

CHAPTER III

RESEARCH METHODOLOGY

A brief description of the procedures and methods adopted in the present study has been presented in this chapter under the following heads and subheads:

- 3.1 Locale of the study
- 3.2 Selection of variables
- 3.3 Concepts, operational definition, and measurement of variables
- 3.4 Construction of tools and techniques of data collection
- 3.5 Formulation of hypothesis
- 3.6 Statistical analysis and interpretation of data

3.1 Locale of the study

The present study was conducted in Assam and Karnataka. The area of investigation has been shown in Fig 3.1 (a) and 3.1 (b). The district describes the following subheadings.

Lakhimpur district was selected from the Assam state based on a purposive selection where sericultural activities are carried out more. Lakhimpur is situated on the North-East corner of Assam and at the north bank of the river Brahmaputra. The district lies between 26° 48' and 27° 53' northern latitude and 93° 42' and 94° 20' east longitude approx. It is bounded on the north by Siang and Papumpar district of Arunachal Pradesh and the East by Dhemaji district and Subansiri River. The river Brahmaputra along with Majuli district stands on the southern side and the Gulapuri sub-division of Biswanath district was on the west Fig. 3.1 (a). Lakhimpur district has a population of 1,042,137 of which males and females are 5,29,674, and 5,12,463. The average literacy rate of Lakhimpur is 83.10 per cent.

Chikkaballapur district was selected from the state of Karnataka based on purposive selection, where sericultural activities are more involved. The district of Chikkaballapur is approximately 56km from Bengaluru, the silicon plateau of India. It lies between 13.4355° N and 77.7315° E. Chikkaballapur has a high elevation located in the center of the Nandi Hills region. "Panchagiri" is a common descriptor of Chikkaballapur as it is surrounded by 5 picturesque hills among which Nandi Hills is the famous one (The

five hills are known as Nandi Giri, Chandra Giri, Skansagiri Giri, Bramha Giri, Hema Giri)
Fig. 3.1 (b).Chikkaballapur district contains a population of 1,255,104 out of which male
and females are 6, 36,437, and 6, 18,667. The average literacy rate is 69.72 percent.

