

**COMPREHENSIVE INFORMATION SYSTEM ON THE  
S&T RESEARCH PROJECTS BY THE UNIVERSITY GEOLOGY  
DEPARTMENTS OF ORISSA, ANDHRA PRADESH AND  
TAMILNADU STATES**

*Project Report Submitted to*  
*NSTMIS Division*  
Department of Science & Technology  
NEW DELHI – 110 016

Investigators

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and  
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## PREFACE

Research in basic and applied aspects in Geology is being carried out by the faculty members of University departments apart from the National Research organizations and individual state departments. The financial assistance for such research activity in the academic institutions is provided by national agencies like DST, UGC, CSIR, DOD etc., and also a few State Governmental Organizations. With an idea of understanding the nature of the assistance and the output aspects in general, the project was proposed, under the NSTMIS of the DST. The study is targeted to collect data from the faculty member (Investigators) of the University Geology Departments of the three states namely Orissa, Andhra Pradesh and Tamilnadu States. The methodology to collect the data was aimed through the responses to questionnaire and by personal interaction with the investigators. The response to the questionnaire was limited and the personal interaction by visits to the Universities could not be undertaken. Presentation of the analysis of obtained data is given in the report. It is with humility agreed that the expected output out of this project is not completely achieved. However, it may be stated that it is necessary to have a mechanism to understand the relationship between the Input and the Output.

The Authors are thankful to the Secretary and the Head of the NSTMIS Division of the Department of Science and Technology, Government of India, New Delhi for sanctioning the project. Thanks are due to Dr. V.Ramesam, Advisor (Retired), DST for his keen interest in the project. Dr. Rakhesh Chatal, Director NSTMIS Division, Dr. C.J.Samadhanam and Dr. A.N.Rai, Scientific Officers of the NSTMIS Division, DST are very helpful and considerate during the tenure of the project. The members of the local Advisory Committee are thankfully acknowledged for their suggestions from time to time. The Andhra University authorities have permitted the investigators to take up the project in the Department of Geology. The authors are thankful to the different project investigators from the University Geology departments of Orissa, Andhra Pradesh and Tamilnadu states for so kindly providing the information.

## PROJECT COMPLETION REPORT

1. Title of the Project : Comprehensive Information System on the S&T Research Projects by the University Geology Departments of Orissa, Andhra Pradesh and Tamilnadu States
2. Principal Investigator and Co-Investigators : Prof. K.L.V. Ramana Rao  
and  
Dr. E.N. Dhanamjaya Rao
3. Implementing Institution and other collaborating Institutions : Department of Geology, Andhra University, Visakhapatnam
4. Date of commencement : 3<sup>rd</sup> October, 1997
5. Planned date of completion : 31<sup>st</sup> December, 1999
6. Actual Date of completion : 31<sup>st</sup> December, 1999
7. Objectives as stated in the project proposal :
- 1) To collect data through questionnaire, personal visits to all the University departments of Geology and through interaction with the investigators of the S& T projects financed by different funding agencies. Mainly the data on the input, targets, and output parameters of the research projects completed between the period from 1985-95
  - 2) The Collected data will computerised and data base will be prepared
  - 3) An empirical interrelation between input-output will be attempted to be worked out.
  - 4) Designing a questionnaire to be sent along with sanction of the future projects by funding agencies.
  - 5) Classification of research projects based on the data base

- |  |   |
|--|---|
| 8. Deviation made from the original objectives if any, while implementing the project and reasons there of :   | No  |
| 9. Experimental work giving full details of experimental set up, methods adopted, data collected supported by necessary tables, charts, diagrams & Photographs : | Please see the detailed Report  |
| 10. Detailed analysis of results indicating contribution made towards increasing the state of knowledge in the subject :   | Please see the detailed Report  |
| 11. Conclusions summarising the achievements and indication of scope fore future work :  | Please see the detailed Report  |
| 12. S& T benefits accrued :  |   |
| i. List of Research Publications :   | Nil   |
| ii. Manpower trained on the Project :  |   |
| a) Research Scientists or Research Associates  | Nil   |
| b) No. of Ph.D's produced  | Nil   |
| c) Other Technical Personnel trained   | Project Fellows:<br>1. P.Appadu Dora - 03-10-97 to 30-06-98<br>2. B.K.Mishra - 03-10-97 to 31-10-98 |
| iii. Patents taken, if any   | Nil   |



### 13. Financial Position

No.	Financial Position	Funds Sanctioned	Expenditure	Percentage of total cost
i.	Salaries	90,000.00	72,907.40	18
ii.	Equipment	2,19,000.00	2,13,315.00	55.4
iii.	Consumables (Supplies and Materials)	1,02,000.00	94,062.00	24
iv.	Travel	50,000.00	4,500.00	1
	<b>Sub Total</b>	<b>4,61,000.00</b>	<b>384,784.40</b>	
v.	Overhead Expenses	69,150.00	57,717.66	15
	<b>Total</b>	<b>5,30,150.00</b>	<b>4,42,502.06</b>	

### 14. Procurement / usage of Equipment

a)

S.No	Name of Equipment	Make/Model	Cost Rs.	Date of Installation	Utilisation rate %	Remarks regarding maintenance / Breakdown
1.	Computer With accessories	Pentium –II	2,13,315.00	26-03-98	100	

b) Plans for utilising the equipment facilities in future: The equipment will be used in the department of Geology, Andhra University, Visakhapatnam for Research and Teaching.



