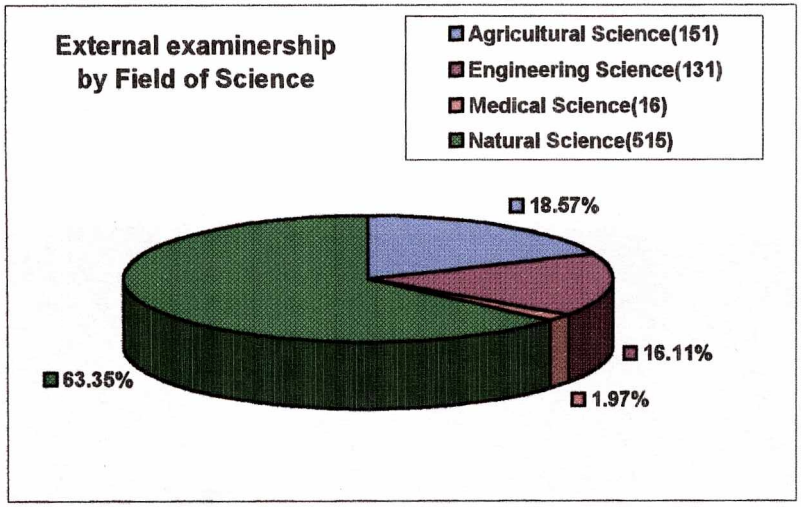


Fig.34

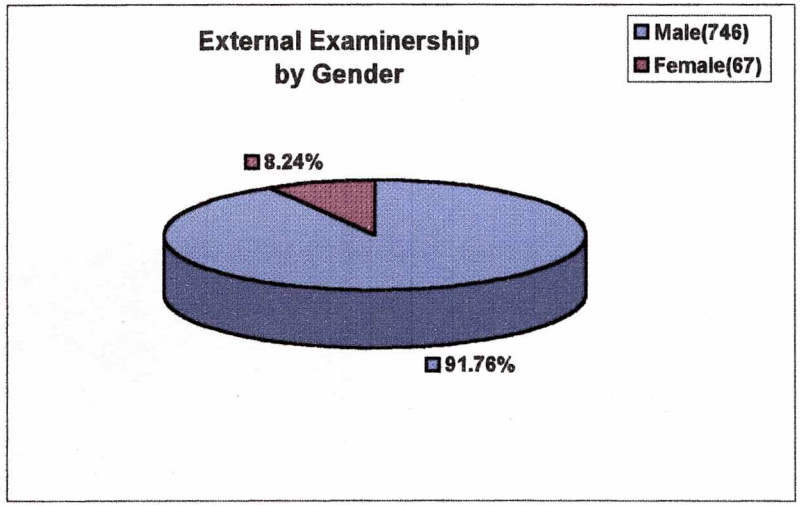


Fig.35

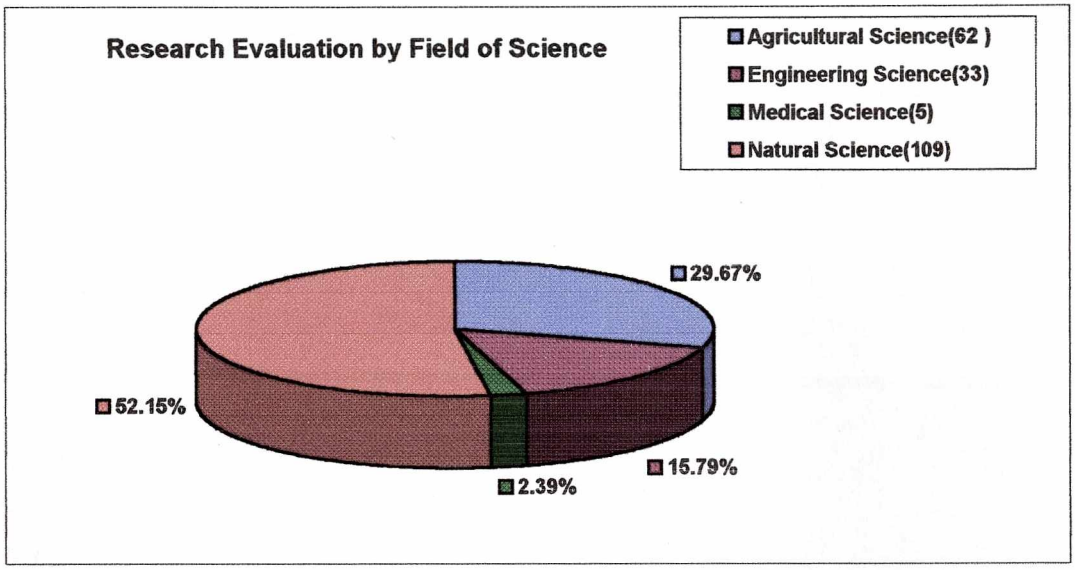

Research Evaluation by Field of Science
Agricultural Science(62)
Engineering Science(33)
Medical Science(5)
Natural Science(109)
29.67%
15.79%
2.39%
52.15%

Fig.36

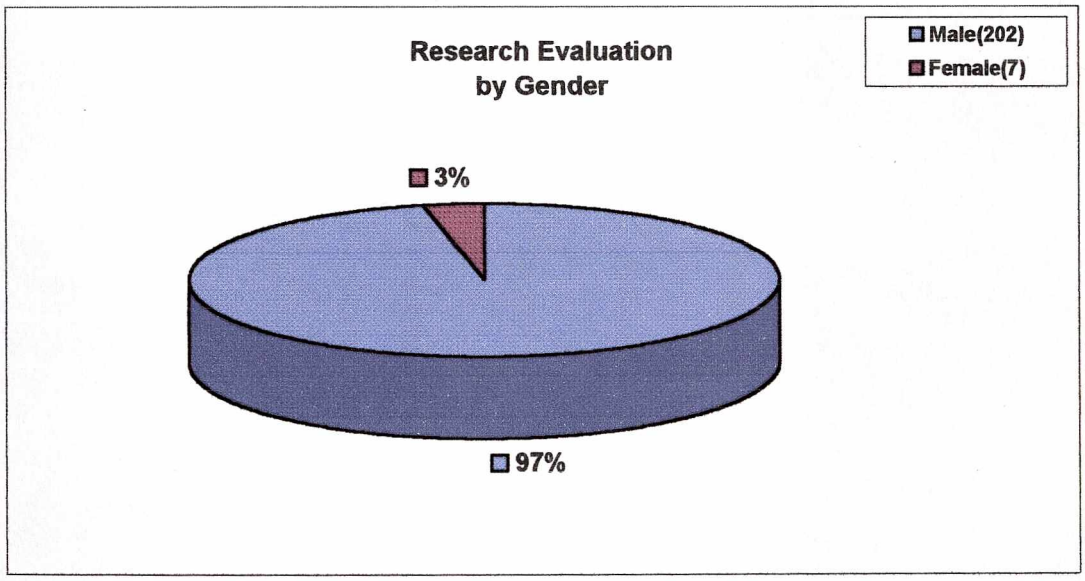

Research Evaluation
by Gender
Male(202)
Female(7)
3%
97%

Fig.37

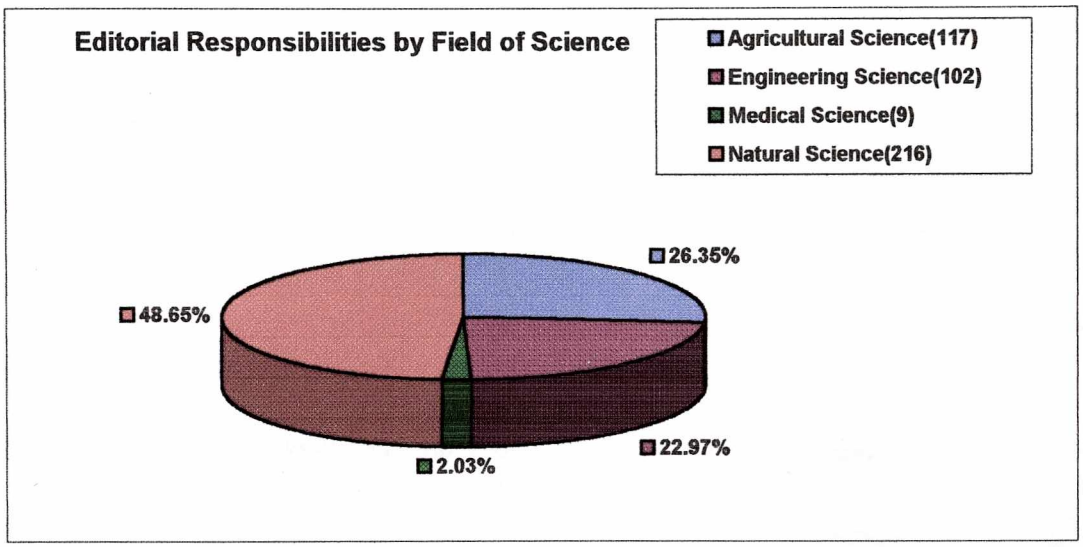

Editorial Responsibilities by Field of Science
Agricultural Science(117)
Engineering Science(102)
Medical Science(9)
Natural Science(216)
26.35%
48.65%
22.97%
2.03%

Fig.38

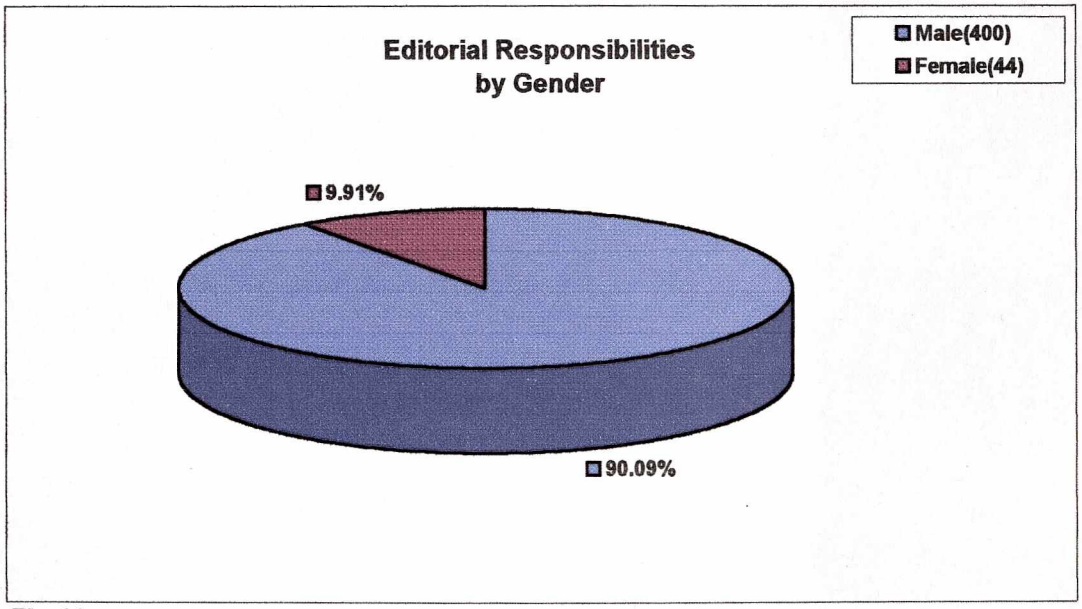

Editorial Responsibilities
by Gender
Male(400)
Female(44)
9.91%
90.09%

Fig.39

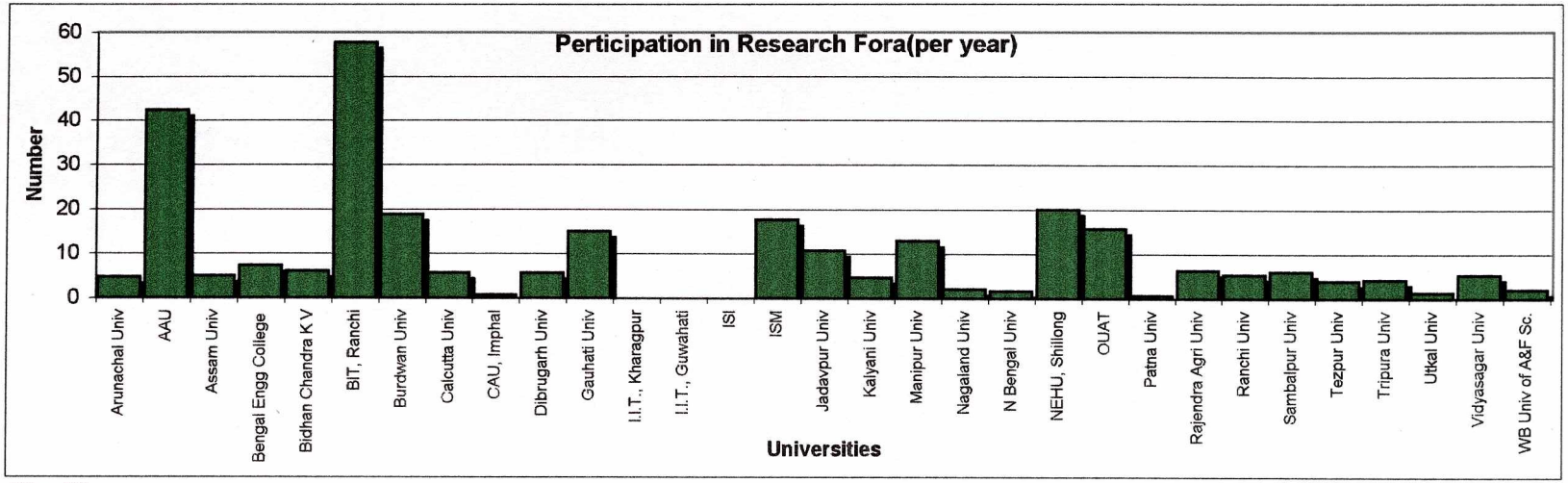


Fig.40

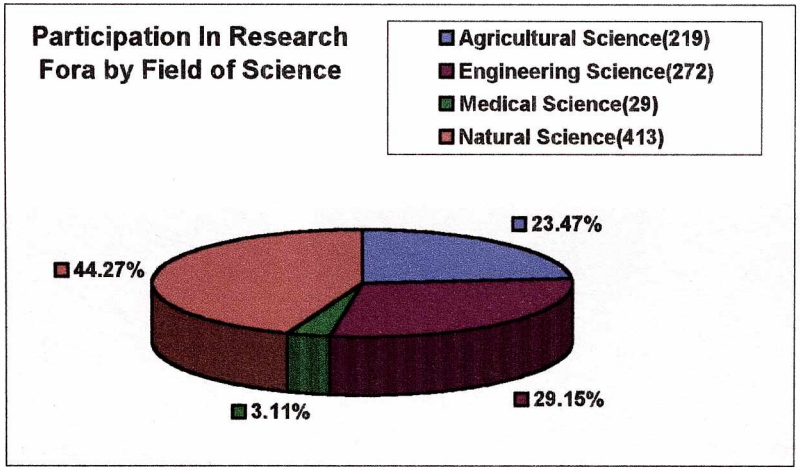


Fig.41

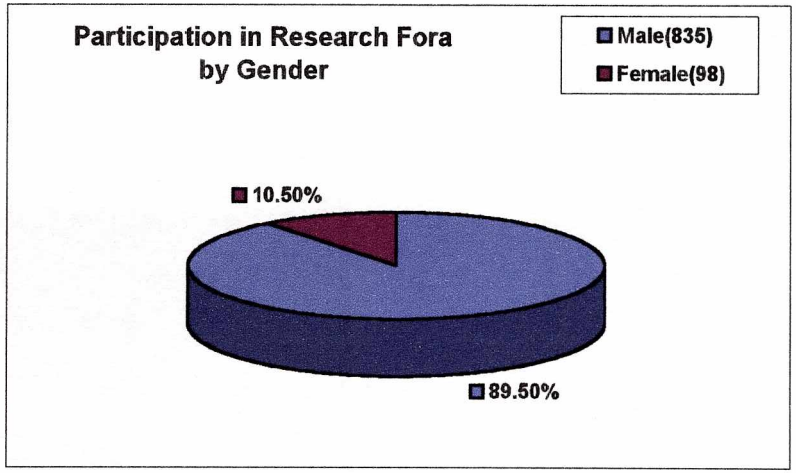


Fig.42

Table 5: Correlation Matrix of major parameters pertaining to financial and manpower resources and output indicators

	Parameters	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	Total Expenditure	1.00	0.94	0.87	0.31	0.14	0.06	0.52	0.29	0.08	-0.05	-0.19	-0.15	0.19	0.01	0.13	-0.07	0.11	0.12	0.39
2	S & T Expenditure		1.00	0.96	0.19	-0.02	-0.08	0.32	0.19	-0.03	-0.19	-0.32	-0.30	0.04	-0.12	0.02	-0.15	0.06	0.03	0.30
3	R & D Expenditure			1.00	0.10	-0.14	-0.16	0.19	0.14	-0.08	-0.25	-0.38	-0.38	-0.05	-0.21	-0.03	-0.19	0.02	-0.09	0.28
4	Years of Standing				1.00	0.21	0.30	0.59	0.01	0.30	0.15	0.13	0.17	0.27	0.19	0.09	0.02	0.20	0.01	0.12
5	Research Guidance					1.00	0.65	0.44	0.61	0.21	0.37	0.48	0.49	0.46	0.36	0.31	0.39	0.08	0.22	0.36
6	Research Project						1.00	0.34	0.60	0.43	0.50	0.41	0.43	0.41	0.47	0.24	0.17	-0.09	-0.07	0.39
7	Consultancy Project							1.00	0.23	0.14	0.33	0.21	0.26	0.54	0.36	0.34	0.22	0.22	0.15	0.37
8	Publication papers								1.00	0.17	0.46	0.32	0.33	0.34	0.43	0.21	0.29	-0.08	0.15	0.54
9	Publication Books									1.00	0.13	0.36	0.36	0.18	-0.03	0.09	0.10	0.06	0.07	0.29
10	Research Fora										1.00	0.43	0.47	0.29	0.95	0.04	0.10	0.15	0.18	0.18
11	External Examiner											1.00	0.99	0.44	0.39	0.41	0.54	0.20	0.39	0.31
12	Editorial Responsibility												1.00	0.47	0.43	0.42	0.53	0.21	0.38	0.34
13	Visiting Faculty													1.00	0.24	0.31	0.56	0.36	0.27	0.38
14	Professional Bodies														1.00	0.03	0.05	0.10	0.16	0.16
15	Awards															1.00	0.65	0.14	0.09	0.38
16	Fellowships																1.00	0.25	0.15	0.39
17	Patents																	1.00	0.44	0.02
18	Technologies																		1.00	0.01
19	% of Faculty with Ph.D																			1.00
20	FTE																			

Table 6a : Ranking of Universities,Instutitutes and Colleges in terms of composite score in a descending order

University/Institute/College	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	Total	1st 25%	last 25%	Cosd. Sco.
Birla Institute of Technology	4	4	3	2	4	2	3	4	4	2	3	3	4	3	4	4	1	4	58	9	1	**80.56**
Indian School of Mines	4	3	3	3	4	2	0	3	4	2	4	4	4	4	4	4	3	3	58	9	1	**80.56**
I.I.T., Kharagpur	4	4	3	2	4	2	2	2	4	1	3	3	4	3	3	3	4	4	55	7	1	**76.39**
I.I.T., Guwahati	4	4	3	2	4	2	2	2	4	1	3	3	4	3	2	3	4	3	53	6	1	**73.61**
OUAT, Orissa	4	2	3	3	2	3	4	1	4	1	3	2	3	2	4	4	3	4	52	6	2	**72.22**
Sambalpur University	2	3	4	2	4	4	4	1	4	1	3	2	4	2	0	2	4	3	49	7	3	**68.06**
Bengal Engineering College	4	4	2	1	4	3	2	1	4	1	3	2	2	4	4	2	2	3	48	6	3	**66.67**
Manipur University	1	3	4	3	2	3	4	1	4	1	3	2	3	4	0	2	4	4	48	6	4	**66.67**
Jadavpur University	3	4	1	1	4	1	4	1	4	1	3	3	2	2	4	3	2	4	47	6	5	**65.28**
Ranchi University	2	4	3	4	2	2	4	1	4	1	3	2	3	4	0	1	4	3	47	6	4	**65.28**
Assam Agricultural University	4	2	2	1	2	3	3	3	4	2	0	4	2	2	0	4	4	4	46	6	3	**63.89**
Gauhati University	2	3	3	3	3	2	2	1	4	1	3	2	2	2	0	4	4	4	45	4	3	**62.50**
Kalyani University	1	2	4	4	0	4	4	1	4	1	3	2	4	4	0	3	2	2	45	7	5	**62.50**
RAU	4	3	4	2	0	4	3	1	4	1	3	2	1	3	0	4	3	3	45	5	5	**62.50**
Tripura University	2	1	1	3	2	3	3	4	4	1	3	4	1	4	0	1	2	1	40	4	7	**55.56**
Utkal University	2	1	4	4	2	4	4	4	4	1	0	4	0	0	0	1	4	1	40	8	8	**55.56**
Burdwan University	1	1	2	2	2	2	2	1	4	1	2	2	3	4	4	2	1	3	39	3	5	**54.17**
Tezpur University	3	3	2	1	2	2	2	1	4	1	0	2	4	4	0	2	3	3	39	3	5	**54.17**
Calcutta University	2	2	2	2	1	2	3	1	4	1	2	2	2	3	0	3	4	2	38	2	4	**52.78**
Dibrugarh University	2	3	2	2	0	3	3	1	4	1	3	2	1	3	0	2	2	4	38	2	5	**52.78**
North Bengal University	2	3	4	4	0	4	3	1	4	1	3	2	1	1	0	1	3	1	38	4	8	**52.78**
NEHU, Shillong	1	4	2	2	1	2	3	1	4	1	2	2	2	1	0	3	3	4	38	3	6	**52.78**
Vidyasagar University	2	3	1	3	2	2	2	1	4	1	0	2	4	1	0	3	3	3	37	2	6	**51.39**
Arunachal University	1	2	4	2	0	2	2	1	4	1	0	2	2	3	4	1	3	2	36	3	6	**50.00**
BCK, Viswavidyalaya	4	4	2	1	1	2	2	1	3	1	1	3	1	2	0	2	2	3	35	2	7	**48.61**
Assam University	1	2	2	1	0	3	2	1	4	1	3	2	0	1	0	4	2	2	31	2	8	**43.06**
Nagaland University	0	0	0	2	0	3	1	1	4	1	0	2	2	4	0	3	3	1	27	2	10	**37.50**
WB University of F & A Sc.	4	2	2	1	1	2	2	1	3	1	1	3	1	1	0	0	0	1	26	1	11	**36.11**
Patna University	0	0	1	4	0	1	4	1	4	1	0	0	0	0	0	1	3	1	21	3	14	**29.17**
CAU, Imphal	0	0	1	0	0	4	2	1	4	1	0	2	0	0	0	3	0	1	19	2	13	**26.39**
Indian Statistical Institute	4	4	2	2	0	2	1	0	0	0	0	0	1	0	0	0	0	0	16	2	13	**22.22**
Birsa Agriculrural University	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1	16	**8.33**
L.N. Mithila University	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	17	**4.17**
Colleges																						
REC, Durgapur	4	3	2	4	2	1	3	1	4	1	3	2	4	1	0	1	2	4	42	5	6	**58.33**
Assam Engineering College	4	3	3	1	4	1	0	1	4	1	0	2	4	2	0	2	2	2	36	4	7	**50.00**
AMC, Dibrugarh	4	1	3	3	0	2	4	1	4	1	0	2	4	3	0	1	0	1	34	4	9	**47.22**
Cotton College, Guwahati	2	1	1	2	2	1	2	2	4	4	0	4	1	0	0	3	2	2	33	3	7	**45.83**
C of Vety. Sc, Guwahati	4	4	2	1	1	2	2	1	3	1	1	3	1	2	1	1	1	2	33	2	9	**45.83**
Guwahati Medical College	4	2	3	3	2	1	0	1	4	1	0	2	0	0	0	1	0	2	26	2	10	**36.11**
Silchar Medical College	4	1	2	1	0	1	0	3	4	1	0	4	0	0	0	1	0	1	23	3	13	**31.94**

A	S & T Expenditure	J	Editorial Responsibility
B	R & D Expenditure	K	Visiting Faculty
C	Research Guidance	L	Professional Bodies
D	Research Project	M	Awards
E	Consultancy Project	N	Fellowships
F	Publication papers	O	Patents
G	Publication Books	P	Technologies
H	Research Fora	Q	% Faculty with Ph.D.
I	External Examiner	R	FTE

Based on responded questionnaires

* Consolidated Score

Table 6b:Ranking of Universities, Institutes and Colleges in terms of composite score - State wise

University/Institute/College	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	Total	1st 25%	last 25%	Cosd. Sco.
North Eastern States																						
I.I.T., Guwahati	4	4	3	2	4	2	2	2	4	1	3	3	4	3	2	3	4	3	53	6	1	**73.61**
Manipur University	1	3	4	3	2	3	4	1	4	1	3	2	3	4	0	2	4	4	48	6	4	**66.67**
AAU	4	2	2	1	2	3	3	3	4	2	0	4	2	2	0	4	4	4	46	6	3	**63.89**
Gauhati University	2	3	3	3	3	2	2	1	4	1	3	2	2	2	0	4	4	4	45	4	3	**62.50**
Tripura University	2	1	1	3	2	3	3	4	4	1	3	4	1	4	0	1	2	1	40	4	7	**55.56**
Tezpur University	3	3	2	1	2	2	2	1	4	1	0	2	4	4	0	2	3	3	39	3	5	**54.17**
Dibrugarh University	2	3	2	2	0	3	3	1	4	1	3	2	1	3	0	2	2	4	38	2	5	**52.78**
NEHU, Shillong	1	4	2	2	1	2	3	1	4	1	2	2	2	1	0	3	3	4	38	3	6	**52.78**
Arunachal University	1	2	4	2	0	2	2	1	4	1	0	2	2	3	4	1	3	2	36	3	6	**50.00**
Assam University	1	2	2	1	0	3	2	1	4	1	3	2	0	1	0	4	2	2	31	2	8	**43.06**
Nagaland University	0	0	0	2	0	3	1	1	4	1	0	2	2	4	0	3	3	1	27	2	10	**37.50**
CAU, Imphal	0	0	1	0	0	4	2	1	4	1	0	2	0	0	0	3	0	1	19	2	13	**26.39**
West Bengal																						
I.I.T., Kharagpur	4	4	3	2	4	2	2	2	4	1	3	3	4	3	3	3	4	4	55	7	1	**76.39**
Bengal Engineering College	4	4	2	1	4	3	2	1	4	1	3	2	2	4	4	2	2	3	48	6	3	**66.67**
Jadavpur University	3	4	1	1	4	1	4	1	4	1	3	3	2	2	4	3	2	4	47	6	5	**65.28**
Kalyani University	1	2	4	4	0	4	4	1	4	1	3	2	4	4	0	3	2	2	45	7	5	**62.50**
Burdwan University	1	1	2	2	2	2	2	1	4	1	2	2	3	4	4	2	1	3	39	3	5	**54.17**
Calcutta University	2	2	2	2	1	2	3	1	4	1	2	2	2	3	0	3	4	2	38	2	4	**52.78**
North Bengal University	2	3	4	4	0	4	3	1	4	1	3	2	1	1	0	1	3	1	38	4	8	**52.78**
Vidyasagar University	2	3	1	3	2	2	2	1	4	1	0	2	4	1	0	3	3	3	37	2	6	**51.39**
BCK, Viswavidyalaya	4	4	2	1	1	2	2	1	3	1	1	3	1	2	0	2	2	3	35	2	7	**48.61**
WB University of F & A Sc.	4	2	2	1	1	2	2	1	3	1	1	3	1	1	0	0	0	1	26	1	11	**36.11**
Indian Statistical Institute	4	4	2	2	0	2	1	0	0	0	0	0	1	0	0	0	0	0	16	2	13	**22.22**
Bihar																						
Birla Institute of Technology	4	4	3	2	4	2	3	4	4	2	3	3	4	3	4	4	1	4	58	9	1	**80.56**
Indian School of Mines	4	3	3	3	4	2	0	3	4	2	4	4	4	4	4	4	3	3	58	9	1	**80.56**
Ranchi University	2	4	3	4	2	2	4	1	4	1	3	2	3	4	0	1	4	3	47	6	4	**65.28**
RAU	4	3	4	2	0	4	3	1	4	1	3	2	1	3	0	4	3	3	45	5	5	**62.50**
Patna University	0	0	1	4	0	1	4	1	4	1	0	0	0	0	0	1	3	1	21	3	14	**29.17**
Birsa Agriculrural University	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1	16	**8.33**
L.N. Mithila University	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	17	**4.17**
Orissa																						
OUAT, Orissa	4	2	3	3	2	3	4	1	4	1	3	2	3	2	4	4	3	4	52	6	2	**72.22**
Sambalpur University	2	3	4	2	4	4	4	1	4	1	3	2	4	2	0	2	4	3	49	7	3	**68.06**
Utkal University	2	1	4	4	2	4	4	4	4	1	0	4	0	0	0	1	4	1	40	8	8	**55.56**
Colleges																						
REC, Durgapur	4	3	2	4	2	1	3	1	4	1	3	2	4	1	0	1	2	4	42	5	6	**58.33**
Assam Engineering College	4	3	3	1	4	1	0	1	4	1	0	2	4	2	0	2	2	2	36	4	7	**50.00**
AMC, Dibrugarh	4	1	3	3	0	2	4	1	4	1	0	2	4	3	0	1	0	1	34	4	9	**47.22**
Cotton College, Guwahati	2	1	1	2	2	1	2	2	4	4	0	4	1	0	0	3	2	2	33	3	7	**45.83**
C of Vety. Sc, Guwahati	4	4	2	1	1	2	2	1	3	1	1	3	1	2	1	1	1	2	33	2	9	**45.83**
Guwahati Medical College	4	2	3	3	2	1	0	1	4	1	0	2	0	0	0	1	0	2	26	2	10	**36.11**
Silchar Medical College	4	1	2	1	0	1	0	3	4	1	0	4	0	0	0	1	0	1	23	3	13	**31.94**