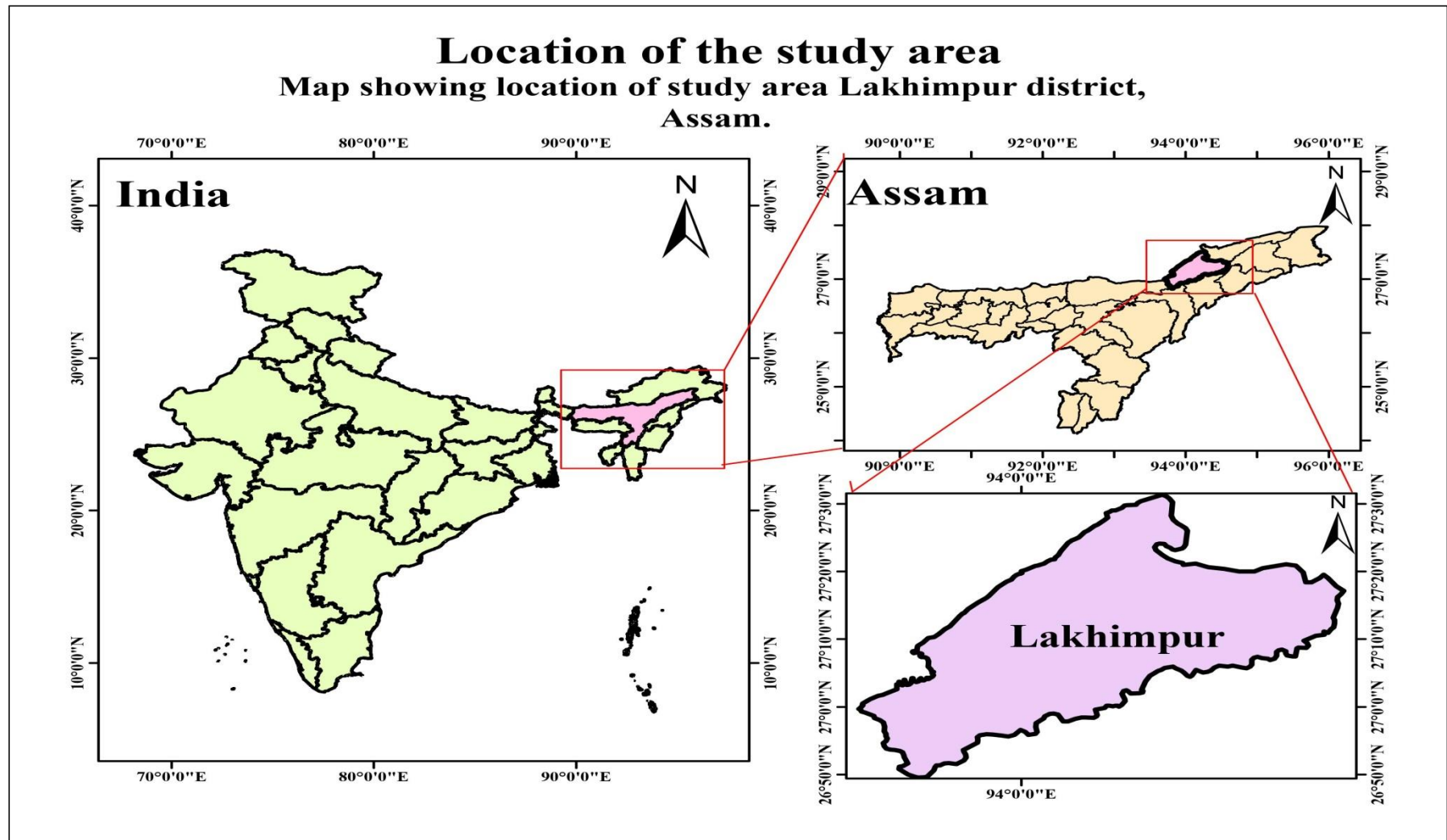


FIG. 3.1 (a): MAP OF THE STUDY AREA SHOWING LAKHIMPUR DISTRICT

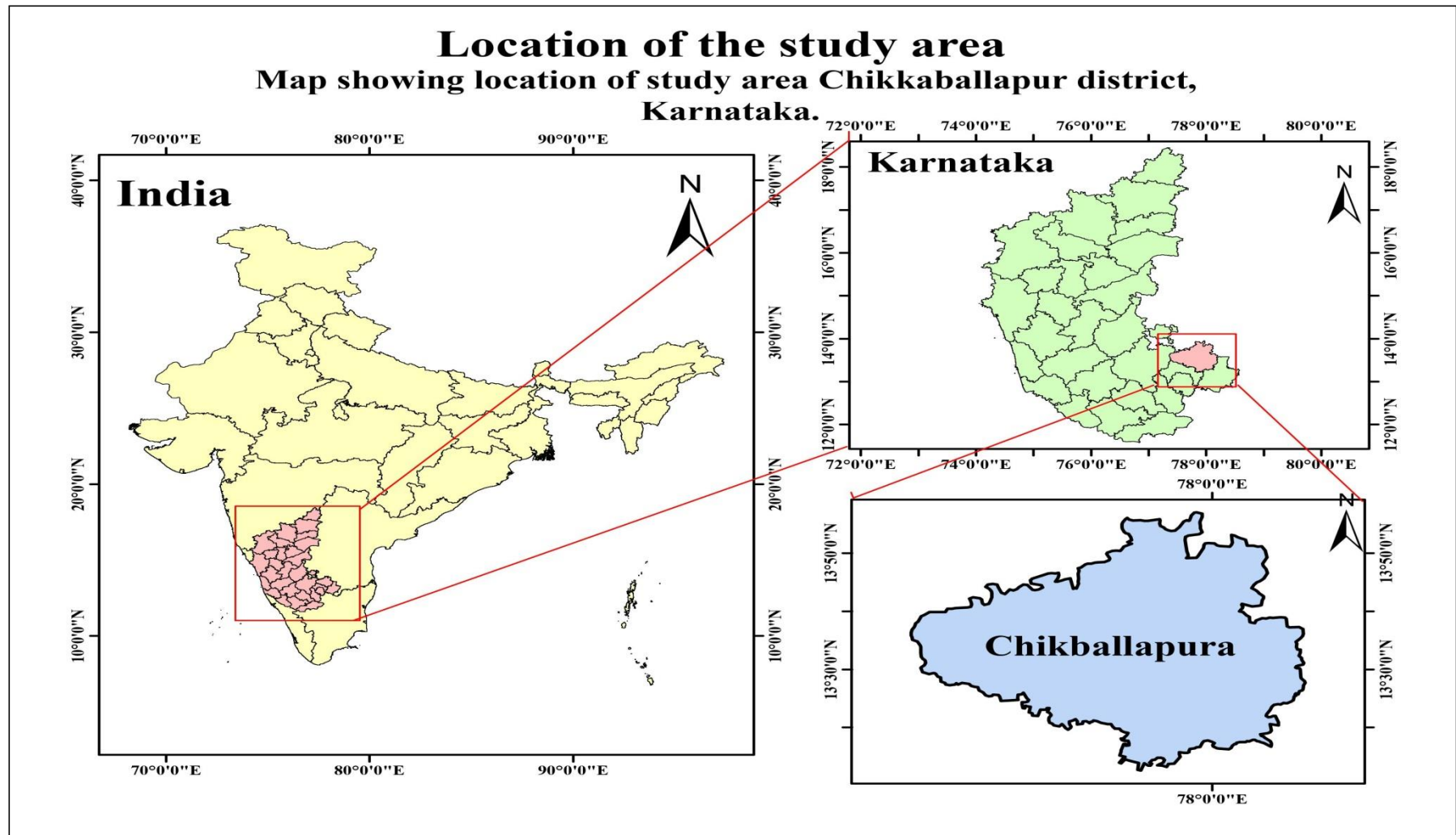


FIG.3.1 (b): MAP OF THE STUDY AREA SHOWING CHIKKABALLAPUR DISTRICT

3.1.1 Sampling design

In the present study, a purposive cum random sampling design was followed. The sampling plan is presented in (Fig. 3.1.1) and the sampling procedure is described in the following heads.

3.1.2 Selection of the districts

Lakhimpur and Chikkaballapur district were selected purposively from both the states of Assam and Karnataka, respectively based on raw silk production data.

3.1.3 Selection of the blocks/taluks

Three representative development blocks/Taluks were selected from each selected district purposively where sericulture activities were more and they were:

1. Telahi dev. block/taluks, Lakhimpur, Assam
2. Boginodi dev. block/taluks, Lakhimpur, Assam
3. Dhakuakhana dev. block/taluks, Lakhimpur, Assam
4. Chintamani dev. block/taluks, Chikkaballapur, Karnataka
5. Chikkaballapur dev. block/taluks, Chikkaballapur, Karnataka
6. Shidlaghatta dev. block/taluks, Chikkaballapur, Karnataka

3.1.4 Selection of the villages

Two villages from each selected developmental blocks/Taluks were selected randomly. They were:

1. Gohain Tekela and Majorguri from Telahi dev. block/taluk, Lakhimpur, Assam
2. Gagoldubi Majgaon and Gagoldubi Borhelia from Boginodi dev. block/taluk, Lakhimpur, Assam
3. Bantow and Katharbari from Dhakuakhana dev. block/taluk, Lakhimpur, Assam
4. Bommekallu and Jangama Shigehalli from Chintamani dev. block/taluk, Chikkaballapur, Karnataka

5. Keshwara and Yelehalli from Shidlaghatta dev. block/taluk, Chikkaballapur, Karnataka
6. Ramachandra Hosuru and Jatwara Hosahalli from Chikkaballapur dev. block/taluk, Chikkaballapur, Karnataka

3.1.5 Selection of the respondents

To obtain information and responses for the present study, 10 silkworm rearers were selected randomly from each selected villages, thus the total number of respondents for the present study were 120.