( K.L.V. Ramana Rao )  
Principal Investigator



( E.N. Dhanamjaya Rao )  
Co-Investigator

## **ACKNOWLEDGEMENTS**

The Investigators are thankful to the Secretary and the Head of the NSTMIS Division of the Department of Science and Technology, Government of India, New Delhi for sanctioning the project. Thanks are due to Dr. V.Ramesam, Advisor (Retired), DST for his keen interest in the project. Dr. Rakesh Chatal, Director NSTMIS Division, Dr. C.J.Samadhanam and Dr. A.N.Rai, Scientific Officers of the NSTMIS Division, DST are very helpful and considerate during the tenure of the project. The members of the local Advisory Committee are thankfully acknowledged for their suggestions from time to time. The Andhra University authorities have permitted the investigators to take up the project in the Department of Geology. The authors are thankful to the different project investigators from the University Geology departments of Orissa, Andhra Pradesh and Tamilnadu states for so kindly providing the information.

**REPORT ON COMPREHENSIVE INFORMATION SYSTEM ON**  
**THE S&T RESEARCH PROJECTS BY THE UNIVERSITY**  
**GEOLOGY DEPARTMENTS OF ORISSA, ANDHRA PRADESH**  
**AND TAMILNADU STATES**

**INTRODUCTION:**

Different National agencies like the Department of Science and Technology, University Grants Commission, Council of Scientific and Industrial Research, All India Council of Technical Education and also State Governmental Agencies are supporting financially for the research activity in the Universities through the sanctions of research projects. Individual faculty members of the Universities are taking up the research projects based on their background knowledge, experience, the need of the society and the facilities available in their respective departments. While approving and sanctioning the projects, there have been standard regular procedures for scrutiny and regular monitoring of the research activities during the operation of the projects by the sanctioning agencies, though the procedures are different for different agencies. On completion of the projects the reports incorporating the results are naturally be submitted by the investigators to the concerned agencies.

The faculty of University Geology Departments are operating the research projects financed by such agencies mentioned above. Normally in any Geological research projects the requirements are in the form of three or four major components of financial assistance, namely Personnel, Equipment, Expenses for Data Collection and Analysis and Operational expenses, which are basically divided into recurring (on annual basis) and Non-recurring ( grant for the total period of the project). Through the project activity it is expected that (1) the results out of the work carried out yields positive contribution to the Science and Technology and useful to the society when applied; (2) Training of the personnel in the direction of systematic scientific approach in the respective fields for the subsequent application and utility through their gained experience; (3) acquiring additional modern equipment in the respective fields. Thus the

inputs through the research projects are expected to contribute towards the Scientific results useful to the Science and Society, training of the personnel in the modern technology, adding up additional facilities to the operational organisations.

Keeping the above in view the present project is proposed as an experimental study to create a database and to find the relationship of the input and the output of the research projects by the University Geology Departments of the three States namely Orissa, Andhra Pradesh and Tamilnadu.

### **OBJECTIVES:**

The major proposed objectives of the project are enumerated as follows:

- 1) To collect data through questionnaire, personal visit to all the University departments of Geology and through interaction with the investigators of the S& T projects financed by different funding agencies. Mainly the data on the input, targets, and output parameters of the research projects completed between the period from 1985-98
- 2) The Collected data will be computerised and data base will be prepared
- 3) An empirical interrelation between input-output will be attempted to be worked out
- 4) Classification of research projects based on the data base

## **METHODOLOGY:**

With the background given above, to achieve the objectives mentioned the following methodology is proposed to be adopted for getting the data to prepare the database and analysis :

- To obtain the list of projects sanctioned to the investigators of the University Geology departments of the three States during the period of reference from the DST and other agencies.
- To prepare preliminary questionnaire and to send the same to all the Investigators, the Heads of the Departments and all faculty members of the University Geology Departments of the three States to get basic information.
- A detailed questionnaire to the respondents to get comprehensive information on the Input and Output of the respective projects.
- To have a personnel interaction with the respective investigators by visiting their departments to obtain a detailed data.

