Chapter 1

Introduction and Methodology

1.1 Introduction

Development of a country does not only refer to the development of infrastructure, innovations and technology but it is actually related to the development of each and every citizen in terms of their quality of life. A country will move on the development path if all the citizens are involved in the development process and enjoy good standard of living by having access to basic amenities of life such as food, clothing, housing, health, clean water, education, employment and good natural and social environment. But, if the people of a country are poor they will think about earning their livelihood only and their inclusion in the progress of nation will be miles away.

India is a developing country in which about 30 per cent of its total population still lives below poverty line. The poor population is mainly concentrated in rural areas. These poor people are malnourished and most of them are unemployed. Therefore, poverty alleviation has remained the major focus for development practitioners since the independence of India. A number of initiatives have been taken from time to time by the government to alleviate poverty. In the development strategy adopted up to 1980s, institutional credit was considered as a powerful instrument for enhancing production and alleviating poverty. It was thought that lending to the poor should be a part of the normal business of banks. The strategy devised for this purpose was comprised of the expansion of the institutional structure, directed lending to the priority sector and subsidised interest rates to the poor. A multi-agency approach was adopted for delivering credit to the rural poor people. The institutional vehicles chosen for this purpose were co-operative banks, commercial banks and regional rural banks. The nationalisation of fourteen major commercial banks in 1969 and another six commercial banks in 1980 and the setting up of regional rural banks in 1975 enabled the creation of an extensive financial infrastructure for taking banking to the far-flung rural areas. The extensive bank branch network was expected to meet the financial needs of the entire rural population. Besides, various institutional and policy measures were taken to attack India’s rural poverty, a number of direct wage-employment programmes were launched to improve
the income of the poor people. In addition, self-employment programmes were also encouraged through subsidised credits to support productive asset creation. Some of these wage and self-employment programmes were: 20-Point Programme, National Rural Employment Programme, Rural Landless Employment Guarantee Programme, Jawahar Rozgar Yojana, Employment Assurance Scheme, Food for Work Programme, Sampoorna Gramin Rozgar Yojna, Integrated Rural Development Programme, Development of Women and Children in Rural Areas, Training of Rural Youth for Self-Employment, Supply of Improved Tool Kits to Rural Artisans, Swarnjayanti Gram Swarojgar Yojana etc.

However, these programmes could not achieve the expected results. Although the share of formal financial sector in total rural credit increased progressively from 8.8 per cent in 1951 to 53.3 per cent in 1991 but it was found that the rural banks served only the needs of comparatively rich rural borrowers instead of the deserving poor (Basu and Srivastava, 2005). This was mainly due to the reason that the lack of collateral makes the poor people not-bankable. Rural Finance Access Survey 2003 indicated that 70 per cent of marginal/landless farmers did not have a bank account and 87 per cent did not have any access to credit from a formal source. The financial sector developed in India by the end of 1980s was largely supply and target driven. Sheokand (2000) and Basu & Srivastava (2005) in their studies of Indian formal banking system found inadequacies in rural access to formal finance. Fisher and Sriram (2002) explained some of the following reasons responsible for the limited success of formal banking system to provide credit to the rural poor:

- The high transaction cost of lending to the small borrowers and the low interest rates affected profitability and viability of financial institutions.
- The focus was on giving credit only rather than providing other financial services such as savings and insurance also.
- The emphasis was on achieving certain quantitative targets as a result, inadequate attention was paid to the qualitative aspects of lending.
- As most of the programmes were subsidy-based, so these faced the problems of political interferences, corruption and low recoveries. The focus on outreach at the expense of prudent lending practices led to very high default rates with accumulated losses.
Due to certain political motives governments resorted loan wavering which led to loan defaults and erosion of repayment ethics by all categories of borrowers. The end result was an alarming growth in overdue, which hampered the recycling of limited resources of banks. The rural bankers developed an attitude that the poor are non-bankable and commercial principles cannot be applied in lending to the poor. Similarly wage-employment and asset owning schemes also served limited purpose and their success was also partial. A number of studies found that the government initiated subsidy and grant based anti-poverty programmes failed to reach the target poor people. Different evaluation studies found various drawbacks of these schemes. The studies by Fisher & Sriram (2002) and Meyer (2002) found that the poverty alleviation programmes were politically motivated and suffered from high default rates; Gaiha et al. (2001) reported mistargeting in the selection of beneficiaries; Pulley (1989) found the lack of repeated lending to the beneficiaries; Singh (2003) reported leakages and misappropriation of funds; and Government of India (1985) found improper selection of beneficiaries, lack of coordination among various agencies and violation of programme guidelines. A study by Saxena and Ravi (2007) stated that subsidy element has led to large-scale corruption on the part of lower level functionaries who certified non-eligible aspirants to get benefits of the programme. Even when the poor are selected, there is often no intention on their part to start income generating activities but only subsidy is the main attraction, which leads to loan repayment problems.