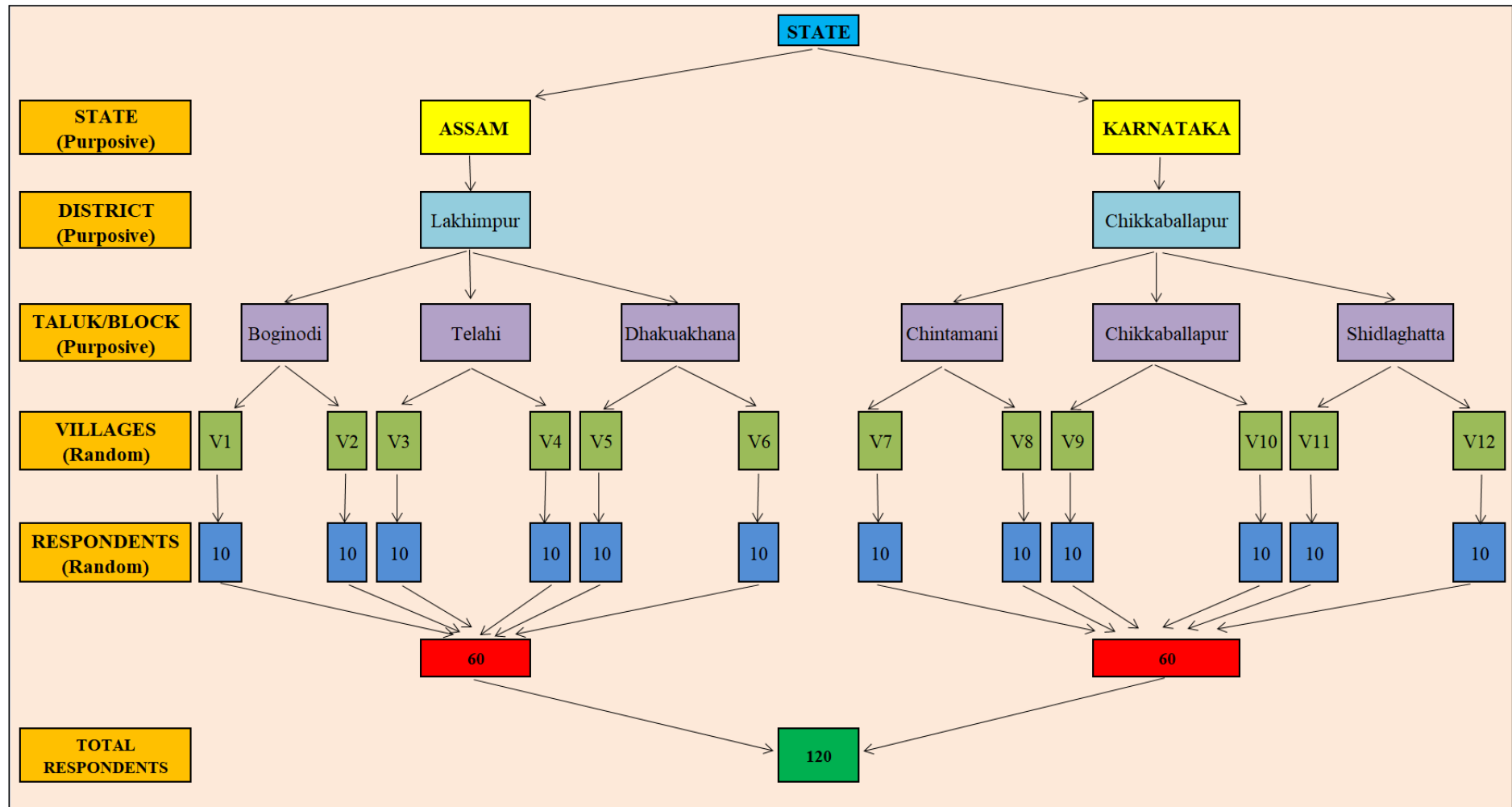


FIG.3.1.1: SAMPLING PLAN FOR THE STUDY

3.2 Selection of variables

Keeping in view the objective of the study and after consulting relevant literature available to the investigator, members of the advisory committee, the following variables were selected for the present study.