## **DATA COLLECTION AND ANALYSIS**

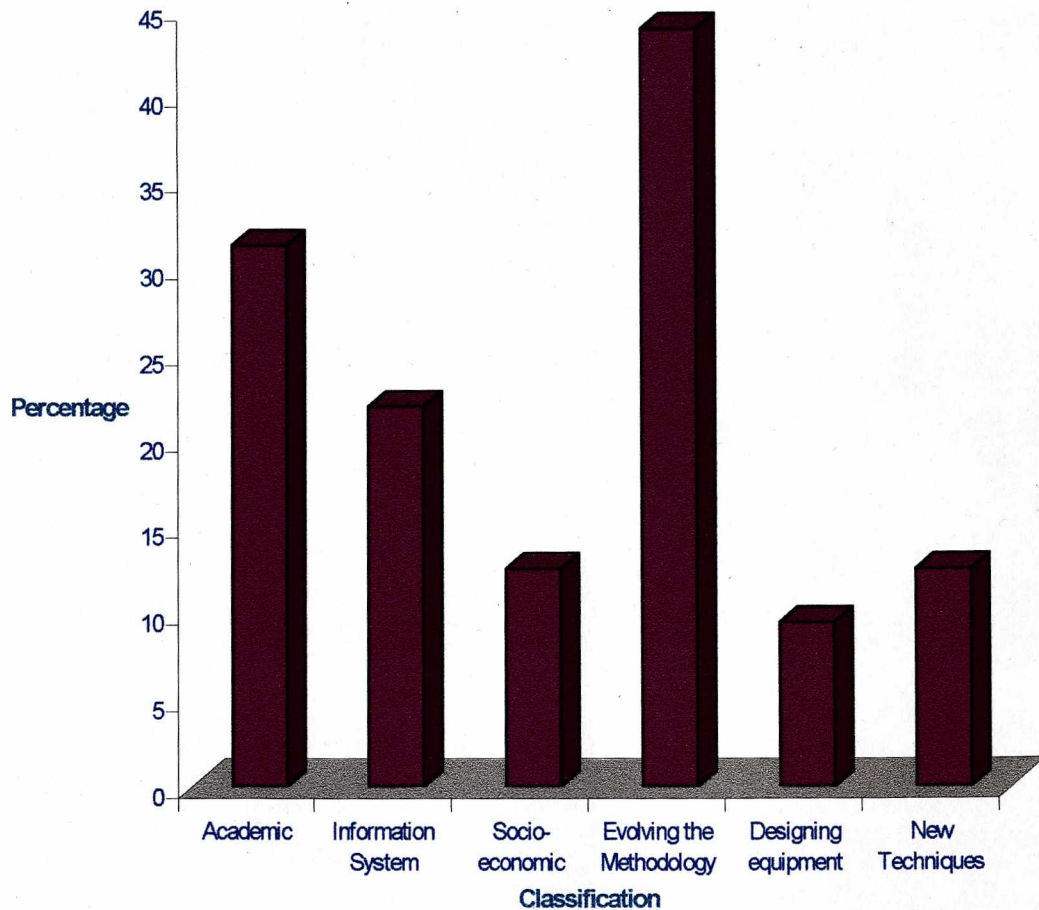
From the various sources, it is gathered that a total of seventy eight research projects were sanctioned to the different faculty members of University Geology Departments of the three States during the period 1985-1998. Copies of the preliminary questionnaires prepared for general information like the total grant, time schedule, utilisation, training of personnel, present status of the trained personnel, achievements and additional facilities created through the project have been sent to all the heads of the departments for circulation and to the individual investigators (where the information is available). Only forty nine have responded with the general information, in spite of repeated reminders.

A detailed questionnaire seeking information on the classification of the research projects, involvement of the research planning of the project, type of aims of the project, data collection system, type of training of the project personnel, experience gained by the project personnel, type of processing of the data, publication of the results, benefits through the projects has been sent to the investigators who responded earlier with the general information and to all other investigators. Only thirty two have sent the information for the detailed questionnaire. Only three Universities namely the Madras University ,Tamil University of Tanjavur, and the Bharathidasan University in Tamilnadu have been visited by the Principal Investigator for interaction with the investigators. Repeated requests reminding for the information have been mailed to all the investigators.

From the data obtained, a database is prepared with the responses to the questionnaire enquiring on different aspects of the projects. Analysing the obtained information the following observations on the different aspects of the projects. More often the responses show the categorisation of different parameters in more than one unit.

### Classification of the Projects:

In the questionnaire it is requested to classify whether their project is under a) academic, b) information system, c) socio-economic, d) evolving the methodology, e) designing of equipment, f) new techniques. The classification of the project as per the information received is shown in Figure No.I. Forty three percent of the projects are carried out in evolving methodology, thirty one percent are purely academic, twenty two percent of the projects are in the filed of information systems, minor percentage of the projects are in Socio-economic applications, designing of equipment and developing new techniques. Some of the projects have more than two parameters of classification.



**Figure - I**

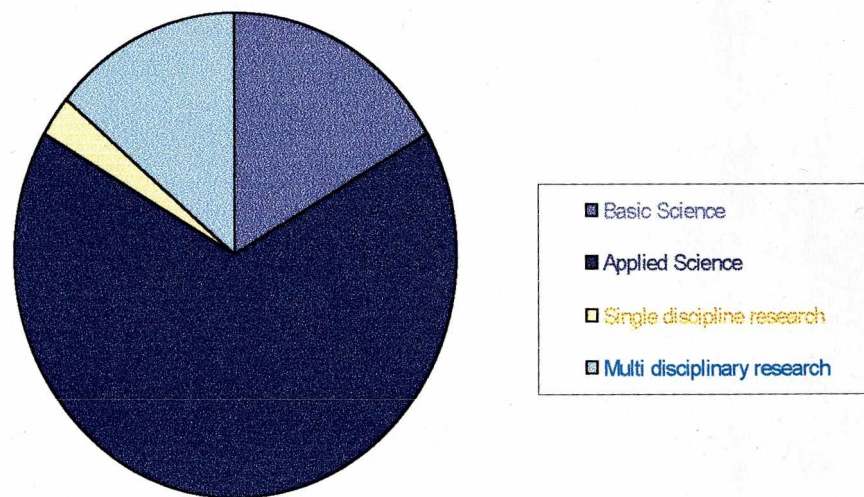
**Classification of the Projects**



### **Involvement of the Research project :**

The investigators are requested to specify whether their project work can be designated under a) basic science, b) applied science, c) single discipline research, d) multi disciplinary research. Some the responses received Seventy eight percent of the projects are in the applied scientific field, where as only eighteen percent of the projects are of basic scientific nature. Fifteen percent of the projects are claimed to be multi disciplinary. This categorisation is shown in Figure –II.

