CHAPTER- IV

Methodology

4.1. Introduction
4.2. Selection of samples
4.3. Selection of Tools
4.4. Scoring procedures
4.5. Administration of Tools
4.6. Tabulation and Organisation of data
CHAPTER – IV

METHODOLOGY

4.0 Introduction

A number of phenomena have been occurring in everyday life. It is one of the characteristic natures of human beings to know what is happening around them. This curiosity in observation, in turn, helps to systematize their needs. Research is a systematic attempt for gaining new knowledge through the application of scientific procedure. In other words knowledge has systematically been organized and presented through research. It is a scientific endeavour by which a casual enquiry due to its scientific applications facilitates to the contribution of knowledge.

An analysis of the awareness and attitude of under graduate and the post graduate students on environmental education is the problem taken for the present study. Selecting an appropriate method of research to solve the chosen problem is the subsequent task of the researcher. There are various steps and plans adopted in solving a research problem consisting of elements like, the definition of terms, the choice of subjects for investigation, the validation of data-gathering tools, the collection, analysis and interpretation of data, and the process of inferences and generalization.

Educational research is an application of scientific and logical process on educational problems. According to Mauly (1963), "Scientific problem can be solved only on the basis of data and the major responsibility of the scientist is to set up a research design capable of providing the data necessary to the solution of a problem".
"The machinery of methodology", according to Barr (1960), "occupies a very important position in any kind of research. The research cannot perform its function without it, since it is the methodology which lays out the way that formal research is to be carried out and outlines the detailed description of the research procedure".

C.R. Meclure and P. Hersson (1991), submits that research is an inquiry process that has clearly defined parameters and has its aim at the discovery or creation of knowledge, or theory building, testing, confirmation, revision, refutation of knowledge and theory or investigation of a problem for local decision making. Kerlinger (1978) put forward that, scientific research is a systematic, controlled, empirical, critical investigation of hypothetical propositions about the presumed relations among natural phenomena.

A close examination of the different views presented above depict that educational research is an inquiry or investigation that has clearly defined parameters. It is a process consisting of critical, controlled and empirical inquiry. Qualitative, Quantitative and Action Research are the approaches of research used in the field of education in which Quantitative approach of educational research has been chosen for the present study.

The said Approach of research is used generally in experimental researches, survey studies and correlation studies. The problem taken for the present study, its nature and its focus on awareness and attitude towards environment education and its relationship if any, with socio-economic status and academic achievement, settlement and discipline between the
undergraduate and post graduate students, has impelled to choose the said approach.

The study comes under the purview of normative survey method of research. The term normative survey is used for the type of research, where a specific or typical conclusion or practice in the present situation is estimated. Survey refers to an assessment for which standardized tools were used to collect data's from a specified population. This method of research is preferred in the field of education for the following reasons:-

(1) The approach of research chosen enables the researcher to recognize the present condition and trends that exist during a particular period of time.

(2) It assists the researcher to identify the problems prevailing in the system, and to find solution of those problems at an appropriate time.

(3) It provides a historical perspective since a good number of studies are conducted on the problem.

(4) It gives an insight for the course of future plans.

(5) It adds an organized form of information in a well recorded format that may be used for further studies by the scholars interested to pursue their research activities.

By looking into the nature of the problem taken for the study, quantitative approach and the normative survey method has been chosen. The present chapter has been limited to the following steps.

(A) Selection of sample.
4.1 (A) Selection of Sample:

It is accepted by the researchers, experts and educationists that it is not possible for an investigator to collect data's from each and every individual of the selected area of research. The term population refers to collection of any specified group of human beings or non-human entities such as objects, educational institutions, time units, geographical areas, individual, etc. The term "Population" signifies the total number of aspects for which the information are collected and the investigations conducted. As it is impossible to collect information's or data from the whole population, a sample is selected from the total population. The process of selecting the true representative is termed as sampling.

In the present study, a sample was selected from undergraduate and post graduate students of Arunachal Pradesh. A sample of 608 students was selected by adopting the random sampling technique. Further, selected sample was divided into two segments of 304 each consisting of undergraduate and post graduate students. Equal representation has been ensured for sex, discipline and settlement in both the undergraduate and post graduate samples. The distribution of sample is shown in the table -1.
# DISTRIBUTION OF THE SAMPLE STUDENTS

## Table: IV-1

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<thead>
<tr>
<th>Category</th>
<th>UNDERGRADUATION</th>
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<th>Humanities (152)</th>
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<td>Female (76)</td>
</tr>
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<td>Tribal (38)</td>
<td>General (38)</td>
</tr>
<tr>
<td>Achievment</td>
<td>HI G O W H</td>
<td>HI G O W H</td>
</tr>
<tr>
<td>Socio Economic status</td>
<td>HI G O W H</td>
<td>HI G O W H</td>
</tr>
<tr>
<td>Settlement</td>
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<td>Settlement</td>
<td>Rural / urban</td>
<td>Rural / urban</td>
</tr>
</tbody>
</table>
4.2 (B) Selections of Tools:

A research design is the experimenter, what a blue print is to an architect (Van Dalen, 1962). For any research study, the researcher has to collect data and on the basis of that data he/she draws conclusions and arrives at generalizations. The generalizations and the conclusions would be acceptable and valid only when the data's are collected methodically. Reliable and valid tools of data collection are needed for collecting the data. Therefore, the researcher needs to be careful enough in the selection of the tools of data collection. Further more the selection of suitable tools for a particular study depends upon its objectives; the following tools are developed and used for the present study:

(1) Environment awareness test for undergraduate and post graduate students.

(2) Attitude scale the undergraduate and post graduate students.

(3) Socio-economic status for the undergraduate and post graduate students.

4.2.1 Environment Education Awareness Test for undergraduate and postgraduate students:

The Environmental Education Awareness Test (EEAT) was constructed and standardized to measure the environmental education awareness among the undergraduate and post graduate students of Arunachal Pradesh. The test consists of of 30 items, comprise the various components of environment and environment pollution and environment education. The test items were collected from the different sources.
The draft consisting of 40 items was given to 2 subject experts who edited the contents of the draft and the draft was further given to 3 language experts to examine the language of each statements. The verified draft was tried out on 30 post graduate students to find out the level of item difficulty. The computed item variance showed that 30 items out of 40 ranged from 0.40 to 0.60 of variance. Therefore 30 items were retained in final draft of the test. Finally, the Test-Retest method was applied to find out the reliability of the test. The computed value reached at 0.83 and indicated that the test has reliability of satisfactory level. The researcher ensured the content validity of test by seeking the opinions of the content experts. The copy of the test has been enclosed as an appendix - I.

4.2.2 Attitude Scale for students:

A Five-point attitude scale was constructed by adopting the step given by Likert (1932) and standardized to measure the attitude of undergraduate and postgraduate students towards the environmental education.

Step – I: Collection and Editing of Statements: The investigator developed 45 statements consisting of opinion towards the environment education. All the statements got edited by the subject and language experts of three each of both the categories since it is described as a criteria by Thurston and Chave (1929), Wang (1932), Bird (1940), Edwards and Kilpatrick (1948). After the completion of the editing, 40 statements were retained in the preliminary draft of this attitude scale.

Step – II: Try out: The preliminary draft of 40 statements was administered to a sample of 50 students of post graduation in the Rajiv Gandhi university
campus. Each statement, in this attitude scale was followed by five responses such as SA, A, U, D, and SD. The respondent was to put the tick (✓) mark on any one option as per his/her willingness. The meaning of SA, A, U, D and SD are given as under:

SA = strongly agree, A = Agree, U = Undecided,
D = Disagree, SD = strongly disagree.

The weightage for positive statements was given 5, 4, 3, 2 and 1 points to SA, A, U, D and SD respectively. The total of all the 40 statements was considered the score of PG students on this attitude scale. The minimum score of a student on this attitude scale could be zero (40 x 1 = 40), whereas the maximum score on this attitude scale could be 200 (40 x 5 = 200).

**Step – III: Preparation of Final Draft:** The preliminary draft of 40 statements was administered on a sample of 50 students, where 25 males and 25 females from post graduate students which was under consideration in this study. The scoring work was done as per the weightage, which has been reflected in the previous step. As per the procedure upper 25 per cent and 25 per cent lower cases in terms of attitude score were taken to compute the ‘t’ value of 40 statements. The ‘t’ value of 30 statements were found greater than 1.75 therefore 30 statements were retained in the final draft of the attitude scale which measuring the attitude of undergraduate and post graduate students. The final draft of the attitude scale has been enclosed as an appendix - II.

**Step – IV: Reliability and Validity:** For computing the reliability of the attitude scale, the investigator used the ‘Test – Re- Test’ method. The coefficient of reliability came out to be 0.95, which indicates a quite high amount
of reliability of the constructed scale. The content validity was ensured by making use of the opinions of the content experts. All the students attempted the attitude scale with full care and interest.

In this way, the researcher collected opinions of 304 undergraduate and 304 postgraduate students, towards the environmental education in Arunachal Pradesh.