A. Independent variables

1. Age
2. Educational level
3. Farming experience
4. Family size
5. Labour availability within the household
6. Size of operational landholding
7. Annual family income
8. Farm equipment availability
9. Extension contact
10. Membership in the farming organizations
11. Extent of communication channels used for collecting information
12. Training exposure
13. Knowledge level of the farmers about host plant cultivation and silkworm rearing

B. Dependent variable

1. Level of satisfaction of the silkworm rearers

C. Descriptive variable

1. Problems and difficulties faced by the silkworm rearers to adopt improved technologies of silkworm rearing practices recommended by the State Department of Sericulture.

3.3 Concepts, operational definition, and measurement of variables

A concept expels an abstraction formed by generalization from particulars. Sometimes variables selected for the study are abstract or conceptual. To make these variables clear understandable and measurable for the study, it is necessary to operationally define and explain them.

An operational definition is the standardization of definitions for measuring the particular research problem. It may also be conceptualized as the manipulated form of definition that is meant for measuring the things in research. In this study, all the included variables were operationally defined, conceptualized, and measured as presented below.

A. Independent variables

1. Age

Age refers to the chronological age of the respondents expressed in terms of years completed at the time of the interview, each completed year was considered as one score on this variable.

The following categories were made to see the distribution of age of the respondents:

Sl. No.	Category	Completed years
1	Young	18- 35 years
2	Middle	36-55 years
3	Old	Above 55 years

2. Educational level

It refers to the formal education qualification possessed by the silkworm rearers at the time of investigation.

Based on educational level, the respondents were categorized and scores were assigned by following the procedure:

Sl. No.	Category	Score
1	Up to primary school	1
2	Up to middle school	2
3	Up to high school	3
4	Higher secondary and above	4
5	Graduate and above	5

3. Farming experience

It refers to the total number of years accomplished by the silkworm rearers in raising the host plants and rearing of silkworms in his own/leased land at the time of interview. The experience of the silkworm rearers in years at the time of investigation was considered as the response of the farmers, and then the respondents were categorized into

three groups by using the procedure adopted by the Venkataramaiah (1983) with suitable modifications as follows:

Sl. No.	Category	Range
1	Low farming experience	Below 10 years
2	Medium farming experience	Between 10-25 years
3	High farming experience	Above 25 years

4. Family size

It refers to the number of members in a silkworm rearer's family including the children. Head count of the total number of family members was considered.

Based on the number of family members of the respondents, they were categorized as small size family, medium-size family, and large size family. The categories were as follows:

Sl. No.	Category	Range
1	Small family	Less than 4 members
2	Medium family	4-6 members
3	Large family	More than 6 members

5. Labour availability within the household

It refers to total number of adult members available in the family who could engage as family labour in silkworm rearing.

It is the total number of male and female family members who are above 18 years were engaged as the family labour in silkworm rearing. A score of one was assigned to each member of the family.

Based on the score obtained the number of the family members engaged as labour was categorized as follows:

Sl. No.	Category	Score
1	Low (<4)	1
2	Medium (5-7)	2
3	High (>8)	3

6. Annual family income

This variable was operationalized as the actual income of the respondent summed up for the whole year from sericulture, agriculture and other allied activities.

The annual family income of the respondents, the family was obtained in rupees and it was categorized into three groups based on the range of income. The results were expressed in the form of frequencies and percentages at the time of presentation of findings.

Sl. No.	Category	Range
1	Low income	$\bar{X} - SD$
2	Medium income	$\bar{X} \pm SD$
3	High income	$\bar{X} + SD$

7. Size of operational land holding

It is the total cultivable land possessed by the respondent. It refers to the cultivable land, owned and leased by respondents in terms of a hectare.

After obtaining data, the selected respondents were categorized based on mean and standard deviation as given below:

Sl. No.	Category	Range	Score
1	Marginal farmer	0-1 ha	1
2	Small farmers	1-2 ha	2
3	Semi medium farmers	2-4 ha	3
4	Medium farmers	4-10 ha	4
5	Large Farmers	>10 ha	5

8. Farm equipment availability

It refers to the total number of farm equipments and types of machinery available to the farmer.