Research in Geology is applied nature rather than basic, though basic and applied research go together when approaching a particular problem of natural science. In geological research application of other disciplines like physicochemical principles is inevitable and hence, whether claimed or not it is imperative that it is a multi disciplinary scientific research. This is very well reflected in the responses received for the questionnaire.



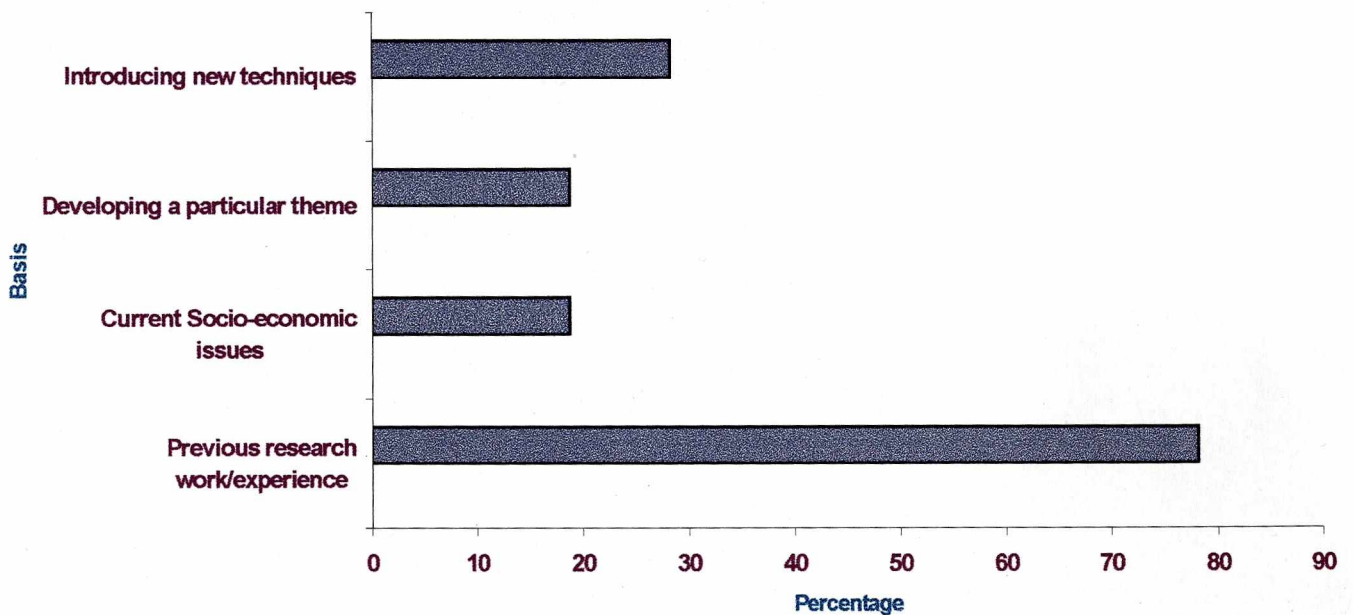
**Figure - II**

**Involvement of Research Project**



### **Basis for Research Planning:**

In the designed questionnaire, the basis for the research planning has been categorised as a) previous research work/experience, b) current socio-economic issues, c) developing a particular theme, d) introducing new techniques. Seventy eight percentage of the projects are based on their previous research work/experience while twenty eight percent are to introduce new techniques of research. Equal percentage (eighteen) of the projects are based on current socio-economic issues and to develop a particular theme. Most of the applied research is naturally depended on either on the experience of the researcher or based on the previous research. This has very well reflected here. Figure – III shows the basis for the research planning.

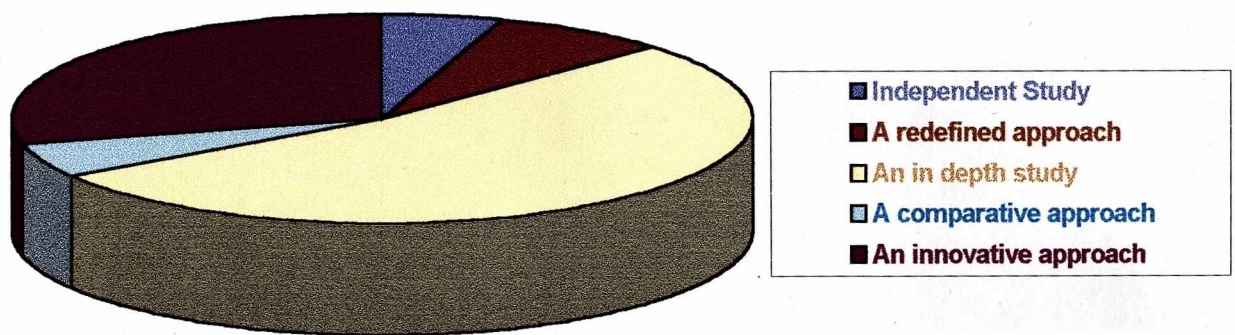


**Figure - III**

**Basis for Research Planning**

**Aims of the Research Projects :**

Independent study, a redefined approach, an in-depth study, a comparative approach and innovative approach are the types of aims given in the questionnaire. Sixty two percent of the responses categorise their aim is for an in-depth study and thirty four percent state that theirs is an innovative approach. Minor percentage claim to be independent study, redefined approach and comparative approach. Figure-IV shows the categories of the aims of the research projects as per the database.

