

CHAPTER 3
METHODOLOGY

The entire chapter presents two aspects of procedures adopted to carry out the research; one, the cognitive aspect consisting of the objectives of the present study and second, the logical aspect including identification of population, selection of the sample, preparation, pretesting, finalization of research instruments and statistical computation for analysis of the research data.

Cognitive Aspect:

The study was conducted with the following objectives:

1. To find out the knowledge of all levels of extension functionaries of the four Eastern states of India and the country of Bangladesh independently in relation to the following selected aspects of population education:
 - Meaning and scope of population education.
 - Factors leading to population increase.
 - Problems due to increase in population.
 - Methods of educating people to adopt small family norm.
 - Ways to limit the family size, and
 - Role of extension functionaries in imparting knowledge of population education.
2. To find out the relationship between the levels of

knowledge possessed by extension functionaries at all levels of the four Eastern states of India and the country of Bangladesh and selected personal and professional variables such as age, religion, size of the family, type of the family, education, professional training and income.

3. To find out the differences in levels of knowledge of extension functionaries at all levels among the four Eastern states of India and the country of Bangladesh regarding the following aspects of population education:
 - Meaning and scope of population education.
 - Factors leading population increase.
 - Problems due to increase in population.
 - Methods of inducing people to adopt small family norm.
 - Ways to limit the family size.
 - Role of extension functionaries in imparting population education.
4. To find out the differences in levels of knowledge of extension functionaries at all levels between India (four Eastern states) and Bangladesh.
5. To find out the differences between the levels of knowledge of extension functionaries of all levels of the four Eastern states, of India and Bangladesh with reference to selected personal and professional

variables like age, religion, size of the family, type of the family, education, professional training and income.

6. To find out the attitudes of extension functionaries of the four Eastern states of India and Bangladesh towards the selected aspects of population education:
 - Meaning and scope of population education
 - Factors leading to population increase
 - Problems due to increase in population
 - Methods of educating people to adopt small family norms
 - Ways to limit the family size
 - Role of extension functionaries in imparting population education.
7. To find out the relationship between attitudes of all levels of extension functionaries of the four Eastern states of India and Bangladesh and certain personal and professional variables such as age, religion, size of the family, type of the family, education, professional training and income.
8. To find out the differences between the attitudes of extension functionaries at all levels among the four Eastern states of India and the country of Bangladesh with reference to the selected aspects of population

education.

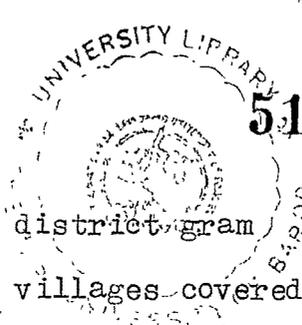
9. To find out the relationship between the knowledge and attitude of extension functionaries at all levels of the four Eastern states of India and Bangladesh.
10. To develop a curriculum or to modify the existing curriculum for teaching population education during the course of pre-service and in-service training of these extension functionaries of both the countries.

Logical Aspect

3.1 Determination of Population and Sample of the Study:

The population for the study comprised of extension functionaries working at state, district, training centres, block and at village level of the four Eastern states of Bihar, West Bengal, Meghalaya and Tripura and the country of Bangladesh, at the time of study.

Information regarding number of districts, number of blocks and villages covered by these blocks in India were collected from the Census Reports of India, 1971, census reports of states of 1971 and the Indian Statistical tables, whereas the list of gram sevak training centres was collected from the Directorate of Extension Training, Ministry of Food and Agriculture, Shastri Bhavan, New Delhi personally by the investigator in May 1980.



Information regarding number of states, district, gram sevak training centres, number of blocks and villages covered by these blocks in Bangladesh and also information regarding the number of extension functionaries working at each of these levels was collected through FAO/UNDP project (BGD/79/034) office, Dhaka and the Directorate of Agriculture Extension and Management based at Dacca in the month of May 1980.

The total population of extension functionaries working at all levels in the four Eastern states of India and Bangladesh were 10757 and 4945 respectively, of which 922 (8.57%) and 862 (17.43%) constituted the samples of the study. Out of this due to practical difficulty of travelling into the interior, non-availability of these extension functionaries at their head quarters inspite of prior intimation, and due to not returning the questionnaires by some of the extension functionaries even though personal requests were made, data could actually be collected only from 747 extension functionaries (81.01%) of the original sample, from the four Eastern states of India and 671 extension functionaries (77.84%) of the original sample from the country of Bangladesh. (Refer Table 3 and 4).