A	S & T Expenditure	J	Editorial Responsibility
B	R & D Expenditure	K	Visiting Faculty
C	Research Guidance	L	Professional Bodies
D	Research Project	M	Awards
E	Consultancy Project	N	Fellowships
F	Publication papers	O	Patents
G	Publication Books	P	Technologies
H	Research Fora	Q	% Faculty with Ph.D.
I	External Examiner	R	FTE

Based on responded questionnaires

* Consolidated Score

Table 6c : Ranking of Universities, Institutes and Colleges in terms of composite score by Field of Science

University/Institute/College	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	Total	1st 25%	last 25%	Cosd. Sco.
Agriculture																						
OUAT, Orissa	4	2	3	3	2	3	4	1	4	1	3	2	3	2	4	4	3	4	52	6	2	**72.22**
AAU	4	2	2	1	2	3	3	3	4	2	0	4	2	2	0	4	4	4	46	6	3	**63.89**
RAU	4	3	4	2	0	4	3	1	4	1	3	2	1	3	0	4	3	3	45	5	5	**62.50**
BCK, Viswavidyalaya	4	4	2	1	1	2	2	1	3	1	1	3	1	2	0	2	2	3	35	2	7	**48.61**
C of Vety. Sc, Guwahati	4	4	2	1	1	2	2	1	3	1	1	3	1	2	1	1	1	2	33	2	9	**45.83**
WB University of F & A Sc.	4	2	2	1	1	2	2	1	3	1	1	3	1	1	0	0	0	1	26	1	11	**36.11**
CAU, Imphal	0	0	1	0	0	4	2	1	4	1	0	2	0	0	0	3	0	1	19	2	13	**26.39**
Birsa Agriculrural University	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1	16	**8.33**
Engineering																						
Birla Institute of Technology	4	4	3	2	4	2	3	4	4	2	3	3	4	3	4	4	1	4	58	9	1	**80.56**
Indian School of Mines	4	3	3	3	4	2	0	3	4	2	4	4	4	4	4	4	3	3	58	9	1	**80.56**
I.I.T., Kharagpur	4	4	3	2	4	2	2	2	4	1	3	3	4	3	3	3	4	4	55	7	1	**76.39**
I.I.T., Guwahati	4	4	3	2	4	2	2	2	4	1	3	3	4	3	2	3	4	3	53	6	1	**73.61**
Bengal Engineering College	4	4	2	1	4	3	2	1	4	1	3	2	2	4	4	2	2	3	48	6	3	**66.67**
REC, Durgapur	4	3	2	4	2	1	3	1	4	1	3	2	4	1	0	1	2	4	42	5	6	**58.33**
Assam Engineering College	4	3	3	1	4	1	0	1	4	1	0	2	4	2	0	2	2	2	36	4	7	**50.00**
Natural Science																						
Sambalpur University	2	3	4	2	4	4	4	1	4	1	3	2	4	2	0	2	4	3	49	7	3	**68.06**
Manipur University	1	3	4	3	2	3	4	1	4	1	3	2	3	4	0	2	4	4	48	6	4	**66.67**
Ranchi University	2	4	3	4	2	2	4	1	4	1	3	2	3	4	0	1	4	3	47	6	4	**65.28**
Jadavpur University	3	4	1	1	4	1	4	1	4	1	3	3	2	2	4	3	2	4	47	6	5	**65.28**
Gauhati University	2	3	3	3	3	2	2	1	4	1	3	2	2	2	0	4	4	4	45	4	3	**62.50**
Kalyani University	1	2	4	4	0	4	4	1	4	1	3	2	4	4	0	3	2	2	45	7	5	**62.50**
Utkal University	2	1	4	4	2	4	4	4	4	1	0	4	0	0	0	1	4	1	40	8	8	**55.56**
Tripura University	2	1	1	3	2	3	3	4	4	1	3	4	1	4	0	1	2	1	40	4	7	**55.56**
Burdwan University	1	1	2	2	2	2	2	1	4	1	2	2	3	4	4	2	1	3	39	3	5	**54.17**
Tezpur University	3	3	2	1	2	2	2	1	4	1	0	2	4	4	0	2	3	3	39	3	5	**54.17**
Dibrugarh University	2	3	2	2	0	3	3	1	4	1	3	2	1	3	0	2	2	4	38	2	5	**52.78**
NEHU, Shillong	1	4	2	2	1	2	3	1	4	1	2	2	2	1	0	3	3	4	38	3	6	**52.78**
Calcutta University	2	2	2	2	1	2	3	1	4	1	2	2	2	3	0	3	4	2	38	2	4	**52.78**
North Bengal University	2	3	4	4	0	4	3	1	4	1	3	2	1	1	0	1	3	1	38	4	8	**52.78**
Vidyasagar University	2	3	1	3	2	2	2	1	4	1	0	2	4	1	0	3	3	3	37	2	6	**51.39**
Arunachal University	1	2	4	2	0	2	2	1	4	1	0	2	2	3	4	1	3	2	36	3	6	**50.00**
Cotton College, Guwahati	2	1	1	2	2	1	2	2	4	4	0	4	1	0	0	3	2	2	33	3	7	**45.83**
Assam University	1	2	2	1	0	3	2	1	4	1	3	2	0	1	0	4	2	2	31	2	8	**43.06**
Nagaland University	0	0	0	2	0	3	1	1	4	1	0	2	2	4	0	3	3	1	27	2	10	**37.50**
Patna University	0	0	1	4	0	1	4	1	4	1	0	0	0	0	0	1	3	1	21	3	14	**29.17**
Indian Statistical Institute	4	4	2	2	0	2	1	0	0	0	0	0	1	0	0	0	0	0	16	2	13	**22.22**
L.N. Mithila University	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	17	**4.17**
Medical Science																						
AMC, Dibrugarh	4	1	3	3	0	2	4	1	4	1	0	2	4	3	0	1	0	1	34	4	9	**47.22**
Guwahati Medical College	4	2	3	3	2	1	0	1	4	1	0	2	0	0	0	1	0	2	26	2	10	**36.11**
Silchar Medical College	4	1	2	1	0	1	0	3	4	1	0	4	0	0	0	1	0	1	23	3	13	**31.94**

A	S & T Expenditure	J	Editorial Responsibility
B	R & D Expenditure	K	Visiting Faculty
C	Research Guidance	L	Professional Bodies
D	Research Project	M	Awards
E	Consultancy Project	N	Fellowships
F	Publication papers	O	Patents
G	Publication Books	P	Technologies
H	Research Fora	Q	% Faculty with Ph.D.
I	External Examiner	R	FTE

Based on responded questionnaires
* Consolidated Score

Appendix-I

INAUGURAL ADDRESS

QUANTIFICATION OF R&D IN S&T FROM THE ACADEMIC SECTOR

By
J. Medhi
Professor Emeritus, Gauhati University

I am extremely happy to have offered this proud privilege to address this galaxy of eminent scientists, academicians and administrators participating in this session organised here to deliberate on an important subject having vital bearing on the development of Science and Technology(S & T) database of the country, in general, and R & D database, in particular. I express my deep sense of gratitude to the organisers of this session for extending this honour to me.

As you would all know, the country spends a sizable amount of her scare resources-financial, manpower & infrastructure on Research and Development (R & D) in science & technology and the country is naturally interested to know if there has been commensurate return from these investments. The need for a comprehensive appraisal of performances, behaviour and status of the R & D system is increasingly being felt in the country since over the past three decades. Such appraisals are necessary, not only for providing cost-benefit analysis but also to enable formulation/revision of R & D plans and programmes, to assist and to stimulate planning, to strengthen the debate on issues dealt with by policy makers and planners. It also helps to compare the national efforts with those of other countries.

With the growing awareness of these needs, increasing efforts are being made for building up a strong information system and database on science and technology statistics in the country with the Department of Science and Technology as the nodal agency and the National Science and Technology Management System (NSTMIS) Division of the Department as the implementing Division of the system.

It is to the credit of the NSTMIS Division that a fairly strong database on science and technology in the country has since been built up. The efforts made by the NSTMIS in this respect is praise worthy. The NSTMIS has been carrying out regularly a number of studies and surveys for further augmenting the database, bringing out a wide range of S & T indicators on input as well as output and publishing a number of very useful publications on S & T statistics. Vital gaps, however, are still there. One such gap as indicated by the NSTMIS Division is in the sphere of R & D statistics in the academic sector. Although the NSTMIS Division has been carrying out regular national statistical surveys to collect data on financial and manpower resources deployed for science and technology activities by the R & D institutions under the centrel Govt., State Govt., and Industries, the academic sector has not been adequtely covered so far under such surveys reportedly due to several conceptual and operational difficulties.

The difficulties are faced in quantitying the manpower engaged in R & D, expenditure incurred in R & D as well as in quntifying the output(*). Since teaching is one of the main activities in the academic sector, the time of the academic staff is divided between teaching, research and other activities and it is difficult to quantity the full-time equivalent of research personnel. On quantifying expenditure also, difficulties arise especially on the issue of intramural source of expenditure on research made by the academic institutions. This situation raises several important issues, like, whether, quantification of manpower should be based on time budgeting or on 'full time research equivalence' or be based on UGC norms. How to apportion towards research expenditure, the expenditure relating to research students who are not recipients of research fellowships or part time researchers who are college teachers. Other issues, relating to standardisation of important terminologies used in this respect vis-a-vis the UNESCO definitions, spelling out "what' should constitute research output as well as the method of collection of data from this sector are also there.

The academic sector is one of the major performers of research. It is also a vast sector comprising of around 30,000 science & technology faculty in 226 universities and other national level institutes of higher education, besides those in a large number of Post-graduate science colleges, Medical colleges and Engineering Colleges. Naturally, therefore, in the interest of development of Science & Technology, these issues effecting realistic data base cannot be overlooked. The issues relate to (i)identifying suitable concepts, (ii) defining appropriate parameters thereof, (iii) evolving relevant measures and (iv) the methology thereof. The issues are complex and varied and demand indepth discussion and debate among persons with wide knowledge and experience and deeply involved in the subject. In this context, the endeavour of the DST (NSTMIS) in organising these 'Brain Storming Sessions' on Zonal basis to develop a methodology for quantification of manpower and financial resources devoted to science and technology in the higher educational sector of the country is indeed in the right direction.

I can see that an elite group of scientists, academicians and administrators have gathered here for the session and I am absolutely sure that their expertise, experiences and involvement on the subject will greatly contribute to the deliberations in the session and will throw up very thoughtful ideas towards formulation of the methodology.

As a long and interesting agenda in the technical sessions is awaiting you, it will not be proper for me to further eat up your otherwise more important time.

I wish the session a grand success. With these words,I have pleasure in inaugurating the session.

---

* Lord Kelvin, the renowned physicist said, "Only if you can measure and express in quantitative terms about a matter, you can claim to have some knowledge about the matter, otherwise your knowledge is incomplete and imperfect."

KEYNOTE ADDRESS

AN OVERVIEW ON THE R&D RESOURCES IN S&T

by
Dr.A.N.N.Murthy
Jt.Adviser & Head(NSTMIS)
DST, New Delhi

Over the past two decades, there is a growing need for an information system and database on science and technology statistics (popularly called as science statistics). Policy makers, particularly those concerned with planning, implementation and management of science, felt the need for comprehensive information not only on the input resources which comprise mainly human and financial resources deployed and the infrastructure available to S&T activities but also the output of such activities measured in terms of increased productivity, economic growth, new products and processes developed, their large scale diffusion and impact on society. Such information could be useful for undertaking cost benefit analysis and other economic studies as well as for efficient programming, planning and budgetting. It will also help to compare the national efforts with that of other countries.

The S&T activities in India are undertaken by institutions /units/departments, which can be classified under the following sectors.

- central(Federal) Government
- State(Provincial) Governments
- Higher Education Sector
- Public Sector Industry
- Private Sector Industry
- Non profit Institutions/associations

The extent of S&T efforts in different sectors vary in terms of quantum of resources deployed for S&T activities and the types of activities undertaken.

The National Science and Technology Management Information System(NSTMIS) Division under the Department of Science and Technology(DST) has the nodal responsibility for providing reliable information on the country's S&T resources in general and their deployment for S&T activities in particular. Towards this end, the NSTMIS Division undertakes regular national statistical survey to collect the data on the quantum of resources deployed for S&T activities by the R&D institutions in the country under the central Govt. state Governments and the industries. However, the Academic sector has not been covered in the surveys so far due to conceptual and operational difficulties.

The following publications are being published by NSTMIS Division of DST:

Research and Development Statistics (since 1973-74)
R&D in Industry (since 1976-77)
S&T pocket Databook (since 1989)
Directory of R&D Institutions (since 1984)
Directory of Extra Mural R&D projects (since 1990-91)

These publication are widely referred and used in policy and planning processes at various levels in the country. In addition this division is also playing a nodal role for providing science statistics to .
UNESCO, NSF(USA) and many other UN organisations and Foreign Missions. Very few developing countries do have a reliable S&T information system like India.

The national investment on R&D activities attained a level of Rs.6821 crores (0.83% of GNP) during 1994-95 risen from Rs.186 cores during 1972-73. Simikarly the number of R&D institutions have grown four timeds from 562 to 2545 during this period. As on 1st April 1994, 3,15,000 people were employed in the R&D institutions of which one third were R&D personnel.

The academic sector being one of the major performers of research, it is vital to quantify the number of personnel engaged in research and the expenditure on R&D in the S&T faculties of the universities as there was no reliable data available at present.

As on May 1996, there were 226 Higher Education Institutions which could be categorised as below.

- conventional universities 156
- Agricultural universities (includes Deemed) 34
- Technological universities 15
- Medical universities 14
- Open universities 7

DST is in a position to quantify the resources devoted to R&D from all other sectors except academic sector. Earlier in-house attempts did not yield fruitful results for the reasons encountered as below.

- poor response
- inconsistency of data
- difficulty in arriving manpower/financial resources
- incomplete information
- non availability of source of funding
- non availability by field of science
- indecisiveness to the focal point
- lack of management information system

The central government through all funding agencies approved during 1995-96, 1716 extramural R&D projects out of which 475 were sanctioned to Higher Education Institutions. The DST has a sound database on EMR projects. So, quantifying the R&D resources through EMR is not a problem.

In order to quantify the resources both R&D manpower and finance in S&T of Academic sector which is hitherto not appeared in the national S&T statistics for the various reasons mentioned above, the NSTMIS division of DST has initiated the current exercise of holding Brain Storming Session in four zones of the country with a view to involve directly the academics and the administrators . The south zone BSS was held at Tamil University during October 1997 while the second one in the west zone held during early January 1998 at Pune University, the third one in the east zone is held in January 1998 at Gauhati University and fourth and final one is expected to be held during March 1998 at Lucknow for the north zone.

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A BACKGROUND NOTE ON THE BRAIN STORMING SESSION (BSS)

The term brain storming in current usage denotes an intellectual exercise where a complex problem that involves great uncertainties and alludes easy resolution is discussed and debated by a peer group of individuals having knowledge and experience on the subject to evolve a methodology for solution of the problem. The main objectives behind the present series of brainstorming sessions being organized on zonal basis covering the whole country by the National Science and Technology Management Information System (NSTMIS) of the Department of Science and Technology (DST) is to formulate a strategy for quantification of manpower and financial resources devoted to science and technology in the higher education sector. Although NSTMIS has been carrying out regular national statistical surveys to collect data on financial and manpower resources deployed for science and technology activities by R & D institutions under the Central, State Govt. and industry, the academic sector could not be adequately covered so far under such surveys due to several conceptual and operational difficulties.

The academic sector is one of the major performers of research. The total strength of the science and technology faculty in 226 Universities and national level institutes of higher education may be around 30,000. The total number of Ph.D.'s produced annually by these centres of higher education is around 10,000 of which 46% is claimed by the science and technology sector. Besides, a number of Universities offer M. Phil. Degrees which are in most cases partly by research and partly by course work.

In view of the urgent need to include the academic sector in the quantification of research in science and technology, the NSTMIS has taken up the present initiative to evolve a proper methodology by means of a series of brainstorming sessions. The attempts so far made by NSTMIS in this regard is quite praiseworthy. The pioneering work in this field was done by Dr.(Mrs) Rajeswari, Ex-Advisor, NSTMIS, DST. It is through her painstaking efforts that NSTMIS could initiate the process of quantification of R & D in science and technology and extent it to cover the academic sector.

The present session at Guwahati for the East Zone covers the Universities and other national level institutes from Orissa, West Bengal, Bihar, Sikkim and the North Eastern States. There are 49 such centres of higher education in this zone.

Since manpower and financial resources represent the two most vital inputs to research in science and technology, these two themes have been selected as the subject matter of the BSS.

Manpower Resources : Quantification of manpower resources engaged in research in science and technology of the academic sector is a difficult task due to certain conceptual and operational difficulties. The manpower engaged in research in the academic institutions divides their time between teaching, research and other activities. Therefore, simple enumeration of the personnel engaged in research may provide erroneous estimates. At the same time, use of statistical sampling techniques is also

greatly handicapped by the inherent variability in respect of institutional types, disciplines, standards, areas etc. Research is carried out in most universities through extramural funding of projects by Govt. agencies and undertaken by faculty members, consultancy services provided by the faculty to the industry or other establishments and by the M. Phil. And Ph. D. students engaged in individual research. The research indicator outputs need to be properly defined to make the quantification meaningful. There is also the need to define full-time equivalence of research personnel. The problem of time budgeting vis-à-vis the UGC norms for teachers of different grade is another issue that is quite relevant.

Financial Resources : Quantification of financial resources deployed in research in the science and technology sector of higher education raised several difficulties at the conceptual and operational levels. Finance for research expenditure in science and technology in the academic sector comes from two sources (i) extramural and (ii) intramural. The extramural finances are received by institutions in the form of research grants provided by funding agencies for specific projects. About 63% of research in higher education is supported through extramural funding. It is relatively easy to quantify this area of expenditure as the required information can be obtained both from the institutions as well as the funding agencies. The problem arises mainly in the case of intramural finance. This happens due to several reasons. Proper apportioning of laboratory expenditure incurred on research activities is difficult to quantify as the same laboratory is used for teaching as well as research. Most universities support some research students who are not recipient of any fellowship out of their annual grant in aid and there is no separate laboratory provision for them. Besides, the research being carried out on part-time basis in colleges by their teachers do not come under reckoning when it comes to quantification of expenditure in research and development in the science and technology sector.

Dr. D.C. Goswami
Coordinator, BSS(East Zone)

Appendix-II

DEPARTMENT OF ENVIRONMENTAL SCIENCE
GAUHATI UNIVERSITY
GUWAHATI - 781014,ASSAM, INDIA

Prof. D.C. Goswami
Principal Investigator

Quantification of Manpower & Financial Resources Devoted to R & D in S & T from Higher Education Sector - East Zone

Co-Investigators:
Dr. S. Kalita
Dr. L. Choudhury

Ref. No:DES Proj(01) 2001

Date:27.07.2001

Local Advisory Committee

1.	Dr. H.L. Duorah Vice Chancellor Gauhati University	Chairman
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3.	Prof. J. Medhi Silpukhuri, Guwahati-3	Member
4.	Prof. Kulendu Pathak Head, Dept. of Physics Cotton College, Guwahati-3	Member
5.	Prof. Haren Choudhury Dept. of Statistics Gauhati University	Member
6.	Prof. S. Sikidar Dept. of Commerce Gauhati University	Member
7.	Principal Assam Engineering College Guwahati-13	Member
8.	Principal Gauhati Medical College Guwahati-5	Member
9.	Prof. O.K. Medhi Dean, faculty of Science Gauhati University.	Member

Telephone : (0361) 570728 (O), 572416 (R) Fax : 0361-570133 e-mail : dggu@sancharnet.in

DEPARTMENT OF ENVIRONMENTAL SCIENCE
GAUHATI UNIVERSITY
GUWAHATI - 781014,ASSAM, INDIA

Prof. D.C. Goswami
Principal Investigator

Quantification of Manpower & Financial Resources Devoted to R & D in S & T from Higher Education Sector - East Zone

Co-Investigators:
Dr. S. Kalita
Dr. L. Choudhury

Ref. No:DES/Proj(01)/2001 *Date:27/07/2001*

10.	Dr. P. Talukdar Dept. of Plant Breeding & Genetics Assam Agricultural University Jorhat	Member
11.	Prof. D. C. Goswami Head, Dept. of Environmental Science Gauhati University	Principal Investigator
12.	Dr. S. Kalita Dept. of Environmental Science Gauhati University	Co-Investigator
13.	Dr. L. Choudhury Dept. of Statistics Gauhati University	Co-Investigator
14.	Prof. Nagen Ch. Das Treasurer Gauhati University	Special Invitee
15.	Dr. Banamali Nath Academic Registrsr Gauhati University	Special Invitee
16.	Dr. H.P. Sarma Dept. of Environmental Science Gauhati University	Special Invitee
17.	Dr. M.M. Saikia Dept. of Environmental Science Gauhati University	Special Invitee
18.	Prof. P.J. Das Dept. of Chemistry Gauhati University	Institutional Coordinator

Telephone : (0361) 570728 (O), 572416 (R) Fax : 0361-570133 e-mail : dggu@sancharnet.in

Appendix-III

MINUTES OF THE FIRST LOCAL ADVISORY COMMITTEE MEETING
of DST Sponsored Project on ***Quantification of Manpower & Financial Resources Devoted to R & D in S & T from Higher Educational Sector- East Zone*** held in the Department of Environmental Science , Gauhati University on 8th February, 1999.

1. Dr. H.L. Duorah , Vice Chancellor, Gauhati University	Chairman
2. Dr. G. J. Somathanam, DST, New Delhi.	Member
3. Dr. Kulendu Pathak , Cotton College, Guwahati .	Member
4. Dr. Haren Choudhury, Dept. of Statistics, Gauhati University	Member
5. Dr. S. Sikidar, Dean, Faculty of Commerce, Gauhati University	Member
6. Dr. Prafulla Ch. Mahanta, Principal, Assam Engineering College.	Member
7. Dr. S.K. Bhattacharjee, Dean, Faculty of Science, Gauhati University	Member
8. Dr. P. Talukdar, Assam Agricultural University , Jorhat.	Member
9. Dr. S. Kalita ,Co-Investigator, Dept. of Environmental Science,G.U.	Member
10. Dr. L. Choudhury, Co-Investigator, Dept. of Statistics, G.U.	Member
11. Dr. Banamali Nath, Academic Registrar, Gauhati University,	Member
12. Sri B. Barkataki, Finance Officer, Gauhati University,	Member
13. Dr. D. C. Goswami, Principal Investigator, Dept. of Env. Sc. , G.U.	Convenor

At the outset Dr. D. C. Goswami , Principal Investigator and Coordinator (East Zone) welcomed the members to the first meeting of the Local Advisory Committee (LAC) and appraised them of the background of the project and the activities done so far in connection with it. He also introduced the scientific staff engaged in the project to the Committee.

Dr. H.L.Duorah, Vice Chancellor , Guwahati University and Chairman LAC, in his introductory remarks, appreciated the initiation taken by the NSTMIS Division of DST in sponsoring the national project on Quantification of Manpower and Financial Resources Devoted to R & D in S & T from the Academic Sector. He expressed his confidence that the database generated through the survey would help assess the actual status of R & D in S&T in the institutions of higher education and provide an effective basis for academic planning and decision-making in the country. The Vice Chancellor thanked the DST for entrusting this University with the responsibility to coordinate the project for the East Zone and assured all possible help and support from the University in successfully carrying out the project.

Dr. G. J. Samathanam, Scientist, NSTMIS Division, DST spoke at length on the aims and objectives of the national survey, and the methodology developed through four zonal brainstorming sessions organised in different parts of the country and several meetings and discussions held at the DST headquarters in New Delhi. Initiating the discussion on the set of draft questionnaires to be used in the survey-one each for **Institutions, Departments and Individual faculty**, he dealt on the salient features of the questionnaires and clarified various queries made by the members.

The Committee appreciated the quality and coverage of the draft questionnaires and thanked the concerned DST scientist and the Zonal coordinators for preparing the same.

Dr. D.C. Goswami appraised the Committee of the need for upward revision of the salary structure of the project personnel, as the salary given at the time of recruitment appears to be low given their qualification and responsibility vis-à-vis the existing salary structure in similar DST sponsored projects. After considerable deliberation on the matter, the Committee decided to recommend the following salary structure for implementation with effect from date of joining.:

	Suggested Salary	Present Salary
Project Assistants :	Rs 4500/-(Rs. 500/- as HRA)	Rs. 4000/-
Computer Programmer -cum – Data Entry Operator :	Rs. 4000/-	Rs. 3000/-
Field Investigators :	Rs. 3000/-	Rs. 1800/-

Dr. Goswami also suggested that there was a need to increase the sample size for PG colleges of Science and Engineering offering Research based degrees from 10 nos. as originally projected to 50 nos., based on the information presently available. The Committee also felt that the sample size need to be increased to at least fifty for a realistic assessment

The meeting ended with a vote of thanks to the Chair and the members present.

Minutes of the Second Local Advisory Committee Meeting of DST Sponsored Project on " Quantification of Manpower & Financial Resources Devoted to R&D in S&T from Higher Education Sector – East Zone" held in Department of Environmental Science, Gauhati University on 26 th October, 1999.

The following personnel participated in the meeting

1.	Dr. H. L. Duorah, Vice Chancellor, Gauhati University	Chairman
2.	Dr. G. J. Samathanam, Scientist, DST, New Delhi	Member
3.	Dr. Haren Choudhury, Dept. of Statistics, Gauhati University	Member
4.	Dr. S. Sikidar, Dept. of Commerce, Gauhati University	Member
5.	Dr. O. K. Medhi, Dean, Faculty of Science, Gauhati University	Member
6.	Dr. S. kalita, Co-Investigator, Dept. of Env. Sc., Gauhati University	Member
7.	Dr. Banamali Nath, Academic Registrar, Gauhati University	Member
8.	Sri B. Barkataki, Finance Officer, Gauhati University	Member
9.	Dr. D.C. Goswami, Principal Investigator, Dept. of Env. Sc., Gauhati University	Convenor

Professor D. C. Goswami, P.I. welcomed the chairman and the members of LPAC for the second meeting. He appreciated the support he has been receiving the from the members for the project. He requested the chairman LPAC for conducting the proceedings.

