CHAPTER-IV
METHODODOLOGY

After going throughout the review of related literature, it has been decided that Research Methodology is must but not fixed for all kinds of researches. Research methodology or research design refers to the plan of action to examine the research problem from various possible angles so that the objectives of the study can be realized. “A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure.” (Kothari, Research Methodology, p. 31) In fact, research design is the conceptual framework within which the whole research is accomplished; it constitutes the blueprint for the collection, measurement and analysis of data. It may be understood as a science of study how the research is undertaken based on logically derived empirical evidences from the circumstances with the help of statistical appliances for the proper treatment of collected data. In carrying out the present study, the following plan of action has been adopted by the investigator-

1. Method used in the study
2. Universe/population of the study
3. Sample of the study and sampling Procedure
4. Selection, preparation and uses of tool for data collection
5. Data Collection Procedure
6. Statistical techniques used for proper treatment of collected data

The above mentioned planning of design or methodology of the study has been undertaken by following the objectives and hypotheses.
4.1 METHOD OF THE STUDY

In the present study, Descriptive Survey method has been applied according to the nature and purpose of the problem. Survey method is scientific and it is relevant to the present problem as it helps to know the present status of the universities of Assam in case of their enrolment, educational achievement, placement opportunity, infrastructural facilities for Human Resource Development and the prevailing Human Resource Development Climate in the universities. Survey studies are done to collect the data related to existing conditions and practices or to make more intelligent plans for improving them. Descriptive survey method is applied to get more pertinent and precise information regarding the problem as it involves the description, recording, analysis and interpretation of conditions that exist within the purview of the investigation. In addition, the method compares contrasts and attempts to discover relationship between different variables under investigation for generalizing a valid conclusion from the facts discovered.

4.2 POPULATION OF THE STUDY

It is very necessary to refer to the population before the selection of a sample for the study to avoid ambiguity. Present study is related with the role of central and state universities of Assam in Human Resource Development and their comparison. Hence, all the Government and Public funded Central and State Universities of Assam comprises the main Population of the study. All the Post Graduate Students studying in these sampled universities, all the Teachers and Non-teaching staff working in these higher educational institutes also fall under the population of the present study. However, the detail description of the population of the study can be presented with the help of the table no. 4.1 and 4.3.
Table No.4.1

Table showing the population of Government and Public Funded Central and State Universities in Assam in 2012

<table>
<thead>
<tr>
<th>Name of University</th>
<th>Type of University</th>
<th>Number of University</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tezpur University</td>
<td>Central University</td>
<td>2</td>
</tr>
<tr>
<td>Assam University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gauhati University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dibrugarh University</td>
<td>State University</td>
<td></td>
</tr>
<tr>
<td>Assam Agricultural University</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Cotton College State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bodoland University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Srimanta Sankardeva University of Health Sciences</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.2

Table showing the selected sample universities for the study

<table>
<thead>
<tr>
<th>Category of Institutes</th>
<th>No. of sampled Institutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Universities</td>
<td>2</td>
</tr>
<tr>
<td>State Universities</td>
<td>2</td>
</tr>
</tbody>
</table>

4.3 SAMPLE OF THE STUDY AND SAMPLING PROCEDURE

Sample refers to a miniature representation of the larger whole. It is drawn from the large group of the population which is to be studied and it must be representative.
Both the two Central universities of Assam and two State universities from the total population have been selected purposively as sample of the present study. For studying the enrolment trends of boys and girls in the Universities, last 5 years enrolment records have been observed and to study the relative status of educational achievement of students also in both the Central and State Universities, five years’ results have been analyzed.

Table No.4.3
Table showing the Various Groups of Population in sampled Universities in 2012

<table>
<thead>
<tr>
<th>Sampled University</th>
<th>Teachers</th>
<th>Non-teaching Staff</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gauhati University</td>
<td>383</td>
<td>1321</td>
<td>3256</td>
</tr>
<tr>
<td>Dibrugarh University</td>
<td>270</td>
<td>172</td>
<td>2326</td>
</tr>
<tr>
<td>CENTRAL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tezpur University</td>
<td>240</td>
<td>275</td>
<td>1280</td>
</tr>
<tr>
<td>Assam University</td>
<td>325</td>
<td>276</td>
<td>2884</td>
</tr>
</tbody>
</table>

Regarding the selection of teachers and students as sample for objective number 5th (fifth) that is, to compare the status of availability of Infrastructural facilities in the central and state universities, Disproportionate stratified random sampling method has been applied. For the purpose of selecting teachers and non-teaching staff in case of Objective number 6th also, that is to compare the prevailing Human Resource Development Climate in the Universities same procedure has been adopted. Total 600 respondents for each objective were taken from four (4) sampled Universities. All the respondents were selected with the help of Disproportionate stratified random sampling method.