A multi-stage purposive cluster sampling method was used to select the sample of the study. The percentage of sample included in the study varied from 4 to 100% depending

Table 3. Existing Number of Extension Functionaries in the Four Eastern States of India and Proposed Number to be included and Actual Number and Percentage from which the Data were collected.

State/ Country	Level	Existing Number	Proposed Number	Actual Data Collected from Number	Percentage of Respondents	Total	Percentage
BIHAR	V.E.A.	5870	293	241	82.25	332/399 = 83.20802	
	B.D.O.	587	60	60	100.00		
	I.S.	28	14	14	100.00		
	D.E.O.	31	31	16	51.61		
	Director Agriculture	1	1	1	100.00		
MEGHALAYA	V.E.A.	240	120	99	82.50	133/154 = 86.363636	
	B.D.O.	24	24	24	100.00		
	I.S.	7	4	4	100.00		
	D.E.O.	5	5	5	100.00		
	Director Agriculture	1	1	1	100.00		
TRIPURA	V.E.A.	170	98	40	40.81	65/123 = 52.8455	
	B.D.O.	17	17	17	100.00		
	I.S.	7	4	4	100.00		
	D.E.O.	3	3	3	100.00		
	Director Agriculture	1	1	1	100.00		
WEST BENGAL	V.E.A.	3350	168	142	84.52	217/246 = 88.211382	
	B.D.O.	335	30	30	100.00		
	I.S.	63	31	31	100.00		
	D.E.O.	16	16	13	81.25		
	Director Agriculture	1	1	1	100.00		

Table 4. Existing Number of Various Level of Extension Functionaries in Bangladesh and Proposed Number to be included and Percentage from which the Data were collected.

Levels	Existing Number	Proposed Number to be Included	Actual number Data Collected from	Percentage of Respondents
V.E.A.	4350	550	389	70.72
B.D.O.	450	225	198	88.00
Instruc- tional staff	121	63	63	100.00
D.E.O.	20	20	18	90.00
Director of Agri- culture	4	4	3	75.00

upon the size of the state and number of extension functionaries.

3.2. Research Instruments

As the study aimed at investigating two major variables - knowledge and attitudes, separate instruments were prepared for collecting the information regarding the knowledge and attitudes of extension functionaries of the four Eastern states of India and the country of Bangladesh regarding selected aspects of population education.

Construction of Research Instruments

Instrument for knowledge test

After reviewing all the available relevant literature to which the investigator had access and various sessions of discussion with the experts and research fellows in the research area items of knowledge tests were constructed.

The content from which the items for the tool were made, comprised of - meaning and scope of population education (including demography); factors like social, educational, economic, religious, cultural, physiological, physical, and psychological, responsible for population increase; problems of land and food, housing conditions and health, employment and family; methods like lecture, demonstration, discussion, exhibition, film shows that could be used to

educate people regarding adoption of small family norm, ways to limit the family size; and role of extension functionaries in imparting population education.

The structure of questions on knowledge were in the form of multiple choice (36), true and false (82) and agree-disagree (14) (yes/no). There were in all 132 questions.

Construction of attitude scale

To formulate the statements for attitude test, relevant literature was referred and experts in the subject were consulted, and a Likert type attitude scale consisting of 122 items was prepared.

The response elicited on each statement were on the five points:

- S.A. : Strongly Agree
- A. : Agree
- U.D. : Undecided
- D.A. : Disagree
- S.D.A. : Strongly Disagree

3.2.1 Validity of Knowledge Test and Attitude Scale

To assess the validity of both the instruments used for data collection, method of logical validation and jury opinion (Good and Hatt, 1952, p.237) were employed. The jury was formed of experts from the Faculty of Home Science, M.S.

University, Baroda; National Council of Educational Research and Training, New Delhi; Department of Extension, Gujarat Agricultural University, Anand; Department of Health, Civil Hospital, Ahmedabad; Directorate of Extension, Ministry of Food and Agriculture, Shastri Bhavan, New Delhi; National Institute of Union Co-operative, New Delhi; and Center of Advance Studies in Education, M.S. University, Baroda. The questionnaire (both knowledge test and attitude scale) were discussed with all the experts, personally and their suggestions incorporated. After finalising the questions and items both the questionnaire were then again given to the experts from Faculty of Home Science, Center of Advance Studies in Education, M.S. University, Baroda and Department of Extension, Gujarat Agricultural University, Anand.