Dr. Duorah in his remarks appreciated the efforts of DST in carrying out the important study for generating data on the area hitherto not attempted. He also expressed his happiness the way this project has been monitored periodically both at national level and zonal level.

Dr. Samathanam informed the status of progress of the project at national level and the significance of the project. He informed the members that earlier recommendations on the project front for revising the project personnel emoluments and the increase of sample size of PG colleges have been considered by DST and the revised sanction had been issued. He also said that the latest publication 'Research and Development statistics 1996-97' of DST also could not fully cover the higher education sector for the national statistics. There is dire need for accomplishing the present exercise on war footing so that we include the findings of the survey for the report of 1998-99.

Prof. Goswami gave a presentation on the project progress. He thanked DST for having extended their cooperation for implementing the recommendations of this LPAC and also close monitoring of the project This has helped in making constructive progress. He said that out of 53 universities 38 have responded for our request and nominated the institutional coordinators The work for identifying 50 PG colleges for the survey is ongoing. Most defaulters are from Bihar which are being pursued further. Following were the actions initiated/accomplished on the project front. :

- Recruitment of staff has been completed .

  Project Assistant – 2
  Project Assistant (Computer Programmer) – 1
  Field Investigator – 2

- Procurement of Equipments has been completed except one more UPS

  Three Intel Pentium II Computers
  One Inkjet and one dot matrix printers
  One 4-in-1 colour scanner, printer, copier and communicator system
  One 1 KVA UPS (20 minutes backup)
  Two CVTs

- The **Pilot Project** based on the set of Questionnaires prepared for the purpose has been carried out in the following institutions :

  1. I.I.T. , Kharagpur
  2. Indian School of Mines , Dhanbad
  3. North East Hill University, Shillong
  4. Gauhati University
  5. Assam Agricultural University, Jorhat
  6. College of Veterinary Science, Khanapara
  7. Assam Medical College, Dibrugarh
  8. Cotton College, Guwahati

- Out of about 1200 numbers of questionnaires distributed for pilot survey the number of filled in questionnaires returned to us so far is little over 200. The rest is going to be collected in the next round of visits by the project persons next month.

- Names of the **Institutional Coordinators** have been received from 38 institutions out of a total of 53. The defaulting Institutions are :

  1. I.S.I, Calcutta
  2. Rabindra Bharati University, Calcutta
  3. Visva Bharati, Santiniketon
  4. B.N. Mandal University, Bihar
  5. B.B.Ambedkar Bihar University, Muzaffarpur
  6. Jay Prakash Vishwavidhalaya, Chapra
  7. Ranchi University, Ranchi

*8. Netaji Subhash Open University, Calcutta

*9. Shri Jagannath Sanskrit Visvavidyalaya, Puri

*10. Kameswar Singh Darbhanga Sanskrit University, Darbhanga

*11. Nalanda Open University, Patna

12. Siddhu Kanhu University, Dumka

13. Veer Kunwar Singh University, Arrah

14. Vonoba Bhave University, Hazaribug

15. Vidhan Ch. Krishi Viswavidhalaya, Nadia

* These Universities have no Science departments, so need not be covered under the survey

- Data entry in the computer has been started but due to certain problems with the Programme the progress has been slow and efforts are being made to modify the programme .

- The revised set of questionnaires for the final phase of survey are being readied now for printing

- Request to be made for release of next instalment (1999 – 2000) amounting to Rs. 12,56,978 (refer document enclosed)

- Utilisation Certificate up to March 1999 is prepared

Amount received	= Rs. 8,00,000
Amount spent	= Rs. 4,14,320
Overhead	= Rs. 1,04,348
Spill over the next financial year	= Rs. 2,81,332

(Statements of expenditure enclosed)

The committee discussed various matters relating to the progress of the project and the difficulties faced by the P.I. and adopted the following recommendations.

1. In order to simplify the procedure and ensure speed and efficiency in the management of this time-bound national project, the P.I. may be allowed to draw an imprest amount starting with Rs. 1.00 lakh and followed subsequently by Rs. 50,000 on submission of the account.

2. In view of large number of tours involved in the project covering different academic institutions in the East Zone and the inadequacy of the existing university rates of daily allowance for the project personnel, the Committee recommends that D.A. rates as per the Central Government rules may be allowed in case of all Project personnel. Such a provision is already made in another DST sponsored project ongoing at G.U.. The project staff may be equated to JRF for this purpose.

3. Considering the necessity for covering different educational institutions with the survey materials like questionnaires and the other project documents, the project personnel may be allowed to hire vehicle for the purpose with due approval of P.I.

4. The Committee was satisfied with SE/UC and considered for further processing and also for releasing the next instalment of grant at the earliest.

5. Printing of Survey Questionnaires have to be pursued on priority. It was decided that it could be given to a private printer after following necessary procedures and due approval.

6. In order to make the institutional Coordinators more accountable, a part payment to such people may be made and hasten the survey process.

7. The next meeting of LPAC could be held during March first week and there should be some presentation on the results of the field data.

8. Computer software problems may be addressed to North Zone/ West Zone and sorted out at the earliest

(Prof. H.L.Duorah)
Vice Chancellor, Gauhati University
&
Chairman, Project Advisory Committee

VICE-CHANCELLOR
GAUHATI UNIVERSITY

MINUTES OF THE THIRD LOCAL ADVISORY COMMITTEE (LAC) MEETING of DST sponsored project on *Quantification of Manpower and Financial Resources Devoted to R & D in S & T from Higher Educational Sector-East Zone* held in the Conference Room of the Law Building, Gauhati University on 27th July, 2001 at 2 p.m.

Members Present :

1. Dr. H.L. Duorah, Vice Chancellor, Gauhati University	Chairman
2. Dr. O.K. Medhi, Dean, Faculty of Science, Gauhati University	Member
3. Dr. N. C. Das, Registrar(i/c) and Treasurer(i/c), G.U.	Member
4. Dr. H. Choudhury, Dept. of Statistics, G.U.	Member
5. Dr. K. Pathak, Professor(Retd), Cotton College, Guwahati	Member
6. Dr. B. Nath, Academic Registrar, G.U.	Member
7. Dr. S. Kalita, Dept. of Environmental Science, G.U.	Member
8. Dr. H.P. Sarma, Dept. of Environmental Science, G.U.	Member
9. Dr. M.M. Saikia, Deputy Director(Retd), RRL-Jorhat	Member

At the outset Dr. D.C. Goswami, Principal Investigator and Coordinator (East Zone) welcomed the members to the 3rd meeting of the Local Advisory Committee (LAC) and briefly outlined its objectives.

Dr. H.L. Duorah, Vice Chancellor, Gauhati University and Chairman, LAC, in his introductory remarks appreciated the initiative taken by the Dept. of Science and Technology (DST), Govt. of India in sponsoring the national level survey to quantify manpower and financial resources devoted to R & D in S & T from the Academic Sector and thanked the Department for entrusting the University with the responsibility to coordinate the project for the East Zone.

Dr. D. C. Goswami presented the results of the survey carried out in 40 Universities, institutes of National Importance and selected P.G. colleges spread over Bihar, Orissa, West Bengal and North Eastern States. The results are included in the draft report presently being readied for despatching to the DST, New Delhi for review and comments.

In the discussions that followed, the members interacted with the P.I., Co- P.I.s and Project Staff in regard to methodology and approach followed in estimating parameters

like 'full time equivalence' , 'R &D component of S & T' etc. The queries raised by the members were duly clarified in course of the discussions.

The meeting adopted the following resolutions in the light of the presentation made by the P.I.

(i) The Committee appreciates the commendable work carried out by the Project team in successfully completing the survey for the East Zone within the specified time frame.

(ii) As requested by the P.I., the committee recommends that he be allowed to retain the present skeletal staff for another month i.e. until the end of August 2001 so as to enable him to finalise the reports and make it complete in all details. We are given to understand that he will be able to manage the salary of the scientists within the already sanctioned amount in the project. The Committee, therefore, recommends that the extension may be allowed without any additional financial commitment by the DST.

The meeting ends with vote of thanks offered by Co-P.I. Dr. S. Kalita.

(Dr. D.C.Goswami)
P.I., DST Project.

(Dr. H.L.Dourah)
Vice Chancellor & Chairman LAC,

Appendix-IV

EAST ZONE - GAUHATI UNIVERSITY S.No. **DST / EZ / Q** ☐☐☐☐☐

National Survey
On

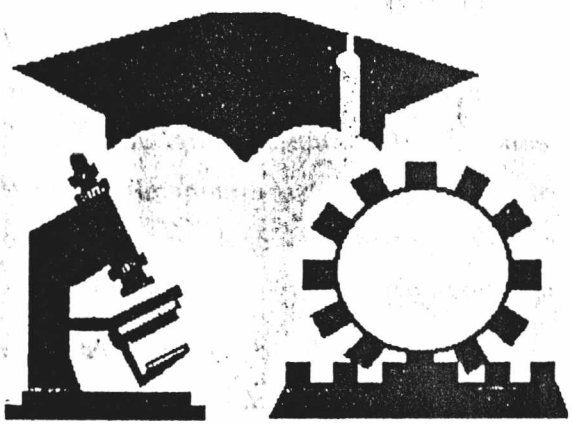
Quantification of Manpower and Financial Resources devoted to R&D in Science and Technology from Higher Education Sector

Sponsored by

Department of Science and Technology (DST)
Government of India, New Delhi

National Science and Technology Management Information System (NSTMIS)

Questionnaire I : University / Institutes



For Office use only

Zone	Category		
State	College	Designation	
Univ.	Field of Science	Gender	
	Department	Individual	

Please read the instructions before filling in the questionnaire.
In case you like to seek any clarification/information for filling the questionnaire, please do not hesitate to write, or telephone, or personally call in..

Name and Address of Institutional Co-ordinator

Prof. D.C. Goswami
Principal Investigator and Zonal Co-ordinator (East Zone)
DST PROJECT
Department of Environmental Science
Gauhati University
Guwahati- 781014, Assam

Phone : (0361) 570728(O), 572416 (R) **Fax** : 0361-570133 **E-mail** : dcggu@gw1.dot.net.in

सत्यमेव जयते

DR. LAXMAN PRASAD
HEAD
DIVISION OF NSTMIS & TT
PHONE/FAX : 6510686

भारत सरकार
विज्ञान और प्रौद्योगिकी विभाग
टेयनोलॉजी भवन, महरोली मार्ग, नई दिल्ली-११० ०१६
GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
Department of Science and Technology
Technology Bhavan, New Mehraulli Road, New Delhi-110 016

No DST/NSTMIS/ACAD/98 **Date 11.02.1999**

Sub : National Survey on "Quantification of Manpower and Financial Resources Devoted to R&D In Science and Technology from Higher Education Sector"

AN APPEAL TO SCIENTISTS

I appeal to all the scientists specialising in different scientific R&D activities to extend their co-operation by filling up the enclosed questionnaire(s) promptly. We are encouraged to approach you pursuant to having overwhelming response to this office letter No. D.O. DST/NST/MIS/Acad/98, dated December 9, 1998, addressed to the Heads of Universities and other scientific/medical/agricultural organisations, seeking their co-operation for the above survey. As Head of NST MIS & TT Division of the Department of Science and Technology (DST), Govt. of India, I am much concerned with the successful outcome of this important project, as the DST has resolved to fulfil the long-existing gap on the data base proposed to be created after the completion of all stages of this project.

Through four BSS programmes, organised by this Division, we have been able to achieve, among others, three main objectives : (i) Enlistment of indicators of R&D of higher education sector, (ii) designing appropriate questionnaires and methodology for quantifying the input resources and output indicators of R&D from higher education sector, and (iii) to identify the areas of strength in order to further strengthen the infrastructure for capability building. The three kinds of questionnaires have since been developed for : (1) University/PG College, (2) University/PG College Departments with R&D component, and (3) Academic staff of University/PG College Departments with R&D Component. With the help of these questionnaires the general survey will be conducted. It needs to be emphasised that reliable results of surveys are absolutely essential for achieving the relevant national objectives. Care has also to be exercised that the entire programme is completed within a period of two years. The results achieved through these surveys should serve as a vital data-bank on science indicators for various national endeavours, besides opening up exciting possibilities for its newer applications, particularly for :

- Human Resource Development
- Estimating Optimum Research Efforts
- Future Planning for R&D, and
- Overall Scientific Research & Development

For a national massive effort of this kind, it is necessary that the project functionaries and workers maintain a complete and close liaison with the academies, academics and executives to extract relevant information speedily and accurately. All this cannot be achieved without complete support and help from the concerned responses. May I, therefore, request the Heads of the various scientific institutions/departments to extend all possible help to the **Project Investigators** and their representatives so as to complete this gigantic task successfully and within the stipulated time.

Lastly, needless to say that we need you by our side at every step of the activity. Only your active involvement and help can make Govt's programme a success, and hopefully the same will be forthcoming generously.

(Laxman Prasad)

Telegram : SCIENCTECH ❑ Phone : 6567373/6962819 (EPABX) ❑ Telex : 73317, 73280 ❑ Fax : 6864570, 6863847, 6862418

INSTRUCTIONS FOR FILLING IN THE QUESTIONNAIRE

1. Please ensure that the number of characters/alphabets does not exceed the number of boxes given. Wherever necessary, abbreviations may be used.

2. All alphabets should be filled in **BLOCK LETTERS.**

3. Enough blank spaces have been provided to enter particulars, as may be pertinent to the respondent, but have not been printed in the Questionnaire. Please fill complete information for the items applicable to your institution. **In professional institutes, there are varieties of departmental nomenclatures. Should you find the blank spaces inadequate, score out names non-existent in your institution and mention the relevant name in the given column.** If information sought for is not relevant, leave the space blank. *In case exact data is not available, use estimates.*

4. Please stick to the units in which figures are asked for. For example, Rs. thousand ('000) should be given in Rs. thousand only and not Rs. Lakhs or Crores. Give information on finance / expenditure details in the box given below, For example, Rs. 1.25 Lakhs should be written in the box as :

0	1	2	5

Similarly, Rs. 16,500 should be written as

0	0	1	7

5. For any other clarification on terminology, refer definitions provided hereunder.

(I) BASIC RESEARCH

Basic research may be defined as any experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts without any particular or specific application or use in view.

(ii) APPLIED RESEARCH

Applied Research may be defined as any original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.

(iii) EXPERIMENTAL DEVELOPMENT

Experimental development may be defined as any systematic work, drawing on existing knowledge gained from research and/or practical experience that is directed to produce new materials, products and devices, to install new processes, systems and services, and to improve substantially those already produced or installed.

(iv) R&D ACTIVITIES

Research and development (R&D) activities can be defined as any systematic and creative work undertaken in order to increase the stock of knowledge and the use of this knowledge to devise new applications. R&D activities include anyone or more of the categories of research, such as basic research, applied research, and experimental development.

(v) **AUXILIARY ACTIVITIES / SUPPORTIVE TECHNICAL**

Auxiliary activities refer to the tasks, such as maintenance and operation of specialised R&D (or S&T) equipment and machinery, preparing materials and equipment and carrying out experiments, tests and analyses. For example, the activities carried out by medical assistants, computer programmers, surveyors, draughtsmen, survey interviewers and investigators can be classified as auxiliary activities.

(vi) **NON-TECHNICAL ACTIVITIES**

Non-technical activities refer to those tasks which are clerical, secretarial and essential services; for example, personnel providing services such as security, janitorial and maintenance.

(vii) **INTRA-MURAL GRANTS AND EXPENDITURE**

Intra-mural grants and expenditure by an institution cover the grants of its own sources and the expenditure incurred therefrom.

(viii) **EXTRA-MURAL GRANTS AND EXPENDITURE**

Extra-mural grants and expenditure cover the funds received by an institution for undertaking R&D projects sponsored by outside organisations, such as Central and State Government Departments/Agencies, International Agencies, Public/Private Industries, etc., and the expenditure therefrom.

(ix) **REVENUE/RECURRING EXPENDITURE**

Revenue or recurring expenditure includes salaries and wages, minor equipments, expendable supplies and expenditure on office and labour, materials, books, journals, rent of buildings, travel and postal services.

(x) **CAPITAL/NON-RECURRING EXPENDITURE**

Capital/non-recurring expenditure includes costs on purchase of major installations, machinery and equipment, land for building, new buildings or large-scale improvements/modifications/repairs to buildings and fixed installations, land improvement works, etc.

(xi) **MAJOR SOCIO-ECONOMIC OBJECTIVES**

- Agriculture, forestry and fishing.
- Industrial development.
- Production and rational use of energy.
- Transport and telecommunications
- Control and care of the environment (Prevention of pollution and Identification and treatment of pollution).
- Health (Excluding pollution).
- Social development and services.
- Exploration and exploitation of the Earth and atmosphere.
- Advancement of knowledge (Advancement of research, general university funds).
- Civil space.
- Defence.
- Urban and rural planning
- Not elsewhere classified

(xii) If any of the designations, such as Vice Chancellor, Principal, Dean, Reader, Lecturer, Finance Officer, etc., does not exist in your institution, give equivalent designation and name, wherever necessary.

<u>Add separate sheet (s) wherever space is inadequate</u>.

General Information

(For University / Institute)

Name of University / Institute_____

Address :_____

_____

STD Code ☐☐☐☐☐☐ Pin code ☐☐☐☐☐☐

E-mail _____ Phone: Office ☐☐☐☐☐☐☐

Internet_____ Fax : ☐☐☐☐☐☐☐

Year of Establishment ☐☐☐☐

Status : **Source of Grant** ☐☐

Government **(Go)**, Private Aided **(Pa)**, Private Unaided **(Pu)**

Name of Vice Chancellor/Director_____

Telephone (O) ☐☐☐☐☐☐☐ ® ☐☐☐☐☐☐☐

Name of Dean/Director/Head : _____

Research:_____

Telephone (O) ☐☐☐☐☐☐☐ ® ☐☐☐☐☐☐☐

Planning : _____

Telephone (O) ☐☐☐☐☐☐☐ ® ☐☐☐☐☐☐☐

Name of Registrar : _____

Telephone (O) ☐☐☐☐☐☐☐ ® ☐☐☐☐☐☐☐

Name of Finance Officer : _____

Telephone (O) ☐☐☐☐☐☐☐ ® ☐☐☐☐☐☐☐

Name of Institutional Coordinator : _____

Address : _____ _____

_____

STD Code ☐☐☐☐☐☐ Pin code ☐☐☐☐☐☐

Phone (O) ☐☐☐☐☐☐☐

(R) ☐☐☐☐☐☐☐

Fax : ☐☐☐☐☐☐☐

E-mail : _____

1. **Distribution of colleges under university's jurisdiction,** if applicable

Faculty→	Science	Engineering*	Medicine **	Agriculture***	#
Number of PG colleges with R & D					

* Includes Technology, Architecture & Planning
** All systems of medicine, including pharmacy
*** Includes Veterinary Science & fisheries
# Mention any other Faculty, if relevant.

2. **Details of Heads of the University Departments with post-graduate programmes***

Department	Name of HOD	Telephone-O*	Telephone-R*
Physics			
Chemistry			
Mathematics			
Statistics			
Botany			
Zoology			
Microbiology			
Biotechnology			
Computer Sc.			
Electronics			
Geological Sc.			
Earth Science			
Life Science			
Environmental Sc.			
Anthropology			
Geography			

*Give STD code, if the office &/or residence have different codes than that of the University.

3 Finance

3.1 Sources of grants and heads of expenditure (Rs.'000) for Institution

For Financial Year 1997- 98.

Furnish information on finance details of your Institution in the space given below.
For example, Rs. 1.25 Lakhs should be written as :

0	1	2	5

Similarly, Rs. 16,700 should be written as

0	0	1	7

Source → Expenditure head ↓	State Govt	Central Govt	Industries	Foreign sources	Donations	Institute's Own Sources	Others *	TOTAL
Building								
Staff								
Equipment								
Books and Journals								
Campus Development								
Health Centres								
Student Amenities								
Counselling								
Faculty Amenities								
Any Other*								
TOTAL								

*** Specify**

3.2 Heads of expenditure for departments with R&D activity.

Particular→ Department ↓	I* E*	Equip-ment	Labora-tory	Salary	Maintenance & Materials	Visiting faculties	Sympo-sium & Seminar	Contin-gency	Depart-mental Re-search	Others	Total
Physics	I										
	E										
Chemistry	I										
	E										
Maths	I										
	E										
Statistics	I										
	E										
Botany	I										
	E										
Zoology	I										
	E										
Microbiology	I										
	E										
Biotechnology	I										
	E										
Computer Science	I										
	E										
Electronics	I										
	E										
Geological Sciences	I										
	E										
Earth Science	I										
	E										
Life Science	I										
	E										
Environmental Science	I										
	E										
Anthroprology	I										
	E										
Geography	I										
	E										
	I										
	E										
	I										
	E										

*** I – Intramural funds; * E – Extramural funds**

4 PG Departments : Manpower (Faculty)

Department	Professor			Reader *			Lecturer *		
	**S	Filled		S	Filled		S	Filled	
		M	F		M	F		M	F
Physics									
Chemistry									
Mathematics									
Statistics									
Botany									
Zoology									
Microbiology									
Biotechnology									
Computer Sc.									
Electronics									
Geological Sc.									
Earth Science									
Life Science									
Environmental Sc.									
Anthropology									
Geography									

* or equivalent
**S – Sanctioned M - Male (Existing) F - Female (Existing)

5. PG Departments : Manpower (Research Scholars - Full Time)

Department	Pool Officer		R.A		S.R.F		J.R.F	
	M	F	M	F	M	F	M	F
Physics								
Chemistry								
Mathematics								
Statistics								
Botany								
Zoology								
Microbiology								
Biotechnology								
Computer Sc.								
Electronics								
Geological Sc.								
Earth Science								
Life Science								
Environmental Sc.								
Anthropology								
Geography								

M – Male, F – Female

EAST ZONE - GAUHATI UNIVERSITY S.No. **DST / EZ / Q** ☐☐☐☐☐

National Survey
On

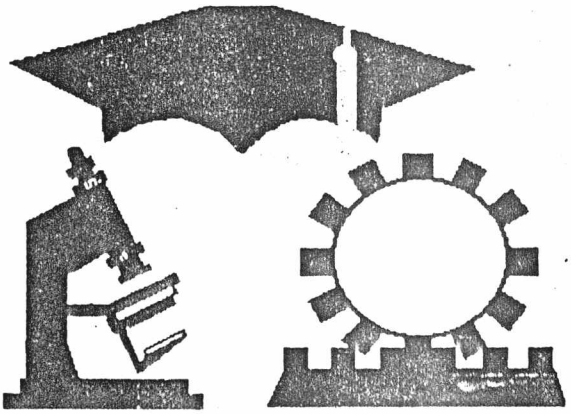
Quantification of Manpower and Financial Resources devoted to R&D in Science and Technology from Higher Education Sector

Sponsored by

Department of Science and Technology (DST)
Government of India, New Delhi

National Science and Technology Management Information System (NSTMIS)

Questionnaire I : PG Colleges with R&D in S&T



For Office Use only			
	Category		
Zone	College		Designation
State	Field of Science		Gender
Univ.	Department		Individual

Please read the instructions before filling in the questionnaire.
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Name and Address of Institutional Co-ordinator

Prof. D.C. Goswami
Principal Investigator and Zonal Co-ordinator (East Zone)
DST PROJECT
Department of Environmental Science
Gauhati University
Guwahati- 781014, Assam

Phone : (0361) 570728(O), 572416 (R) **Fax** : 0361-570133 **E-mail** : dcggu@gw1.dot.net.in

Dr. D. C. Goswami,
Ph. D. (Johns Hopkins Univ., USA)
PROFESSOR & HEAD
Department of Environmental Science
GAUHATI UNIVERSITY
GUWAHATI-781014 : Assam : India

Phone : 91-0361- 570728 (O)
572416 (R)
Fax : 570133
E-mail : dcggu @ gw1.dot.net.in

Date : 15. 12. 1999

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In view of the great need and pressing urgency to develop a comprehensive and reliable database on the subject, the DST, Govt. of India has taken up a new initiative on the subject by launching this project on Zonal basis.

We trust and believe that as a dedicated and conscientious academic and scientist, you will appreciate the significance and relevance of the database for the country as a whole and the academic sector in particular and extend your kind cooperation by filling in the questionnaire offered to you. Your help and cooperation will go a long way in successfully completing the project.

With warm regards,

Yours truly,

D C Goswami

(D. C. Goswami)
Principal Investigator

सत्यमेव जयते

DR. LAXMAN PRASAD
HEAD
DIVISION OF NSTMIS & TT
PHONE/FAX : 6510686

भारत सरकार
विज्ञान और प्रौद्योगिकी विभाग
टेयनोलॉजी भवन, महरोली मार्ग, नई दिल्ली-११० ०१६
GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
Department of Science and Technology
Technology Bhavan, New Mehraulli Road, New Delhi-110 016

No DST/NSTMIS/ACAD/98 **Date 11.02.1999**

Sub : National Survey on "Quantification of Manpower and Financial Resources Devoted to R&D in Science and Technology from Higher Education Sector"

AN APPEAL TO SCIENTISTS

I appeal to all the scientists specialising in different scientific R&D activities to extend their co-operation by filling up the enclosed questionnaire(s) promptly. We are encouraged to approach you pursuant to having overwhelming response to this office letter No. D.O. DST/NST/MIS/Acad/98, dated December 9, 1998, addressed to the Heads of Universities and other scientific/medical/agricultural organisations, seeking their co-operation for the above survey. As Head of NST MIS & TT Division of the Department of Science and Technology (DST), Govt. of India, I am much concerned with the successful outcome of this important project, as the DST has resolved to fulfil the long-existing gap on the data base proposed to be created after the completion of all stages of this project.

Through four BSS programmes, organised by this Division, we have been able to achieve, among others, three main objectives : (i) Enlistment of indicators of R&D of higher education sector, (ii) designing appropriate questionnaires and methodology for quantifying the input resources and output indicators of R&D from higher education sector, and (iii) to identify the areas of strength in order to further strengthen the infrastructure for capability building. The three kinds of questionnaires have since been developed for : (1) University/PG College, (2) University/PG College Departments with R&D component, and (3) Academic staff of University/PG College Departments with R&D Component. With the help of these questionnaires the general survey will be conducted. It needs to be emphasised that reliable results of surveys are absolutely essential for achieving the relevant national objectives. Care has also to be exercised that the entire programme is completed within a period of two years. The results achieved through these surveys should serve as a vital data-bank on science indicators for various national endeavours, besides opening up exciting possibilities for its newer applications, particularly for :

- Human Resource Development
- Estimating Optimum Research Efforts
- Future Planning for R&D, and
- Overall Scientific Research & Development

For a national massive effort of this kind, it is necessary that the project functionaries and workers maintain a complete and close liaison with the academies, academics and executives to extract relevant information speedily and accurately. All this cannot be achieved without complete support and help from the concerned responses. May I, therefore, request the Heads of the various scientific institutions/departments to extend all possible help to the **Project Investigators** and their representatives so as to complete this gigantic task successfully and within the stipulated time.

Lastly, needless to say that we need you by our side at every step of the activity. Only your active involvement and help can make Govt's programme a success, and hopefully the same will be forthcoming generously.

(Laxman Prasad)

Telegram : SCIENCTECH ❑ Phone : 6567373/6962819 (EPABX) ❑ Telex : 73317, 73280 ❑ Fax : 6864570, 6863847, 6862418

INSTRUCTIONS FOR FILLING IN THE QUESTIONNAIRE

1. Please ensure that the number of characters/alphabets does not exceed the number of boxes given. Wherever necessary, abbreviations may be used.

2. All alphabets should be filled in **BLOCK LETTERS.**

3. Enough blank spaces have been provided to enter particulars, as may be pertinent to the respondent, but have not been printed in the Questionnaire. Please fill complete information for the items applicable to your institution. **In professional institutes, there are varieties of departmental nomenclatures. Should you find the blank spaces inadequate, score out names non-existent in your institution and mention the relevant name in the given column.** If information sought for is not relevant, leave the space blank. *In case exact data is not available, use estimates.*

4. Please stick to the units in which figures are asked for. For example, Rs. thousand ('000) should be given in Rs. thousand only and not Rs. Lakhs or Crores. Give information on finance / expenditure details in the box given below, For example, Rs. 1.25 Lakhs should be written in the box as :

0	1	2	5

Similarly, Rs. 16,500 should be written as

0	0	1	7

5. For any other clarification on terminology, refer definitions provided hereunder.

(i) BASIC RESEARCH

Basic research may be defined as any experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts without any particular or specific application or use in view.