4.2.4. Socio-economic Status Scale for UG and PG students:

To measure the socio-economic status of the teachers, the investigator used the socio-economic status scale. This scale was prepared on the basis of B. Kupuswamy's socio-economic status scale keeping in view of the various aspects of items, which stand for their status. The whole scale was divided into four sections and those are put as under:

(i) Educational Qualification:

The qualifications of father / mother / guardian were divided into three categories – (i) Under Matric, (ii) Matriculation to Graduation and (iii) Post-Graduation / Diploma, etc. and weightage was given 3, 6, 10 points to each category respectively.

(ii) Occupation:

The scale is having three categories of occupation like primary, secondary and Class I service. Occupations and weightage to each category of occupation was given such as 7 points in case of first class officer, 6 points in case of class-II officers, 5 points in 3rd grade, 2 points in skilled workers respectively. In case of land, less than 3 paddy fields, 4 to 6 paddy fields and more than 6 paddy fields, the weightage was given 3, 5, 7 points respectively.
Less than 5 family members and 6 to 15 and more than 15 family members were categorised separately. The weightage was given 2, 3 and 5 points to each category respectively. Similarly, the weightage was given to the members of children going to educational institution for education.

(iii) Income:

The third category is income. On the basis of income there are four categories i.e. less than 5000/- p.m., 5001-10,000/- p.m., 10,000/- - 15,000/- p.m. and more than 15,000/- p.m., the weightage is given 1, 3, 5, 7 points respectively.

4.3 Administration of Tools:

After having the completion of selection of sample and preparation of data gathering tools, the next step is to proceed for collecting data. The investigator as a first step of his research study established contacts with the principals of the selected colleges in order to get effective co-operation and smooth conducting of the research study. With the approval from the principal concerned the investigator visited the Jawaharlal Nehru College, located in Pasighat, capital of east siang district of Arunachal Pradesh and Dera natung Government colleges of Itanagar capital of the state for collecting data from the undergraduate students.

The investigator collected data from the Post Graduate students of both the Humanities and Science disciplines of Rajiv Gandhi University. For administrating the tests and scales, the investigator took every care so that the students are not to find any difficulty in attempting the tools of the study.
Environmental awareness test, attitude scale, and socio-economic status scale were administered on the students. The investigator visited the mentioned institutions personally.

To begin with, the instructions relating to the environmental awareness test were explained to the students by the investigator. The procedure for attempting each section of the test was explained with some examples. Furthermore, the students were asked to follow the instructions given and attempt all the questions of the test in half an hour as it was found sufficient for the student to complete this test. As per the directions and requirements of the test, students completed this test within the stipulated duration.

After giving a gap of 5 minutes, the students were given instructions about the attitude scale to measure their attitude towards environmental education. Each aspect of the attitude scale was explained with some examples. When the students were found ready to attend the second test they were requested to give their responses within 30 minutes by going through each statement of the attitude scale. The students completed the task within 30 minutes.

The researcher administered the socio-economic status scale in the afternoon by giving a gap of two hours. Similarly, the researcher visited Dera Natung Government College, Jawaharlal Nehru College, and Rajiv Gandhi University for collecting the required data from the sample students of undergraduate and postgraduate students.
4.4 Scoring Procedures:

(i) Environmental Awareness Test of undergraduate and postgraduate Students:

The investigator developed the scoring keys for Environmental education awareness test of students. The scoring work was done as per the said scoring keys, with the weightage of five to the correct responses.

(ii) Socio-economic Status Scale for undergraduate and postgraduate and Students:

The forms of socio-economic status scale were marked in accordance with weightage given for each item of different sections of the scale of students. These socio-economic status scales have been divided into 3 sections and each section is having different items. The details of the weightage given to each item are as under:

Section – A: This section of the scale contains 15 items relating to educational qualifications of parents/guardian. The qualifications may be Ph.D., M.A./M. Sc., B.A./B.Sc. /B. Com., etc. 10+2 school stage certificate, middle school certificate, primary school certificate and illiterate. The weightage were given 7, 6, 5, 4, 3, 2 and 1 respectively.

Section – B: This section of the scale is concerning with the occupations of the parents. The categories of the occupations are profession, semi-profession, clerical, shopkeeper, farming, skilled worker, semi-skilled worker and unemployment. The weightage were given 7, 6, 5, 4, 3, 2 and 1 respectively. The weightage were given to the children studying in school, college and university, 1, 2 and 3 points respectively.
Section – C: This section of scale is concerning to the income of the father/mother/guardian. The categories of the income are more than 30,000 p.m., more than 25,000 p.m., more than 20,000 p.m., more than 15,000 p.m., more than 10,000 p.m., more than 5,000 p.m. and less than 5,000 p.m. The weightage were given as 7, 6, 5, 4, 3, 2 and 1 respectively.

By following these weightage, the researcher did the scoring work of socio-economic scale of teachers and students with every care and the scores of teachers and students on socio-economic status scale are shown in the appendix.