Once again, there was a need for an innovative programme for credit which must be collateral free, flexible and must fulfil the needs of underprivileged classes. It was also realised that majority of the poor people are women but they were ignored by most of the programmes, so they remained laggard and less participative in poverty alleviation processes. It was understood that unless this section is provided opportunities to improve their condition, the poverty alleviation efforts are bound to fail and the development would be imperfect. As a result, the developing countries including India prioritised the combined goal of poverty alleviation and women empowerment among their development plans. Moreover, alleviating extreme poverty, gender equality and women empowerment were specified as important targets to be achieved under the Millennium Development Goals [1] set by World Bank and Organisation for Economic Co-operation and Development in 2000.
In such an environment microfinance emerged all over the world as an innovative scheme of lending to the poor people, especially women. Under this programme collateral free small loans are given to a group of poor people who make savings regularly. The whole group remains responsible for the repayment of the loan and the peer pressure within the group helps the successful and timely repayment of the loans. These loans may be used for starting some income generating economic activities to create self-employment. These small loans are known as micro-credit, whereas microfinance is a broader term and it provides not only micro-credit but also savings, insurance and some other non-financial services such as guidance and motivation to start income generating activities, occupational training and product marketing facilities etc. In this programme, lending to the groups result in low transaction costs and high loan recovery rates which makes this programme profitable for lending institutions and is helpful for sustainability of the programme. These loans are flexibly used. These are provided primarily for income generation activities, but these can also be used for consumption and contingency needs. The microfinance programme provides a model of development that is based on bottom up approach. Groups emerge locally with the efforts of members and enable the borrowers to improve their situation through their own efforts, rather than relying on external development strategies. Moreover, rather than wage-employment the programme promotes self-employment which leads to sustainable reduction in poverty. These unique features led to the worldwide acceptance of programme as an important development tool. According to the United Nations Secretary-General, Kofi Annan (2002),

“Microcredit is a critical anti-poverty tool – a wise investment in human capital. When the poorest, especially women, receive credit, they become economic actors with power. Power to improve not only their own lives but, in a widening circle of impact, the lives of their families, their communities, and their nations.”

The steadily growing popularity of microfinance led to reach of this programme in many developing countries all over the world. The United Nations proclaimed 2005 as the year of Micro-credit to globally promote the benefits and potentials of microfinance as means to fight poverty. In 2006, Muhammad Yunus, founder of microfinance programme in Bangladesh and the Grameen Bank were awarded the Nobel Peace Prize for their efforts in the economic and social development of poor people.
In India, microfinance programme was formally initiated by National Bank for Agriculture and Rural Development (NABARD) in 1992; and now it is the world’s largest microfinance programme in terms of its client outreach. The programme, in India, was originated and developed in the Southern region and it started in other regions at later stage, mainly in the present decade. Microfinance in India is mainly provided through Self-Help Groups (SHGs), Microfinance Institutions (MFIs) and some other methodologies. The network of many financial institutions like public and private sector commercial banks, co-operative banks, regional rural banks and MFIs is used to provide microfinance to the poor people.

Microfinance programme claims to provide the poor an access to capital and give them opportunities to climb the economic ladder. In order to find the impact of microfinance programme, impact assessment studies have been done by many authors in different countries like Bangladesh, India, Pakistan, Nepal, Thailand, Ghana, Rwanda, Peru and many other countries of South Asia and Africa. These impact studies give the effect of the microfinance programme at the individual and household level of the participants on their level of income, level of employment, ownership of productive assets, access to education, health, food and clean water, ability to participate in decision-making and access to social networks. There are various studies which conclude that microfinance programme has a significant positive impact in increasing self-employment and reducing poverty. However, some other studies show that microfinance is not an effective tool to eliminate poverty and generating employment.

