CHAPTER III
METHODOLOGY
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Methodology

3.1 The Exploratory Research Question

What is the present contribution and status of women in the farming sector in the state of Sikkim?

3.2 Objectives of the Study

The main objectives of the research work include:

3.2.1 To assess the following parameters:-

(a) Land/cattle possession and their ownership by the Sikkimese female farmers.
(b) Decision making rights viz-a-viz use of land, plants and livestock.
(c) Employment intensity (Number of hours worked/day).
(d) Access to production resources, inputs, credit and technology of rural female farmers of Sikkim.
(e) The gender participation in crop production and animal husbandry and related activities in the rural area of Sikkim in North-Eastern India.

3.2.2 To assess their views on farming/family roles, integrated farming, Value addition and technology.

3.2.3 To assess their indigenous knowledge related to their farms/animals.

3.2.4 To assess the tangible and intangible contribution they are making to the State.

3.3 Scope of the Study

3.3.1 The study covers Land/cattle possession and ownership status of farming females of Sikkim.

3.3.2 The study includes Decision making rights viz-a-viz use of land, plants and livestock of farming females of Sikkim.

3.3.3 The study includes participation of farming females of Sikkim in farm, animal and related activities.

3.3.4 The study includes Employment intensity (Number of hours/day) of farming females of Sikkim.
3.3.5 The study includes access of farming females of Sikkim to production resources and inputs.

3.3.6 The study has assessed their views on farming/family roles, integrated farming and value addition and technology.

3.4 Delimitations of the Study

Married females living in rural areas who do not participate in farm/animal activities are excluded from the study. Also the male farmers of the rural Sikkim are not the part of the study.

3.5 The Hypotheses

Women function in farms with considerable restrictions/limitations.

To achieve the objective of the research it is expected that following hypotheses may be accepted or rejected:

3.5.1 Property (land/cattle) Ownership Status of Female Farmers:

Hypothesis Statement – There is discrimination in ownership of property (land/cattle) by women.

Ho – Ownership of property (land/cattle) by women is not more than that of men.

Ha - Ownership of property (land/cattle) by women is more than that of men.

3.5.2 Land Status

3.5.2.1 Possession of Farms Sizes with Women

Hypothesis Statement – No more farming females of rural area possess large landholdings.

Ho – Possession of large landholdings by women is not more than that of smaller one.

Ha - Possession of large landholdings by women is more than that of smaller one.

3.5.2.2 Type of Land Holdings with Women

Hypothesis Statement – More no. of females cultivators rather than agriculture labours are there.

Ho – Females cultivators are not more than agriculture labours.

Ha – Females cultivators are more than agriculture labours.

3.5.3 Participation in Decision Making of Farm/Related Activities by Sample Farmers

Hypothesis Statement – Women are not consulted for decision making in farm, animal and related activities.
Decision making by women is not more in farm, animal and related activities. 

Ha - Decision making by women is more in farm, animal and related activities.

3.5.4 Female Farmers Participation in Farms

3.5.4.1 Gender Wise Participation

Hypothesis Statement – Participation in farm, animal and related activities by women is more than that of men.

Ho – Participation in farm, animal and related activities by women is not more than that of men.

Ha - Participation in farm, animal and related activities by women is more than that of men.

3.5.4.2 Employment Intensity

Hypothesis Statement – Women work for longer duration than men in farm, animal and related activities.

Ho – Working hours of women are not more in farm, animal and related activities than that of men.

Ha - Working hours of women are more in farm, animal and related activities than that of men.

3.5.5 Accessibility

3.5.5.1 Accessibility of farming females to Production Resources

Hypothesis Statement – There is discrimination in accessibility of farming females of rural area to production resources.

Ho - Accessibility of farming females of rural area is not more to production resources.

Ha - Accessibility of farming females of rural area is more to production resources.

3.5.5.2 Accessibility of farming females to Production Inputs

Hypothesis Statement – There is discrimination in accessibility of farming females of rural area to production inputs.

Ho - Accessibility of farming females of rural area is not more to production inputs.

Ha - Accessibility of farming females of rural area is more to production inputs.
3.5.5.3 Credit Status

**Hypothesis Statement** – Credit status of farming females of rural area is not as good as that of men.

**Ho** – No more number of farming females of rural area avail credit on their name for commercial purposes by using formal institution.

