Chapter - 4
CHAPTER IV

METHODOLOGY

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METHODOLOGY

This chapter deals with selection of research tools, their construction, locale of the study, sample, collection of data and statistical techniques used in the study.

4.01 Selection of Tools:

Any type of research study essentially requires a tool or technique to gather data from the field. This study attempts to identify the knowledge and educational needs of rural adults in environmental education. Rural adults may lack knowledge about global issues, but still they do not feel the necessity of the knowledge. Some people may have knowledge, but yet they may like to update their knowledge. While studying the educational needs, it is equally important to keep in view the knowledge they possess. The study examines both the need and knowledge of the rural adults, and therefore, selection of tools for measuring both need and knowledge are needed.

In the past researchers used different tools to assess the knowledge and needs of the community. For assessing knowledge, researchers like Jacklin (1964), Shinde (1972), Jacob (1972), Boysen (1972), Thomsen et.al (1977) Santhakumari (1976), Ushadevi (1983) used questionnaires.
Dexit (1975), Nagappa (1966) and North Eastern Hill University (1977) used both questionnaire and interview schedules to identify the needs of the community.

Taking into account the tools used by the past researchers in the field, the investigator selected questionnaires to assess the knowledge and needs of rural adults in different areas of environmental education.

4.02 Description of Questionnaires:

Webster (1961) defines questionnaires as "a written or printed form used in gathering information on some subject or subjects consisting of a list of questions to be submitted to one or more persons."

According to Goode and Hatt (1952, p.33), "the word questionnaire refers to a device for securing answers to questions by using a form which the respondent fills in himself."

Barr et al (1953, p.65) defined questionnaire as "a systematic compilation of questions that are submitted to a sampling of population from which information is desired."
4.03. Development of Questionnaires:

For preparation of questions, relevant literature has been collected by the researcher. A number of standard books, journals were also carefully studied for the selection of the items. Experts in the field were consulted. The questionnaire contains questions given under eleven areas namely 1. Air pollution, 2. Water pollution, 3. Noise pollution, 4. Energy, 5. Forests, 6. Mines and dams, 7. Land pollution, 8. Population explosion, 9. Environmental sanitation, 10. Food issues and 11. Environmental legislation. These 11 areas adequately cover the scope of environmental education.

The questionnaire for testing knowledge was constructed with multiple choice questions. Utmost care was taken in the development of questions. The following points were kept in mind while developing the questions as suggested by Bajpai (1966).

1. The questions should be few, short, clearly worded, simple and easy to reply.

2. They should be within the scope of the informational scope of the respondent.

3. Tabulation plan must be kept in mind while framing the questionnaire.
4. Questions should have a direct bearing, upon the problem.

5. Questions should be inter-related with each other so that the sequence may be maintained.

6. The question should be thorough and no place for any doubt should be allowed

7. The change from one topic to another should be very smooth.

The need assessment questionnaire contains the same number of statements as in knowledge test with three alternative responses viz., necessary, uncertain and unnecessary. The questions found in the test for knowledge are altered into statements which facilitate any one of the three responses.

The investigator had framed the questionnaires both to test knowledge and need level in Telugu language as the respondents are not familiar with English language.

4.04 Pilot Study:

The pilot or preliminary form of the questionnaires developed were administered by the investigator on a sample of 10 respondents from each group (Adult education learners, adult education volunteers, non-formal education instructors,
elementary school teachers, health workers, anganwadi workers, village development officers, village sarpanchas, organised and unorganised workers. The objectives of the pilot study were:

1. To find out whether the items included in the questionnaire were relevant, easily understood and direct.

2. To find out whether each of the items listed in the preliminary form was marked.

3. To find out whether the directions in the questionnaire were clear and pointed and

4. To find out the adequacy of items to cover the objectives of the study

At the end of the pilot study, the objectives of the pilot study were checked with reference to the data gathered. Many respondents answered well. The items answered by less than 10 per cent of the respondents were rejected and the items answered by 10 per cent of the respondents and more were selected for inclusion in the final questionnaires.