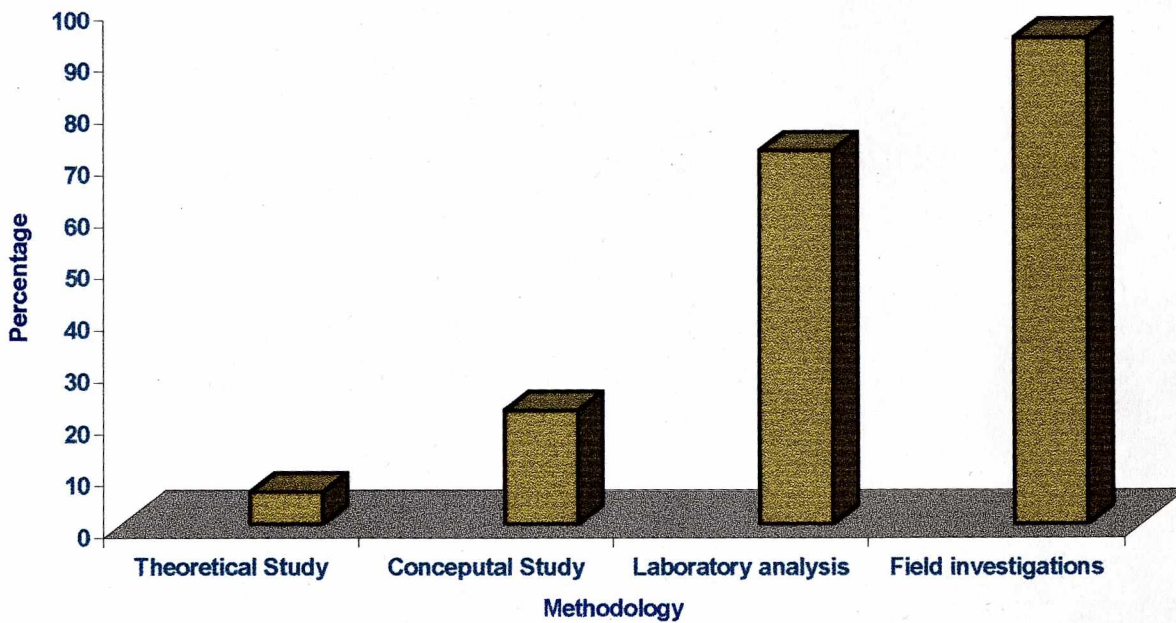


**Figure - IV**

**Aims of the Research Projects**

**Methodology of Data collection:**

The designated data collection systems are through a) theoretical study, b) conceptual study, c) laboratory analysis and d) field investigations. Only twenty two percent have collected data through a conceptual study and majority of the projects are based on field investigations and laboratory analysis. Only six percent have claimed that their data collecting system includes theoretical study. It is but natural in the Geological research activities maximum importance is to be given to the field studies supported by the laboratory analysis. This has clearly reflected in the database, which is shown in Figure – V.

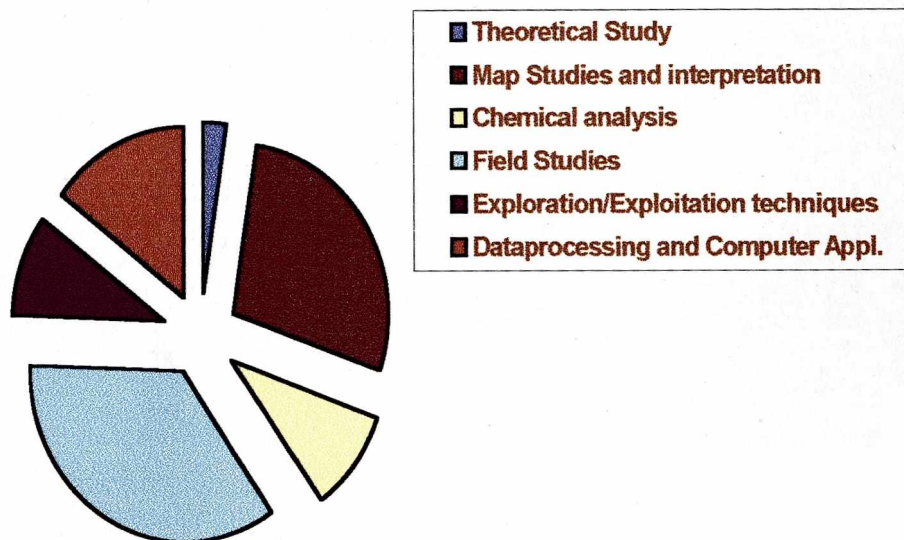


**Figure - V**

**Mode of Data Collection**

### **Exposure of the Project Personnel:**

Exposure of the personnel of the project during the course of the project work is divided into a) theoretical study, b) map studies and interpretation, c) chemical analysis, d) field studies, e) exploration/exploitation techniques and f) data processing and computer applications. Generally candidates are exposed in more than two parameters stated above and thus it is a multi faceted exposure. The database shows maximum exposure is in the field studies (ninety percent) and map studies and interpretation (seventy two percent), probably in combination of each other. Exposure in the theoretical studies is minimum (six percent). Applications of computers and data processing is around thirty seven percent. Chemical analysis and exploration/exploitation techniques is in an equal percentage (twenty five percent). It is as per the general expectation of Geological Research.