“In the case where there is considerable variation in different strata the proportional stratification method may not work. In that case disproportionate stratified
sample is taken. In this method, an equal number of items from each stratum irrespective of its size are taken.” (Saha, K. Pp.136, 2012).

Sample of the present study for objective no.5 and for objective no. 6 has been described with the help of table number 4.4 given below.

**Table No.4.4**

Table representing the detail description of the selected sample for the study

<table>
<thead>
<tr>
<th>Group</th>
<th>Subgroup</th>
<th>No. of Sample Respondents</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers</td>
<td>Tezpur University</td>
<td>60 (20%)</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>Assam University</td>
<td>90 (30%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gauhati University</td>
<td>90 (30%)</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>Dibrugarh University</td>
<td>60 (20%)</td>
<td></td>
</tr>
<tr>
<td>Students</td>
<td>Tezpur University</td>
<td>60 (20%)</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>Assam University</td>
<td>90 (30%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gauhati University</td>
<td>90 (30%)</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>Dibrugarh University</td>
<td>60 (20%)</td>
<td></td>
</tr>
<tr>
<td>Non-teaching Staff</td>
<td>Tezpur University</td>
<td>60 (20%)</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>Assam University</td>
<td>90 (30%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gauhati University</td>
<td>90 (30%)</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>Dibrugarh University</td>
<td>60 (20%)</td>
<td></td>
</tr>
</tbody>
</table>

*Figures within parentheses in the above table indicate the sample % of each subgroup to the total sample of 300 in one group.*
The rationale for adopting Disproportionate sample cited in table no. 4.4 is supported by Kothari, C R (2004). “If the purpose happens to be to compare the differences among the strata, then equal sample selection from each stratum would be more efficient even if the strata differ in sizes…” (p. 63, Kothari; Research methodology).

Disproportionate Stratified Sampling is when an equal number of cases are taken from each stratum/group regardless of the size of the strata in proportion to universe.

**FIGURE-4**
Sample distribution through schematic diagram

4 UNIVERSITIES

2 CENTRAL

150 TEACHERS

150 STUDENTS

150 NON TEACHING STAFF

2 STATE

150 TEACHERS

150 STUDENTS

150 NON TEACHING STAFF

4 UNIVERSITIES

4.4 SELECTION AND PREPARATION OF RESEARCH TOOLS

In order to collect the relevant data the investigator has used various tools depending upon the objectives of the study and category of respondents. For observing the enrolment status of central and state Universities and enrolment trend of boys and girls in different disciplines the investigator prepared an Institutional Data schedule. This data schedule was also prepared to get information regarding educational achievement of students in last five years with their quality of results. Placement related data from Placement Cell in Universities were also collected at the same time with this Institutional Data Schedule.

To assess the differentiate role of central and state universities for Human Resource Development by measuring available Infrastructural facilities the investigator has
prepared two Opinionnaire related to Infrastructural Facilities For Human Resource Development- one for Faculty members and another for Students.

In order to make comparative assessment of the prevailing Human Resource Development Climate in the Central and State universities the investigator used a readymade standardized tool developed by Rao and Abraham (1990) at Xavier's Labor Relation Institution, Jamshedpur Centre (XLRI). It is popularly known as (HRDCQ) Human Resource Development Climate Questionnaire. However, the tools used for collection of relevant data in the present study are-

(i) Institutional Data Schedule
(ii) Opinionnaire Related to Infrastructural facilities for HRD (Self-Prepared)
  (A) Opinionnaire Related to Infrastructural Facilities for Faculty Members
  (B) Opinionnaire Related to Infrastructural Facilities for Students
(iii) Human Resource Development Climate Questionnaire (HRDCQ)

Apart from the above mentioned tools, the investigator collected necessary informations of the respondents through informal mode of interview with them. The detailed descriptions of the above tools are given below-

4.4.i INSTITUTIONAL DATA SCHEDULE

Institutional Data Schedule is usually used to collect different types of informations/data from the sampled institutions of study. Informations or data which are collected with the use of this tool must be as per the objective of the study and accordingly the schedule is made ready. In the present study, this Institutional Data Schedule tool consists of two parts for collecting information about enrolment, educational achievement of Students, nonconventional subjects introduced in the University, and information related to placement.