4.05 The Final form of the Questionnaires:

For the final study, the items spread under different areas of environmental education in the knowledge as well as need assessment questionnaires are given below:
Table 1: The Number of Items spread under each area of Environmental Education, in the Knowledge as well as Educational Needs Questionnaires

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Name of the area in the knowledge and Educational need</th>
<th>No. of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Air pollution</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>Water pollution</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>Noise pollution</td>
<td>18</td>
</tr>
<tr>
<td>4</td>
<td>Energy</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>Forests</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>Dams and Mines</td>
<td>7</td>
</tr>
<tr>
<td>7</td>
<td>Land pollution</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>Population explosion</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>Environmental sanitation</td>
<td>11</td>
</tr>
<tr>
<td>10</td>
<td>Food issues</td>
<td>6</td>
</tr>
<tr>
<td>11</td>
<td>Environmental legislation</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td><strong>Total:</strong></td>
<td><strong>106</strong></td>
</tr>
</tbody>
</table>

The final forms of the knowledge and need assessment questionnaires in English version and Telugu version were given in Appendices.

4.06 **Validity of the Questionnaire:**

The validity of the questionnaire must be established prior to its use, for validation is an aspect of its development and not of its use in the solution of the problem.
It should also be noted that invalidity is not restricted to the instrument itself. Face validity and content validity of questionnaires were established.

a) Face validity:

It is necessary for any questionnaire to have face validity i.e., each question must be related to the topic under investigation. Lindquist (1966, p.672) says "a test is face valid if it looks valid particularly if it looks valid to layman." When the questionnaire was shown to a few lay persons, who had no knowledge of construction of questionnaire and also not convergent with the subject matter, they felt that it measures the knowledge and educational needs of rural adults in environmental education. From this point of view, it may be said that the questionnaires have face validity.

b) Content validity:

Content validity indicates how adequate is the content of a questionnaire. To restore this type of validity to the questionnaire, an attempt was made to see that all aspects of environmental education were covered with adequate number of items included under each aspect of the questionnaire. The preparation of questionnaire items was preceded by a thorough and systematic examination of literature related to the
problem areas. Experts were also consulted. The questionnaire items were reviewed in the light of the suggestions of the experts for content adequacy and accuracy. In view of these, it may be said that the questionnaires possess content validity.

4.07 Reliability of Questionnaires:

There are four different methods of estimating the reliability coefficients for a test, viz. 1. Test-retest method, 2. parallel forms method, 3. the split-half method and 4) the method of 'Rational equivalence'. In this study, the investigator used test-retest method, with a gap of 15 days, to establish the reliability. The test-retest reliability found was 0.8 for knowledge questionnaire and 0.85 for the need questionnaire. The questionnaires have high reliability.

4.08 Sample of the Study:

The total sample comprised of 600 respondents, from the 10 groups of rural adults i.e., adult education learners, adult education volunteers, non-formal education instructors, elementary school teachers, anganwadi workers, health workers, village development officers, village sarpanches, organised and unorganised workers at the rate
of 60 members from each group. The required sample i.e., six persons from each group were selected at random from each mandal.

4.09 Locale of the Study:

The locale of the study is the Chittoor district of Andhra Pradesh. This district comes under Rayalasema region of Andhra Pradesh and it is agriculturally, economically and socially backward. The Chittoor district is comprised of 66 newly constituted mandals in three major Revenue divisions namely, Chittoor Revenue Division, Tirupati Revenue Division and Madanapalle Revenue Division.