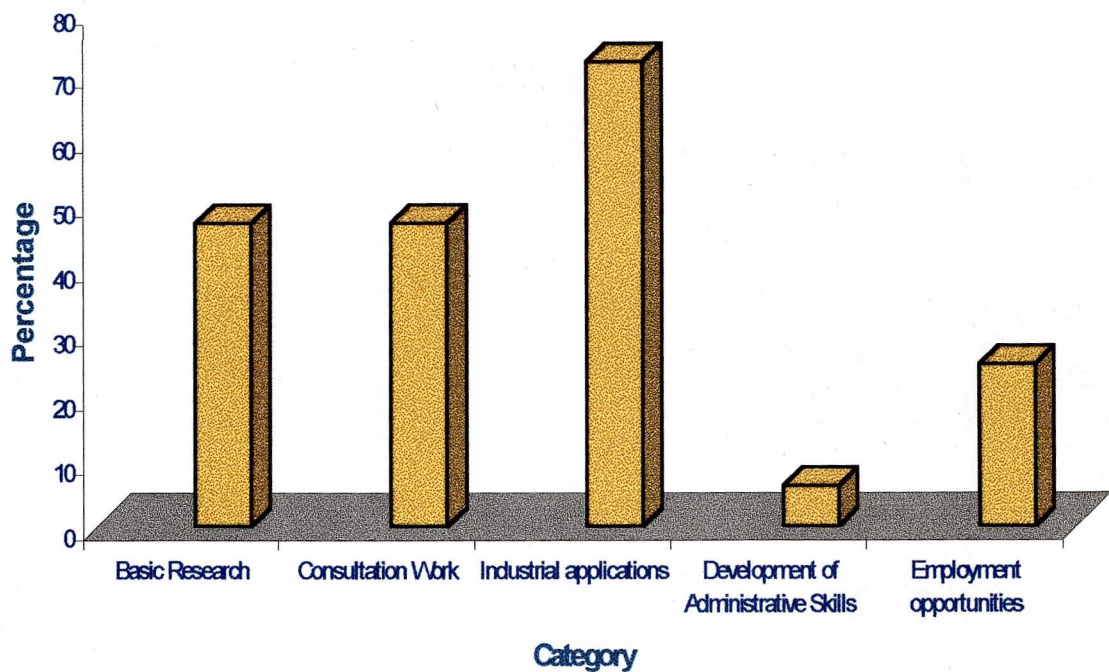
**Figure - VI**

**Exposure of the Project Personnel**



### Utility of the Experience of the Project Personnel:

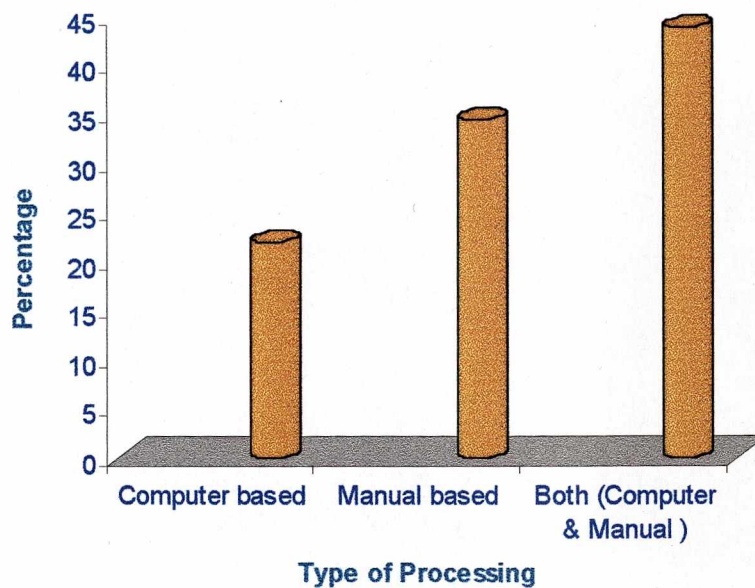
The experience gained by the project personnel during the course of the project should normally be useful in their subsequent professional activities which are classified for the present purpose as a) in the basic research, b) consultation work, c) industrial applications, d) development of administrative skills, e) employment opportunities. The data base shows the utility in the development of administrative skills is minimum (six percent) while industrial applications is maximum (seventy two percent). Use in basic research and consultation is in equal percentage (forty seven percent each). Application of the experience in the employment opportunities is at twenty five percent. The information is shown in Figure No. - VII



**Figure - VI** Utility of the Experience by the Project Personnel

### Processing of the Project Data:

The Processing of the data collected in the project is either computer based or manual or using both the process. Figure-VIII shows the type of processing and the respective percentage from the database. Forty three percent have used the combination of both the processes while thirty four percent have process the data mainly using manual process. Exclusive computer based processing is at twenty two percent.