Hossain (1988) in the study of Bangladesh; Todd (2001) in the study of Andhra Pradesh; Chen and Donald (2001) in their study of SEWA Bank in Ahmedabad; Chowdhury et al. (2005) in study of Bangladesh; and Kabeer & Noponen (2005) in the study of PRADAN in Jharkhand of India have confirmed that microfinance programme has resulted in reducing poverty and the participants enjoyed higher standards of living. The non-income indicators show that programme beneficiaries spend greater income on food, child education, health and household improvements as compared to the non-beneficiaries. Singh (2001) in a study of Uttar Pradesh; Banu et al.(2001) in a study of Bangladesh; Raghavendra (2001) in a study of Karnataka; MYRADA (2002) in a study of southern India; Puhazhendhi & Badatya (2002) in a study of eastern India; Gaonkar (2001) in a study of Goa; Misra (2006) in a study of western and central parts of India; and Hoque (2008) in a study of Bangladesh conclude that group loans have reduced the
dependence of the beneficiaries on money-lenders; and the participant households are able to face financial crisis through their own savings and group loans. Develtere and Huybrechts (2002) in their study of Bangladesh; Swain (2007) in a study of five Indian states; and Hoque (2008) in a study of Bangladesh conclude that microfinance programme has succeeded in reducing consumption as well as income vulnerability. Littlefield et al. (2003) explained that microfinance programme is helpful in attaining millennium development goals by reducing poverty, hunger, infectious diseases and through empowering women. Khandker et al. (1998) and World Bank (1999) in their studies of Bangladesh; Sarangi (2007) in a study of Madhya Pradesh; and Borbora & Mahanta (2008) in a study of Assam report that microfinance programme participants are engaged in gainful micro-enterprises. They shifted from wage-employment and are mainly self-employed in non-farm activities. There are a number of studies which explain that microfinance programme has led to higher levels of women empowerment. Hashemi et al. (1996); and Yunus & Jolis (1998) in their studies of Bangladesh; Puhazhendi and Satyasai (2000) in a study of eleven Indian states; Manimekalai and Rajeswari (2001) in a study of Tamil Nadu of India; Puhazhendi and Badatya (2002) in a study of eastern India; Tracey et al.(2006) in a study of Rajasthan in India; and Sharma (2007) in a study of Nepal conclude that the participation in the programme has led to greater levels of women empowerment in terms of increase in knowledge, self-confidence, economic, social and political awareness, mobility, development of organisational skills etc. It is also found that the members in the older (mature) groups are more benefited as compared to the new members.

However, some of the studies, such as Morduch (1998) in a study of Bangladesh, and Coleman (1999) in a study of Thailand find no significant impact of the programme in generating income and in reducing poverty. Misra (2006) in a study of western and central part of India shows that loans from the microfinance programme are mainly used for non-income generating activities such as consumption and other emergency needs. Amin (1993) and White (1995) in their studies show that the participant women have a limited or no control over the loan use and loans are utilised by other male members of the family. Some other studies, Develtere & Huybrechts (2002) in a study of Bangladesh and Sarangi (2007) in a study of Madhya Pradesh, find that very poor people or the people at the lower end of income distribution are excluded from the microfinance scheme. On the other hand some studies indicate that microfinance programme has

In this way, the literature available on microfinance does not provide any clear idea about the impact and success of microfinance programme. Thus, the impact of microfinance programme is still a debatable issue and there is a need to conduct impact assessment studies to evaluate the functioning of the programme and removing the shortcomings and problems in its way. A number of studies have been conducted in Southern region of India but there is a dearth of studies in Northern region. In Punjab, the programme was started in 1998-99, and no comprehensive study, by any researcher or government organisation, is available so far, which assessed the impact of microfinance programme in Punjab. The study in hand is a modest attempt to assess the impact of microfinance programme on poor people. In this study, the impact of microfinance programme has been assessed on poverty alleviation, employment generation and empowerment of women participants in rural areas of Punjab.

Microfinance is considered as a unique programme for helping the poor and empowering women. As the programme is different in structure and claims to reach the poor especially women, so a number of questions arise. Who is being served through microfinance? Does the programme reach the poor people? Does microfinance lead to reduction in poverty? Does it provide employment opportunities to the poor? Does microfinance contribute to enterprise growth and income? How women’s roles as microfinance beneficiary translate into their empowerment? These are a few questions and there are many more to answer. Therefore, the present study is conducted by taking the following specific objectives.