(ii) APPLIED RESEARCH

Applied Research may be defined as any original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.

(iii) EXPERIMENTAL DEVELOPMENT

Experimental development may be defined as any systematic work, drawing on existing knowledge gained from research and/or practical experience that is directed to produce new materials, products and devices, to install new processes, systems and services, and to improve substantially those already produced or installed.

(iv) R&D ACTIVITIES

Research and development (R&D) activities can be defined as any systematic and creative work undertaken in order to increase the stock of knowledge and the use of this knowledge to devise new applications. R&D activities include anyone or more of the categories of research, such as basic research, applied research, and experimental development.

(v) **AUXILIARY ACTIVITIES / SUPPORTIVE TECHNICAL**

Auxiliary activities refer to the tasks, such as maintenance and operation of specialised R&D (or S&T) equipment and machinery, preparing materials and equipment and carrying out experiments, tests and analyses. For example, the activities carried out by medical assistants, computer programmers, surveyors, draughtsmen, survey interviewers and investigators can be classified as auxiliary activities.

(vi) **NON-TECHNICAL ACTIVITIES**

Non-technical activities refer to those tasks which are clerical, secretarial and essential services; for example, personnel providing services such as security, janitorial and maintenance.

(vii) **INTRA-MURAL GRANTS AND EXPENDITURE**

Intra-mural grants and expenditure by an institution cover the grants of its own sources and the expenditure incurred therefrom.

(viii) **EXTRA-MURAL GRANTS AND EXPENDITURE**

Extra-mural grants and expenditure cover the funds received by an institution for undertaking R&D projects sponsored by outside organisations, such as Central and State Government Departments/Agencies, International Agencies, Public/Private Industries, etc., and the expenditure therefrom.

(ix) **REVENUE/RECURRING EXPENDITURE**

Revenue or recurring expenditure includes salaries and wages, minor equipments, expendable supplies and expenditure on office and labour, materials, books, journals, rent of buildings, travel and postal services.

(x) **CAPITAL/NON-RECURRING EXPENDITURE**

Capital/non-recurring expenditure includes costs on purchase of major installations, machinery and equipment, land for building, new buildings or large-scale improvements/modifications/repairs to buildings and fixed installations, land improvement works, etc.

(xi) **MAJOR SOCIO-ECONOMIC OBJECTIVES**

- Agriculture, forestry and fishing.
- Industrial development.
- Production and rational use of energy.
- Transport and telecommunications
- Control and care of the environment (Prevention of pollution and Identification and treatment of pollution).
- Health (Excluding pollution).
- Social development and services.
- Exploration and exploitation of the Earth and atmosphere.
- Advancement of knowledge (Advancement of research, general university funds).
- Civil space.
- Defence.
- Urban and rural planning
- Not elsewhere classified

(xii) If any of the designations, such as Vice Chancellor, Principal, Dean, Reader, Lecturer, Finance Officer, etc., does not exist in your institution, give equivalent designation and name, wherever necessary.

<u>Add separate sheet (s) wherever space is inadequate</u>.

General Information

(For P. G. Colleges)

Name of College _____

Address : _____

_____

STD Code ☐☐☐☐☐☐ Pin code ☐☐☐☐☐☐

Email _____ Phone: Office ☐☐☐☐☐☐☐

Internet _____ Fax : ☐☐☐☐☐☐☐

Name of Affiliating University : _____

Year of Establishment of College ☐☐☐☐

Status : **1) Affiliation** ☐☐

Autonomous (**Au**), Constituent (**Co**), Affiliated (**Af**)

2) Source of Grant ☐☐

Government (**Go**), Private Aided (**Pa**), Private Unaided (**Pu**)

Name of Principal/Director : _____

Telephone (O) ☐☐☐☐☐☐☐ ® ☐☐☐☐☐☐☐

Name of Vice-Principal : _____

Telephone (O) ☐☐☐☐☐☐☐ ® ☐☐☐☐☐☐☐

Name Of Adm. Officer/Office Superintendent _____

Telephone (O) ☐☐☐☐☐☐☐ ® ☐☐☐☐☐☐☐

Name of Finance/Accounts Officer : _____

Telephone (O) ☐☐☐☐☐☐☐ ® ☐☐☐☐☐☐☐

Name of Institutional Coordinator : _____

Address : _____ _____

_____

STD Code ☐☐☐☐☐☐ Pin code ☐☐☐☐☐☐

Phone (O) ☐☐☐☐☐☐☐

(R) ☐☐☐☐☐☐☐

Fax : ☐☐☐☐☐☐☐

Availability of Internet : Yes ☐ No ☐

E-mail : _____

1. **Details of College Management** _____

_____

_____

2. **Details of Heads of the Post-graduate departments with R&D activity**

Subject	Name of HOD	Telephone-O*	Telephone-R*
Physics			
Chemistry			
Mathematics			
Statistics			
Botany			
Zoology			
Microbiology			
Biotechnology			
Computer Sc.			
Electronics			
Geological Sc.			
Earth Science			
Life Science			
Environmental Sc.			
Anthropology			
Geography			

*Give STD code, if the office &/or residence have different codes than that of the College.

3 Finance

3.1 Sources of grants and heads of expenditure (Rs.'000) for Institution

For Financial Year 1997- 98.

Furnish information on finance details of your Institution in the space given below.

For example, Rs. 1.25 Lakhs should be written as :

0	1	2	5

Similarly, Rs. 16,700 should be written as

0	0	1	7

Source → Expenditure head ↓	State Govt	Central Govt	Industries	Foreign sources	Donations	Institute's Own Sources	Others *	TOTAL
Building								
Staff								
Equipment								
Books and Journals								
Campus Development								
Health Centres								
Student Amenities								
Counselling								
Faculty Amenities								
Any Other*								
TOTAL								

*** Specify**

3.2 Heads of expenditure for departments with R&D activity.

Particular→ Department ↓	I* E*	Equip-ment	Labora-tory	Salary	Mainte-nance & Materials	Visiting faculties	Sympo-sium & Seminar	Contin-gency	Depart-mental Re-search	Others	**Total**
Physics	I										
	E										
Chemistry	I										
	E										
Maths	I										
	E										
Statistics	I										
	E										
Botany	I										
	E										
Zoology	I										
	E										
Microbiology	I										
	E										
Biotechnology	I										
	E										
Computer Science	I										
	E										
Electronics	I										
	E										
Geological Science	I										
	E										
Earth Science	I										
	E										
Life Science	I										
	E										
Environmental Science	I										
	E										
Anthroprology	I										
	E										
Geography	I										
	E										
	I										
	E										
	I										
	E										

*** I – Intramural funds; * E – Extramural funds**

4 PG Departments with R&D : Manpower (Faculty)

Department	Professor			Reader *			Lecturer *		
	**S	Filled		S	Filled		S	Filled	
		M	F		M	F		M	F
Physics									
Chemistry									
Mathematics									
Statistics									
Botany									
Zoology									
Microbiology									
Biotechnology									
Computer Sc.									
Electronics									
Geological Sc.									
Earth Science									
Life Science									
Environmental Sc.									
Anthropology									
Geography									

* or equivalent
**S – Sanctioned M - Male (Existing) F - Female (Existing)

5. PG Departments with R&D : Manpower (Research Scholars - Full Time)

Department	Pool Officer		R.A		S.R.F		J.R.F	
	M	F	M	F	M	F	M	F
Physics								
Chemistry								
Mathematics								
Statistics								
Botany								
Zoology								
Microbiology								
Biotechnology								
Computer Sc.								
Electronics								
Geological Sc.								
Earth Science								
Life Science								
Environmental Sc.								
Anthropology								
Geography								

M – Male, F – Female

Signature

EAST ZONE - GAUHATI UNIVERSITY S.No. DST / EZ / Q ☐☐☐☐☐

National Survey
On

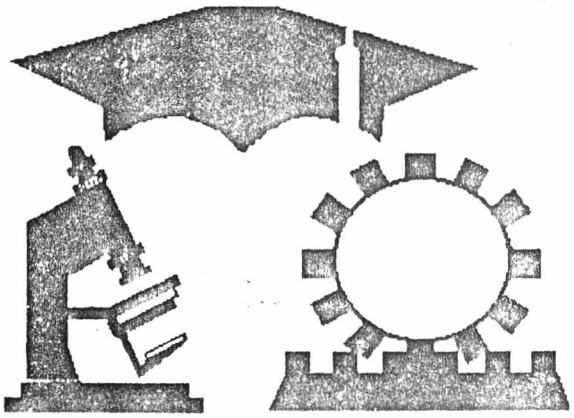
Quantification of Manpower and Financial Resources devoted to R&D in Science and Technology from Higher Education Sector

Sponsored by

Department of Science and Technology (DST)
Government of India, New Delhi

National Science and Technology Management Information System (NSTMIS)

Questionnaire I : Medical Institutions



For Office Use only			
	Category ☐		
Zone ☐	College ☐☐☐	Designation ☐	
State ☐☐	Field of Science ☐	Gender ☐	
Univ. ☐☐☐	Department ☐☐☐	Individual ☐☐	

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Name and Address of
Institutional Co-ordinator

Prof. D.C. Goswami
Principal Investigator and Zonal Co-ordinator (East Zone)
DST PROJECT
Department of Environmental Science
Gauhati University
Guwahati- 781014, Assam

Phone : (0361) 570728(O), 572416 (R) x : 0361-570133 E-mail : dcggu@gw1.dot.net.in

Dr. D. C. Goswami,
Ph. D. (Johns Hopkins Univ., USA)
PROFESSOR & HEAD
Department of Environmental Science
GAUHATI UNIVERSITY
GUWAHATI-781014 : Assam : India

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With warm regards,

Yours truly,

D. C. Goswami

(D. C. Goswami)
Principal Investigator

सत्यमेव जयते

DR. LAXMAN PRASAD
HEAD
DIVISION OF NSTMIS & TT
PHONE/FAX : 6510686

भारत सरकार
विज्ञान और प्रौद्योगिकी विभाग
टेयनोलॉजी भवन, महरोली मार्ग, नई दिल्ली-११० ०१६
GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
Department of Science and Technology
Technology Bhavan, New Mehraulli Road, New Delhi-110 016

No DST/NSTMIS/ACAD/98 **Date 11.02.1999**

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Telegram : SCIENCTECH ❑ Phone : 6567373/6962819 (EPABX) ❑ Telex : 73317, 73280 ❑ Fax : 6864570, 6863847, 6862418

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5. For any other clarification on terminology, refer definitions provided hereunder.

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Basic research may be defined as any experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts without any particular or specific application or use in view.

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Experimental development may be defined as any systematic work, drawing on existing knowledge gained from research and/or practical experience that is directed to produce new materials, products and devices, to install new processes, systems and services, and to improve substantially those already produced or installed.

(iv) R&D ACTIVITIES

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(v) **AUXILIARY ACTIVITIES / SUPPORTIVE TECHNICAL**

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(xi) **MAJOR SOCIO-ECONOMIC OBJECTIVES**

- Agriculture, forestry and fishing.
- Industrial development.
- Production and rational use of energy.
- Transport and telecommunications
- Control and care of the environment (Prevention of pollution and Identification and treatment of pollution).
- Health (Excluding pollution).
- Social development and services.
- Exploration and exploitation of the Earth and atmosphere.
- Advancement of knowledge (Advancement of research, general university funds).
- Civil space.
- Defence.
- Urban and rural planning
- Not elsewhere classified

(xii) If any of the designations, such as Vice Chancellor, Principal, Dean, Reader, Lecturer, Finance Officer, etc., does not exist in your institution, give equivalent designation and name, wherever necessary.

Add separate sheet (s) wherever space is inadequate.

General Information

(For Medical Institutions)

Name of University/Institution _____

Address _____ _____

_____

STD Code ☐☐☐☐☐☐ Pin code ☐☐☐☐☐☐

Email _____ Phone: Office ☐☐☐☐☐☐☐

Internet _____ Fax : ☐☐☐☐☐☐☐

Name of Affiliating University(in case of college) : _____

Year of Establishment ☐☐☐☐

Status : **1) Affiliation** ☐☐

Autonomous (**Au**), Constituent (**Co**), Affiliated (**Af**)

2) Source of Grant ☐☐

Government (**Go**), Private Aided (**Pa**), Private Unaided (**Pu**)

Name of Vice Chancellor/Director/Principal : _____

Telephone (O) ☐☐☐☐☐☐☐ ® ☐☐☐☐☐☐☐

Name of the Director / Head of the Hospital _____

Telephone (O) ☐☐☐☐☐☐☐ ® ☐☐☐☐☐☐☐

Name of Registrar / Administrative Officer : _____

Telephone (O) ☐☐☐☐☐☐☐ ® ☐☐☐☐☐☐☐

Name of Finance / Accounts Officer : _____

Telephone (O) ☐☐☐☐☐☐☐ ® ☐☐☐☐☐☐☐

Name of Institutional Coordinator : _____

Address : _____ _____

_____

Pin code ☐☐☐☐☐☐

STD Code ☐☐☐☐☐☐ Phone (O) ☐☐☐☐☐☐☐

(R) ☐☐☐☐☐☐☐

Fax : ☐☐☐☐☐☐☐

E-mail : _____

1.1 Details of Management (in case of colleges) : _____

_____

_____

1.2 Mode of selection of students at MBBS or equivalent

(Tick mark (√) whichever is applicable, even if it is more than one)

1.2.1 Based on marks of qualifying ☐

1.2.2 Based on marks of the result of entrance test ☐

1.2.3 Based on marks in interview ☐

1.2.4 Based on donation ☐

2. Details of Heads of the Departments° with post-graduate programmes

Subject	Name of HOD	Telephone-O*	Telephone-R*
HOSPITAL			
Anatomy			
Physiology			
Biochemistry & Biophysics			
Community Medicine			
Pathology			
Pharmacology			
Microbiology			
Forensic Medicine			
General Medicine			
Paediatrics			
Tuberculosis & Chest			
Dermatology & Venerology			
Psychiatry			
Radiodiagnosis			

*Give STD code, if the office &/or residence have different codes than that of the institution.

° In case of Ayurvedic, Unani , Siddha or Homeopathic Colleges, please use appropriate terminology in Table 2, 3.2, 4 or 5 such as **Maulik Siddhanta** (*Basic Principles*), **Dravyaguna** (*Materia Medica*), **Kayachikitsa** (*Medicine*), **Kaumarbhritya** (*Paedeatrics*), **Rasashastra and Bhaishjya Kalpana** (*Pharmacology and Pharmacognosy*), **Shalya** (*Surgery*), **Shalakya** (*ENT- Opthal.*), **Prasuti tantra and Stri-roga** (*Obstetrics & Gynaecology*), **Vikriti Vijnan** (*Pathology*), **Panchkarm**, etc. as per Instruction No. 3.

Continued on page 3

2 Details of Heads of the Departments with post-graduate programmes (continued)

Subject	Name of HOD	Telephone-O*	Telephone-R*
Radiotherapy			
Infectious Diseases			
General Surgery			
Orthopaedics			
Opthalmology			
Otorhinolaryngalogy			
Anaesthesiology & Critical Care			
Dentistry			
Obstetrics & Gynaecology			
Cardiology/CVTS			
Gastroenterology			
Neurology			
Endocrinology			
Immunology			
Nephrology			
Nuclear Medicine			
Urology			
Pharmacy			
Nursing			
Biomedical Engg. / Instrumentation			
Nuclear Medicine			
Human Metabolism			

* Give STD code, if the office & or residence have different code than that of the institutions.

3 Finance

3.1 Sources of grants and heads of expenditure (Rs.'000) for Institution

For Financial Year 1997- 98.

Furnish information on finance details of your Institution in the space given below.
For example, Rs. 1.25 Lakhs should be written as :

0	1	2	5

Similarly, Rs. 16,700 should be written as

0	0	1	7

Source → Expenditure head ↓	State Govt	Central Govt	Industries	Foreign sources	Donations	Institute's Own Sources	Others *	TOTAL
Building (Acad.)								
Building (Hospital)								
Staff (Academic)								
Staff (Hospital*)								
Equipment (Acad.)								
Equipment (Hosp)								
Books/Journals								
Campus Dev.								
Student Amenities								
Counselling								
Faculty Amenities								
Any Other								
TOTAL								

*Restricted to Hospital.

3.2 Heads of expenditure for departments

Particular→ Departments ↓	I* E*	Equip-ment	Labora-tory	Salary	Mainte-nance & Materials	Visiting faculties	Sympo-sium & Seminar	Contin-gency	Depart-mental Research	Others	Total
HOSPITAL	I										
	E										
Anatomy	I										
	E										
Physiology	I										
	E										
Biochemistry &	I										
Biophysics	E										
Community	I										
Medicine	E										
Pathology	I										
	E										
Pharmacology	I										
	E										
Microbiology	I										
	E										
Forensic	I										
Medicine	E										
General	I										
Medicine	E										
Paediatrics	I										
	E										
Tuberculosis &	I										
Chest	E										
Dermatology &	I										
Venerology	E										
Psychiatry	I										
	E										
Radiodiagnosis	I										
	E										
Radiotherapy	I										
	E										
Infectious	I										
Diseases	E										
Cardiology	I										
	E										

*** I – Intramural funds; * E – Extramural funds**

Continued on page 6 →

3.2 Heads of expenditure for departments (continued)

Particular→ Departments ↓	I* E*	Equip-ment	Labora-tory	Salary	Mainte-nance & Materials	Visiting faculties	Sympo-sium & Seminar	Contin-gency	Depart-mental Research	Others	Total
General Surgery	I										
	E										
Orthopaedics	I										
	E										
Opthalmology	I										
	E										
Otorhinolary-ngology	I										
	E										
Anaesthesiology & Critical Care	I										
	E										
Dentistry	I										
	E										
Obstetrics & Gynaecology	I										
	E										
CVTS	I										
	E										
Neurology	I										
	E										
Gastroenterology	I										
	E										
Human Metabolism	I										
	E										
	I										
	E										
	I										
	E										
	I										
	E										
	I										
	E										

I – Intramural funds, E – Extramural funds

4 PG Departments : Manpower (Faculty)

Department	Professor			Reader *			Lecturer *		
	**S	Filled		S	Filled		S	Filled	
		M	F		M	F		M	F
HOSPITAL									
Anatomy									
Physiology									
Biochemistry & Biophysics									
Community Medicine									
Pathology									
Pharmacology									
Microbiology									
Forensic Medicine									
General Medicine									
Paediatrics									
Tuberculosis & Chest									
Dermatology & Venerology									
Psychiatry									
Radiodiagnosis									
Radiotherapy									
Infectious Diseases									
Cardiology									
General Surgery									
Orthopaedics									
Opthalmology									
Otorhinolaryngology									
Anaesthesiology & Critical Care									

Continued on page 8 →

PG Departments : Manpower (Faculty) continued.....

Department	Professor			Reader *			Lecturer *		
	**S	Filled		S	Filled		S	Filled	
		M	F		M	F		M	F
Dentistry									
Obstetrics & Gynaecology									
CVTS									
Neurology									
Gastroentrology									
Human Metabolism									
▪									
▪									
▪									

*or equivalent **S – Sanctioned, M - Male (Existing), F - Female (Existing)

▪ Note : Please fill in the names of the relevant departments or attach extra sheets.

5. PG Manpower Research Scholars - Full Time

Department	Pool Officer		R.A		S.R.F		J.R.F	
	*M	*F	M	F	M	F	M	F
HOSPITAL								
Anatomy								
Physiology								
Biochemistry & Biophysics								
Community Medicine								
Pathology								
Pharmacology								
Microbiology								
Forensic Medicine								
General Medicine								
Paediatrics								
Tuberculosis & Chest								
Dermatology & Venerology								
Psychiatry								
Radiodiagnosis								
Radiotherapy								
Infectious Diseases								
Cardiology								
General Surgery								
Orthopaedics								
Opthalmology								
Otorhinolaryngology								
Anaesthesiology & Critical Care								
Dentistry								
Obstetrics & Gynaecology								

Continued on page 10 →

PG Manpower Research Scholars - Full Time (continued)

Department	Pool Officer		R.A		S.R.F		J.R.F	
	*M	*F	M	F	M	F	M	F
CVTS								
Neurology								
Gastroentrology								
Human Metabolism								
Gastroentrology								
Human Metabolism								
▪								
▪								
▪								
▪								

*M - Male *F – Female

▪ Note : Please fill in the names of the relevant departments or attach extra sheets.

6. **Hospital :** Please furnish following details :

6.1 **Name of Hospital** _____

6.2 **Speciality-wise** details of beds in the hospital.

S.No.	Speciality	No. of Beds			Emergency & average daily O.P.D. attendance
		Male	Female	Total	
A. **Medicine and allied**					
1.	General Medicine				
2.	Paediatrics				
3.	Tuberculosis and Chest				
4.	Skin and S.T.D.				
5.	Psychiatry				
6.	Radiodiagnosis				
7.	Infectious Diseases				
8.					
9.					
10.					
11.					
12.					
B. **Surgery and allied**					
1.	General Surgery				
2.	Orthopaedic Surgery				
3.	Opthalmology				
4.	Otorhinolaryngology				
5.	Dental Surgery				
6.	Obstectrics and Gynaecology				
7.	CVTS				
8.	Neuro-surgery				
9.					
10.					
11.					
12.					

Note : Please indicate any Super-specialisation or speciality of the Medical College and Hospital by mentioning it in the table.

6.3 **State-of-Art treatment facilities :**

S.No	Particulars	Cost Rs lakh	Source of Funds	Utilisation Mandays/ month
1.				
2.				
3.				
4.				
5.				
6.				

6.4 **Training of Doctors/Scientist on sophisticated instruments/technologies in last three Years (1995-98)**

S.No	Instruments/Technology	No. of Training programmes organised	No. of Individuals trained	Source of Funds
1.				
2.				
3.				
4.				
5.				
6.				

6.5 **Give briefly advancements in treatment & diagnostics** developed in last three years (1995-98) along with names of involved professionals, if possible

6.6 **Give briefly the surgical treatments developed and / or started** in the last three years (1995-98) along with names of involved professionals / surgeons

_____

_____

_____

_____

_____

6.7 **Give percentage of financial self-sufficiency of the hospital** ☐☐

Place :

Signature

Date :

EAST ZONE - GAUHATI UNIVERSITY S.No. **DST / EZ / Q** ☐☐☐☐☐

National Survey
On

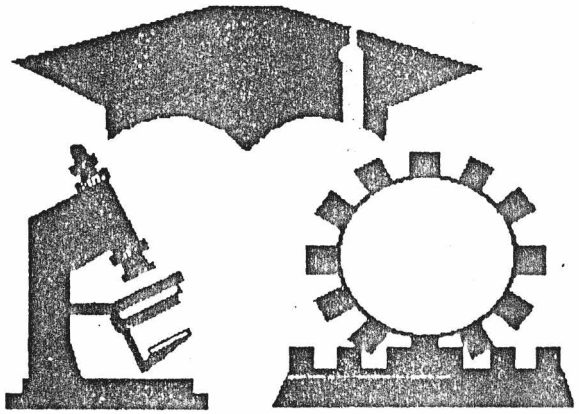
Quantification of Manpower and Financial Resources devoted to R&D in Science and Technology from Higher Education Sector

Sponsored by

Department of Science and Technology (DST)
Government of India, New Delhi

National Science and Technology Management Information System (NSTMIS)

Questionnaire I : University / Institutions of Engineering / Technology



For Office Use only			
	Category		
Zone	College		Designation
State	Field of Science		Gender
Univ.	Department		Individual

Please read the Instructions before filling in the questionnaire.
In case you like to seek any clarification/information for filling the questionnaire, please do not hesitate to write, or telephone, or personally call in.

Name and Address of Institutional Co-ordinator

Prof. D.C. Goswami
Principal Investigator and Zonal Co-ordinator (East Zone)
DST PROJECT
Department of Environmental Science
Gauhati University
Guwahati- 781014, Assam

Phone : (0361) 570728(O), 572416 (R) **Fax** : 0361-570133 **E-mail** : dcggu@gw1.dot.net.in

Dr. D. C. Goswami,
Ph. D. (Johns Hopkins Univ., USA)
PROFESSOR & HEAD
Department of Environmental Science
GAUHATI UNIVERSITY
GUWAHATI-781014 : Assam : India

Phone : 91-0361- 570728 (O)
572416 (R)
Fax : 570133
E-mail : dcggu @ gw1.dot.net.in

Date : 15. 12. 1999

Dear Friend,

The questionnaire in your hand is part of the National Survey on Quantification of Manpower and Financial Resources Devoted to R & D in Science and Technology from Higher Education Sector sponsored by Department of Science and Technology (DST), Govt. of India, New Delhi and coordinated by us for the East Zone. The survey covers basic sciences, engineering, technology, agricultural and medical sciences and is aimed at embracing as large a teaching community of India as can be possible. Although there have been several attempts earlier to quantify manpower and financial resources devoted to R & D from the academic sector, those surveys did not achieve the desired results due to lack of good response and prevalence of several complexities unique to this sector.

In view of the great need and pressing urgency to develop a comprehensive and reliable database on the subject, the DST, Govt. of India has taken up a new initiative on the subject by launching this project on Zonal basis.

We trust and believe that as a dedicated and conscientious academic and scientist, you will appreciate the significance and relevance of the database for the country as a whole and the academic sector in particular and extend your kind cooperation by filling in the questionnaire offered to you. Your help and cooperation will go a long way in successfully completing the project.

With warm regards,

Yours truly,

D.C.Goswami

(D. C. Goswami)
Principal Investigator

सत्यमेव जयते

DR. LAXMAN PRASAD
HEAD
DIVISION OF NSTMIS & TT
PHONE/FAX : 6510686

भारत सरकार
विज्ञान और प्रौद्योगिकी विभाग
टेयनोलॉजी भवन, महरोली मार्ग, नई दिल्ली-११० ०१६
GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
Department of Science and Technology
Technology Bhavan, New Mehraulli Road, New Delhi-110 016

No DST/NSTMIS/ACAD/98 **Date 11.02.1999**

Sub : National Survey on "Quantification of Manpower and Financial Resources Devoted to R&D in Science and Technology from Higher Education Sector"

AN APPEAL TO SCIENTISTS

I appeal to all the scientists specialising in different scientific R&D activities to extend their co-operation by filling up the enclosed questionnaire(s) promptly. We are encouraged to approach you pursuant to having overwhelming response to this office letter No. D.O. DST/NST/MIS/Acad/98, dated December 9, 1998, addressed to the Heads of Universities and other scientific/medical/agricultural organisations, seeking their co-operation for the above survey. As Head of NST MIS & TT Division of the Department of Science and Technology (DST), Govt. of India, I am much concerned with the successful outcome of this important project, as the DST has resolved to fulfil the long-existing gap on the data base proposed to be created after the completion of all stages of this project.

Through four BSS programmes, organised by this Division, we have been able to achieve, among others, three main objectives : (i) Enlistment of indicators of R&D of higher education sector, (ii) designing appropriate questionnaires and methodology for quantifying the input resources and output indicators of R&D from higher education sector, and (iii) to identify the areas of strength in order to further strengthen the infrastructure for capability building. The three kinds of questionnaires have since been developed for : (1) University/PG College, (2) University/PG College Departments with R&D component, and (3) Academic staff of University/PG College Departments with R&D Component. With the help of these questionnaires the general survey will be conducted. It needs to be emphasised that reliable results of surveys are absolutely essential for achieving the relevant national objectives. Care has also to be exercised that the entire programme is completed within a period of two years. The results achieved through these surveys should serve as a vital data-bank on science indicators for various national endeavours, besides opening up exciting possibilities for its newer applications, particularly for :

- Human Resource Development
- Estimating Optimum Research Efforts
- Future Planning for R&D, and
- Overall Scientific Research & Development

For a national massive effort of this kind, it is necessary that the project functionaries and workers maintain a complete and close liaison with the academies, academics and executives to extract relevant information speedily and accurately. All this cannot be achieved without complete support and help from the concerned responses. May I, therefore, request the Heads of the various scientific institutions/departments to extend all possible help to the **Project Investigators** and their representatives so as to complete this gigantic task successfully and within the stipulated time.