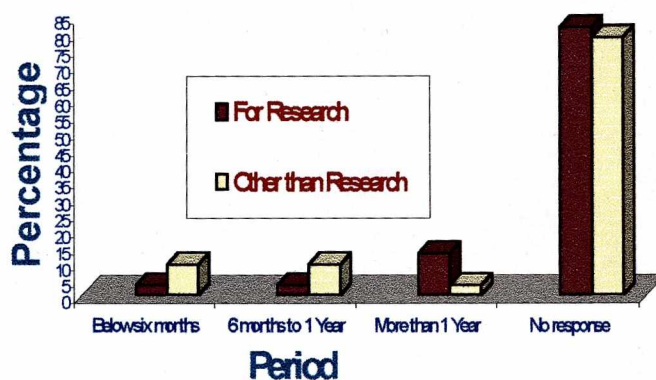
**Figure - VIII**

**Processing of Project Data**

### Use of Computer Facility:

In the previous section the information on the application of computer facility for the research project is given. In this section classification of the period of the use of computer facility exclusively for the research work and for the purpose of other than research work is shown period wise; a) below six months, b) six months to 1 year, c) more than one year and d) no response.

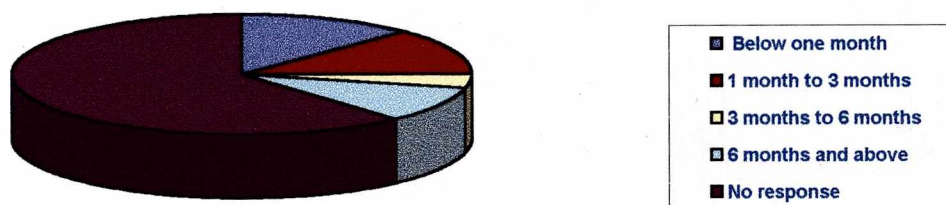
Figure – IX shows both the categories of computer application. In both the cases the percentage of “ No response” from the investigators is very high – of the order of about eighty percent. Exclusively for research work the computer has been claimed to have been used for less. Same is the case with the utility of computer for other than the research work is also very less as per the obtained data.



**Figure-IX** Use of Computer Facility

### **Period of Field Work**

This section is designed to understand the number of days per year spent in the field data collection during the project period. Figure – X show the percentage of the period spent for the field data collection. Here also “no response” from the investigators is in the highest percentage namely sixty five.



**Figure - X**

**Period of Field Work**

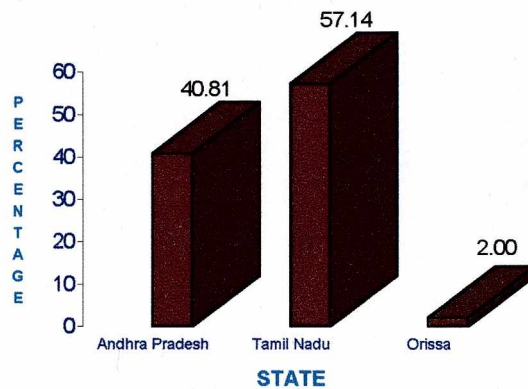
### **Output of the Projects:**

While gathering the information on the output of the projects, the research degrees produced, number of research papers published, the equipment purchased, the nature of the personnel trained and such information has been requested from the investigators. The feedback for the requests is not in a congenial format to prepare any understandable system. More often than not, the response for this section is meagre and highly abstractive with some bare figures. It is also requested to add their specific comments on the results and output of the projects, but there is no response to record. It is very difficult to estimate the output either qualitatively or quantitatively.



**State wise Percentage Distribution of Projects:**

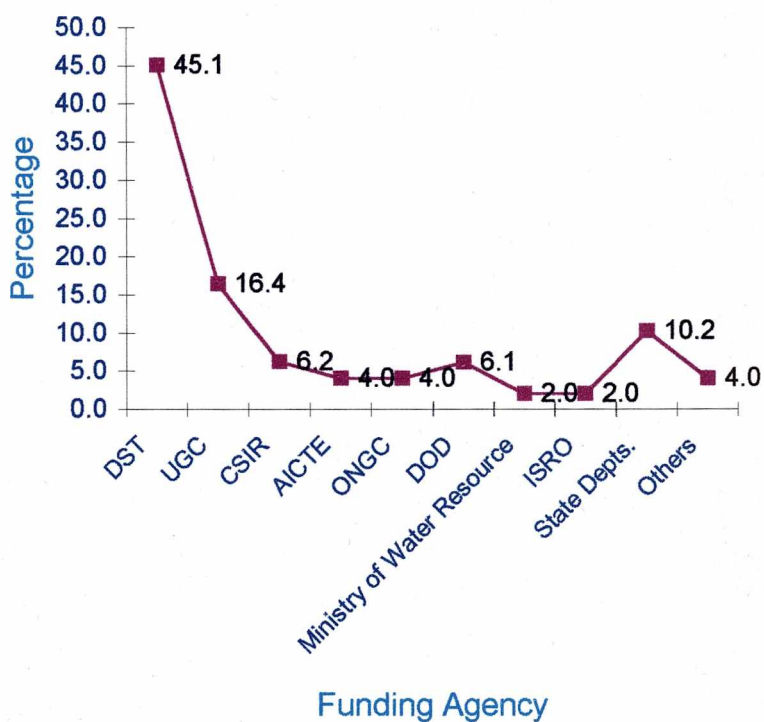
The Distribution of the Research Projects in the Geology Departments of the Universities in the three states is given in Fig.XI. Maximum number of projects (57.14 %) are from the Tamilnadu State followed by Andhra Pradesh (40.81). The State of Orissa is lagging behind.