The classification was according to the total number of machinery or machines owned, owned in groups, rented, and shared with other implements. The total percentage of farmers with owned, owned in groups, rented, and shared with other implements were calculated.

Sl. No.	Category	Score
1	Owned	4
2	Owned in group	3
3	Hired	2
4	Shared (with other implement)	1

Based on the score obtained by the respondents, they were categorized into the following three categories:

Sl. No.	Category	Range
1	Low	$\bar{X}-SD$
2	Medium	$\bar{X}\pm SD$
3	High	$\bar{X}+SD$

9. Extension contact

It refers to the frequency of contact between the respondents and extension personnel's like Sericultural Extension Officers (SEO), Village-Level Extension Worker (VLEW), Sericulture Demonstrator or Sericulture Inspector (SD/SI), Krishi Vigyan Kendra (KVK), Central Silk Board (CSB Scientists), NGO's and private extension personnel's, within a specified period shown in the bellow table:

Sl. No.	Category	Score
1	Frequently (15 days interval)	3
2	Often (30 days interval)	2
3	Seldom (60 days interval)	1
4	Never	0

Based on the score obtained by the respondents, they were categorized into the following three categories by using the procedure adopted by DasGupta (1989) with the suitable modifications as shown below:

Sl. No.	Category	Range
1	Low	$\bar{X}-SD$
2	Medium	$\bar{X}\pm SD$
3	High	$\bar{X}+SD$

10. Membership in the farming organization

Socio-politico participation was operationalized as the degree of involvement of the respondents in terms of their membership or organization position and active participation in the meetings of NGOs, SHGs, Farmer's Cooperatives, Farmers Associations, and other organizations. The variable was measured using the procedure followed by Trivedi (1963) with suitable modifications. The respondents were asked to indicate their responses and a score of 1 was given to the member of the farming organization and 0 was given to non-member of the farming organization.

Similarly, their participation in the farming organization was taken by a three-point continuum of regularly, occasionally, and never. A score of 3 was given to regularly, 2 to occasionally and 1 was given to never.

Sl. No.	Category	Score
Membership position		
1	a) Member	1
	b) Non- member	0
Participation in the meetings of the institution		
2	a) Regular	3
	b) Occasionally	2
	c) Never	1

11. Extent of communication channels used for collecting information

Communication channels used for collecting information was operationalized as the extent of exposure of respondents to the mass media such as radio, television, newspapers, agricultural books, information material, and farm magazines, etc. The mass media exposure was quantified as per the procedure followed by Seshachar (1980) with suitable modifications.

Sl. No.	Category	Score
1	Most regular	3
2	Regular	2
3	Not regular	1
4	Never	0

The total score of a respondents based on the frequency of exposure to each media was calculated by adding the score under each item. Based on the scores obtained by respondents they were grouped into three categories based on mean and standard deviation.

Sl. No.	Category	Range
1	Low	$\bar{X} - SD$
2	Medium	$\bar{X} \pm SD$
3	High	$\bar{X} + SD$

12. Training exposure

Training is teaching or developing any skills and knowledge, or fitness that relate to specific useful competencies. Training has specific goals of improving silkworm rearer's capability, capacity, productivity, and performance.

Based on the number of days a person has undergone any kind of training related to sericulture and other activities, the respondents were grouped as follows:

Sl. No.	Category	Range
1	Low	Below 7 days
2	Medium	Between 7-14 days
3	High	Above 14 days

13. Knowledge level of the farmers about host plant cultivation and silkworm rearing

The knowledge level was measured by employing a knowledge test. The test contains 20 items. A score of one was given to the corrected response and zero was given to the incorrect responses. The total scores arrived at the 20 items become the knowledge of the respondents. To draw meaningful inferences percentage analysis was used. Based on the score obtained, the respondents were categorized as follows:

Sl. No.	Category	Range
1	Low	$\bar{X} - SD$
2	Medium	$\bar{X} \pm SD$
3	High	$\bar{X} + SD$

B. Dependent variable

1. Level of satisfaction of the silkworm rearers from sericultural extension services

The satisfaction level of the silkworm rearers is the extension service providers are charged with a responsibility to ensure farmers are satisfied with the services being delivered.