**Ha** - More number of farming females of rural area avail credit on their name for commercial purposes by using formal institution.

3.5.5.4 Awareness Regarding Technology and Government Policies

**Hypothesis Statement** – More farming females of rural area are not aware regarding Technology and Govt. policies.

**Ho** – Awareness regarding Technology and Govt. policies is not more of rural farming females.

**Ha** - Awareness regarding Technology and Govt. policies is more of rural farming females.

3.5.6 Assessment of Female Farmer’s Views on Farming/ Family Roles, Integrated Farming, Value Addition and Technology

**Hypothesis Statement** – More farming females of rural area hold the positive view for their participation in farming/ family roles.

**Ho** – no more number of sample female farmers hold the positive view for their respective participation in farming/ family roles.

**Ha** – more number of sample female farmers hold the positive view for their respective participation in farming/ family roles.

3.5.7 Looking After the Responsibilities of Children at Home

**Hypothesis Statement** – More farming females of rural area look after the responsibilities (nurturing, health, education, rituals ceremonies) of children at home.

**Ho** – no more number of sample female farmers looks after the responsibilities (nurturing, health, education, rituals ceremonies) of children at home.

**Ha** - more number of sample female farmers looks after the responsibilities (nurturing, health, education, rituals ceremonies) of children at home.

3.6 Nature of the Study

An empirical research is that which reports the results of a study that uses data derived from actual observation or experimentation. Empirical essentially means based on observation. This study is
empirical by nature, as the researcher is concerned to develop principles by arriving at generalizations and an aid to solve problems by improving knowledge, understanding skill and ability to make decisions.

3.7 Research Design

A research design is purely and simply the framework or plan for a study that guides the collection and analysis of the data. It is a blueprint that is followed in completing the study. This ensures that study remains relevant to the problem and employs economical procedures.

In essence exploratory studies are undertaken to better comprehend the nature of the problem where very few studies have been considered in the chosen area. Extensive interviews with many people are undertaken to get a handle on the situation and understand the phenomena. More rigorous research then proceeds. Some qualitative studies where data are collected through observation or interviews are exploratory in nature. Exploratory studies are also necessary when some facts are known but more information is needed for developing a viable theoretical framework. Therefore, after going through literature survey and the problem in detail, researcher thought that it was most feasible to use exploratory research design for the study. To a certain extent design has also been built around descriptive research, as the work required describing certain behaviours, strategies, beliefs etc. This research design has helped the researcher in enhancing familiarity with the problem under investigation and to clarify the concepts. It will help in finding out the new hypotheses that could be pursued by future researchers.

Basic methods of exploratory research are Literature Survey; Experience Survey; Analysis of Case Studies (Case studies have been a time tested research methodology. The researcher, for this research work also has attempted to find some good case studies that have failed or succeeded. This as well as literature survey has helped to propose model that would help planners and the government to make suitable policies). Interview schedule, was provided to the village heads. The female’s participation in farming sector in developing countries was also studied. All these methods, were useful for the research work, therefore were accepted as parts of the research design.

3.8 Universe or Population

The universe or population for the study consists of total number of married females in rural areas who are employed in farming in the state of Sikkim. This forms the pivotal point of the present research.
3.9 Sampling Frame

A sampling frame may be defined as the listing of the general components of the individual units that comprise the defined population. For this research work the sampling frame consist of four parameters, described as below:

### Table 3.1: Sampling Frame

<table>
<thead>
<tr>
<th>Districts/State</th>
<th>Circles</th>
<th>Revenue Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Sample</td>
</tr>
<tr>
<td>East</td>
<td>21</td>
<td>06</td>
</tr>
<tr>
<td>West</td>
<td>21</td>
<td>06</td>
</tr>
<tr>
<td>North</td>
<td>07</td>
<td>04</td>
</tr>
<tr>
<td>South</td>
<td>23</td>
<td>08</td>
</tr>
<tr>
<td>Sikkim</td>
<td>46</td>
<td></td>
</tr>
</tbody>
</table>

3.9.1 People: The people include all those married females who work in the farms of rural area of the state of Sikkim.

3.9.2 Area: The area includes the four districts of the State namely East, West, North and South. Thus farming females of all the four districts become the basis of the study.