**Figure- X1** Statewise Percentage Distribution of Projects

**Funding Agency wise Distribution:**

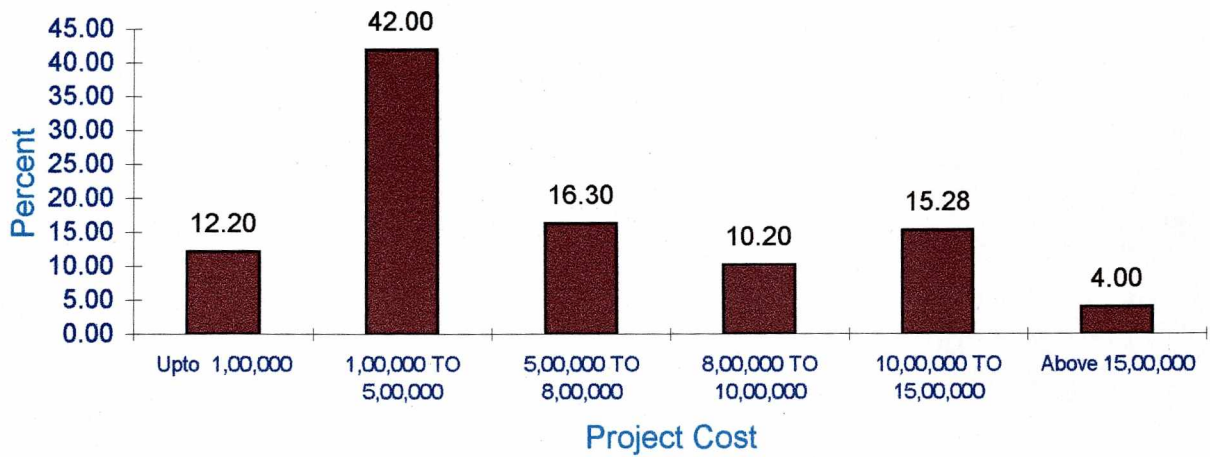
From the collected data, the Department of Science and Technology (DST) tops the list of funding agencies with 45 % of the total number of projects that are funded for the University Geology departments of the three States. UGC and CSIR funded for 16.4 percent and 6.2 percent of the projects. All other financial agencies have funded for a limited number of projects. Fig XII shows the distribution.



**Figure - XII** Funding Agency wise Distribution

**Cost wise Distribution of the Project:**

From the sample projects only four percent of the projects are having a budget of more than Rs.15 lakhs. Maximum no of projects are having a budget within Rs.5 lakhs. The Fig. XIII shows the cost wise distribution of the projects.



**Figure XIII** Costwise Distribution of Projects

## SUMMARISED CONCLUSIONS

The present project is expected to give at least a partial information on input and output interrelationship for the guidance of planning and the classification of the project funding. For the purpose database of the S& T projects in the University Geology Departments of three states is taken up as an experimental study. The results of the present study is depended on the response of the investigators who have carried out the projects during the period of reference.

Normally the University faculty members take up research projects, in addition to their routine teaching activity – 1) to use scientific knowledge and experience for new problems and new areas, 2) to apply knowledge for the benefit of the society and / or advancement of science and improvement, 3) to train the personnel in the respective fields to keep abreast with the developments, 4) to procure equipment in addition to the facilities already available in their respective departments. To fulfil the purposes the faculty members seek financial assistance from the different funding agencies and they in turn on systematic scrutiny of the proposals sanction the grants. The final product of the project is in the report form which generally contains the details of the output of the work carried out during the period. To have an empirical relationship between the input and output the investigators should be in a position to send a feedback appropriately. With this intention questionnaires are prepared and sent to the investigators to get the details of the input and output thereof. The response from the investigators is expected to be most encouraging to prepare an information system and to create an empirical relationship. But in reality it is against the expectation. With the result the formulated objective of the present study could not be entirely fulfilled. The information available through the responses is only partial and that too not from all the investigators. Though it is beyond the scope of the present study, it may be pointed out that, because of the fact that the faculty members are preoccupied with their teaching and research activities and may not be finding enough time slot to make an analysis of their own projects to respond to the queries sent to them to cater to the needs of this type of work.

From the database and the analysis presented in the previous section it can be observed that majority of the research projects are designed through the previous research experience of the proposer of the project involving mainly field and laboratory studies in the applied aspects. The training of the personnel in the projects is mostly in field studies, map studies and exploration techniques. The utility of the experience gained project personnel is claimed to have been used maximum in Industrial applications and next to that is in consultation work. The output of the project works is given by way of Doctoral Degrees and research papers though the data is not helping to suggest any type of analysis. The details regarding equipment and output through the equipment are not available clearly.

It is suggested that the funding agencies may formulate a format for getting to feedback on the different aspects of the output of the projects after completion of the project and at regular intervals. Also seminars may be organised at least region wise at regular intervals to monitor and to understand the utility of the output of the research.