In this study farmers' satisfaction was the people's response towards the extension services.

Farmers' satisfaction regarding the extension services was measured by using the structured schedule of silkworm rearers, which consisting of statements which were prepared after thorough discussion with experts in the respective field.

The research schedule consists of 15 statements which include the farmers' satisfaction level of silkworm rearers, the statements were categorized into 5 continuum strongly agree, agree, undecided, disagree, and strongly disagree.

The maximum and minimum one could get on the satisfaction of silkworm rearers were 5 and 0 respectively. All the score obtained for each respondent was summed up and categorized based on their mean and standard deviation bellow:

Sl. No.	Category	Range
1	Low	$\bar{X} - SD$
2	Medium	$\bar{X} \pm SD$
3	High	$\bar{X} + SD$

C. Descriptive variable

1. Problems and difficulties faced by the silkworm rearers to adopt improved technologies of silkworm rearing practices recommended by the State Department of Sericulture

It refers to the various obstruction/ hindrances encountered by farmers in availing various services provided by the state department of sericulture. A list of different issues was prepared and the responses were sought in an open-ended manner.

3.4 Construction of tools and technique of data collection

3.4.1 Tools of data collection

Keeping in view, the objective of the present study, a research schedule was prepared for data collection. The research schedule in this study consisted of both semi-structured and open-ended questions which consisted of four parts. The first part of the schedule was designed to collect the general information of the respondents. The second was independent variables viz., age, educational level, farming experience, family size, labour availability within the household, annual family income, size of operational land holding, farm equipment availability, extension contact, , membership in the farming organization, extent of communication channels used for collecting information, training exposure, and knowledge level of the farmers. Third part was designed to collect the level of satisfaction of silkworm rearers. The fourth part was problems faced by the silkworm rearers.

3.4.2 Pre testing of schedule

The research schedule prepared for the study was pre-tested with a sample of 10 farmers from non-sample areas and necessary modifications were made.

3.4.3 Technique of data collection

From Assam, the data were collected from the respondents by investigator himself through personal interview method in the residence of the respondents. Thus relevant data were collected with the help of questions contained in the research schedule.

3.4.4 Period of data collection

The personal interview was conducted during the period of April to May, 2021 in Assam and during May to June, 2021 in Karnataka.

3.5 Formulation of hypotheses

A set of explicit hypotheses were formulated for testing the present study. Depending upon the theoretical supports, the relationships have been predicted in stating the alternative hypotheses. The hypotheses assumed herein were the verbal statements by null hypothesis (H_0) along with their alternative hypothesis (H_1). Based on available theoretical supports, the directions of relationships were predicted in stating the alternative hypothesis. For the present investigation 13 hypotheses were tested which are given below:

H_0 1: There is no significant difference between age and level of satisfaction of silkworm rearer's of Assam and Karnataka.

H_0 2: There is no significant association between educational qualifications of the farmers and level of satisfaction of silkworm rearer's of Assam and Karnataka.

H_0 3: There is no significant difference between farming experience of the farmers and level of satisfaction of silkworm rearer's of Assam and Karnataka.

H_0 4: There is no significant difference between family size and level of satisfaction of silkworm rearer's of Assam and Karnataka.

H_0 5: There is no significant difference between labour availability within the household and level of satisfaction of silkworm rearer's of Assam and Karnataka.

H_0 6: There is no significant difference between annual family income and level of satisfaction of silkworm rearer's of Assam and Karnataka.

H₀ 7: There is no significant difference between size of operational land holding and level of satisfaction of silkworm rearer's of Assam and Karnataka.

H₀ 8: There is no significant difference between farm equipment availability and level of satisfaction of silkworm rearer's of Assam and Karnataka.

H₀ 9: There is no significant difference between extension contact and level of satisfaction of silkworm rearer's of Assam and Karnataka.