3.9.3 Activities: Management and participation in farm, animal and related activities are considered to be looked into for the study.

3.9.4 Tools of the Study: Tools of the study include all those statistical methods used for studying the participation characteristics of females working in farming sector.

3.10 Sampling Method

Approach where only a few units of population study are considered for analysis is called sampling method. For the present study because of severe time, money and geographical constraints, census method was not feasible. Therefore, sampling method was the only option left with the researcher. Further there are two broad methods of sampling namely probability and non-probability. As researcher had some knowledge of type of female labour participation in farming sector, use of non-probability sampling rather than probability sampling method, was considered to be more appropriate. But at some stages probability Sampling methods were also followed. Sampling methods adopted are as follows:

3.10.1 Sampling Method for Selected Area of Study

Multi-stage stratified random sampling technique of probability method is used to select the population from circles, revenue blocks and villages, then a combination of Judgment, Convenience and Quota sampling techniques of non-probability methods is decided upon for this study. Non-probability methods are of three types, namely Judgment, Convenience and
Quota sampling. The state has only four districts; so, all of them have been taken for the study. Initially, under the multistage stratified random sampling technique- a selection of a tentative list of circles and revenue blocks from all the four districts was made followed by a selection of villages to be visited at the second and a selection of respondents at the final stage. A final list of the respondents from different farm households was prepared based on convenience and their accessibility to the researcher by stratified random sampling.

### 3.10.2 Sample Size

<table>
<thead>
<tr>
<th>District/State</th>
<th>Total area (sq.km)</th>
<th>% of total area</th>
<th>Population Concentration</th>
<th>% of total Population</th>
<th>Total* (irrigated+unirrigated) land</th>
<th>Total no. of circles</th>
<th>No. of circles sampled</th>
<th>No. of female sample farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>East</td>
<td>954</td>
<td>13.5</td>
<td>2,45,040</td>
<td>45.3</td>
<td>12,007.60 (23%)</td>
<td>21</td>
<td>6</td>
<td>80</td>
</tr>
<tr>
<td>West</td>
<td>1,166</td>
<td>16.5</td>
<td>1,23,256</td>
<td>22.8</td>
<td>12,552.95 (24%)</td>
<td>21</td>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td>North</td>
<td>4,226</td>
<td>59.5</td>
<td>41,030</td>
<td>07.6</td>
<td>4,846.81 (9%)</td>
<td>07</td>
<td>4</td>
<td>30</td>
</tr>
<tr>
<td>South</td>
<td>750</td>
<td>10.5</td>
<td>1,31,525</td>
<td>24.3</td>
<td>17540.36 (34%)</td>
<td>23</td>
<td>8</td>
<td>60</td>
</tr>
<tr>
<td>Sikkim</td>
<td>7,096</td>
<td>100</td>
<td>5,40,851</td>
<td>100</td>
<td>51947.72 (100%)</td>
<td>72</td>
<td>24</td>
<td>230</td>
</tr>
</tbody>
</table>


Rural areas from all 4 districts of Sikkim have been selected. As is clear from the above table, though North district contains maximum area of the State i.e. almost 60%, but it holds only 7-8% of the population. On the contrary East district contains only 13% area of the State, but it holds maximum i.e. 45% of the population. So, for this study, maximum no. of females for data collection has been taken from East and minimum from North. Here the size of the sampling female farmers from each district is neither proportional to the minimum size of the sampling female farmers of the district nor in the same ratio as is the percentage ratio of each district to the total population of the state. But the sample size of each district is just an indicative of the reason of taking maximum/minimum sampling units from that area. A data collected from a total of 24 circles from all the four districts in Sikkim has been analysed. The district wise i.e. (East, West, North and South) distribution of circles selected is 6, 6, 4 and 8 respectively. A total of 80 females of farming community from East, 30 from North and 60 each from West and South districts have been interviewed. Data for 115 samples (50% of 230), has been collected by
the researcher herself, while for rest of 115 samples (40, 30, 15 and 30 from East, West, North and South respectively), has been collected through village heads by sending schedules to the village heads. Data thus collected from 230 females of the state, employed in farming sector has become the basis of the Primary Data analysis in this Study.