For the purpose of the study, the investigator has selected 10 mandals out of 15 mandals from Tirupati Revenue division. The ten mandals covered in the study included - Tirupati Rural, 2) Chandragiri, 3) Renigunta, 4) Yarpedu, 5) Sri Kalahasti, 6) Thottambedu, 7) KVB Puram, 8) B.N.Kandriga, 9) Varadaiahpalem, 10) Satyavedu. All the mandals have more than 20 villages each and large number of rural adults. The map 1 indicates the Chittoor district and the mandals covered in the study.
4.10 Data Collection:

The required data were collected by the investigator from the respondents directly, through the questionnaires prepared for the purpose. The investigator collected data through interview technique from the adult education learners and unorganised workers as they could not write the answers.

The rest of respondents were handed over the questionnaires and then collected by the investigator. No time limit was set up for the respondents.

4.11 Scoring the Questionnaires:

For scoring the knowledge and need assessment questionnaires, the following procedure was adopted. The knowledge items were given 1 mark for right response, and 0 for wrong one. The need assessment items were scored as 2, 1 and 0 for necessary, uncertain and unnecessary responses respectively.

4.12 Statistical Techniques used in the Study:

To know the knowledge in all the areas of environmental education puttogether and in each area, mean and standard deviation were calculated. To know the significant differences in the knowledge in all the areas of environmental education puttogether and also in each area
among different categories of rural adults, Anova was used. The same techniques were used to know the educational need in all the areas of environmental education put together and in each area as well as significant differences.

When Anova test indicates the differences, then t-test was employed to identify, where exactly the difference exist.

One of the major objectives of the study is to identify the priority items of different categories of respondents under each area of environmental education. In this study, knowledge of the respondents is also considered along with the expressed educational need to identify the priority items in each area of environmental education.

The respondents may lack knowledge, but still they do not feel the necessity of knowledge in environmental education. Some may have knowledge, but yet they may like to update their knowledge. Some others may not have knowledge, but they may feel the need to know it. There is no guarantee that the respondents who do not know really feel the need for knowing. So while studying the educational needs, it is equally important to keep in view the knowledge level as well as need aspect while identifying the priority items.

In order to find out the priority items under each area of environmental education based on knowledge and
educational needs, the investigator has taken up item-wise analysis.

In the first stage, the mean values for each category of respondents under each area of environmental education have been calculated. To identify the priority items under each area, the ranges of scores obtained on knowledge as well as educational need of that area were taken into consideration. Based on the range of knowledge level, the respondents have been divided into three groups namely: low knowledge group, average knowledge group and high knowledge group.

Similarly, the need level has been divided into three groups namely: low need group, average need group and high need group.

For example, in air pollution area, the minimum and maximum knowledge scores obtained by the adult education learners are 0.00 and 0.87 respectively. So the range between groups is 0.87/3 = 0.29. Based on the range, the three knowledge groups are as follows:

- Low knowledge group = 0.00 - 0.29 range
- Average knowledge group = 0.30 - 0.58 range
- High knowledge group = 0.59 - 0.87 range
Similarly in the case of need also the minimum and maximum need scores obtained by the adult education learners are 0.23 and 2.00 respectively. So the range between groups is 1.77/3 = 0.59. Based on the range, the need groups are as follows:

Low need group = 0.23 - 0.81  
Average need group = 0.82 - 1.40  
High need group = 1.41 - 2.00

The same procedure was adopted to categorise the groups in each area of environmental education.

In the second phase, the priority items of each category of respondents under each area of environmental education were divided into three categories based on the following criteria, taking into account of both knowledge and needs.

The first priority items were those items with:

1. Low knowledge and high need,
2. Average knowledge and high need, and
3. High knowledge and high need

The second priority items were those items with:

1. Low knowledge and average need,
2. Average knowledge and average need, and
3. High knowledge and average need
And finally, the third priority items were those items with:

a) Low knowledge and low need,
b) Average knowledge and low need, and
c) High knowledge and low need.

Thirdly, the items are presented in ascending order in each category under each of the area of environmental education based on the scores of felt needs.

Based on the above criteria, the priority items of each category of respondents under each area of environmental education were identified and presented.

The data were presented, analysed by using appropriate statistical techniques and objective-wise conclusions were drawn. The results of the study are found in the succeeding chapter.