4.5. Tabulation and Organization of Data:

The raw scores of 608 students on socio-economic status have been taken into consideration for preparing the frequency table to find out the high and low socio-economic status of Students.

Table: IV-3 Frequency Table of Socio-economic Status Scores of undergraduates and post graduate students.

<table>
<thead>
<tr>
<th>c.i</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>160-169</td>
<td>3</td>
</tr>
<tr>
<td>150-159</td>
<td>4</td>
</tr>
<tr>
<td>140-149</td>
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<tr>
<td>120-129</td>
<td>36</td>
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<tr>
<td>110-119</td>
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<tr>
<td>100-109</td>
<td>107</td>
</tr>
<tr>
<td>90-99</td>
<td>134</td>
</tr>
</tbody>
</table>
Calculations made to find out the 33rd and 66th percentile scores of the undergraduate and post graduate students relating to their socio-economic status is as follows.

\[ P_{33} = L + \frac{N - f b}{\frac{f w}{3}} \times i \]

\[ = 79.5 + \frac{608 - 127}{3} \times 10 \]

\[ = 79.5 + \frac{202.67 - 127}{86} \times 10 \]

\[ = 79.5 + \frac{75.67}{86} \times 10 \]

\[ = 79.5 + 8.798 \]

\[ = 88.298 \]

\[ P_{33} = 88 \]
\[ P_{66} = L + \frac{2N - fb}{3fw} \times i \]

\[ P_{66} = 99.5 + \frac{608 - 347}{107} \times 10 \]

\[ = 99.5 + \frac{405.33 - 347}{107} \times 10 \]

\[ = 99.5 + \frac{58.33}{107} \times 10 \]

\[ = 99.5 + 5.451 \]

\[ = 104.951 \]

\[ = 104.951 \]

\[ = 105 \]
4.5. Academic achievement.

The raw scores of 608 students on Academic achievement have been taken into consideration for preparing the frequency table to find out the high and low socio-economic status of Students.

Table: IV: – 4 Frequency Table of Achievement Scores of under graduates and post graduate students.

<table>
<thead>
<tr>
<th>c.i</th>
<th>f</th>
</tr>
</thead>
<tbody>
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<td>70-74</td>
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</tr>
<tr>
<td>65-69</td>
<td>7</td>
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<td>45-49</td>
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<td>40-44</td>
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<td>35-39</td>
<td>10</td>
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<tr>
<td>30-34</td>
<td>7</td>
</tr>
<tr>
<td>25-29</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>608</td>
</tr>
</tbody>
</table>

Calculations made to find out the 33rd and 66th percentile scores of the undergraduate and post graduate students relating to their Academic achievement is as follows.

\[ P_{33} = L + \frac{N - fb}{f w} \times i \]
\[ P_{33} = 51 \]

33\textsuperscript{rd} percentile = 50.69 = 51 and below Low

\[ P_{66} = L + \frac{2\ N - f\ b}{3\ \frac{f\ w}{w}} \times i \]

\[ P_{66} = 54.5 + \frac{2 \times 608 - 347}{3 \ \frac{173}{173}} \times 5 \]

\[ = 54.5 + \frac{405.33 - 368}{173} \times 5 \]
\[ = 54.5 + \frac{37.33}{173} \times 5 \]
\[ = 54.5 + 0.21579 \times 5 \]
\[ = 54.5 + 1.078 \]
\[ = 55.578 \]
\[ = 56 \]

66\textsuperscript{th} percentile = 55.58

= 56 and above High

4.6. MULTIVARIATE CATEGORISATION OF SAMPLE STUDENTS.

It was assumed that the awareness and the attitudes of students on various phenomena are not identical since the students of a state comprise different social, economical, educational, and ethnic background, academic achievement, and the level of their education i.e., under graduation and post graduation. Therefore in order to study these differences and influence if any, of the said variables the sample students were Categorised, based as under.

1. UG / SES / DISCIPLINE / ACHIVEMENT / AWARENESS SCORE
2. UG / SES / DISCIPLINE / ACHIVEMENT / ATTITUDE SCORE
3. PG / SES / DISCIPLINE / ACHIVEMENT / AWARENESS SCORE
4. PG / SES / DISCIPLINE / ACHIVEMENT / ATTITUDE SCORE
5. UG / SEX / SETTLEMENT / RACE / AWARENESS SCORE
6. UG / SEX / SETTLEMENT / RACE / ATTITUDE SCORE
6. UG / SEX / SETTLEMENT / RACE / ATTITUDE SCORE

7. PG / SES / DISCIPLINE / ACHIVEMENT / AWARENESS SCORE

8. PG / SES / DISCIPLINE / ACHIVEMENT / ATTITUDE SCORE.