Lastly, needless to say that we need you by our side at every step of the activity. Only your active involvement and help can make Govt's programme a success, and hopefully the same will be forthcoming generously.

(Laxman Prasad)

Telegram : SCIENCTECH ❑ Phone : 6567373/6962819 (EPABX) ❑ Telex : 73317, 73280 ❑ Fax : 6864570, 6863847, 6862418

INSTRUCTIONS FOR FILLING IN THE QUESTIONNAIRE

1. Please ensure that the number of characters/alphabets does not exceed the number of boxes given. Wherever necessary, abbreviations may be used.

2. All alphabets should be filled in **BLOCK LETTERS.**

3. Enough blank spaces have been provided to enter particulars, as may be pertinent to the respondent, but have not been printed in the Questionnaire. Please fill complete information for the items applicable to your institution. **In professional institutes, there are varieties of departmental nomenclatures. Should you find the blank spaces inadequate, score out names non-existent in your institution and mention the relevant name in the given column.** If information sought for is not relevant, leave the space blank. *In case exact data is not available, use estimates.*

4. Please stick to the units in which figures are asked for. For example, Rs. thousand ('000) should be given in Rs. thousand only and not Rs. Lakhs or Crores. Give information on finance / expenditure details in the box given below, For example, Rs. 1.25 Lakhs should be written in the box as :

0	1	2	5

Similarly, Rs. 16,500 should be written as

0	0	1	7

5. For any other clarification on terminology, refer definitions provided hereunder.

(i) BASIC RESEARCH

Basic research may be defined as any experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts without any particular or specific application or use in view.

(ii) APPLIED RESEARCH

Applied Research may be defined as any original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.

(iii) EXPERIMENTAL DEVELOPMENT

Experimental development may be defined as any systematic work, drawing on existing knowledge gained from research and/or practical experience that is directed to produce new materials, products and devices, to install new processes, systems and services, and to improve substantially those already produced or installed.

(iv) R&D ACTIVITIES

Research and development (R&D) activities can be defined as any systematic and creative work undertaken in order to increase the stock of knowledge and the use of this knowledge to devise new applications. R&D activities include anyone or more of the categories of research, such as basic research, applied research, and experimental development.

(v) **AUXILIARY ACTIVITIES / SUPPORTIVE TECHNICAL**

Auxiliary activities refer to the tasks, such as maintenance and operation of specialised R&D (or S&T) equipment and machinery, preparing materials and equipment and carrying out experiments, tests and analyses. For example, the activities carried out by medical assistants, computer programmers, surveyors, draughtsmen, survey interviewers and investigators can be classified as auxiliary activities.

(vi) **NON-TECHNICAL ACTIVITIES**

Non-technical activities refer to those tasks which are clerical, secretarial and essential services; for example, personnel providing services such as security, janitorial and maintenance.

(vii) **INTRA-MURAL GRANTS AND EXPENDITURE**

Intra-mural grants and expenditure by an institution cover the grants of its own sources and the expenditure incurred therefrom.

(viii) **EXTRA-MURAL GRANTS AND EXPENDITURE**

Extra-mural grants and expenditure cover the funds received by an institution for undertaking R&D projects sponsored by outside organisations, such as Central and State Government Departments/Agencies, International Agencies, Public/Private Industries, etc., and the expenditure therefrom.

(ix) **REVENUE/RECURRING EXPENDITURE**

Revenue or recurring expenditure includes salaries and wages, minor equipments, expendable supplies and expenditure on office and labour, materials, books, journals, rent of buildings, travel and postal services.

(x) **CAPITAL/NON-RECURRING EXPENDITURE**

Capital/non-recurring expenditure includes costs on purchase of major installations, machinery and equipment, land for building, new buildings or large-scale improvements/modifications/repairs to buildings and fixed installations, land improvement works, etc.

(xi) **MAJOR SOCIO-ECONOMIC OBJECTIVES**

- Agriculture, forestry and fishing.
- Industrial development.
- Production and rational use of energy.
- Transport and telecommunications
- Control and care of the environment (Prevention of pollution and Identification and treatment of pollution).
- Health (Excluding pollution).
- Social development and services.
- Exploration and exploitation of the Earth and atmosphere.
- Advancement of knowledge (Advancement of research, general university funds).
- Civil space.
- Defence.
- Urban and rural planning
- Not elsewhere classified

(xii) If any of the designations, such as Vice Chancellor, Principal, Dean, Reader, Lecturer, Finance Officer, etc., does not exist in your institution, give equivalent designation and name, wherever necessary.

<u>Add separate sheet (s) wherever space is inadequate</u>.

General Information

(For Medical Institutions)

Name of University/Institution_____

Address _____

_____

STD Code ☐☐☐☐☐☐ Pin code ☐☐☐☐☐☐

Email _____ Phone: Office ☐☐☐☐☐☐☐

Internet_____ Fax : ☐☐☐☐☐☐☐

Name of Affiliating University(in case of college) :_____

Year of Establishment ☐☐☐☐

Status : **1) Affiliation** ☐☐

Autonomous (**Au**), Constituent (**Co**), Affiliated (**Af**)

2) Source of Grant ☐☐

Government (**Go**), Private Aided (**Pa**), Private Unalded (**Pu**)

Name of Vice Chancellor/Director/Principal :_____

Telephone (O) ☐☐☐☐☐☐☐ ® ☐☐☐☐☐☐☐

Name of the Dean / Director / Head : _____

Research : _____

Telephone (O) ☐☐☐☐☐☐☐ ® ☐☐☐☐☐☐☐

Faculty : _____

Telephone (O) ☐☐☐☐☐☐☐ ® ☐☐☐☐☐☐☐

Name of Registrar :_____

Telephone (O) ☐☐☐☐☐☐☐ ® ☐☐☐☐☐☐☐

Name of Finance Officer : _____

Telephone (O) ☐☐☐☐☐☐☐ ® ☐☐☐☐☐☐☐

Name of Institutional Coordinator : _____

Address : _____ _____

_____

STD Code ☐☐☐☐☐☐ Pin code ☐☐☐☐☐☐

Phone (O) ☐☐☐☐☐☐☐

(R) ☐☐☐☐☐☐☐

Fax : ☐☐☐☐☐☐☐

E-mail : _____

1. Details of Management (in case of colleges) :

_____

_____

2. Details of Heads of the Departments with post-graduate programmes

Subject Engg./Tech./Sc.	Name of HOD	Telephone-O*	Telephone-R*
Aeronautical			
Chemical			
Civil			
Communication			
Computer			
Electrical			
Electronics			
Industrial/ Production			
Mechanical			
Metallurgical			
Mining			
Petroleum			
Pharmaceutical			
Printing			
Pulp & Paper			
Textile			
USIC			
Continuing Education			

*Give STD code, if the office and /or residence have different codes than that of the University.

Continued on page 3

2. Details of Heads of the Departments with post-graduate programmes

Subject Engg./Tech./Sc.	Name of HOD	Telephone-O*	Telephone-R*
Architecture & Planning			
Biosciences / Biotechnology			
Chemistry			
Earthquake			
Earth Sciences / Geological Sc.			
Environmental Sc.			
Marine / Ocean			
Fuel			
Hydrology			
Mathematics			
Physics			

*Give STD code, if the office and/or residence have different codes than that of the University.

3 Finance

3.1 Sources of grants and heads of expenditure (Rs.'000) for Institution

For Financial Year 1997- 98.

Furnish information on finance details of your Institution in the space given below.
For example, Rs. 1.25 Lakhs should be written as :

0	1	2	5

Similarly, Rs. 16,700 should be written as

0	0	1	7

Source → Expenditure head ↓	State Govt.	Central Govt.	Industries	Foreign sources	Donations	Institute's Own Sources	Others *	TOTAL
Building								
Workshop								
Staff								
Equipment								
Books and Journals								
Campus development								
Health Centres								
Student Amenities								
Counselling								
Faculty Amenities								
Any Other								
TOTAL								

3.2 Heads of expenditure for departments

Particular→ Departments ↓	I* E*	Equip-ment	Labora-tory & Workshop	Salary	Mainte-nance & Materials	Visiting faculties	Sympo-sium & Seminar	Contin-gency	Depart-mental Research	Others	Total
Aeronautical	I										
	E										
Chemical	I										
	E										
Civil	I										
	E										
Communic-ation	I										
	E										
Computer	I										
	E										
Electrical	I										
	E										
Electronics	I										
	E										
Industrial / Production	I										
	E										
Mechanical	I										
	E										
Metallurgical	I										
	E										
Mining	I										
	E										
Petroleum	I										
	E										
Pharmace-utical	I										
	E										
Printing	I										
	E										
Pulp & Paper	I										
	E										
Textile	I										
	E										

*** I – Intramural funds; * E – Extramural funds**

Continued on page 6 →

3.2 Heads of expenditure for departments (continued)

Particular→ Departments ↓	I* E*	Equip-ment	Labora-tory & Workshop	Salary	Mainte-nance & Materials	Visiting faculties	Sympo-sium & Seminar	Contin-gency	Depart-mental Research	Others	**Total**
Architecture & Planning	I										
	E										
Biosciences/ Biotechnology	I										
	E										
Chemistry	I										
	E										
Earthquake	I										
	E										
Earth Sciences/ Geological Sc	I										
	E										
Environmental Sciences	I										
	E										
Fuel	I										
	E										
Hydrology	I										
	E										
Marine / Ocean	I										
	E										
Mathematics	I										
	E										
Physics	I										
	E										
USIC, etc.	I										
	E										
Continuing Education	I										
	E										
	I										
	E										
	I										
	E										

*** I – Intramural funds; * E – Extramural funds**

4 PG Departments with R & D (Engg./Tech./Sc.) : Manpower (Faculty)

Department	Professor			Reader *			Lecturer *		
	**S	Filled		S	Filled		S	Filled	
		M	F		M	F		M	F
Chemical									
Civil									
Communication									
Computer									
Electrical									
Electronics									
Industrial / Production									
Mechanical									

*or equivalent **S – Sanctioned, M - Male (Existing), F - Female (Existing)

Note : Please fill in the names of the relevant departments or attach extra sheets.

5. **PG department with R & D : Manpower (Engg./Tech./Sc.) Research Scholars - Full Time**

Department	Pool Officer		R.A		S.R.F		J.R.F	
	M	F	M	F	M	F	M	F
Chemical								
Civil								
Communication								
Computer								
Electrical								
Electronics								
Industrial / Production								
Mechanical								

M - Male F – Female; R. A – Research Asseciate, S.R.F. – Senior Research Fellow, J.R.F. – Junier Research Fellow

Note : Please fill in the names of the relevant departments or attach extra sheets.

Place :

Date : Signature

EAST ZONE - GAUHATI UNIVERSITY S.No. DST / EZ / Q ☐☐☐☐☐

National Survey
On

Quantification of Manpower and Financial Resources devoted to R&D in Science and Technology from Higher Education Sector

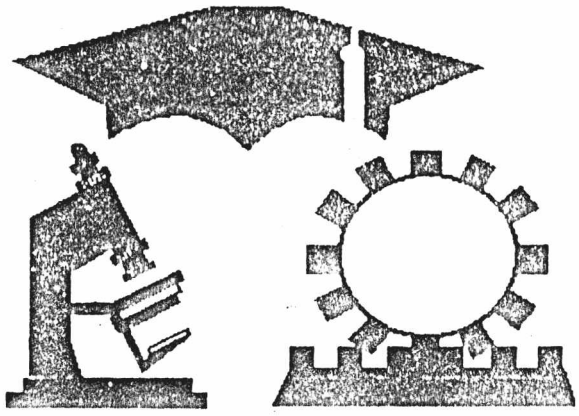
Sponsored by

Department of Science and Technology (DST)
Government of India, New Delhi

National Science and Technology Management Information System (NSTMIS)

Questionnaire II : P.G. Department with R&D

In Science & Technology



For Office Use only			
Zone ☐☐	Category ☐		
State ☐☐	College ☐☐☐	Designation ☐	
Univ. ☐☐☐	Field of Science ☐	Gender ☐	
	Department ☐☐☐	Individual ☐☐	

Please read the instructions before filling in the questionnaire.
In case you like to seek any clarification/information for filling the questionnaire, please do not hesitate to write, or telephone, or personally call in.

Name and Address of Institutional Co-ordinator

Prof. D.C. Goswami
Principal Investigator and Zonal Co-ordinator (East Zone)
DST PROJECT
Department of Environmental Science
Gauhati University
Guwahati- 781014, Assam

Phone : (0361) 570728(O), 572416 (R) **Fax** : 0361-570133 **E-mail** : dcggu@gw1.dot.net.in

Dr. D. C. Goswami,
Ph. D. (Johns Hopkins Univ., USA)
PROFESSOR & HEAD
Department of Environmental Science
GAUHATI UNIVERSITY
GUWAHATI-781014 : Assam : India

Phone : 91-0361- 570728 (O)
572416 (R)
Fax : 570133
E-mail : dcggu @ gw1.dot.net.in

Date : 15. 12. 1999

Dear Friend,

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In view of the great need and pressing urgency to develop a comprehensive and reliable database on the subject, the DST, Govt. of India has taken up a new initiative on the subject by launching this project on Zonal basis.

We trust and believe that as a dedicated and conscientious academic and scientist, you will appreciate the significance and relevance of the database for the country as a whole and the academic sector in particular and extend your kind cooperation by filling in the questionnaire offered to you. Your help and cooperation will go a long way in successfully completing the project.

With warm regards,

Yours truly,

D. C. Goswami

(D. C. Goswami)
Principal Investigator

सत्यमेव जयते

DR. LAXMAN PRASAD
HEAD
DIVISION OF NSTMIS & TT
PHONE/FAX : 6510686

भारत सरकार
विज्ञान और प्रौद्योगिकी विभाग
टेयनोलॉजी भवन, महरोली मार्ग, नई दिल्ली-११० ०१६
GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
Department of Science and Technology
Technology Bhavan, New Mehraulli Road, New Delhi-110 016

No DST/NSTMIS/ACAD/98 **Date 11.02.1999**

Sub : National Survey on "Quantification of Manpower and Financial Resources Devoted to R&D in Science and Technology from Higher Education Sector"

AN APPEAL TO SCIENTISTS

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- Human Resource Development
- Estimating Optimum Research Efforts
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For a national massive effort of this kind, it is necessary that the project functionaries and workers maintain a complete and close liaison with the academies, academics and executives to extract relevant information speedily and accurately. All this cannot be achieved without complete support and help from the concerned responses. May I, therefore, request the Heads of the various scientific institutions/departments to extend all possible help to the **Project Investigators** and their representatives so as to complete this gigantic task successfully and within the stipulated time.

Lastly, needless to say that we need you by our side at every step of the activity. Only your active involvement and help can make Govt's programme a success, and hopefully the same will be forthcoming generously.

(Laxman Prasad)

Telegram : SCIENCTECH ❑ Phone : 6567373/6962819 (EPABX) ❑ Telex : 73317, 73280 ❑ Fax : 6864570, 6863847, 6862418

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3. Enough blank spaces have been provided to enter particulars, as may be pertinent to the respondent, but have not been printed in the Questionnaire. Please fill complete information for the items applicable to your institution. **In professional institutes, there are varieties of departmental nomenclatures. Should you find the blank spaces inadequate, score out names non-existent in your institution and mention the relevant name in the given column.** If information sought for is not relevant, leave the space blank. *In case exact data is not available, use estimates.*

4. Please stick to the units in which figures are asked for. For example, Rs. thousand ('000) should be given in Rs. thousand only and not Rs. Lakhs or Crores. Give information on finance / expenditure details in the box given below, For example, Rs. 1.25 Lakhs should be written in the box as :

0	1	2	5

Similarly, Rs. 16,500 should be written as

0	0	1	7

5. For any other clarification on terminology, refer definitions provided hereunder.

(i) BASIC RESEARCH

Basic research may be defined as any experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts without any particular or specific application or use in view.

(ii) APPLIED RESEARCH

Applied Research may be defined as any original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.

(iii) EXPERIMENTAL DEVELOPMENT

Experimental development may be defined as any systematic work, drawing on existing knowledge gained from research and/or practical experience that is directed to produce new materials, products and devices, to install new processes, systems and services, and to improve substantially those already produced or installed.

(iv) R&D ACTIVITIES

Research and development (R&D) activities can be defined as any systematic and creative work undertaken in order to increase the stock of knowledge and the use of this knowledge to devise new applications. R&D activities include anyone or more of the categories of research, such as basic research, applied research, and experimental development.

(v) **AUXILIARY ACTIVITIES / SUPPORTIVE TECHNICAL**

Auxiliary activities refer to the tasks, such as maintenance and operation of specialised R&D (or S&T) equipment and machinery, preparing materials and equipment and carrying out experiments, tests and analyses. For example, the activities carried out by medical assistants, computer programmers, surveyors, draughtsmen, survey interviewers and investigators can be classified as auxiliary activities.

(vi) **NON-TECHNICAL ACTIVITIES**

Non-technical activities refer to those tasks which are clerical, secretarial and essential services; for example, personnel providing services such as security, janitorial and maintenance.

(vii) **INTRA-MURAL GRANTS AND EXPENDITURE**

Intra-mural grants and expenditure by an institution cover the grants of its own sources and the expenditure incurred therefrom.

(viii) **EXTRA-MURAL GRANTS AND EXPENDITURE**

Extra-mural grants and expenditure cover the funds received by an institution for undertaking R&D projects sponsored by outside organisations, such as Central and State Government Departments/Agencies, International Agencies, Public/Private Industries, etc., and the expenditure therefrom.

(ix) **REVENUE/RECURRING EXPENDITURE**

Revenue or recurring expenditure includes salaries and wages, minor equipments, expendable supplies and expenditure on office and labour, materials, books, journals, rent of buildings, travel and postal services.

(x) **CAPITAL/NON-RECURRING EXPENDITURE**

Capital/non-recurring expenditure includes costs on purchase of major installations, machinery and equipment, land for building, new buildings or large-scale improvements/modifications/repairs to buildings and fixed installations, land improvement works, etc.

(xi) **MAJOR SOCIO-ECONOMIC OBJECTIVES**

- Agriculture, forestry and fishing.
- Industrial development.
- Production and rational use of energy.
- Transport and telecommunications
- Control and care of the environment (Prevention of pollution and Identification and treatment of pollution).
- Health (Excluding pollution).
- Social development and services.
- Exploration and exploitation of the Earth and atmosphere.
- Advancement of knowledge (Advancement of research, general university funds).
- Civil space.
- Defence.
- Urban and rural planning
- Not elsewhere classified

(xii) If any of the designations, such as Vice Chancellor, Principal, Dean, Reader, Lecturer, Finance Officer, etc., does not exist in your institution, give equivalent designation and name, wherever necessary.

Add separate sheet (s) wherever space is inadequate.

General Information About The Department

Name of Head : _____

Department : _____

Institute/University/College : _____

_____

Address: _____

_____

STD Code ☐☐☐☐☐☐

Pin code ☐☐☐☐☐☐

Phone : (O) ☐☐☐☐☐☐☐

(R) ☐☐☐☐☐☐☐

Fax ☐☐☐☐☐☐☐

E-mail _____ Internet: Yes ☐ No ☐

Year of Establishment of the Department :

Name of the affiliating University _____

Special Status (if any): (Tick √ whichever is applicable)

Centre of Excellence (CE) ☐

Centre of Advanced Studies (CAS) ☐

Department of Special Assistance (DSA) ☐

Committee for strengthening of Infrastructure in Science and Technology (COSIST) ☐

Ocean Science and Technology Cell (OSTC) ☐

Departmental Research Support Projects (DRSP) ☐

Others, Specify _____ ☐

Existing Facilities

1. **Space**

Is the Department housed in a separate building ? Yes ☐ No ☐

(Tick √ whichever is applicable)

	Available	**Not available**		**Available**	**Not available**
1.01 Class Rooms	☐	☐	1.02 Laboratories	☐	☐
1.03 Operation Theatre	☐	☐	1.04 Diagnostic Theatre	☐	☐
1.05 Design Studio	☐	☐	1.06 Art Room/Studio	☐	☐
1.07 Library	☐	☐	1.08 Seminar Halls	☐	☐
1.09 Museum	☐	☐	1.10 Workshop	☐	☐
1.11 Drawing Hall	☐	☐	1.12 Glass House	☐	☐
1.13 Animal House	☐	☐	1.14 Cold Room	☐	☐

	Available	Not available		Available	Not available
1.15 Faculty Room	☐	☐	1.16 Office	☐	☐
1.17 Ladies Room	☐	☐	1.18 Computer facility	☐	☐
1.19 Common Room	☐	☐	1.20 Vehicle	☐	☐
1.21 Audio Visual systems	☐	☐	1.22 Dark Room	☐	☐
1.23 Photographic Lab	☐	☐	1.24 Any Other (specify)	☐	☐

2. **List the currently functioning equipments** costing more than Rs. 5 Lakhs

*Equipments (Give details of those costing more than Rs. 5 Lakhs.)				
	Name of Equipment	Cost Rs. Lakhs Approximate	Funding Source	Funds generated if any Yes/No
2.1				
2.2				
2.3				
2.4				
2.5				
2.6				
2.7				
2.8				
2.9				
2.10				

* In case the number of equipments is more than the space available in the table, use extra sheets.

3.1 Post-graduate courses offered by the department

S.no.	Subject of the PG Course	Degree Awarded*	Duration in months	Sanctioned in-take	Total no. of Faculty P+R+L	Socio-economic objective**
1.						
2.						
3.						
4.						
5.						

* M.Sc/M.Phil/M.E./M.Tech./M.D./M.S./M.Sc. Ag./M.V.Sc., etc.

** Major socio-economics objectives of research as given in para (xi) of instructions or Item 7.

P- Professor, R- Reader, L-Lecturer

3.2 List of Faculty members

S. No.	Name	Sex	Designation	Specialisation

4. R & D Manpower

4.1 Other than Teaching Faculty

Nature of Post	Sanctioned	Filled	Confirmed	Temporary
4.1.1 Supportive Technical	☐☐	☐☐	☐☐	☐☐
4.1.2 Non-Technical (Establishment)	☐☐	☐☐	☐☐	☐☐

5. Students' Strength and Mode of Selection

5.1 Post-graduate diploma intake capacity (in number) ☐☐ Enrolment ☐☐

5.2 Post-graduate degree intake capacity (in number) ☐☐ Enrolment ☐☐

5.3 Research Scholars intake capacity (in number) ☐☐ Enrolment ☐☐

5.4 Mode of selection of students (Tick √ whichever is applicable, even if it is more than one)

5.4.1 Post-graduate class

5.4.1.1 Based on marks in qualifying degree examination ☐

5.4.1.2 Based on marks in entrance test ☐

5.4.1.3 Based on marks in interview ☐

5.4.2 Research Scholars

5.4.2.1 Based on marks in qualifying degree examination ☐

5.4.2.2 Based on marks in entrance test ☐

5.4.2.3 Based on marks in interview ☐

5.4.2.4 Based on the performance at NET / GATE/ equivalent exam. ☐

5.4.3 Are Pre- Ph.D courses compulsory ? Yes ☐ No ☐

(Tick √ whichever is applicable)

Research Outputs

6. **Research Achievements**	1996–97	1997–98
6.1 **Dissertations** (in number)		
6.1.1 PG Diploma in medical Faculties		
6.1.1.1 (Enrolled)	☐☐	☐☐
6.1.1.2 (Awarded)	☐☐	☐☐
6.1.2 M. Phil /M.Tech /M. E./M. Sc. Ag./MS/MD/ Equivalent		
6.1.2.1 (Enrolled)	☐☐	☐☐
6.1.2.2 (Awarded)	☐☐	☐☐
6.1.3 Doctorate (Ph. D / D.Sc./DM)		
6.1.3.1. (Enrolled)	☐☐	☐☐
6.1.3.2 (Awarded)	☐☐	☐☐
6.2 **Research Projects** (in number)		
6.2.1 Sanctioned	☐☐	☐☐
6.2.2 Completed	☐☐	☐☐
6.3 **Research Papers** Published : (in number)		
6.3.1 International refereed Journals	☐☐	☐☐
6.3.2 National refereed Journals	☐☐	☐☐
6.3.3 Other National/ International Journals	☐☐	☐☐
6.3.4 In-house Journals	☐☐	☐☐
6.3.5 Special volumes	☐☐	☐☐
6.4 **Books / Monographs, Technical Bulletins, Technical reports, etc.:**(in number)	☐☐	☐☐
6.5 **Awards** (in number)		
6.5.1 International	☐☐	☐☐
6.5.2 National	☐☐	☐☐
6.5.3 Others	☐☐	☐☐
6.6 **Patents, Copyrights,** etc. (in number)		
6.6.1 Patents sealed	☐☐	☐☐
6.6.2 Copyright obtained	☐☐	☐☐

6.7 **Development Work**

6.7.1 Products developed

6.7.2 Processes developed

6.7.3 Import substitutes developed

6.7.4 Design prototypes developed

6.7.5 Technologies Developed (Hardware)*

*Such as instruments, equipments, machinery, tools, etc.

6.7.6 Technologies Developed (Specialities)*

*Such as improved varieties, breeds, cropping system, package of practices, medical specialities, improved processes, drugs, surgical innovations, softwares, etc.

6.8 **Consultancy Provided**

6.8.1 Consultancy provided with research component

6.8.2 Consultancy provided without research component Such as routine testing, analyses, designs, etc.

6.9 **Collaborative research work / clinical trials accomplished** (in numbers)

6.9.1 Multi-institutional

6.9.2 Multi-discipline

6.9.3 Multi-centre / Multi-laboratory

6.9.4 With Industries

6.9.5 International

6.10 **Conferences/training organised** (in number)

6.10.1 Seminars organised

6.10.2 Workshops organised

6.10.3 Continuing education / QIP

6.10.4 Summer School

6.10.5 Others

6.11 **Research Propagation Services**	Yes	No
6.11.1 Museum Services		
6.11.2 Special Instrumental Facilities		
6.11.3 Special Expertise offered		
6.11.4 Visiting Dignitaries		

7 **Major Socio-economic Objectives of Research:** *(provide break-up of expenditure information which best explains the Department's R & D activities based on UNESCO definition of objectives listed)*

S.No.	Objectives	Research expenditure from all sources in %
1	Agriculture, Forestry and Fishing	
2	Industrial Development	
3	Energy	
4	Transport and Telecommunication	
5	Urban and Rural Planning	
6	Control and Care of environment	
7	Health	
8	Social Development and Services	
9	Earth and Atmosphere	
10	Advancement of Knowledge	
11	Civil space	
12	Defence	
13	Not elsewhere classified	

8. **Type of Work:** (Estimated *Percentage* of Time/ Resources devoted to the following activites may be indicated in the boxes). As for example, 25%

	0 2 5
1.Basic Research	
2. Applied Research	
3. Experimental Development	
4. Other Activities	
Total - 1+ 2+ 3 + 4	*1 0 0*

Reactions and Responses : *(Your suggestions and reactions for this exercise shall be highly appreciated. You may use the space below for the same.)*

EAST ZONE - GAUHATI UNIVERSITY S.No. DST / EZ / Q ☐☐☐☐☐

National Survey
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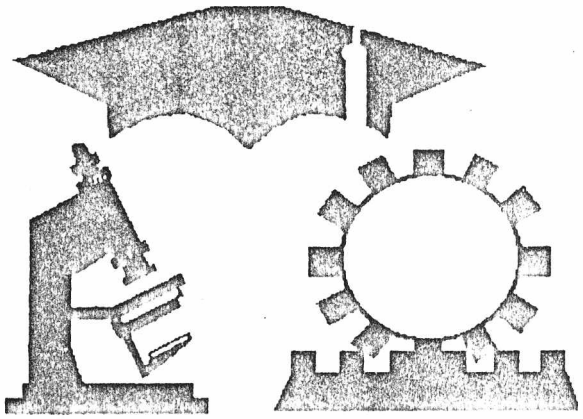
Questionnaire III : Faculty



For Office Use only			
	Category ☐		
Zone ☐	College ☐☐☐	Designation ☐	
State ☐☐	Field of Science ☐	Gender ☐	
Univ. ☐☐☐	Department ☐☐☐	Individual ☐☐	

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Dr. D. C. Goswami,
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DR. LAXMAN PRASAD
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GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
Department of Science and Technology
Technology Bhavan, New Mehraulli Road, New Delhi-110 016

No DST/NSTMIS/ACAD/98 **Date 11.02.1999**

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(Laxman Prasad)

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0	0	1	7

5. For any other clarification on terminology, refer definitions provided hereunder.

(i) BASIC RESEARCH

Basic research may be defined as any experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts without any particular or specific application or use in view.