1.2 Objectives of the Study

The primary objective of the present study is to find out the impact of microfinance on poverty, employment and women empowerment in rural Punjab. The specific objectives of the study are:

(i) To examine the impact of microfinance on income, income inequality and poverty alleviation among the participant households.

(ii) To study the impact of microfinance in generating employment opportunities.
(iii) To assess the role of microfinance in empowering the women participants.
(iv) To find the impact of self-help group maturity on the income, employment and women empowerment of the programme participants.
(v) To analyse the problems and prospects of microfinance programme.

1.3 Hypothesis
The study is based upon the following hypotheses:
(i) Microfinance increases the level of income and reduces income inequalities among the participant households.
(ii) Microfinance reduces the level of poverty among the participant households.
(iii) Very poor borrowers get more benefits than already better-off borrowers.
(iv) As Self-help Groups grow older, the members of the groups are more benefited as compared to the new entrants.
(v) Microfinance helps in increasing the level of employment of the programme participants.
(vi) Participation in microfinance programme leads to women empowerment.

1.4 Methodology
In the present study, the impact of microfinance programme has been determined by comparing two groups: participant women of the programme (henceforth called as participants) and non-participants. Participants are the members of the SHGs who have been benefited from the scheme and have received the bank loans (credit linked) up to March 2006. Non-participants are those members in the same areas who are eligible for the microfinance scheme and have formed the SHGs but did not access credit up to the time of the survey, i.e., October 2007 to March 2008. As per the NABARD guidelines, SHGs are provided bank loans only after the active existence of the groups for about six months after the time of their inception. So, the non-participants belong to the groups which are less than six months old at the time of survey; and have not availed any benefit of the programme.

1.4.1 Selection of Study Area
The study is based on the primary data. The primary data is collected from participants and non-participants sample households. The study is conducted in the rural areas of Punjab state. The administrative division of the state is into 20 districts. For the
purpose of collecting the primary data, a multistage random sampling method is used. In the first stage, Punjab is agro-climatically divided into three regions:

(i) Alluvial Plains

It comprises the districts of Amritsar, Jalandhar, Kapurthala, Nawanshahr, Ludhiana, Patiala, Fatehgarh Sahib, Tarn Taran, Sangrur and Batala tehsil of district Gurdaspur.

(ii) Hilly Sub-mountainous Strip

This is northeastern region of Punjab. It includes Hoshiarpur, Gurdaspur, Ropar and Mohali districts.

(iii) Sandy Region or South Western Region

South Western region of Punjab is sandy and dry. This part includes districts of Bathinda, Mansa, Faridkot, Moga, Muktsar, Ferozepur and Barnala.

1.4.2 Selection of Districts

For the purpose of present study, one district is selected from each region having sufficiently large number of credit linked SHGs under the microfinance programme up to March 2006. As a result, Jalandhar district from alluvial plains, Hoshiarpur district from sub-mountainous region and Bathinda district from sandy region is selected. The number of SHGs in Jalandhar, Hoshiarpur and Bathinda districts are 595, 492 and 184 respectively.

1.4.3 Selection of Blocks

In the second stage, three blocks from each of these districts are selected where there are a large number of credit linked SHGs. In this way, Jalandhar East, Jalandhar West and Nakodar blocks are selected from district Jalandhar; Garhshankar, Hoshiarpur-1 and Bhunga blocks from district Hoshiarpur; and Nathana, Sangat and Bathinda blocks are selected from district Bathinda. These blocks of Jalandhar, Hoshiarpur and Bathinda districts comprise of 444, 276 and 136 SHGs respectively.

1.4.4 Selection of Sample

In the third stage, five per cent of the credit linked SHGs in the three districts are selected. As a result 30, 25 and 9 SHGs are selected from Jalandhar, Hoshiarpur and Bathinda districts respectively. These SHGs are taken proportionately from the selected blocks according to their total number in that block as shown in Table 1.1. In the last stage, three members from each SHG are selected randomly and interviewed. In this way, 90, 74 and 26 participants are surveyed from the selected blocks of Jalandhar,
Hoshiarpur and Bathinda districts respectively. Matching number of non-participants, i.e., 190 are also selected from the same areas with the same method.