Part-I is prepared to get discipline-wise information of enrolment records since 2007 to 2012. Part-II of the schedule collects data with regards to students’ results along with their level of educational achievement as 1st class/A grade holder and 2nd class/B grade holder. It also fills the knowledge of non-conventional subjects introduced by the universities. At last, the schedule collects placement records from the universities. Data related to placement have been collected from the placement officer of the sampled Universities.
4.4.ii OPINIONNAIRE RELATED TO INFRASTRUCTURAL FACILITIES FOR HUMAN RESOURCE DEVELOPMENT (Self-prepared)

4.4.ii. A. Opinionnaire Related to Infrastructural Facilities for Faculty Members

This tool was developed by the investigator. It consists of total twelve (12) statements. Among these 12, three (3) statements are given in negative form, which are item no. 1, item no. 8 and item number 10. Others all were given in positive mode to have more validity of the questionnaire. This is a five point scale as 5 refers to -almost always true, 4-mostly true; 3-sometimes true, 2-rarely true, 1 -not at all true. For negative items reverse scoring from strongly agree to strongly disagree was followed. The Maximum /Highest score of one Respondent in this Opinionnaire may be (5x12) 60. The following table shows the area-wise distribution of the statements of Opinionnaire Related to Infrastructural Facilities for Faculty Members -

<table>
<thead>
<tr>
<th>SL No.</th>
<th>AREA</th>
<th>ITEM NO.</th>
<th>‘+’VE ITEMS</th>
<th>‘-’VE ITEMS</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Library facility</td>
<td>1, 2</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Classroom facility</td>
<td>5, 8, 9,</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Facility of Using ICT</td>
<td>3, 4</td>
<td>2</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Laboratory Facility</td>
<td>6,</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Health&amp; Sanitation</td>
<td>7, 10</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Career development facility</td>
<td>11, 12</td>
<td>2</td>
<td>-</td>
<td>2</td>
</tr>
</tbody>
</table>

| TOTAL | 12 |

For computing the reliability of the tool the researcher has used the Split-Half method. The tool was administered on a sample of 30 respondents selected randomly.
from Gauhati University and Tezpur University. The items of the tool were divided into two ‘halves’ that means odd and even number items and the scores of the two halves were noted separately. The correlation between the two sets of scores was calculated by using Spearman Brown Formula. The reliability coefficient of the tool was established to be 0.7. Then it was given to (5) Five Research Guides to give their Expert Opinion on it. All the experts were agreed that the items given in the questionnaire cover all the concept areas of infrastructural facilities which prove to be having high face validity. Finally, it was distributed among the respondents of the sampled universities for data collection.

4.4.ii. B. Opinionnaire Related to Infrastructural facilities for Students

Opinionnaire on Infrastructural Facilities for Students’ was developed by the investigator herself. It was designed in such a way that the respondents don’t find any difficulty in responding to the questions and they were given scope for free and frank responses. It comprised of total sixteen (16) items to be responded on a five (5) point scale as 5 for almost always true, 4 for mostly true, 3 means sometimes true, 2 for rarely true and 1 for not at all true. For negative items reverse scoring from strongly agree to strongly disagree was followed. The possibility of highest score of this tool for one respondent is (5x16) = 80.

In order to standardize the tool it was distributed to five (5) research guides of Gauhati University to give their expert opinion. All the experts with minor differences were agreed with each other that the items given in the questionnaire cover all the concept areas of infrastructural facilities which proved to be having high face validity.

The reliability of the tool was established by the application of split-half method with a sample 80 post-graduate students taking from Gauhati University and Tezpur University. In case of dividing the sample 80 into two halves, scores of odd and even items were taken separately. The Spearman Brown Prophecy formula of Correlation was calculated and it was found to be 0.73. Among the total 16 items of the Opinionnaire, a few questions were given in negative form and those were item number 5, item number 7, item number 13, item number 15 and item number 16. This further
ascertained the validity of the tool. The following table shows the area-wise distribution of the statements of Opinionnaire Related to Infrastructural facilities for Students.

### Table 4.6

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>AREA</th>
<th>ITEM NO.</th>
<th>‘+’ VE ITEMS</th>
<th>‘_’ VE ITEMS</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Health &amp; Sanitation</td>
<td>1, 14</td>
<td>1+1</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Classroom Facility</td>
<td>4, 5, 8, 11</td>
<td>1+1+1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Library Facility</td>
<td>13, 15</td>
<td>-</td>
<td>1+1</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Facility of Using ICT</td>
<td>7, 12</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Transportation Facility</td>
<td>6,</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Students support facilities</td>
<td>2, 3, 16</td>
<td>1+1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Facilities of co-scholastic Activity</td>
<td>9, 10</td>
<td>1+1</td>
<td>-</td>
<td>2</td>
</tr>
</tbody>
</table>

**TOTAL 16**

### 4.4.iii. HUMAN RESOURCE DEVELOPMENT CLIMATE QUESTIONNAIRE (HRDCQ)

This questionnaire was developed and standardized by Rao and Abraham (1990) at Xavier's Labor Relation Institution, Jamshedpur Centre (XLRI). It comprised of 38 (thirty eight) items to be responded on a 5 point scale as 4-almost always true, 3-mostly true, 2-sometimes true, 1-rarely true, 0-not at all true. Noor Jehan (2007) modified the questionnaire and reduced the number of items up to 35, the reliability of
The tool was established to be 0.71. The validity was established by taking the square root of reliability and it was 0.87. Mufeed and Gurkoo (2006) also picked upon the questionnaire of Rao and Abraham (1990) and slightly modified on the basis of some similar studies including total 38 items.