(ii) APPLIED RESEARCH

Applied Research may be defined as any original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.

(iii) EXPERIMENTAL DEVELOPMENT

Experimental development may be defined as any systematic work, drawing on existing knowledge gained from research and/or practical experience that is directed to produce new materials, products and devices, to install new processes, systems and services, and to improve substantially those already produced or installed.

(iv) R&D ACTIVITIES

Research and development (R&D) activities can be defined as any systematic and creative work undertaken in order to increase the stock of knowledge and the use of this knowledge to devise new applications. R&D activities include anyone or more of the categories of research, such as basic research, applied research, and experimental development.

(v) **AUXILIARY ACTIVITIES / SUPPORTIVE TECHNICAL**

Auxiliary activities refer to the tasks, such as maintenance and operation of specialised R&D (or S&T) equipment and machinery, preparing materials and equipment and carrying out experiments, tests and analyses. For example, the activities carried out by medical assistants, computer programmers, surveyors, draughtsmen, survey interviewers and investigators can be classified as auxiliary activities.

(vi) **NON-TECHNICAL ACTIVITIES**

Non-technical activities refer to those tasks which are clerical, secretarial and essential services; for example, personnel providing services such as security, janitorial and maintenance.

(vii) **INTRA-MURAL GRANTS AND EXPENDITURE**

Intra-mural grants and expenditure by an institution cover the grants of its own sources and the expenditure incurred therefrom.

(viii) **EXTRA-MURAL GRANTS AND EXPENDITURE**

Extra-mural grants and expenditure cover the funds received by an institution for undertaking R&D projects sponsored by outside organisations, such as Central and State Government Departments/Agencies, International Agencies, Public/Private Industries, etc., and the expenditure therefrom.

(ix) **REVENUE/RECURRING EXPENDITURE**

Revenue or recurring expenditure includes salaries and wages, minor equipments, expendable supplies and expenditure on office and labour, materials, books, journals, rent of buildings, travel and postal services.

(x) **CAPITAL/NON-RECURRING EXPENDITURE**

Capital/non-recurring expenditure includes costs on purchase of major installations, machinery and equipment, land for building, new buildings or large-scale improvements/modifications/repairs to buildings and fixed installations, land improvement works, etc.

(xi) **MAJOR SOCIO-ECONOMIC OBJECTIVES**

- Agriculture, forestry and fishing.
- Industrial development.
- Production and rational use of energy.
- Transport and telecommunications
- Control and care of the environment (Prevention of pollution and Identification and treatment of pollution).
- Health (Excluding pollution).
- Social development and services.
- Exploration and exploitation of the Earth and atmosphere.
- Advancement of knowledge (Advancement of research, general university funds).
- Civil space.
- Defence.
- Urban and rural planning
- Not elsewhere classified

(xii) If any of the designations, such as Vice Chancellor, Principal, Dean, Reader, Lecturer, Finance Officer, etc., does not exist in your institution, give equivalent designation and name, wherever necessary.

<u>Add separate sheet (s) wherever space is inadequate</u>.

Personal Information

Name : _____

Address : _____

_____

_____

STD Code ☐☐☐☐☐☐

Pin Code ☐☐☐☐☐☐

Phone : Office ☐☐☐☐☐☐☐

Residence ☐☐☐☐☐☐☐

Fax No ☐☐☐☐☐☐☐

Email _____ Availability of Internet : Yes ☐ No ☐

Sex: Male ☐ Female ☐ Date of Birth : ☐☐ ☐☐ ☐☐☐☐ (dd mm year)

1. Appointments

1.1 Present Appointment

1.1.1 Designation : _____

1.1.2 University/Institute/College: _____

_____

1.1.3 Department : _____

1.1.4 Current Basic pay Rs. ☐☐☐☐☐

1.1.5 Specialisation (Use maximum five keywords) _____

_____

_____

1.2 **Career Details** starting from present position:

S. No.	Institution	Designation	Duration in years
1.2.1			
1.2.2			
1.2.3			
1.2.4			
1.2.5			

1.3 **Educational Qualifications:** (starting from the **highest degree**)

Degree	Subject	University / Institution	Year

1.4 **Experience**

1.4.1 Total experience (in years) ☐☐

1.4.2 Teaching and research experience (in years) inclusive of research guidance for DM/ Ph.D./M.V.Sc./M.Tech/M.E./M. Phil or Other equivalent degrees ☐☐

1.4.3 Subjects taught during the last three years. Give **FIVE** key words.

_____

_____

_____

1.4.4 Estimated percentage of time per week devoted to the following activities

time	Teaching	Research	Administration/ Management	Training	Extension/ Hospital/ Field	Others	Total
in %							100

Research Output

2. **Research Supervision** **As on 1.4.1998**

2.1 M. Phil/ M.Tech/M.E./M.Sc. Ag./ MS/ MD, etc., (ongoing, give numbers) ☐☐

2.2 Ph.D. or equivalent research degree (ongoing) as on 1.4.1998. (give numbers) ☐☐

Last three years (1995 - 98)

2.3 Completed M.Phil/M.Tech/M.E./M.S./M.D./M.Sc. Ag., etc. (give numbers) ☐☐

2.4 Completed Ph.D., D.M. or equivalent research degree (give numbers) ☐☐

2.5 Details of completed Ph. D./ D.M. / M.Tech / M.E./M.S./M.D./ M. Sc. Ag., etc. , for the **last three years** (1995 - 98)

S.No.	Scholar's Name	Broad Area	Degree	Source of Support	Year

(Use separate sheets if necessary)

3. **Research Projects**

3.1 Total number of completed projects till date

3.2 Total number of ongoing projects as on 1.4.1998

3.3 Details of research projects completed during **the last three years** (1995 - 98)

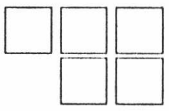
S. No.	Short Title (Give 3 keywords)	Funding Agency	Participation *		Cost in Rs.Lakhs	Year
			PI	Co-I		

* PI : Principal Investigator, Co-I : Co-Investigator (Use separate sheets if necessary)

4.1 **Publications**

4.1.1 Total Number of research publications till-date

4.1.2 Number of research articles published during the last **three** years (1995 - 98)



4.1.3 Please give details :

S. No.	Short Title (Give 3 keywords)	Journal	Medium of Publication	Year / Vol. / No.	Author-ship*

*A : First Author, C : Co-author (Use separate sheets if necessary)

Books/Monographs,

4.2.1 Total number of books, monographs, technical bulletin, technical reports, etc., published till date ☐☐

4.2.2 Details of books, monographs, technical bulletin, technical reports, etc., during the last three years (1995 - 98)

S. No.	Short Title	Publisher	Medium of Publication	Year	Author-ship *

* Authorship: First Author [A], Co-author[C], Editor [E], Co-Editor [D] (Use separate sheets if required)

5. **External Examinership**

Have you been external examiner for M.E./M.S./M.D./ Ph. D or for any Public Service Commissions or Selection Boards during 1995-1998 ?

Yes ☐ No ☐

If yes, please give details :

Post graduate Degree Examination

Yes ☐ No ☐

Ph. D or other research degree

Yes ☐ No ☐

U.P.S.C., etc.

Yes ☐ No ☐

Interviews/ Viva-Voce for Selection Boards

Yes ☐ No ☐

6. **Have you been invited to evaluate** research papers/reports/research projects during the last three years (1995 - 98) ? Yes ☐ No ☐

If yes, give details :

6.1 For research articles / review of books / monographs, name the journals.

1

2

3

6.2 For research proposals / reports, etc., name the agency / organisation.

1

2

3

7. **Editorial responsibilities** during the last three years (1995-98)

S. No	Name of Journal / Periodical	Editorial Responsibility *	Year

* Chief Editor (CE), Editor (E), Member Editorial Board (ME), etc. (Use separate sheets if required)

8. **Number of Patents Sealed/Filed** during the last **five** years (1993 - 98).

8.1. International ☐☐ 8.2 National ☐☐

8.3 Please give details of patents Sealed / Filed during last three years (1995-98).

S. No.	Title	Status*	Year

* **Status**: Sealed [S], Filed [F]. (Use separate sheets if required)

9. **Technologies Developed** during the last **five** years (1993 - 98)

S. No.	Technology/ item developed *	Year of development	Time taken** (years)	Mode of transfer of technology ##

** Such as improved varieties/ breeds/ cropping system/ package of practices, processes, equipments/ machinery/ tools, etc., surgical innovations, development of new materials/ drugs/ therapeutic regimes, etc. Give the specific name of technology developed.*

*** Approximate time spent to develop the item / technology*

whether commercialised or transferred through some agencies
(Use separate sheets if required)

10. **Awards received** till date (in number):

10.1 International

10.2 National

10.3 Please give details of **four** most prestigious ones :

S. No.	Title of award	Agency	Year
1			
2			
3			
4			

11. **Fellowships/Titles Conferred** (eg., FAMS, FMAS, FASc, FNA, FIE, etc.). Give numbers.

11.1 International 11.2 National

11.3 Please give details of **three** most prestigious fellowships/titles :

S. No.	Title	Academy/Society	Year
1.			
2.			
3.			

Research Related Activities

12. **Participation in Research Fora** during in the **last three** years (1995-98): Conferences/Seminars/ Workshops/Summer Institutes/Symposia/Invited Lectures/Refresher Courses, etc.

S. No.	Year	Title of Forum	Category*	Participation Status ##	Organising Agency
1.					
2.					
3.					
4.					
5.					

Participation: Director/Convenor/Chairperson/Resource Person/Paper Presentation, etc.

* **Category**: National (N)/ International (I)

13. **Membership of Professional Bodies** as on 1.4.1998

S. No.	Name of Professional Body	Membership Status*	Designation (if office bearer)

* Membership Status: Life Member (LM), Annual Member (AM), Patron (P), Fellow (F).
(Use separate sheets if required)

14. **Important Visiting Faculty Positions** held during the last three years (1995 - 98) (National / International)

S.No.	Name of Institution/ University	Place, Country	Designation

(Use separate sheets if required)

15. **Important Consultancy Projects** undertaken with government/industry, etc., during the last **three** years (1995 - 98). Please give numbers.

15.1 National ☐ **15.2** International ☐

15.3 Please give details of TWO important consultancy projects

S.No.	Name of Agency	Total Cost (Rs. Lakhs)

16. **Assistance to outside researchers** during the last **three** years (1995 - 98)

Nature of Assistance →	Methodology	Data Collection	Analytical	Drafting	Editing
Names of the Institutes →					
Total Numbers →					

17. **Establishing new activities** during the last **three** years (1995 - 98)

S. No.	Activity *	Place / University	Quantum of funds spent (Rs. Lakhs)	Year

* Activity: Department, Laboratory, Hospital, Library, University Extension Centre, Museum, etc.

18. **Science-related promotional activities** during the last **three** years (1995 - 98)

S. No.	Nature of Activity *

*Nature of activity, such as Science Quiz , Exhibitions, Science Day, Popular Articles, T.V Interviews, Radio Talks, Participation in AVRC programme, etc.

19. **Managerial and Administrative Responsibilities** during the last **three** years (1995 - 98)

S. No.	Type*	From	To
1.			
2.			
3.			
4.			
5.			

* Dean/ Head/ Proctor/ Warden/ Staff advisor/ Student Advisor/ In-charge of Hospital Examinations/ Seminar/ Museum/ Laboratory/ Student Counselling/ etc.

20. **Participation in National/State Level Advisory Committees** during the **last three** years (1995- 98)

S. No.	Name of Committee	Category	Position held**
1.			
2.			
3.			
4.			
5.			

* Category: National (N), State Level (S)
** Position held: Chairman (C), Member (M), Member Secretary (MS), Resource Person (RP).

21. **Contribution to the Hospital (in case of medical professional)**

Particulars	Contribution	
	Average hours/month	Remark, if any
OPD		
ICU		
CCU		
Nutrition		
Bio-instrumentation		
Protocol-based studies		
Specialized Medicine		
Specialized Surgery		
Community Service		
Emergency		
Any other		

Research Ethos

22. **Nature of Authorship** of Research Publications during the **last three years** (1995 - 98) (in number)

Own	Jointly with				
	Students	Colleagues in Department	Colleagues in other Departments	Other Institutes	Foreign Scholars

23. **Academic Collaborations** with other universities, institutes, research laboratories, hospitals, industries, NGO's, etc. during the **last three years** (1995 - 98)

S. No.	Nature of Collaboration	Name of Collaborative Agency

24. **Any other additional information** that you may like to provide :

Place :

Signature

Date :

Reactions and Responses : *(Your suggestions and reactions for this exercise shall be highly appreciated. You may use the space below for the same.)*

Appendix-V

Response Status(East Zone)

Universitites / Institutes /Colleges	Questionnaire-I			Questionnaire-II			Questionnaire-III		
	Distributed	Received	% Resp.	Distributed	Received	% Resp.	Distributed	Received	% Resp.
North East									
Arunachal University	1	1	100%	3	3	100%	18	18	100%
Assam Agricultural University	1	1	100%	18	4	22.2%	100	57	57%
Assam University	1	1	100%	6	5	83.3%	26	22	84.6%
Central Agricultural University, Imphal	1	-		8	1	12.5%	40	2	5%
Dibrugarh University	1	1	100%	12	9	75%	90	42	46.7%
Gauhati University	1	1	100%	14	10	71.4%	120	70	58.3%
I.I.T., Guwahati	1	1	100%	7	7	100%	38	38	100%
Manipur University	1	1	100%	10	9	90%	80	59	73.8%
Nagaland University	1	-	0	8	2	25%	52	7	13.5%
North Eastern Hill University, Shillong	1	1	100%	10	2	20%	74	45	60.8%
Tezpur University	1	1	100%	7	7	100%	45	23	51.1%
Tripura University	1	1	100%	5	0	0	22	6	27.3%

Universitites / Institutes /Colleges	Questionnaire-I			Questionnaire-II			Questionnaire-III		
	Distributed	Received	% Resp.	Distributed	Received	% Resp.	Distributed	Received	% Resp.
Bihar									
Birla Institute of Technology, Ranchi	1	1	100%	18	18	100%	135	132	97.8%
Birsa Agricultural University	1	1	100%	27	0	0	96	0	0
Indian School of Mines, Dhanbad	1	1	100%	14	3	21.4%	105	30	28.6%
L.N. Mithila University	1	1	100%	8	0	0	45	0	0
Patna University	1	-	-	6	3	50%	60	8	13.3%
Rajendra Agricultural University, Bihar	1	1	100%	17	4	23.5%	70	24	34.3%
Ranchi University	1	1	100%	7	5	71.4%	50	28	56%
Orissa									
Orissa University of Agriculture & Technology	1	1	100%	34	11	32.4%	175	100	57.1%
Sambalpur University	1	1	100%	9	5	55.6%	61	21	34.4%
Utkal University	1	1	100%	8	2	25%	70	2	2.9%

Universitites / Institutes /Colleges	Questionnaire-I			Questionnaire-II			Questionnaire-III		
	Distributed	Received	% Resp.	Distributed	Received	% Resp.	Distributed	Received	% Resp.
West Bengal									
Bengal Engineering College	1	1	100%	11	4	36.4%	190	34	17.9%
Bidhan Chandra Krishi Vishwavidyalaya	1	1	100%	30	7	23.3%	180	34	18.9%
Burdwan University	1	1	100%	12	3	25%	95	28	29.5%
Calcutta University	1	1	100%	22	1	4.5%	350	10	2.9%
I.I.T., Kharagpur	1	1	100%	26	26	100%	445	445	100%
Indian Statistical Institutes	1	1	100%	-	-	-	-	-	-
Jadavpur University	1	1	100%	21	0	0	450	237	52.7%
Kalyani University	1	1	100%	9	2	22.2%	110	20	18.2%
North Bengal University	1	1	100%	7	2	28.6%	75	5	6.7%
Vidyasagar University	1	1	100%	9	8	88.9%	40	23	57.5%
West Bengal University of Animal & Fishery Sc.	1	1	100%	28	1	3.6%	105	3	2.9%

Universitites / Institutes /Colleges	Questionnaire-I			Questionnaire-II			Questionnaire-III		
	Distributed	Received	% Resp.	Distributed	Received	% Resp.	Distributed	Received	% Resp.
P.G. Colleges									
Cotton College, Guwahati	1	1	100%	9	5	55.6%	55	18	32.7%
Assam Engineering College, Guwahati	1	1	100%	2	2	100%	20	20	100%
Guwahati Medical College	1	1	100%	14	6	42.9%	150	21	14%
Assam Medical College, Dibrugarh	1	1	100%	18	6	33.3%	119	34	28.6%
College of Veterinary Science, Guwahati	1	1	100%	14	8	57.1%	110	56	50.9%
Silchar Medical College, Assam	1	1	100%	5	2	40%	23	10	43.5%
Regional Engineering College, Durgapur	1	1	100%	9	0	0	66	28	42.4%
Total (Universities + Colleges)	40	37	92.50%	469	193	41.15%	4155	1760	42.36%

Appendix-VI

Appendix-6.1

Finances

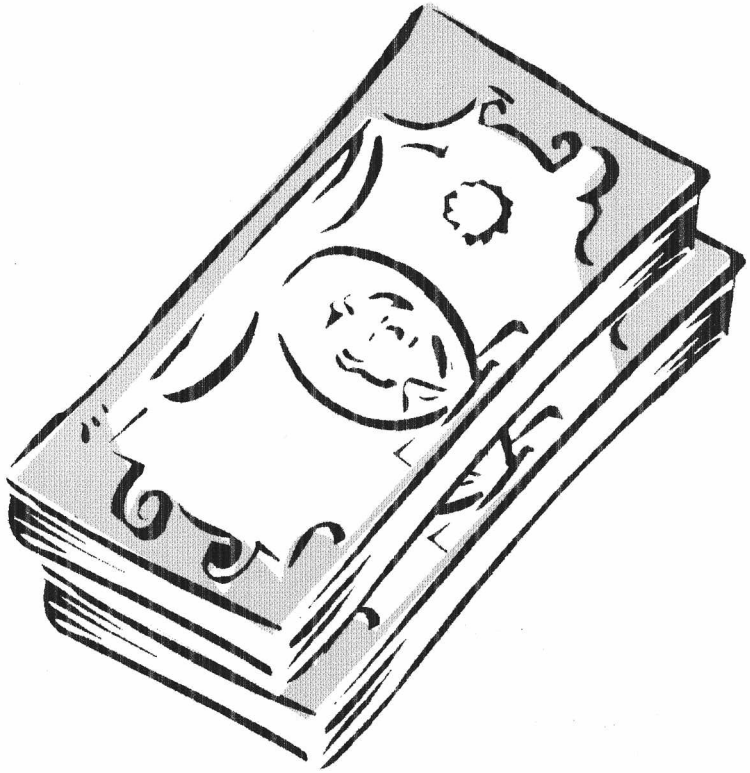


Table A-6.1.1: Total Expenditure(1997-98)

(Rs.)

Institute Name	Total Expenditure
Universities / Institutes of National Importance	
Arunachal University	33510000
Assam Agricultural University	301890000
Assam University	31812000
Bengal Engineering College	76045000
Bidhan Chandra Krishi Viswavidyalaya	255920000
Birla Institute of Technology, Ranchi	147876000
Birsa Agriculrural University	14376000
Burdwan University	123280000
Calcutta University	760819000
Central Agricultural University, Imphal	NA
Dibrugarh University	84215621
Gauhati University	136564000
I.I.T., Kharagpur	1106708941
I.I.T., Guwahati	178603341
Indian Statistical Institute	258900167

Indian School of Mines		172744000
Jadavpur University		460759000
Kalyani University		139050000
L.N. Mithila University		23127000
Manipur University		63989000
Nagaland University	NA	
North Bengal University		101119107
North Eastern Hill University, Shillong		181066000
Orissa University of Agricultural & Technology		237440000
Patna University	NA	
Rajendra Agricultural University		328670000
Ranchi University		32287000
Sambalpur University		113590000
Tezpur University		60264000
Tripura University		48600000
Utkal University		115600000
Vidyasagar University		26465000
West Bengal University of Animal & Fishery Sc.		45500000

Colleges - Affiliated	
Cotton College, Guwahati	125898494
Assam Engineering College	24968000
Guwahati Medical College	59259849
Assam Medical College, Dibrugarh	123311000
College of Veterinary Science, Guwahati	44274000
Silchar Medical College	73333333
Regional Engineering College, Durgapur	82047000
Total	6193881853

Based on Responded Questionna
Source: DST Questionnaire I - 3.1
Value Rounded to nearest integer

Table A-6.1.2: Total Expenditure by Source of Grant(1997-98)

(Rs)

Institute Name	State Govt.	Central Govt.	Ind	F S	Donations	Own Sources	Others	Total
Universities / Institutes of National Importance								
Arunachal University	30,380,000	3,130,000						33,510,000
Assam Agricultural University	233,380,000	28,180,000					40,330,000	301,890,000
Assam University		29,253,000				2,559,000		31,812,000
Bengal Engineering College	70,045,000						6,000,000	76,045,000
Bidhan Chandra Krishi Viswavidyalaya	203,360,000	32,050,000					20,510,000	255,920,000
Birla Institute of Technology	110,000	2,163,000	NA	NA	NA	71,205,000	74,398,000	147,876,000
Birsa Agriculrural University	117,400,000	25,300,000					1,060,000	14,376,000
Burdwan University	77,960,000	45,320,000						123,280,000
Calcutta University	444,367,000	40,000,000			5,521,000	200,931,000	70,000,000	760,819,000
Central Agricultural University, Imphal	NA	NA	NA	NA	NA	NA	NA	NA
Dibrugarh University	29,887,370	4,080,126			50,000	48,462,100	1,736,025	84,215,621
Gauhati University	75,573,000	1,332,000				59,285,000	374,000	136,564,000
I.I.T., Kharagpur		635,440,241			5,185,166	466,083,534		1,106,708,941
I.I.T., Guwahati		178,603,341						178,603,341
Indian Statistical Institute		253,105,000				5,795,167		258,900,167

Indian School of Mines		145,400,000			27,344,000			172,744,000
Jadavpur University	373,380,000	87,379,000						460,759,000
Kalyani University	135,950,000	600,000			2,500,000			139,050,000
L.N. Mithila University	23,127,000							23,127,000
Manipur University	56,089,000	6,059,000			1,841,000			63,989,000
Nagaland University	NA	NA	NA	NA	NA	NA	NA	NA
North Bengal University	97,786,730	3,332,377						101,119,107
North Eastern Hill University, Shillong		174,570,000			6,496,000			181,066,000
Orissa University of Agricultural & Technology	179,770,000	46,090,000				11,580,000		237,440,000
Patna University	NA	NA	NA	NA	NA	NA	NA	NA
Rajendra Agricultural University	278,180,000	34,520,000				15,970,000		328,670,000
Ranchi University	20,000,000	1,000,000			11,287,000			32,287,000
Sambalpur University	86,766,000	9,851,000			14,447,000	2,526,000		113,590,000
Tezpur University		60,264,000						60,264,000
Tripura University	23,859,000	23,134,000				1,607,000		48,600,000
Utkal University	96,321,000	15,331,000		948,000	3,000,000			115,600,000
Vidyasagar University	20,607,000	300,000			5,558,000			26,465,000
West Bengal University of Animal & Fishery Sc.	36,700,000	6,300,000				2,500,000		45,500,000

Colleges - Affiliated								
Cotton College, Guwahati	95,898,494	30,000,000						125,898,494
Assam Engineering College	24,800,000	168,000						24,968,000
Guwahati Medical College	59,259,849							59,259,849
Assam Medical College, Dibrugarh	123,311,000							123,311,000
College of Veterinary Science, Guwahati	39,565,000	2,248,000				2,214,000	147,000	44,274,000
Silchar Medical College	73,333,333							73,333,333
Regional Engineering College, Durgapur	31,846,000	50,201,000						82,047,000
Total	3,159,011,776	1,974,704,085	-	948,000	10,756,166	929,007,801	248,736,025	6,193,681,853

Based on Responded Questionnaires
Source: DST Questionnaire I - 3.1, 3.2
Value Rounded to nearest integer

Table A-6.1.3: S & T Expenditure(1997-98)

(Rs.)