3.11 Sources of Data

There are two types of data available to a researcher, namely primary data and secondary data. In the proposed study the researcher has planned to use both types - secondary and primary data. Since the present study is the first of its kind and earlier research works are not available, therefore, the researcher has mainly relied on the primary data. However, the researcher has also exhausted the secondary data sources. Researcher has tried her best to use the secondary data in an effective manner to understand the frame, components and parameters of the problem undertaken.

The major secondary data sources which have been used by the researcher include reports, records, journals, state publications, professional publications, books, magazines, newspapers, websites etc. The researcher has also used primary data in order to fill the gaps and deficiencies and to update secondary data.

3.12 Data Collection Methods

For this research work, following methods of data collection have been used:

3.12.1 Secondary Data

Secondary information has been collected online, from magazine, journals and also from the libraries of Sikkim Manipal Institute of Technology, Majitar, Sikkim and Sikkim Manipal Institute of Medical Sciences, Gangtok, Sikkim. Besides this, data has also been collected from National Sample Survey Report, Census of India, relevant Central and State Government publications, Central and State agriculture, labour, women and child development department. In addition to this, the Krishi Vigyan Kendras (KVK), the “GB Pant Institute of Himalayan Environment and Development” (GBPIHED) located at Pangthang (Sikkim), ATMA (Agricultural Technology Management Agency in South and East districts) have been visited.
3.12.2 Primary Data

In order to collect qualitative data, three group discussion sessions were arranged separately in three villages namely (Syari, Sichey and Rawtey Rumtek); each group contained 10 participants. During these group sessions, several open-ended questions were asked from the respondents in order to collect deeper information about their accessibility to resources and their participation in different farms and the related activities along with many hidden facts and factors. Based on this information, the research instrument i.e. questionnaire containing dichotomous, multiple choice and open end questions was designed and a pre-test was conducted with 18 respondents for its necessary modification. It was then translated into Nepali also for the convenience of the farm population. Primary data was collected by researcher by visiting the farming females of rural area in Sikkim, using questionnaires. The primary data was collected between the months of March to September 2011 from all districts of Sikkim.

3.13 Data Analysis

As the nature of data collected is non-metric which is also referred as qualitative data, the ordinal scale of measurement is taken into account for access of a rural woman to productive resources, in decision making of different activities and to understand their views concerning different question which have direct bearing with the topic. Nominal scale of measurement is taken into account for their participation in farm, animal and related activities, ownership of livestock and land, credit status, education level, home responsibility status and membership status of any rural institution, in selecting a statistical tool and techniques for hypotheses testing.

Data has been analysed using the Statistical Package for the Social Science (SPSS) and some descriptive statistics, such as percentage, mean, standard deviation (SD), coefficient of variation (CV) and rank were used for descriptive interpretation of the data.

Access of a rural woman to productive resources and their participation in decision making of farm, animal and related activities has been measured using a five-point Discrete rating scale with a weight of 1 representing ‘no/poor access and no/poor decision making’, 2 for ‘rare access and rare decision making’, 3 for ‘sometimes access and sometimes decision making’, 4 for ‘frequent access and frequent decision making’ and 5 for ‘always access and always decision making’. Finally, a rank order has been developed based on mean score obtained for each item. The accessibility and decision making is considered - ‘no/poor accessibility and no decision
making’ with mean score values ranging from 1-1.50, ‘limited’ for 1.50-2.50, ‘good’ for 2.50-3.50, ‘better’ for 3.50-4.50 and ‘best’ for 4.50-5.50. Factor analysis of the data on production resources and decision making has also been done using Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett’s test of sphericity.

Ten-point Discrete rating scale with a weight of 1 to 10 has been used to analyse their views concerning different question which have direct bearing with the topic.

There is only one sample in the study. Also the study contains ordinal and nominal level data which can be analysed using parametric statistics; therefore One-Sample ‘t’-test for inferential interpretation of the data has been run to understand the nature of relation between the variables.