Table 1.1: Sample Frame for the Study

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Region</th>
<th>District Selected</th>
<th>No. of Groups Surveyed</th>
<th>Block Selected</th>
<th>Total No. of SHGs</th>
<th>No. of Surveyed Groups</th>
<th>No. of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Alluvial Plains</td>
<td>Jalandhar (595)</td>
<td>30</td>
<td>Jalandhar East</td>
<td>163</td>
<td>11</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Jalandhar West</td>
<td>156</td>
<td>11</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Nakodar</td>
<td>125</td>
<td>08</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>444</strong></td>
<td><strong>30</strong></td>
<td><strong>90</strong></td>
</tr>
<tr>
<td>2.</td>
<td>Hilly Sub-mountainous Strip</td>
<td>Hoshiarpur (492)</td>
<td>25</td>
<td>Garhshankar</td>
<td>123</td>
<td>11</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hoshiarpur-1</td>
<td>104</td>
<td>09</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bhunga</td>
<td>49</td>
<td>05</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>276</strong></td>
<td><strong>25</strong></td>
<td><strong>74</strong></td>
</tr>
<tr>
<td>3.</td>
<td>South Western Region</td>
<td>Bathinda (184)</td>
<td>09</td>
<td>Nathana</td>
<td>77</td>
<td>05</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sangat</td>
<td>38</td>
<td>03</td>
<td>09</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bathinda</td>
<td>21</td>
<td>01</td>
<td>03</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>136</strong></td>
<td><strong>09</strong></td>
<td><strong>26</strong></td>
</tr>
</tbody>
</table>

Source: Secondary data from C.D.P.O. office of the concerned district.
Note: The figures given in parentheses indicate total number of credit linked SHGs in respective districts up to March 2006.

1.4.5 Data Collection

The data is collected with the help of a schedule especially prepared and pre-tested for the purpose of this study. Some of the questions asked to the respondents were about their family structure, availability of basic amenities, ownership of assets, value of land holding, individual and household income, financial vulnerability, insurance cover, nature and days of employment etc.

To study the impact of microfinance on women empowerment the respondent women were asked various questions related to their self-confidence, general awareness, level of mobility, participation in household decision-making, participation in social matters, help extended by other family members etc.

The microfinance programme participants were also asked some questions related to the SHG activities, such as number of group members, group maturity, amount of saving per month, total amount of group saving, number of bank loans received by the group, total amount of bank loans received, rate of interest, purposes for which loans are utilised, repayment procedure etc.
1.5 Analysis of Data

The data collected from the field is edited and analysed carefully. Simple average and percentage techniques are used to summarise the data. Findings of the study are presented with the help of tables and graphs. A number of statistical techniques, such as t-test, F-test, Chi-square test, correlation analysis, multiple regression analysis, poverty measurement indexes, Lorenz curve, Gini coefficient etc. are applied to find out the impact of microfinance programme. Computer software like Microsoft-Excel 2002 and SPSS 11.0.0 are used to apply various statistical techniques and to draw various graphs. A brief analysis of the statistical techniques used is given below:

1.5.1 t-test

The t-test is applied to test the significance of various results obtained from the analysis of surveyed data in the following ways:

(i) Testing difference between means of two independent samples; and

(ii) Testing difference between means of two dependent samples.

(i) Testing Difference between Means of Two Independent Samples

The test is applied to measure the mean income difference between the participants of the microfinance programme and the non-participants. The null hypothesis (H0) is that both the samples come from the same normal population and there is no significant difference in their mean values. The alternate hypothesis (H1) is that there is significant difference in the mean incomes of two samples. To carry out the test, t-value is calculated as follows:

\[
t = \frac{\overline{X}_1 - \overline{X}_2}{S} \sqrt{\frac{n_1 n_2}{n_1 + n_2}}
\]

\[
S = \sqrt{\frac{\sum (X_1 - \overline{X}_1)^2 + \sum (X_2 - \overline{X}_2)^2}{n_1 + n_2 - 2}}
\]

Where:

\(\overline{X}_1\) = Mean value of the first sample

\(\overline{X}_2\) = Mean value of the second sample

\(n_1\) = Size of first sample

\(n_2\) = Size of second sample

\(S\) = Combined standard deviation of two samples

The degree of freedom is equal to \(n_1+n_2-2\).
Results: In order to test the set hypothesis, the calculated value of ‘t’ is compared with the Table value for degree of freedom at certain level of significance.