H₀ 10: There is no significant association in membership in farming organizations and level of satisfaction of silkworm rearer's of Assam and Karnataka.

H₀ 11: There is no significant difference between the extent of communication channels used for collecting information and level of satisfaction of silkworm rearer's of Assam and Karnataka.

H₀ 12: There is no significant difference between training exposure and level of satisfaction of silkworm rearer's of Assam and Karnataka.

H₀ 13: There is no significant difference between knowledge level of the silkworm rearers and level of satisfaction of silkworm rearer's of Assam and Karnataka.

3.6 Statistical analysis and interpretation of data

1. Frequency distribution

In the present study, number of observations or frequency (*f*) was used to know the distribution pattern of the respondents according to the objectives under study.

2. Percentage

“The percentage is the number, amount, rate etc., expressed as if it is a part of total which is 100”. It is denoted by the per cent sign ‘%’. It was used in this study for the categorization of silkworm rearers. Also used in response analysis of satisfaction level of silkworm rearers.

$$\text{Percentage (\%)} = \frac{X}{N}$$

Where,

X= frequency of respondents

N= total number of respondents

3. Mean

It is defined as the sum of all values of the observations divided by the total number of observations. Symbolically it is represented as \bar{X}

$$\text{Means } (\bar{X}) = \frac{\sum X}{N}$$

Where,

\bar{X} = Arithmetic Mean

$\sum X$ = Summation of observed value

N = Total number of observations

4. Standard deviation

To find out the extent of variability shown by the variables, i.e. the dispersion of the variables around the mean and standard deviation (SD) was used. It is positive square root of the mean of the squared deviations taken from arithmetic mean. It is represented by symbol ' σ '.

$$SD (\sigma) = \sqrt{\frac{1}{n} \left[\sum x^2 - \frac{(\sum x)^2}{n} \right]}$$

Where,

$\sum x^2$ = Sum of squares of observations

$(\sum x)^2$ = Square of sum of 'x' values

n = number of observations

5. Pearson's correlation

This test was used to study the relationship between the scores of independent variables and the scores of dependent variables. It measures the degree of relationship between the two sets of variables.

$$r = \frac{\sum xy - \frac{\sum x \sum y}{n}}{\sqrt{\left[\sum x^2 - \frac{(\sum x)^2}{n} \right]} \sqrt{\left[\sum y^2 - \frac{(\sum y)^2}{n} \right]}}$$

Where,

r = Correlation coefficient

Σx = Sum of scores of independent variables

Σy = Sum of scores of dependent variables

Σx^2 = Sum of the squares of scores of an independent variables

Σy^2 = Sum of the squares of scores of a dependent variable

Σxy = The sum of productivity of x and y

n = Size of the sample

6. Chi-square test

Chi-square (χ^2) test was used to find out the association between the qualitative independent variables (having nominal and ordinal scale) and dependent variables. Chi-square (χ^2) test was used to analyze the test of independence, i.e. whether one factor is independent of the other or not.

The formula of Chi-square (χ^2) test is:

$$\chi^2 = \sum \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

Where,

O_{ij} Observed frequencies of ij^{th} cell of contingency table

E_{ij} = Expected frequencies of ij^{th} cell of contingency table

r = Number of rows of contingency table

$$E_{ij} = \frac{\text{Marginal total of } i^{\text{th}} \text{ row frequency} \times \text{Marginal total } j^{\text{th}} \text{ column frequency}}{n}$$

Where,

n = total number of respondents

7. Independent t-test

The t score is also associated with a p value, which tests for statistical significance. The p value assesses how likely we would obtain this dataset by chance, if the null hypothesis were true. The lower the p value, the less likely it is that the null hypothesis is true. Typically, our alpha level, the threshold for statistical significance was set at 0.05. So, if our p value is below 0.05, then we reject the null hypothesis.

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}\right)}}$$

Where,

\bar{X}_1 = Mean of sample 1

\bar{X}_2 = Mean of sample 2

n_1 = total number of sample in sample 1

n_2 = total number of sample in sample 2

S_1^2 = sum squares of sample 1

S_2^2 = sum squares of sample 2