Institute Name	Total S & T Expenditure
Universities / Institutes of National Importance	
Arunachal University	10,053,000
Assam Agricultural University	301,890,000
Assam University	8,836,666
Bengal Engineering College	76,045,000
Bidhan Chandra Krishi Viswavidyalaya	255,920,000
Birla Institute of Technology, Ranchi	147,876,000
Birsa Agriculrural University	143,760,000
Burdwan University	46,963,809
Calcutta University	410,842,260
Central Agricultural University, Imphal	NA
Dibrugarh University	44,584,740
Gauhati University	63,729,860
I.I.T., Kharagpur	1,106,708,941
I.I.T., Guwahati	178,603,341
Indian Statistical Institute	258,900,167
Indian School of Mines	172,744,000

Jadavpur University		263,290,857
Kalyani University		63,204,545
L.N. Mithila University		11,563,500
Manipur University		29,085,909
Nagaland University	NA	
North Bengal University		56,177,281
North Eastern Hill University, Shillong		80,473,777
Orissa University of Agricultural & Technology		237,440,000
Patna University	NA	
Rajendra Agricultural University		328,670,000
Ranchi University		16,143,500
Sambalpur University		56,795,000
Tezpur University		38,741,142
Tripura University		24,300,000
Utkal University		57,600,000
Vidyasagar University		13,232,500
West Bengal University of Animal & Fishery Sc.		45,500,000

Colleges - Affiliated	
Cotton College, Guwahati	59,636,128
Assam Engineering College	24,968,000
Guwahati Medical College	59,259,849
Assam Medical College, Dibrugarh	123,311,000
College of Veterinary Science, Guwahati	44,274,000
Silchar Medical College	73,333,333
Regional Engineering College, Durgapur	82,047,000
Total	5,016,705,105

Based on Responded Questionnaires
Source: DST Questionnaire I - 3.1. 3.2
Value Rounded to nearest integer
* - Departmental Data Not Available

Table A-6.1.4: R & D Expenditure(1997-98)

(Rs)

Institute Name	R & D Expenditure
Universities / Institutes of National Importance	
Arunachal University	1,693,875
Assam Agricultural University	53,954,241
Assam University	1,680,344
Bengal Engineering College	24,171,594
Bidhan Chandra Krishi Viswavidyalaya	74,388,791
Birla Institute of Technology, Ranchi	43,903,849
Birsa Agriculrural University	27,499,917
Burdwan University	5,372,680
Calcutta University	79,053,466
Central Agricultural University, Imphal	NA
Dibrugarh University	12,939,598
Gauhati University	12,353,228
I.I.T., Kharagpur	505,551,926
I.I.T., Guwahati	59,280,902
Indian Statistical Institute	94,219,258

Indian School of Mines		41087674
Jadavpur University		76561462
Kalyani University		9566794
L.N. Mithila University		934632
Manipur University		7315539
Nagaland University	NA	
North Bengal University		14726876
North Eastern Hill University, Shillong		26172009
Orissa University of Agricultural & Technology		37985107
Patna University	NA	
Rajendra Agricultural University		67210106
Ranchi University		5205717
Sambalpur University		11940466
Tezpur University		8966567
Tripura University		2497475
Utkal University		7620214
Vidyasagar University		2920444
West Bengal University of Animal & Fishery Sc.		8195103

Colleges - Affiliated

Cotton College, Guwahati	5165557
Assam Engineering College	4976800
Guwahati Medical College	8061008
Assam Medical College, Dibrugarh	11591925
College of Veterinary Science, Guwahati	14156699
Silchar Medical College	9445333
Regional Engineering College, Durgapur	18875448
Total	1397242629

Based on Responded Questionnaires
Source: DST Questionnaire I - 3.1,3.2
DST Questionnaire II - 5
DST Questionnaire III - 1.1.4,1.4.4
Value Rounded to nearest integer
* - Departmental Data Not Available

Table A-6.1.5: R & D Expenditure

(Type of Expenditure)

(Rs)

Institute Name	RDExp1	RDExp2	Total
Universities / Institutes of National Importance			
Arunachal University	655,500	1,038,375	1,693,875
Assam Agricultural University	37,205,261	16,748,980	53,954,241
Assam University	316,467	1,363,877	1,680,344
Bengal Engineering College	5,587,314	18,584,280	24,171,594
Bidhan Chandra Krishi Viswavidyalaya	61,406,328	12,982,463	74,388,791
Birla Institute of Technology, Ranchi	8,804,722	35,099,127	43,903,849
Birsa Agriculrural University	17,498,612	10,001,305	27,499,917
Burdwan University	4,106,852	1,265,828	5,372,680
Calcutta University	37,777,741	41,275,725	79,053,466
Central Agricultural University, Imphal	NA	NA	NA
Dibrugarh University	2,614,481	10,325,117	12,939,598
Gauhati University	811,143	11,542,085	12,353,228
I.I.T., Kharagpur	457,749,382	47,802,544	505,551,926
I.I.T., Guwahati	56,446,713	2,834,189	59,280,902
Indian Statistical Institute	46,288,629	47,930,629	94,219,258
Indian School of Mines	16,055,954	25,031,720	41,087,674

Jadavpur University	18,108,339	58,453,123	76,561,462
Kalyani University	1,026,794	8,540,000	9,566,794
L.N. Mithila University	274,532	660,100	934,632
Manipur University	2,291,221	5,024,318	7,315,539
Nagaland University	NA	NA	NA
North Bengal University	1,116,428	13,610,448	14,726,876
North Eastern Hill University, Shillong	17,108,489	9,063,520	26,172,009
Orissa University of Agricultural & Technology	28,448,606	9,536,501	37,985,107
Patna University	NA	NA	NA
Rajendra Agricultural University	53,249,951	13,960,155	67,210,106
Ranchi University	1,485,717	3,720,000	5,205,717
Sambalpur University	620,816	11,319,650	11,940,466
Tezpur University	7,336,076	1,630,491	8,966,567
Tripura University	564,573	1,932,902	2,497,475
Utkal University	1,104,521	6,515,693	7,620,214
Vidyasagar University	472,684	2,447,760	2,920,444
West Bengal University of Animal & Fishery Sc.	2,585,402	5,609,706	8,195,108

Colleges - Affiliated			
Cotton College, Guwahati	251,894	4,913,663	5,165,557
Assam Engineering College	16,800	4,960,000	4,976,800
Guwahati Medical College	3,073,139	4,987,869	8,061,008
Assam Medical College, Dibrugarh	6,174,195	5,417,730	11,591,925
College of Veterinary Science, Guwahati	369,629	13,787,070	14,156,699
Silchar Medical College	4,033,333	5,412,000	9,445,333
Regional Engineering College, Durgapur	5,537,928	13,337,520	18,875,448
Total	908,576,166	488,666,463	1,397,242,629

Based on Responded Questionna 908,576,166
Source: DST Questionnaire I - 3.1,3.2
DST Questionnaire II - 5
DST Questionnaire III - 1.1.4,1.4.4
Value Rounded to nearest integer
* - Departmental Data Not Available
RDExp1 Expenditure on Equipment, Laboratory, Maintenance, Seminar (apportioned on basis of Research students & PG Students
RDExp2 Expenditure on Salary of Teaching Staff (apportioned as per time devoted to research)

Table A-6.1.6: R & D Expenditure

by Field of Science(1997-98)

Field of Science	R & D Expenditure
Agriculture Science	283,389,969
Engineering Science	697,848,193
Medical Science	29,098,266
Natural Science	386,906,201
Total	1,397,242,629

Based on Responded Questionnaires
Source: DST Questionnaire I - 3.1, 3.2
Value Rounded to nearest integer

Table A-6.1.7: R & D Expenditure

(by Type of Research)

	Basic Research	Applied Research	Experimental Development	Other Activities	Total R & D Expenditure
R & D Expenditure	363,283,084	516,979,773	167,669,115	349,310,657	1,397,242,629

Based on Responded Questionnaires

Source: DST Questionnaire I - 3.2
DST Questionnaire II - 8

Table A-6.1.8: R & D Expenditure(1997-98)

by Major Socio-Economic objectives

		(Rs.) R & D Expenditure
Agriculture, Forestry & Fishing	[1]	405200362
Industrial Development	[2]	139724263
Energy	[3]	125751837
Transport and Telecommunication	[4]	0
Urban and Rural Planning	[5]	83834558
Control and Care of Environment	[6]	111779410
Health	[7]	83834558
Social Development and Services	[8]	125751837
Earth and Atmosphere	[9]	13972426
Advancement of Knowledge	[10]	251503673
Civil Space	[11]	0
Defence	[12]	0
Not elsewhere classified	[13]	55889705
Total		1397242629

Based on Responded Questionnaires

Source: DST Questionnaire I - 3.1,3.2
DST Questionnaire II - 5
DST Questionnaire III - 1.1.4,1.4.4

Appendix-6.2

Manpower

Table A-6.2.1: R & D Personnel

(by Designation and Gender)

(in Numbers)

Category	Male	Female	Total
Professor	117	4	121
Reader/Equivalent	79	18	97
Lecturer/Equivalent	121	19	140
Tutor/Scientist/Equivalent	16	0	16
Pool Officer	30	3	33
Research Associate	68	32	100
SRF	92	44	136
JRF	128	46	174
Total	651	166	817

IIT, Kharagpur*		445
IIT, Guwahati*		38
	Total	1300

Based on Responded Questionnaires

Source : DST Questionnaire I - 5

DST Questionnaire III - 1.4.4

R & D Personnel :- Full Time Equivalent of faculty engaged in research

Values rounded off to nearest integer (Totals may not tally)

* Genderwise breakup not available

Table A-6.2.2 : Percent Time spent on different activities

(in %)

Field of Science/Activity	Teaching	Research	Administra	Others
Natural Science	42	34	13	11
Engineering Science	46	27	17	10
Medical Science	40	25	24	11
Agricultural Science	52	34	11	3

Based on Responded Questionnaires
Sourc DST Questionnaire III - 1.4.4

Table A-6.2.3: R & D Personnel

(by Field of Science)

(in Numbers)

Field of Science	Respondents	R & D Personnel
Agricultural Science	268	232
Engineering Science	747	594
Medical Science	60	6
Natural Science	660	468
Total	1735	1300

Based on Responded Questionnaires
Source : DST Questionnaire III - 1.4.4
Value Rounded to nearest integer (Totals may not tally)

Table A-6.2.4: R & D Personnel

(by Gender)

(in Numbers)

Gender	R & D Personnel
Male	651
Female	166
Total	817
IIT, Kharagpur*	445
IIT, Guwahati*	38
Total	1300

Based on Responded Questionnaires
Source : DST Questionnaire III - 1.4.4
Value Rounded to nearest integer (Totals may not tally)
* Genderwise breakup not available

Table A-6.2.5: Directory List of Eminent R & D Personnel

(Based on guidelines provided by DST)

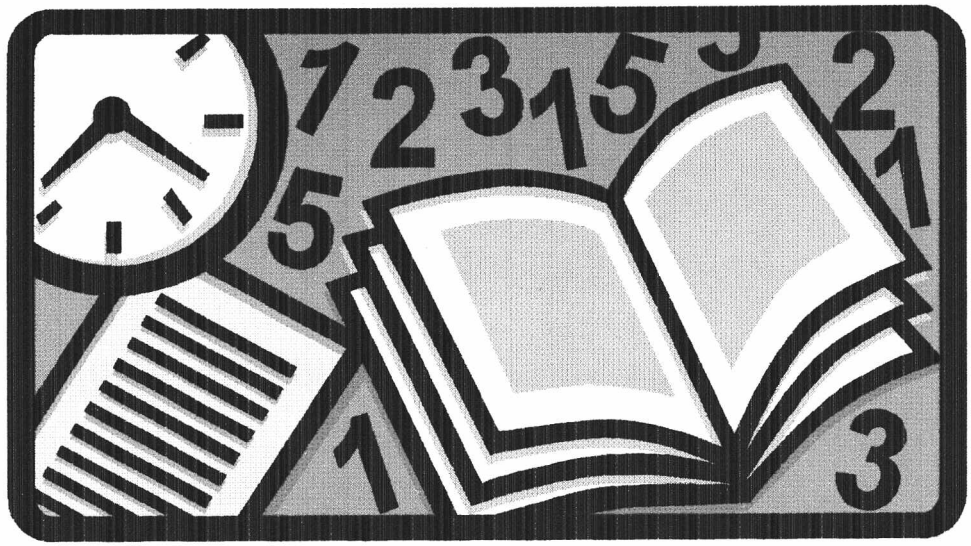
Institute Name	No. of R & D Personnel
Universities/Institutes of National Importance	
Arunachal University	11
Assam Agricultural University	72
Assam University	14
Bengal Engineering College	18
Bidhan Chandra Krishi Vishwavidyalaya	11
Birla Institute of Technology, Ranchi	71
Burdwan University	14
Calcutta University	7
Central Agricultural University, Imphal	2
Dibrugarh University	7
Gauhati University	26
IIT, Kharagpur*	445
IIT, Guwahati*	38
Indian Statistical Institute**	
Indian School of Mines, Dhanbad	28
Jadavpur University	45

Kalyani University	11
Manipur University	25
Nagaland University	6
North Bengal University	4
North Eastern Hill University, Shillong	14
Orissa University of Agriculture & Technology	40
Patna University	2
Rajendra Agricultural University	13
Ranchi University	10
Sambalpur University	13
Tezpur University	12
Tripura University	4
Utkal University	1
Vidyasagar University	9
WB University of Animal & Fishery science	0

Colleges	
Cotton College, Guwahati	8
Assam Engineering College, Guwahati	9
Gauhati Medical College, Guwahati	2
Assam Medical College, Dibrugarh	7
College of Veterinary Science, Guwahati	10
Silchar Medical College, Assam	4
Regional Engineering College, Durgapur	10
Total R & D Personnel	1023

Based on Responded Questionnaires
Source : DST Questionnaire III(Full)
* All Faculty taken as R & D Personnel
** Incomplete

Appendix-6.3



Outputs Indicators

Table A-6.3.1: Awards Received by Faculty Members

(in Number)

University Name	National	International	Total	Faculty Involved	Awards / Faculty
Universitites / Institutes of National Importance					
Arunachal University	3	3	6	4	1.50
Assam Agricultural University	17	0	17	12	1.42
Assam University	0	0	0	0	0
Bengal Engineering College	7	2	9	7	1.29
Bidhan Chandra Krishi Vishwavidyalaya	0	0	0	0	0
Birla Institute of Technology, Ranchi	15	0	15	8	1.88
Burdwan University	8	2	10	6	1.67
Calcutta University	6	8	14	5	2.80
Central Agricultural University, Imphal	0	0	0	0	0
Dibrugarh University	1	1	2	2	1.00
Gauhati University	4	4	8	5	1.60
I.I.T., Kharagpur	35	8	43	41	1.05
I.I.T., Guwahati	-	-	-	-	-
Indian Statistical Institute	11	0	11	11	1.00
Indian School of Mines, Dhanbad	14	6	20	11	1.82

Jadavpur University	3	1	4	3	1.33
Kalyani University	1	3	4	1	4.00
Manipur University	11	2	13	8	1.63
Nagaland University	3	1	4	3	1.33
North Bengal University	1	1	2	2	1.00
North Eastern Hill University, Shillong	2	1	3	3	1.00
Orissa University of Agriculture & Technology	13	4	17	10	1.70
Patna University	0	0	0	0	0
Rajendra Agricultural University, Bihar	2	0	2	2	1.00
Ranchi University	4	3	7	4	1.75
Sambalpur University	6	4	10	4	2.50
Tezpur University	8	0	8	3	2.67
Tripura University	1	0	1	1	1.00
Utkal University	0	0	0	0	0
Vidyasagar University	14	3	17	4	4.25
West Bengal University of Animal & Fishery Sc.	0	0	0	0	0

Colleges					
Cotton College, Guwahati	1	0	1	1	1.00
Assam Engineering College, Guwahati	1	1	2	1	2.00
Guwahati Medical College	0	0	0	0	0
Assam Medical College, Dibrugarh	3	2	5	2	2.50
College of Veterinary Science, Guwahati	0	0	0	0	0
Silchar Medical College, Assam	0	0	0	0	0
Regional Engineering College, Durgapur	3	1	4	2	2.00
Total	198	61	259	166	1.79

Based on Responded Questionnaires
Source : DST Questionnaire III - 10
Value rounded to two decimal places

Table A-6.3.2: Awards Received

(by Field of Science)

(in Numbers)

Field of Science	Total
Agricultural Science	36
Engineering Science	93
Medical Science	5
Natural Science	125
Total	259

Based on Responded Questionnaires
Source : DST Questionnaire III - 10

Table A-6.3.3: Awards Received

(By Gender)

(in Numbers)

Gender	Total
Male	244
Female	15
Total	259

Based on Responded Questionnaires
Source : DST Questionnaire III - 10

Table A-6.3.4: Technologies Developed

(in Numbers)

Institute Name	Total	Faculty Involved	Technology / Faculty
Universities / Institutes of National Importance			
Arunachal University	5	4	1.25
Assam Agricultural University.	78	20	3.90
Assam University, Silchar	13	5	2.60
Bengal Engineering College	10	6	1.67
Bidhan Chandra Krishi Vishwavidyalaya	10	3	3.33
Birla Institute of Technology, Ranchi	79	13	6.08
Burdwan University	14	8	1.75
Calcutta University	9	4	2.25
Central Agricultural University, Imphal.	2	1	2.00
Dibrugarh University	5	3	1.67
Gauhati University	17	7	2.43
I.I.T., Kharagpur	-	-	-
I.I.T., Guwahati	-	-	-
Indian Statistical Institute	-	-	-

Indian School of Mines, Dhanbad.	31	6	5.17
Jadavpur University	24	13	1.85
Kalyani University	10	5	2.00
Manipur University	18	12	1.50
Nagaland University	4	2	2.00
North Bengal University	4	3	1.33
North Eastern Hill University, Shillong.	9	5	1.80
Orissa University of Agriculture and Technology.	33	7	4.71
Patna University	2	2	1.00
Rajendra Agricultural University, Bihar	11	4	2.75
Ranchi University	6	5	1.20
Sambalpur University	8	5	1.60
Tezpur University	8	5	1.60
Tripura University	2	2	1.00
Utkal University	1	1	1.00
Vidyasagar University	6	3	2.00

P.G.Colleges

Silchar Medical Colleges	4	2	2.00
Regional Engineering College, Durgapur	7	4	1.75
Assam Medical College, Dibrugarh	4	3	1.33
Cotton College, Guwahati	6	5	1.20
Guwahati Medical College, Guwahati.	1	1	1.00
Assam Engineering College, Guwahati.	4	4	1.00
Total	446	174	2.56

Based on Responded Questionnaires
Sour DST Questionnaire III - 9
Value rounded to two decimal places

Table A-6.3.5: Technologies Developed

(by Field of Science)

(in Numbers)

Field of Science	Total
Agricultural Science	134
Engineering Science	132
Medical Science	9
Natural Science	171
Total	446

Based on Responded Questionnaires
Source : DST Questionnaire III - 9

Table A-6.3.6: Technologies Developed

(by Gender)

(in Numbers)

Gender	Total
Male	402
Female	44
Total	446

Based on Responded Questionnaires
Source : DST Questionnaire III - 9

Table A-6.3.7: Patents Secured

(in Number)

Institute Name	National	International	Total	Faculty Involved	Patents/ Faculty
Universitites / Institutes of National Importance					
Arunachal University	1	0	1	1	1
Assam Agricultural University	0	0	0	0	0
Assam University	0	0	0	0	0
Bengal Engineering College	1	0	1	1	1
Bidhan Chandra Krishi Vishwavidyalaya	0	0	0	0	0
Birla Institute of Technology, Ranchi	5	0	5	3	1.67
Burdwan University	1	0	1	1	1
Calcutta University	0	0	0	0	0
Central Agricultural University, Imphal	0	0	0	0	0
Dibrugarh University	0	0	0	0	0
Gauhati University	0	0	0	0	0
I.I.T., Kharagpur	NA	NA	NA	NA	NA
I.I.T., Guwahati	NA	NA	NA	NA	NA
Indian Statistical Institutes	NA	NA	NA	NA	NA
Indian School of Mines, Dhanbad	2	1	3	3	1

Jadavpur University	2	0	2	1	2
Kalyani University	0	0	0	0	0
Manipur University	0	0	0	0	0
Nagaland University	0	0	0	0	0
North Bengal University	0	0	0	0	0
North Eastern Hill University. Shillong	0	0	0	0	0
Orissa University of Agriculture & Technology	1	0	1	1	1
Patna University	0	0	0	0	0
Rajendra Agricultural University, Bihar	0	0	0	0	0
Ranchi University	0	0	0	0	0
Sambalpur University	0	0	0	0	0
Tezpur University	0	0	0	0	0
Tripura University	0	0	0	0	0
Utkal University	0	0	0	0	0
Vidyasagar University	0	0	0	0	0
West Bengal University of Animal & Fishery Sc.	0	0	0	0	0

Colleges					
Cotton College, Guwahati	0	0	0	0	0
Assam Engineering College, Guwahati	0	0	0	0	0
Guwahati Medical College	0	0	0	0	0
Assam Medical College, Dibrugarh	0	0	0	0	0
College of Veterinary Science, Guwahati	0	0	0	0	0
Silchar Medical College, Assam	0	0	0	0	0
Regional Engineering College, Durgapur	0	0	0	0	0
Total	13	1	14	11	1.27

Based on Responded Questionnaires
Source : DST Questionnaire III - 8
Value rounded to two decimal places

NA : data not available

Table A-6.3.8: Patents Secured

by Field of Science

(in Numbers)

Field of Science	Total
Agricultural Science	1
Engineering Science	9
Medical Science	0
Natural Science	4
Total	14

Based on Responded Questionnaires
Source : DST Questionnaire III - 8

Table A-6.3.9: Patents Secured

By Gender

(in Numbers)

Gender	Total
Male	14
Female	0
Total	14

Based on Responded Questionnaires
Source : DST Questionnaire III - 8

Table A-6.3.10: Research Projects Completed(1995-98)

(in Number)

Institute Name	Total Faculty Involved		Projects/ Faculty
Universitites / Institutes of National Importance			
Arunachal University	12	9	1.33
Assam Agricultural University	43	79	0.54
Assam University	9	14	0.64
Bengal Engineering College	10	14	0.71
Bidhan Chandra Krishi Vishwavidyalaya	62	21	2.95
Birla Institute of Technology, Ranchi	86	71	1.21
Burdwan University	55	20	2.75
Calcutta University	32	6	5.33
Central Agricultural University, Imphal	0	0	-
Dibrugarh University	15	18	0.83
Gauhati University	81	39	2.08
I.I.T., Kharagpur	192	N.A.	N.A.
I.I.T., Guwahati	5	4	1.25
Indian Statistical Institutes	8	7	1.14
Indian School of Mines, Dhanbad	68	26	2.62

Jadavpur University	22	65	0.34
Kalyani University	51	13	3.92
Manipur University	81	36	2.25
Nagaland University	4	5	0.80
North Bengal University	23	5	4.60
North Eastern Hill University, Shillong	37	19	1.95
Orissa University of Agriculture & Technology	128	52	2.46
Patna University	16	5	3.20
Rajendra Agricultural University, Bihar	18	16	1.13
Ranchi University	27	10	2.70
Sambalpur University	24	15	1.60
Tezpur University	3	12	0.25
Tripura University	15	6	2.50
Utkal University	7	1	7.00
Vidyasagar University	24	12	2.00
West Bengal University of Animal & Fishery Sc.	0	0	-

Colleges			
Cotton College, Guwahati	15	9	1.67
Assam Engineering College, Guwahati	2	7	0.29
Guwahati Medical College	15	8	1.88
Assam Medical College, Dibrugarh	10	5	2.00
College of Veterinary Science, Guwahati			
Silchar Medical College, Assam	3	4	0.75
Regional Engineering College, Durgapur	72	15	4.80
Total	1275	648	1.97

Based on Responded Questionnaires
Source : DST Questionnaire III -3

Table A-6.3.11: Research Projects Completed

(by Field of Science)

(in Numbers)

Field of Science	Total
Agricultural Science	251
Engineering Science	435
Medical Science	28
Natural Science	561
Total	1275

Based on Responded Questionnaires
Source : DST Questionnaire III - 3

Table A-6.3.12: Research Projects Completed

(by Gender)

(in Numbers)

Gender	Total
Male	1216
Female	59
Total	1275

Based on Responded Questionnaires
Source : DST Questionnaire III -3

Table A-6.3.13: Fellowship Conferred

(in Numbers)

University Name	Total Faculty Involved		Fellowships/ Faculty
Universitites / Institutes of National Importance			
Arunachal University	9	5	1.80
Assam Agricultural University	18	15	1.20
Assam University	1	1	1.00
Bengal Engineering College	3	1	3.00
Bidhan Chandra Krishi Vishwavidyalaya	3	2	1.50
Birla Institute of Technology, Ranchi	17	11	1.55
Burdwan University	4	2	2.00
Calcutta University	5	3	1.67
Central Agricultural University, Imphal	0	0	-
Dibrugarh University	5	3	1.67
Gauhati University	9	6	1.50
I.I.T., Kharagpur	N.A.	N.A.	N.A.
I.I.T., Guwahati	N.A.	N.A.	N.A.
Indian Statistical Institutes	N.A.	N.A.	N.A.
Indian School of Mines, Dhanbad	18	8	2.25

Jadavpur University	36	28	1.29
Kalyani University	11	3	3.67
Manipur University	35	10	3.50
Nagaland University	2	1	2.00
North Bengal University	2	2	1.00
North Eastern Hill University, Shillong	4	4	1.00
Orissa University of Agriculture & Technology	9	6	1.50
Patna University	0	0	-
Rajendra Agricultural University, Bihar	5	3	1.67
Ranchi University	15	7	2.14
Sambalpur University	7	5	1.40
Tezpur University	6	2	3.00
Tripura University	2	1	2.00
Utkal University	0	0	-
Vidyasagar University	1	1	1.00
West Bengal University of Animal & Fishery Sc.	0	0	-

Colleges			
Cotton College, Guwahati	0	0	-
Assam Engineering College, Guwahati	3	2	1.50
Guwahati Medical College	0	0	-
Assam Medical College, Dibrugarh	5	3	1.67
College of Veterinary Science, Guwahati	0	0	-
Silchar Medical College, Assam	0	0	-
Regional Engineering College, Durgapur	2	2	1.00
Total	237	137	1.73

Based on Responded Questionnaires
Source : DST Questionnaire III -11
Value rounded to two decimal places

Table A-6.3.14: Fellowship Conferred

(by Field of Science)

(in Numbers)

Field of Science	Total
Agricultural Science	35
Engineering Science	43
Medical Science	5
Natural Science	154
Total	237

Based on Responded Questionnaires
Source : DST Questionnaire III - 11

Table A-6.3.15: Fellowship Conferred

(by Gender)

(in Numbers)

Gender	Total
Male	234
Female	3
Total	237

Based on Responded Questionnaires
Source : DST Questionnaire III - 11

Table A-6.3.16: Research Guidance (M.Phil./ M. Tech. + Ph. D.)

(1995-1998)

(in Numbers)

Institute Name	Degrees Awarded	Guidance/year	Faculty Involved	(guidance/year)/faculty
Universitites / Institutes of National Importance				
Arunachal University	34	11.33	6	1.89
Assam Agricultural University	228	76.00	86	0.88
Assam University	20	6.67	9	0.74
Bengal Engineering College	30	10.00	13	0.77
Bidhan Chandra Krishi Vishwavidyalaya	112	37.33	24	1.56
Birla Institute of Technology, Ranchi	227	75.67	61	1.24
Burdwan University	73	24.33	18	1.35
Calcutta University	39	13.00	5	2.60
Central Agricultural University, Imphal	4	1.33	2	0.67
Dibrugarh University	80	26.67	31	0.86
Gauhati University	158	52.67	49	1.07
I.I.T., Kharagpur*	103	103.00	N.A.	N.A.
I.I.T., Guwahati	120	40	38	1.05
Indian Statistical Institutes*	20	20	19	1.05
Indian School of Mines, Dhanbad	70	23.33	22	1.06

Jadavpur University	337	112.33	215	0.52
Kalyani University	66	22.00	13	1.69
Manipur University	190	63.33	42	1.51
Nagaland University	0	0.00	0	0.00
North Bengal University	22	7.33	5	1.47
North Eastern Hill University, Shillong	74	24.67	26	0.95
Orissa University of Agriculture & Technology	191	63.67	57	1.12
Patna University	4	1.33	4	0.33
Rajendra Agricultural University, Bihar	75	25.00	18	1.39
Ranchi University	81	27.00	25	1.08
Sambalpur University	94	31.33	17	1.84
Tezpur University	24	8.00	10	0.80
Tripura University	6	2.00	4	0.50
Utkal University	13	4.33	2	2.17
Vidyasagar University	5	1.67	9	0.19
West Bengal University of Animal & Fishery Sc.	0	0.00	0	0.00

Colleges				
Cotton College, Guwahati	2	0.67	6	0.11
Assam Engineering College, Guwahati	40	13.33	12	1.11
Guwahati Medical College	49	16.33	14	1.17
Assam Medical College, Dibrugarh	49	16.33	13	1.26
College of Veterinary Science, Guwahati	0	0.00	0	0.00
Silchar Medical College, Assam	15	5.00	5	1.00
Regional Engineering College, Durgapur	63	21.00	20	1.05
Total / Average	2718	906	900	1.01

Based on Responded Questionnaires
Source : DST Questionnaire III - 2
Value rounded to two decimal places

Table 6.3.17: Research Students Guided

(by Field of Science)

(in Numbers)

Field of Science	Faculty Involved	Degree Awarded	Guidance / Faculty
Agricultural Science	187	610	3.26
Engineering Science	151	655	4.34
Medical Science	32	113	3.53
Natural Science	530	1340	2.53
Total / Average	900	2718	3.02

Based on Responded Questionnaires
Source : DST Questionnaire III - 2
Value rounded to two decimal places

Table A-6.3.18: Research Students Guided

By Gender

(in Numbers)

Gender	Faculty Involved	Degree Awarded	Guidance / Faculty
Male	823	2540	3.09
Female	77	178	2.31
Total / Average	900	2718	3.02

Based on Responded Questionnaires
Source : DST Questionnaire III - 2
Value rounded to two decimal places

Table A-6.3.19: Consultancy Projects Completed

(1995-1998)

(in Numbers)

Institute Name	National	International	Total	Faculty Involved	(projects / Faculty)
Universitites / Institutes of National Importance					
Arunachal University	0	0	0	0	0
Assam Agricultural University	2	0	2	2	1
Assam University	0	0	0	0	0
Bengal Engineering College	10	0	10	5	2
Bidhan Chandra Krishi Vishwavidyalaya	3	0	3	2	1.50
Birla Institute of Technology, Ranchi	27	2	29	12	2.42
Burdwan University	0	1	1	1	1
Calcutta University	0	9	9	1	9
Central Agricultural University, Imphal	0	0	0	0	
Dibrugarh University	0	0	0	0	0
Gauhati University	5	0	5	4	1.25
I.I.T., Kharagpur	53	10	63	40	1.58
I.I.T., Guwahati	1	0	1	1	1.00
Indian Statistical Institute	NA	NA	NA	NA	NA
Indian School of Mines, Dhanbad	37	0	37	9	4.11

Jadavpur University	2	0	2	1	2
Kalyani University	0	0	0	0	0
Manipur University	1	0	1	1	1
Nagaland University	0	0	0	0	0
North Bengal University	0	0	0	0	0
North Eastern Hill University, Shillong	0	2	2	1	2
Orissa University of Agriculture & Technology	3	0	3	3	1
Patna University	0	0	0	0	0
Rajendra Agricultural University, Bihar	0	0	0	0	0
Ranchi University	1	0	1	1	1
Sambalpur University	2	0	2	1	2
Tezpur University	2	1	3	3	1
Tripura University	0	1	1	1	1
Utkal University	1	0	1	1	1
Vidyasagar University	1	0	1	1	1
West Bengal University of Animal & Fishery Sc.	0	0	0	0	0