The experts were requested to check both the questionnaires regarding:

1. Adequacy of the content and statements keeping in view the objectives and purpose of study.
2. Clarity in comprehension of items.
3. Consistency of ideas in each section and sub-section.

Only a few changes were suggested by the jury, which however, were induced in the questionnaires.

3.3 Pre-testing of Knowledge test and Attitudes scale

Both the questionnaires testing the knowledge and attitudes of extension functionaries regarding the selected aspects were then pre-tested with 55 extension functionaries from the Baroda district of Gujarat. The respondents for pre-test were mainly from Padra, Karjan, Vaghodia, Sankheda and Savli for block levels, from Karjan and Padra for village level and from Baroda district for the district level.

The data for pre-testing were collected personally by the investigator on two occasions of the cluster meeting of the extension functionaries of the aforesaid blocks and district, which was held on Friday, 18th September and 25th September 1981. Information from the district extension officers were collected during the period from 18th to 28th September 1981.

Analysis of Pre-test Data

After collecting the filled in questionnaires for pre-test the responses were scored, frequencies tabulated and percentages were calculated and t and r tests results were computed.

3.3.1 Reliability of Knowledge Test

To test the reliability of knowledge items, split half method was used as it was found to be the only suitable appropriate and possible method from the point of view of

availability of respondents. Keeping the circumstances in mind and to increase the reliability of the test in consultations with experts from statistics, section-wise reliability was calculated.

Sections which were comparable in content and difficulty level were merged together and then split into two halves with even numbers on one side and odd numbers on the other.

The formula (Garret, p.142) used for calculating reliability of half test was:

$$r = \frac{\sum XY - NM_x Y_x}{\sqrt{(\sum X^2 - NM_x^2)(\sum Y^2 - NM_y^2)}}$$

and to calculate the r for the whole test the formula (Garrett, p.339) used was:

$$r_{II} = \frac{2r \frac{1}{2} \frac{1}{II}}{1 + r \frac{1}{2} \frac{1}{II}}$$

(Spearman Brown Prophecy formula for estimating reliability from two comparable halves of a test).

Where r_{II} = reliability coefficient of the whole test, and

$r \frac{1}{2} \frac{1}{II}$ = reliability coefficient of the half-test

Table 5. Section-wise reliability value for knowledge test.

Sections	r test
Meaning and scope of population education.	.78
Factors responsible for increase in population.	1.00
Problems due to increase in population.	.76
Methods of limiting family size.	.74
Ways to educate people regarding adoption of small family norms	.80
Role of extension functionaries in imparting information regarding population education.	.88

Finally as no changes were needed in the knowledge test it was retained as it was.

3.3.2. Item Analysis for the Attitude Scale

The attitude scale consisted of 122 statements in a combination of both positive and negative statements. To finalise the attitude scale, it was administered to the same 55 extension functionaries to which the knowledge test was administered. Respondents were requested to opine on a five point continuum and a score of 5, 4, 3, 2 and 1 was given for a positive statement which was reversed for the negative statement.

Positive statement	SA 5	A 4	UD 3	DA 2	SDA 1
Negative statement	SA 1	A 2	UD 3	DA 4	SDA 5

The response of each respondent was scored for each section which were summed up to get the total score. Each respondent's scores were then arranged in descending order from highest to the lowest. Fifty percent of the respondents, high and low achievers, consisting of 25% from the higher limit and 25% from the lower limit were identified and t values were calculated to find out the difficulty index. The scores of these high and low achievers were used to calculate the t for all 122 statements.

The formula (Edward, p.153) used for computing t was:

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\left(\sum (X_H - \bar{X}_H)^2 + \sum X_L - \bar{X}_L \right)^2}{N \times N - 1}}}$$

Statements with t value of more than 1.78 were retained (see Appendix C). The final scale testing the attitudes consisted of 83 items, as 39 items (31.96%) had to be rejected.

3.3.3. Reliability of the Attitude Scale

The reliability of the scale was established by Split-half method. The entire scale with 83 items were divided in to two, with even numbers on one side and odd on the other.