- **Inferential Analysis**

One-sample t- statistic for each sample has been conducted to test the entire hypothesis. The t column in all the one-Sample t-test tables displays the observed t statistic for each sample, calculated as the ratio of the mean difference divided by the standard error of the sample mean.

The column labelled Sig. (2-tailed) displays a probability from the t distribution with 229 degrees of freedom df, calculated as (n-1). The value listed is the probability of obtaining an absolute value greater than or equal to the observed t statistic, if the difference between the sample mean and the test value is purely random. The Mean Difference is obtained by subtracting the test value from each sample mean. Test statistic represents the value pertaining to both. More than this value means female dominance and less than this means male dominance.

The 95% Confidence Interval of the Difference has been taken. It provides an estimate of the boundaries between which the true mean difference lies in 95% of all possible random samples of 230 females. At this level if value of ‘t’ is less than 1.96 and is also negative, then our null hypothesis is accepted else alternate hypothesis is accepted. For the inferences of the hypotheses, Information from literature survey has also been taken to support some assumptions.

Test statistic 2 has been used for inferential analysis of gender wise participation in farm and related activities of sample female farmers and ownership of livestock. It represents Participation/ownership of both (male and female). More than 2 mean female Participation/ownership and less than 2 means male Participation/ownership. 1.5 has been used for inferential analysis of credit status. Test statistic 3 has been used for inferential analysis of access and decision making in farm and related activities of sample female farmers. It represents sometimes access and decision
making by women. More than 3 means frequently/always and less than 3 means never/rarely access and decision making by women.

Farm women according to their socio-economic characteristic have also been studied. This has been analysed with SPSS. Cross-tabs tool of descriptive statistics in SPSS, using percentage for cells has been used to analyse for conclusion.

The Seven Steps followed for Hypothesis Testing –

Step 1     Set null and alternative hypothesis  
Step 2     Determining the appropriate statistical test  
Step 3     Setting the level of significance  
Step 4     Setting the decision rule  
Step 5     Collecting the sample  
Step 6     Analysing the data  
Step 7     Arriving at a statistical conclusion

3.14       Chapter of the Thesis are as under:

Chapter I  : Introduction  
Chapter II : Literature Survey  
Chapter III : Methodology  
Chapter IV : Result Analysis and Findings  
Chapter V  : Conclusion and Recommendations

3.15       Need of the study

3.15.1     For better understanding of policy implications of women empowerment

The researcher got motivated to choose this topic after going through the swelling literatures on empowerment of women and with voluminous amount of public expenditure on women empowerment schemes. It becomes imperative on the part of the researcher to understand the concept of empowerment of women in the farming sector of Sikkim State so as to have a better understanding of its policy implications.

3.15.2     To provide a basis for overcoming gender discrimination

India is famous as a great country of many cultures, traditions, religions and geographical characteristics. However, at the same time, India is also known as patriarchal nation. So, gender
equality plays a crucial role in uplifting the status of a woman to a great extent, which is very crucial in the era of revolutionary technological environment.

3.15.3 To highlight the invisible contribution of rural females so that it gets counted

The researcher found in the literature review that in rural India though the contribution of females in farm/animal and the related activities is enormous, but still invisible and does not get counted for. Due to this they have to face several challenges. This in turn limits the role of women to drudgery prone, unskilled activities forcing them to have poor socio-economic condition. The researcher also found in the literature review that rural women throughout the developing nations are having almost the same state of participation as well as the socio-economic condition. Hence, in order of study in detail the socio-economic condition of rural women and the activities they perform, the researcher has selected one of the North-Eastern States of India i.e. Sikkim. After analysing their present socio-economic state, the researcher will try to make a fair endeavour to suggest some points for the upliftment of the socio-economic condition of the women. The researcher also believes that the suggestions given for them are universal in improving the socio-economic condition of rural women facing such problems.

3.15.4 To consolidate social science information in the state of Sikkim

The place researcher selected for study is particularly important because social science research in the state of Sikkim is inadequate despite several incentives provided by the state. There are many reasons for this - including the fact that English education started off late and there are no secondary and senior secondary boards in Sikkim and the State is fully dependent on Central Boards. Very few scholars from North Bengal University and other universities have undertaken research on the socio-political and economic aspects of Sikkimese women.