Colleges					
Cotton College, Guwahati	2	0	2	2	1
Assam Engineering College, Guwahati	10	2	12	6	2
Guwahati Medical College	0	1	1	1	1
Assam Medical College, Dibrugarh	0	0	0	0	0
College of Veterinary Science, Guwahati	0	0	0	0	0
Silchar Medical College, Assam	0	0	0	0	0
Regional Engineering College, Durgapur	1	0	1	1	1
Total / Average	164	29	193	101	1.91

Based on Responded Questionnaires
Source : DST Questionnaire III - 15
Value rounded to two decimal places

Table A-6.3.20: Consultancy Projects Completed

(by Field of Science)

(in Numbers)

Field of Science	Faculty Involved	Total	Projects / Faculty
Agricultural Science	7	8	1.14
Engineering Science	74	153	2.07
Medical Science	1	1	1.00
Natural Science	19	31	1.63
Total / Average	101	193	1.91

Based on Responded Questionnaires
Source : DST Questionnaire III - 15
Value rounded to two decimal places

Table A-6.3.21: Consultancy Projects Completed

(By Gender)

(in Numbers)

Gender	Faculty Involved	Total Projects	Projects / Faculty
Male	95	185	1.95
Female	6	8	1.33
Total / Average	101	193	1.91

Based on Responded Questionnaires
Source : DST Questionnaire III - 2
Value rounded to two decimal places

Table A-6.3.22: Research Publications : Research Articles

(1995-1998) (in Numbers)

Institute Name	Total Papers	Papers / Year	Faculty Involved	(Paper/year) / Faculty
Universitites / Institutes of National Importance				
Arunachal University	60	20	17	1.18
Assam Agricultural University	358	119.33	64	1.86
Assam University	84	28.00	15	1.87
Bengal Engineering College	105	35.00	19	1.84
Bidhan Chandra Krishi Vishwavidyalaya	232	77.33	25	3.09
Birla Institute of Technology, Ranchi	220	73.33	56	1.31
Burdwan University	207	69.00	20	3.45
Calcutta University	84	28.00	8	3.50
Central Agricultural University, Imphal	18	6.00	2	3.00
Dibrugarh University	161	53.67	31	1.73
Gauhati University	118	39.33	23	1.71
I.I.T., Kharagpur*	1070	535.00	203	2.64
I.I.T., Guwahati*	38	38	17	2.24
Indian Statistical Institute	393	196.50	197	1.00
Indian School of Mines, Dhanbad	92	30.67	21	1.46

Jadavpur University	600	200.00	232	0.86
Kalyani University	158	52.67	13	4.05
Manipur University	191	63.67	29	2.20
Nagaland University	11	3.67	2	1.83
North Bengal University	24	8.00	3	2.67
North Eastern Hill University, Shillong	167	55.67	32	1.74
Orissa University of Agriculture & Technology	365	121.67	67	1.82
Patna University	9	3.00	5	0.60
Rajendra Agricultural University, Bihar	147	49.00	17	2.88
Ranchi University	85	28.33	21	1.35
Sambalpur University	143	47.67	16	2.98
Tezpur University	40	13.33	9	1.48
Tripura University	41	13.67	6	2.28
Utkal University	34	11.33	2	5.67
Vidyasagar University	53	17.67	11	1.61
West Bengal University of Animal & Fishery Sc.	6	2.00	2	1

Colleges				
Cotton College, Guwahati	19	6.33	8	0.79
Assam Engineering College, Guwahati	3	1.00	3	0.33
Guwahati Medical College	5	1.67	2	0.83
Assam Medical College, Dibrugarh	13	4.33	3	1.44
College of Veterinary Science, Guwahati	0	0	0	0
Silchar Medical College, Assam	1	0.33	1	0.33
Regional Engineering College, Durgapur	37	12.33	13	0.95
Total / Average	5.392	1797.33	1215	1.48

Based on Responded Questionnaires
Source : DST Questionnaire III - 4.1
Value rounded to two decimal places

Table A-6.3.23: Research Publications : Research Articles

(by Field of Science)

(in Numbers)

Field of Science	Faculty Involved	Total Papers	Papers / Faculty
Agricultural Science	177	1126	6.36
Engineering Science	332	1565	4.71
Medical Science	6	19	3.17
Natural Science	700	2682	3.83
Total / Average	1215	5392	4.44

Based on Responded Questionnaires
Source : DST Questionnaire III - 4.1
Value rounded to two decimal places

Table A-6.3.24: Research Publications : Research Articles

(By Gender)

(in Numbers)

Gender	Faculty Involved	Total Papers	Papers / Faculty
Male	1108	5180	4.68
Female	107	212	1.98
Total / Average	1215	5392	4.44

Based on Responded Questionnaires
Source : DST Questionnaire III - 4.1
Value rounded to two decimal places

Table A-6.3.25: Research Publications : Books & Monographs

(till date)

(in Numbers)

Institute Name	Books Published	Faculty Involved	Books / Faculty
Universitites / Institutes of National Importance			
Arunachal University	8	3	2.67
Assam Agricultural University	73	25	2.92
Assam University	6	4	1.50
Bengal Engineering College	2	1	2.00
Bidhan Chandra Krishi Vishwavidyalaya	55	12	4.58
Birla Institute of Technology, Ranchi	63	20	3.15
Burdwan University	24	9	2.67
Calcutta University	26	3	8.67
Central Agricultural University, Imphal	2	1	2.00
Dibrugarh University	17	4	4.25
Gauhati University	26	15	1.73
I.I.T., Kharagpur	3	3	1.00
I.I.T., Guwahati	2	2	1.00
Indian Statistical Institute	13	13	1.00
Indian School of Mines, Dhanbad	0	0	0.00

Jadavpur University	16	2	8.00
Kalyani University	23	5	4.60
Manipur University	20	4	5.00
Nagaland University	1	1	1.00
North Bengal University	9	2	4.50
North Eastern Hill University, Shillong	9	3	3.00
Orissa University of Agriculture & Technology	179	36	4.97
Patna University	44	2	22.00
Rajendra Agricultural University, Bihar	34	8	4.25
Ranchi University	37	6	6.17
Sambalpur University	40	7	5.71
Tezpur University	8	3	2.67
Tripura University	9	2	4.50
Utkal University	5	1	5.00
Vidyasagar University	4	2.00	2
West Bengal University of Animal & Fishery Sc.	0	0	0

Colleges			
Cotton College, Guwahati	13	5	2.6
Assam Engineering College, Guwahati	0	0	0
Guwahati Medical College	0	0	0
Assam Medical College, Dibrugarh	5	1	5
College of Veterinary Science, Guwahati	0	0	0
Silchar Medical College, Assam	0	0	0
Regional Engineering College, Durgapur	3	1	3
Total / Average	779	206	3.78

Based on Responded Questionnaires
Source : DST Questionnaire III - 4.1
Value rounded to two decimal places

Table A-6.3.26: Research Publications : Books & Monographs

(by Field of Science)

(in Numbers)

Field of Science	Faculty Involved	Total Books	Books / Faculty
Agricultural Science	82	343	4.18
Engineering Science	27	73	2.70
Medical Science	1	5	5.00
Natural Science	96	358	3.73
Total / Average	206	779	3.78

Based on Responded Questionnaires
Source : DST Questionnaire III - 4.2
Value rounded to two decimal places

Table A-6.3.27: Research Publications : Books & Monographs

(By Gender)

(in Numbers)

Gender	Faculty Involved	Total Books	Books / Faculty
Male	185	745	4.03
Female	21	34	1.62
Total / Average	206	779	3.78

Based on Responded Questionnaires
Source : DST Questionnaire III - 4.2
Value rounded to two decimal places

Table A-6.3.28: External Examinership

(in Numbers)

Institute Name	Examinership	Faculty Involved	Examinership / Faculty
Universitites / Institutes of National Importance			
Arunachal University	8	8	1.00
Assam Agricultural University	63	63	1.00
Assam University	15	15	1.00
Bengal Engineering College	15	15	1.00
Bidhan Chandra Krishi Vishwavidyalaya	18	18	1.00
Birla Institute of Technology, Ranchi	65	65	1.00
Burdwan University	22	22	1.00
Calcutta University	7	7	1.00
Central Agricultural University, Imphal	1	1	1.00
Dibrugarh University	31	31	1.00
Gauhati University	41	41	1.00
I.I.T., Kharagpur	NA	NA	NA
I.I.T., Guwahati	NA	NA	NA
Indian Statistical Institutes	NA	NA	NA
Indian School of Mines, Dhanbad	24	24	1.00

Jadavpur University	226	226	1.00
Kalyani University	14	14	1.00
Manipur University	34	34	1.00
Nagaland University	4	4	1.00
North Bengal University	4	4	1.00
North Eastern Hill University, Shillong	28	28	1.00
Orissa University of Agriculture & Technology	55	55	1.00
Patna University	7	7	1.00
Rajendra Agricultural University, Bihar	14	14	1.00
Ranchi University	22	22	1.00
Sambalpur University	15	15	1.00
Tezpur University	10	10	1.00
Tripura University	5	5	1.00
Utkal University	1	1	1.00
Vidyasagar University	16	16	1.00
West Bengal University of Animal & Fishery Sc.	0	0	0.00

Colleges			
Cotton College, Guwahati	5	5	1.00
Assam Engineering College, Guwahati	7	7	1.00
Guwahati Medical College	6	6	1.00
Assam Medical College, Dibrugarh	6	6	1.00
College of Veterinary Science, Guwahati	0	0	0.00
Silchar Medical College, Assam	4	4	1.00
Regional Engineering College, Durgapur	20	20	1.00
Total / Average	813	813	1.00

Based on Responded Questionnaires
Source : DST Questionnaire III - 5
Value rounded to two decimal places

Table A-6.3.29: External Examinership

(by Field of Science)

(in Numbers)

Field of Science	Faculty Involved	Total Examinerships	Examinership / Faculty
Agricultural Science	151	151	1.00
Engineering Science	131	131	1.00
Medical Science	16	16	1.00
Natural Science	515	515	1.00
Total / Average	813	813	1.00

Based on Responded Questionnaires
Source : DST Questionnaire III - 5
Value rounded to two decimal places

Table A-6.3.30: External Examinership

(By Gender)

(in Numbers)

Gender	Faculty Involved	Total Examinership	Examinership / Faculty
Male	746	746	1.00
Female	67	67	1.00
Total / Average	813	813	1.00

Based on Responded Questionnaires
Source : DST Questionnaire III - 5
Value rounded to two decimal places

Table A-6.3.31: Research Evaluation

(1995-1998)

(in Numbers)

Institute Name	Invitations for Evaluation	Faculty Involved
Universitites / Institutes of National Importance		
Arunachal University	4	4
Assam Agricultural University	25	25
Assam University	4	4
Bengal Engineering College	6	6
Bidhan Chandra Krishi Vishwavidyalaya	12	12
Birla Institute of Technology, Ranchi	16	16
Burdwan University	10	10
Calcutta University	4	4
Central Agricultural University, Imphal	0	0
Dibrugarh University	4	4
Gauhati University	19	19
I.I.T., Kharagpur	NA	NA
I.I.T., Guwahati	NA	NA
Indian Statistical Institute	NA	NA
Indian School of Mines, Dhanbad	7	7

Jadavpur University	2	2
Kalyani University	9	9
Manipur University	12	12
Nagaland University	2	2
North Bengal University	4	4
North Eastern Hill University, Shillong	3	3
Orissa University of Agriculture & Technology	17	17
Patna University	2	2
Rajendra Agricultural University, Bihar	8	8
Ranchi University	11	11
Sambalpur University	6	6
Tezpur University	5	5
Tripura University	1	1
Utkal University	1	1
Vidyasagar University	6	6
West Bengal University of Animal & Fishery Sc.	0	0

Colleges		
Cotton College, Guwahati	0	0
Assam Engineering College, Guwahati	0	0
Guwahati Medical College	1	1
Assam Medical College, Dibrugarh	2	2
College of Veterinary Science, Guwahati	0	0
Silchar Medical College, Assam	2	2
Regional Engineering College, Durgapur	4	4
Total / Average	209	209

Based on Responded Questionnaires
Source: DST Questionnaire III - 6
Value rounded to two decimal places

Table A-6.3.32: Research Evaluation

(by Field of Science)

(in Numbers)

Field of Science	Faculty Involved	Total Invitations
Agricultural Science	62	62
Engineering Science	33	33
Medical Science	5	5
Natural Science	109	109
Total / Average	209	209

Based on Responded Questionnaires
Source : DST Questionnaire III - 6
Value rounded to two decimal places

Table A-6.3.33: Research Evaluation

(By Gender)

(in Numbers)

Gender	Faculty Involved	Total Invitations
Male	202	202
Female	7	7
Total / Average	209	209

Based on Responded Questionnaires
Source : DST Questionnaire III - 6
Value rounded to two decimal places

Table A-6.3.34: Editorial Responsibilities

(in Numbers)

Institute Name	Total Responsibilities	Responsibilities / year	Faculty Involved	(Responsibilities / year) / Faculty
Universitites / Institutes of National Importance				
Arunachal University	6	2	6	0.33
Assam Agricultural University	65	21.67	62	0.35
Assam University	13	4.33	13	0.33
Bengal Engineering College	10	3.33	10	0.33
Bidhan Chandra Krishi Vishwavidyalaya	9	3.00	9	0.33
Birla Institute of Technology, Ranchi	55	18.33	54	0.34
Burdwan University	18	6.00	15	0.40
Calcutta University	7	2.33	6	0.39
Central Agricultural University, Imphal	1	0.33	1	0.33
Dibrugarh University	7	2.33	7	0.33
Gauhati University	35	11.67	35	0.33
I.I.T., Kharagpur	NA	NA	NA	NA
I.I.T., Guwahati	NA	NA	NA	NA
Indian Statistical Institute	NA	NA	NA	NA
Indian School of Mines, Dhanbad	25	8.33	24	0.35

Jadavpur University	24	8.00	24	0.33
Kalyani University	10	3.33	10	0.33
Manipur University	21	7.00	21	0.33
Nagaland University	4	1.33	4	0.33
North Bengal University	3	1.00	3	0.33
North Eastern Hill University, Shillong	13	4.33	12	0.36
Orissa University of Agriculture & Technology	31	10.33	31	0.33
Patna University	2	0.67	2	0.33
Rajendra Agricultural University, Bihar	11	3.67	11	0.33
Ranchi University	9	3.00	9	0.33
Sambalpur University	10	3.33	10	0.33
Tezpur University	7	2.33	7	0.33
Tripura University	4	1.33	4	0.33
Utkal University	1	0.33	1	0.33
Vidyasagar University	13	4.33	13	0.33
West Bengal University of Animal & Fishery Sc.	0	0	0	0

Colleges				
Cotton College, Guwahati	9	3	8	0.38
Assam Engineering College, Guwahati	4	0 1.33	4	0.33
Guwahati Medical College	1	0.33	1	0.33
Assam Medical College, Dibrugarh	4	1.33	4	0.33
College of Veterinary Science, Guwahati	0	0.00	0	0
Silchar Medical College, Assam	4	1.33	4	0.33
Regional Engineering College, Durgapur	8	2.67	8	0.33
Total / Average	444	148.00	433	0.34

Based on Responded Questionnaires
So DST Questionnaire III - 7
Value rounded to two decimal places

Table A-6.3.35: Editorial Responsibilities

(by Field of Science)

(in Numbers)

Field of Science	Faculty Involved	Total Responsibilities	Responsibilities / Faculty
Agricultural Science	114	117	1.00
Engineering Science	100	102	1.02
Medical Science	9	9	1.00
Natural Science	210	216	1.03
Total / Average	433	444	1.03

Based on Responded Questionnaires
Sour DST Questionnaire III - 7
Value rounded to two decimal places

Table A-6.3.36: Editorial Responsibilities

(By Gender)

(in Numbers)

Gender	Faculty Involved	Total Responsibilities	Responsibilities / Faculty
Male	390	400	1.03
Female	43	44	1.02
Total / Average	433	444	1.03

Based on Responded Questionnaires
Source : DST Questionnaire III - 7
Value rounded to two decimal places

Table A-6.3.37: Participation in Research fora

(in Numbers)

Institute Name	Total Participation	Participations / year	Faculty Involved	(Participations / year) / Faculty
Universitites / Institutes of National Importance				
Arunachal University	14	4.67	14	0.33
Assam Agricultural University	127	42.33	90	0.47
Assam University	15	5.00	15	0.33
Bengal Engineering College	22	7.33	22	0.33
Bidhan Chandra Krishi Vishwavidyalaya	18	6.00	18	0.33
Birla Institute of Technology, Ranchi	173	57.67	88	0.66
Burdwan University	56	18.67	22	0.85
Calcutta University	17	5.67	7	0.81
Central Agricultural University, Imphal	2	0.67	2	0.33
Dibrugarh University	17	5.67	17	0.33
Gauhati University	45	15.00	45	0.33
I.I.T., Kharagpur	NA	NA	NA	NA
I.I.T, Guwahati	NA	NA	NA	NA
Indian Statistical Institute	NA	NA	NA	NA

Indian School of Mines, Dhanbad	53	17.67	26	0.68
Jadavpur University	32	10.67	32	0.33
Kalyani University	14	4.67	14	0.33
Manipur University	39	13.00	39	0.33
Nagaland University	6	2.00	6	0.33
North Bengal University	5	1.67	5	0.33
North Eastern Hill University, Shillong	60	20.00	27	0.74
Orissa University of Agriculture & Technology	47	15.67	47	0.33
Patna University	2	0.67	2	0.33
Rajendra Agricultural University, Bihar	19	6.33	19	0.33
Ranchi University	16	5.33	16	0.33
Sambalpur University	18	6.00	18	0.33
Tezpur University	12	4.00	12	0.33
Tripura University	13	4.33	6	0.72
Utkal University	4	1.33	1	1.33
Vidyasagar University	16	5.33	16	0.33
West Bengal University of Animal & Fishery Sc.	6	2.00	2	1.00

Colleges				
Cotton College, Guwahati	12	4.00	8	0.50
Assam Engineering College, Guwahati	8	2.67	8	0.33
Guwahati Medical College	6	2.00	6	0.33
Assam Medical College, Dibrugarh	8	2.67	8	0.33
College of Veterinary Science, Guwahati	0	0.00	0	0.00
Silchar Medical College, Assam	15	5.00	8	0.63
Regional Engineering College, Durgapur	16	5.33	16	0.33
Total / Average	933	311.00	684	0.46

Based on Responded Questionnaires
Source : DST Questionnaire III - 12
Value rounded to two decimal places

Table A-6.3.38: Participation in Research Fora

(by Field of Science)

(in Numbers)

Field of Science	Faculty Involved	Total Participation	Participation / Faculty
Agricultural Science	178	219	1.23
Engineering Science	162	272	1.68
Medical Science	22	29	1.32
Natural Science	322	413	1.28
Total / Average	684	933	1.36

Based on Responded Questionnaires
Source : DST Questionnaire III - 12
Value rounded to two decimal places

Table A-6.3.39: Participation in Research Fora

(By Gender)

(in Numbers)

Gender	Faculty Involved	Total Participation	Participation / Faculty
Male	610	835	1.37
Female	74	98	1.32
Total / Average	684	933	1.36

Based on Responded Questionnaires
Source : DST Questionnaire III - 12
Value rounded to two decimal places

Table A-6.3.40: Membership of Professional Bodies

(1995-1998)

(in Numbers)

Institute Name	Total Membership	Faculty Involved	Membership / Faculty
Universitites / Institutes of National Importance			
Arunachal University	13	13	1.00
Assam Agricultural University	221	104	2.13
Assam University	18	18	1.00
Bengal Engineering College	23	23	1.00
Bidhan Chandra Krishi Vishwavidyalaya	21	21	1.00
Birla Institute of Technology, Ranchi	175	98	1.79
Burdwan University	54	21	2.57
Calcutta University	18	6	3.00
Central Agricultural University, Imphal	2	2	1.00
Dibrugarh University	10	10	1.00
Gauhati University	51	51	1.00
I.I.T., Kharagpur	NA	NA	NA
I.I.T., Guawahati	NA	NA	NA
Indian Statistical Institute	NA	NA	NA

Indian School of Mines, Dhanbad	77	27	2.85
Jadavpur University	88	86	1.02
Kalyani University	16	16	1.00
Manipur University	40	40	1.00
Nagaland University	6	6	1.00
North Bengal University	5	5	1.00
North Eastern Hill University, Shillong	33	16	2.06
Orissa University of Agriculture & Technology	73	73	1.00
Patna University	3	3	0.00
Rajendra Agricultural University, Bihar	19	19	1.00
Ranchi University	17	17	1.00
Sambalpur University	17	17	1.00
Tezpur University	13	13	1.00
Tripura University	15	6	2.50
Utkal University	5	1	5.00
Vidyasagar University	15	15	1.00
West Bengal University of Animal & Fishery Sc.	6	2	3.00

Colleges			
Cotton College, Guwahati	26	10	2.60
Assam Engineering College, Guwahati	11	11	1.00
Guwahati Medical College	17	17	1.00
Assam Medical College, Dibrugarh	16	16	1.00
College of Veterinary Science, Guwahati	0	0	0.00
Silchar Medical College, Assam	23	8	2.88
Regional Engineering College, Durgapur	31	31	1.00
Total / Average	1178	822	1.43

Based on Responded Questionnaires
Source : DST Questionnaire III - 13
Value rounded to two decimal places

Table A-6.3.41: Membership of Professional Bodies

(by Field of Science)

(in Numbers)

Field of Science	Faculty Involved	Total Memberships	Membership / Faculty
Agricultural Science	221	342	1.55
Engineering Science	190	317	1.67
Medical Science	41	56	1.37
Natural Science	370	463	1.25
Total / Average	822	1178	1.43

Based on Responded Questionnaires
Source : DST Questionnaire III - 13
Value rounded to two decimal places

Table A-6.3.42: Membership of Professional Bodies

(By Gender)

(in Numbers)

Gender	Faculty Involved	Total Membership	Memberships / Faculty
Male	745	1072	1.44
Female	77	106	1.38
Total / Average	822	1178	1.43

Based on Responded Questionnaires
Source : DST Questionnaire III - 13
Value rounded to two decimal places

Table A-6.3.43: Visiting Faculty Positions

(1995-1998)

(in Numbers)

Institute Name	Total Positions	Faculty Involved	Positions / Faculty
Universitites / Institutes of National Importance			
Arunachal University	0	0	0.00
Assam Agricultural University	8	8	0.00
Assam University	1	1	1.00
Bengal Engineering College	2	2	1.00
Bidhan Chandra Krishi Vishwavidyalaya	4	4	1.00
Birla Institute of Technology, Ranchi	15	15	1.00
Burdwan University	11	8	1.38
Calcutta University	7	4	1.75
Central Agricultural University, Imphal	0	0	0.00
Dibrugarh University	3	3	1.00
Gauhati University	10	10	1.00
I.I.T., Kharagpur	N.A.	N.A.	N.A.
I.I.T., Guwahati	N.A.	N.A.	N.A.
Indian Statistical Institute	N.A.	N.A.	N.A.
Indian School of Mines, Dhanbad	10	5	2.00

Jadavpur University	2	2	1.00
Kalyani University	3	3	1.00
Manipur University	8	8	1.00
Nagaland University	0	0	0.00
North Bengal University	1	1	1.00
North Eastern Hill University, Shillong	5	4	1.25
Orissa University of Agriculture & Technology	1	1	1.00
Patna University	1	1	0.00
Rajendra Agricultural University, Bihar	1	1	1.00
Ranchi University	3	3	1.00
Sambalpur University	4	4	1.00
Tezpur University	0	0	0.00
Tripura University	2	2	1.00
Utkal University	0	0	0.00
Vidyasagar University	2	2	0.00
West Bengal University of Animal & Fishery Sc.	0	0	0.00

Colleges			
Cotton College, Guwahati	0	0	0.00
Assam Engineering College, Guwahati	0	0	0.00
Guwahati Medical College	0	0	0.00
Assam Medical College, Dibrugarh	0	0	0.00
College of Veterinary Science, Guwahati	0	0	0.00
Silchar Medical College, Assam	0	0	0.00
Regional Engineering College, Durgapur	3	3	1.00
Total / Average	107	95	1.13

Based on Responded Questionnaires
Sour DST Questionnaire III - 14
Value rounded to two decimal places

Table A-6.3.44: Visiting Faculty Positions

(by Field of Science)

(in Numbers)

Field of Science	Faculty Invoived	Total Positions	Positions / Faculty
Agricultural Science	14	14	1.00
Engineering Science	25	30	1.20
Medical Science	0	0	0.00
Natural Science	56	63	1.13
Total / Average	95	107	1.13

Based on Responded Questionnaires
Source : DST Questionnaire III - 14
Value rounded to two decimal places

Table A-6.3.45: Visiting Faculty Positions

(By Gender)

(in Numbers)

Gender	Faculty Involved	Total Positions	Positions / Faculty
Male	91	103	1.13
Female	4	4	1.00
Total / Average	95	107	1.13

Based on Responded Questionnaires
Source : DST Questionnaire III - 14
Value rounded to two decimal places

Table A-6.3.46: Managerial Responsibilities

(in Numbers)

Institute Name	Total Responsibilites	Faculty Involved	Responsibilities / Faculty
Universitites / Institutes of National Importance			
Arunachal University	5	5	1.00
Assam Agricultural University	61	49	1.24
Assam University	10	10	1.00
Bengal Engineering College	10	10	1.00
Bidhan Chandra Krishi Vishwavidyalaya	13	13	1.00
Birla Institute of Technology, Ranchi	77	50	1.54
Burdwan University	7	5	1.40
Calcutta University	3	1	3.00
Central Agricultural University, Imphal	1	1	1.00
Dibrugarh University	10	10	1.00
Gauhati University	23	23	1.00
I.I.T., Kharagpur	NA	NA	NA
I.I.T., Guwahati	NA	NA	NA
Indian Statistical Institute	NA	NA	NA
Indian School of Mines, Dhanbad	30	20	1.50

Jadavpur University	14	14	1.00
Kalyani University	3	3	1.00
Manipur University	10	10	1.00
Nagaland University	2	2	1.00
North Bengal University	3	3	1.00
North Eastern Hill University, Shillong	10	10	1.00
Orissa University of Agriculture & Technology	36	36	1.00
Patna University	2	2	1.00
Rajendra Agricultural University, Bihar	7	7	1.00
Ranchi University	10	10	1.00
Sambalpur University	9	9	1.00
Tezpur University	11	11	1.00
Tripura University	5	3	1.67
Utkal University	1	1	1.00
Vidyasagar University	9	9	1.00
West Bengal University of Animal & Fishery Sc.	6	2	3.00

Colleges			
Cotton College, Guwahati	11	6	1.83
Assam Engineering College, Guwahati	7	7	1.00
Guwahati Medical College	5	5	1.00
Assam Medical College, Dibrugarh	6	6	1.00
College of Veterinary Science, Guwahati	0	0	
Silchar Medical College, Assam	3	2	1.50
Regional Engineering College, Durgapur	19	19	1.00
Total / Average	439	374	1.17

Based on Responded Questionnaires
Source : DST Questionnaire III - 19
Value rounded to two decimal places

Table A-6.3.47: Managerial Responsibilites

(by Field of Science)

(in Numbers)

Field of Science	Faculty Involved	Total Responsibilities	Responsibilities / Faculty
Agricultural Science	108	124	1.15
Engineering Science	106	143	1.35
Medical Science	13	14	1.08
Natural Science	147	158	1.07
Total / Average	374	439	1.17

Based on Responded Questionnaires
Source : DST Questionnaire III - 19
Value rounded to two decimal places

Table A-6.3.48: Managerial Responsibilities

(By Gender)

(in Numbers)

Gender	Faculty Involved	Total Responsibilites	Responsibilities / Faculty
Male	340	405	1.19
Female	34	34	1.00
Total / Average	374	439	1.17

Based on Responded Questionnaires
Source : DST Questionnaire III - 19
Value rounded to two decimal places