The investigator followed the slightly modified questionnaire by Mufeed and Gurkoo (2006) in the present study (Annexure-V). The 38 items of the Questionnaire captures the three components of Human Resource Development Climate which are perception towards the top management’s commitment to HRD (General Climate), existence of OCTAPAC culture; and functioning of the HRD mechanism. The OCTOPAC culture indicates the existence of seven factors, namely, Openness, Confrontation, Trust, Autonomy, Pro-activity, Authenticity and Collaboration in an Institution. HRD Mechanism indicates the extent to which the various sub-systems of the HRD mechanism such as training, performance appraisal, potential appraisal, organization development, feedback and performance coaching, career planning, rewards, employee welfare, quality of work life and human resource information systems are implemented seriously (Rao, 1999). In preparing the present research instrument of the 38-item HRD Climate Questionnaire, 14 items were given to measure general HRD Climate; HRD Mechanism has 15 items and OCTAPAC culture has 9 items which prove to having high content Validity. Thus, the questionnaire further need not to be standardized as it is being used in India which almost culturally is the same (Appendix-V).

4.5 DATA COLLECTION PROCEDURE

In the present research investigation, the sample of the study are scattered throughout the four different universities of Assam located in four different districts. Hence, the investigator did her field work at different times according to her convenience. It was decided to administer the relevant tools as a set to the respective university members. The investigator personally visited all the universities and administered all the Opinionnaire and questionnaires to the respective faculty members, non-teaching staff and students. At the time of first field visit of the investigator, the contact numbers and e-mail I.D. were also collected from the sample
Data were collected through e-mail also. Most of the Questionnaires were collected back on the same day of the visit. Important mail I.D. and contact numbers of non-teaching staff were collected by the investigator from the prospectus of the concerned university. Though the total sample of the study is 900, but for objective number 5 that is to compare the infrastructural facilities of Central and State universities for Human Resource Development, data have been collected from 600 (300 teachers +300 students) respondents. For making this comparative assessment of the infrastructural facilities of the Central and State universities, students and teachers ratings are sufficient. Hence nonteaching staff has not been included as sample for this objective.

In achieving Objective number 6 also, data have been collected from 600 (300 teachers + 300 Non-Teaching Staff) respondents to make a comparative assessment of the HRD Climate of the Central and State universities of Assam. To measure the HRD climate in the university, students sample had nothing to respond with this variable. Therefore, students were not included for this objective number 6 in the sample category.

For the study of students’ enrolment status, students’ educational achievement in terms of their final results, placement status through campus interview and non-conventional subjects introduced by the universities, data were collected from the Office of the Secretary of University Classes, Internal Quality Assurance Cell (IQAC), Examination Branch and from the Placement Coordinator of Placement Cell of respective university.

4.6 STATISTICAL TECHNIQUES APPLIED FOR DATA ANALYSIS

Data analysis plays a vital role in giving direction towards the research problem and helps in organizing and achieving the objectives and discovering the inherent facts of the study.

After collection of data the analysis plan was done. In the present problem first of all, the distributed questionnaires were collected personally by the Investigator and calculated the raw score of every respondent. Data collected through various research
instruments were checked and rechecked before the tabulation of work. Incomplete questionnaires were dropped and data were collected again as per the requirements of the sampling plan. After that, as per the nature of each instrument analysis and interpretation has been done.

For the purpose of analysis of collected data following statistics have been used-

(i) Tables
(ii) Maps
(iii) Percentage analysis
(iv) Bar diagram & Pie graph for graphical representation
(v) t-Test.

This t-test has been applied to find out the differentiate role of Central and State Universities in human resource development by studying the perception of the Respondents towards human resource development climate prevailing in their respective universities and adequacy of Infrastructural facilities in the universities for students and teachers.

This chapter identified the procedure/methodology that has been applied to study the role of central and state universities of Assam in human resource development. In order to carry out the study with in a definite period of time, sample was delimited to four universities- two central and two state universities. Three research tools were used for data collection namely- Institutional data schedule, Opinionnaire related to Infrastructural facilities for students and faculty members differently and Human Resource Development Climate Questionnaire. To analyse the data, statistical techniques like- simple percentage, mean, standard deviation, t-test, bar graph and pie graph have been used.