The formula (Garrett, p.339) used for calculating r was for half test:

$$r \frac{1}{2} \frac{I}{II} = \frac{\sum XY}{\sqrt{(\sum X^2) (\sum Y^2)}}$$

and for calculating whole test was:

$$r_{II} = \frac{2r \frac{1}{2} \frac{1}{II}}{1 + r \frac{1}{2} \frac{1}{II}}$$

Table 6. Section-wise reliability for attitude scale.

Sections	r of test
Meaning and scope of population education.	.64
Factors responsible for population growth.	.78
Problems due to increase in population.	.64
Methods of limiting family size.	.54
Ways to educate people regarding adoption of small family norms.	.72
Role of extension functionaries in improving information regarding population education.	.59

In attitude scales there were 83 items to be responded on a continuum of 5 point scale, which was finally used for the purpose of data collection.

3.4 Procedure of Collection of Data

The study comprised of a survey of knowledge and attitudes of extension functionaries towards population education.

Though the techniques applied for collection of data were questionnaire method, it was quite a challenge to collect the data from extension functionaries as they are apathetic to reply and research queries either by post or even in person. It was decided to travel and collect the data personally by the investigator to induce the respondent and to ensure that the questionnaires were filled in sincerely. Thus the researcher travelled to as many as possible places in West Bengal, Meghalaya and Bangladesh. It was not possible to reach some of the interior places in Bihar and Tripura from security point of view and physical inaccessibility. Help was sought from Professors of Agricultural Universitys and Principals of Gram Sevak Training Centers in Bihar and district extension officers and 2 block development officers of Tripura.

Prior to the time of data collection letters were written to Directors of Agriculture on 16th October, 1981 to seek the permission to collect the data from their respective states and the country.

A letter of introduction dated 23rd October, 1981 from the Director of Extension Training, Ministry of Food and Agriculture, Shastri Bhavan, New Delhi, and from Professor and Head of Home Science Education and Extension Department, M.S. University of 7.11.1981 were carried in person to seek all possible local help to facilitate and speed up the

collection of data.

The data were collected during November 9th, 1981 to February 6th, 1982 personally by the investigator from the four selected states and from the country of Bangladesh.

The percentages of data collection from the four Eastern states were 81.01 and from Bangladesh were 77.84. Further to make it easier and ellicit the response the questionnaires were translated into Bengali and were explained verbally in Hindi according to the need of the respondents.

3.5 Analysis of Data

After the data collection, each questionnaire on knowledge and attitude was scored with the help of a pre-formulated key. Scores were then tabulated. These tabulated data were then punched on cards and fed to the computer for processing. The complex data were computerised and the remaining of the analyses were done by the investigator herself. The tests were carried out on the M.S. University Computer Center.

Table 7. Para-Metric and Non-Parametric Tests used
for the Analysis of the Data.

Statistical Test	Formula used for Computation of the Test
Mean	$M = \frac{\sum X}{N}$
Median	$Mdn = 1 + \left[\frac{\frac{N}{2} - F}{f_m} \right] i'$
Percentages	The standard method
Chi-square	$\chi^2 = \frac{(fo - fe)^2}{fe}$
t-Test	$\frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{(\bar{X}_1 - \bar{X}_2)^2 + (X_2 - \bar{X}_2)^2}{n(n-1)}}$
Product moment correlation	$r = \frac{\frac{\sum X^1 Y^1}{N} - C_x \times C_y}{\sqrt{O^1_x \times O^1_y}}$

The above cited tests were used to find out the general characteristics of respondents, their levels of knowledge and degree of favourableness, attitudes, relationship with selected personal and professional variables, and to find out the differences among the states and countries.

1. Mean scores on aspects and sub-aspects were calculated for knowledge and attitude independently.
2. According to percentages and degree of favourable attitudes levels of knowledge on aspects of population education were determined.
3. Chi-square tests of association between the level of knowledge and the selected personal and professional characteristics were computed.
4. Chi-square test of association between the degree of favourable attitude and personal and professional characteristics were computed.
5. Tests of significance of difference between the level of knowledge amongst the extension functionaries of the four Eastern States of India and between the country of Bangladesh and India were calculated.
6. Tests of significance of difference between the degree of favourable attitude amongst the extension functionaries of the four Eastern states of India and between the country of Bangladesh and India also were calculated.
7. Product moment correlations were calculated between knowledge and attitudes at all levels of extension functionaries of the four Eastern states of India and the country of Bangladesh.

The findings and the interpretation are presented in Chapter 4.