If ‘t’ > \( t_{0.05(0.01)} \) for \( n_1+n_2-2 \) then \( H_0 \) is rejected and \( H_1 \) accepted.

If ‘t’ < \( t_{0.05(0.01)} \) for \( n_1+n_2-2 \) then \( H_0 \) is accepted and \( H_1 \) rejected.

(ii) Testing Difference between Means of Two Dependent (Paired) Samples

When the two samples consist of pairs of observations made on the same selected individuals then the samples are called paired samples. In this study, the income and employment level of the participants, after receiving the benefits of the programme is compared with their pre-SHG situation. In order to test the significance of difference in the pre- and post-SHG situation, the paired sample t-test is applied as follows:

\[
t = \frac{\bar{d}\sqrt{n}}{S}
\]

\[
S = \sqrt{\frac{\sum (d - \bar{d})^2}{n-1}}
\]

Where:

\( \bar{d} \) = The mean of the differences of the values in pre- and post-SHG situation

\( S \) = The standard deviation of the differences

The degree of freedom is \( n-1 \).

Results: If the calculated value of t is greater than the Table value, then, there are significant differences in the values of two paired samples; and if the calculated value of t is less than the Table value, then, the differences between the two samples are considered non-significant.

1.5.2 Analysis of Variance (F-Test)

Analysis of variance is a statistical technique designed to test or compare the means of more than two quantitative samples. The test is used to find out the significance of difference in the mean income of the programme participants under different group ages. The test is applied as follows:

\[
H_0 = \bar{X}_1 = \bar{X}_2 = \bar{X}_3 = \cdots = \bar{X}_k
\]

\[
H_1 = \bar{X}_1 \neq \bar{X}_2 \neq \bar{X}_3 \neq \cdots \neq \bar{X}_k
\]
\[ F = \frac{\text{Sum of squares between samples}}{\text{Sum of squares within samples}} \times \frac{n - K}{K - 1} \]

Where:

- \( H_0 \) = Null hypothesis
- \( H_1 \) = Alternative hypothesis
- \( \bar{X}_i \) = Mean incomes of different groups
- \( n \) = Total number of observations
- \( K \) = Total number of samples.

The null hypothesis assumes that means of \( K \) samples are equal to each other. F-test measures the ratio of variance between groups to the variance within the group. Variance between the samples measures the squared differences between the sample means of each group and the overall mean. The variance within the samples measures the inter-sample squared differences of various items of different samples from their respective means.

**Results:** If the calculated value of \( F \) is greater than the Table value for given degrees of freedom \((K-1), \ (n-K)\) at certain level, it is concluded that the difference in the sample means is significant.

**1.5.3 Chi-square Test**

It is a non-parametric test applied to find out the association among two or more attributes. The test is applied to find out whether the microfinance programme participation has led to increased level of confidence, physical mobility, household decision-making power etc. among the programme participants. The value of Chi-square is calculated as follows:

\[ \chi^2 = \sum \frac{(O - E)^2}{E} \]

Where:

- \( O \) = Observed frequencies
- \( E \) = Expected frequencies.

The expected frequency for any cell can be calculated as follows:

\[ E = \frac{RT \times CT}{n} \]
14

Where:

\[ RT = \text{The row total for the row containing the cell} \]
\[ CT = \text{The column total for the row containing the cell} \]
\[ n = \text{Total number of observations.} \]

The calculated value of Chi-square is compared with the Table value for degree of freedom which is equal to: (No. of columns\(-1\)) × (No. of rows\(-1\)) at certain specified level of significance. If the calculated value is greater than the Table value the difference between observed and expected value is considered significant.

1.5.4 Regression Analysis

(i) Multiple Regression Analysis

Regression analysis is concerned with the study of the dependence of one variable (the dependent variable) on one or more other variables (the explanatory variables) with a view to estimating the mean or average value of the former in terms of the fixed values of the latter. In this study, the multiple regression analysis technique is used to find out the influence of various factors in determining the level of income, employment and women empowerment.

The \( K \) variable population regression function is as follows:

\[ Y_i = b_1 + b_2X_{2i} + b_3X_{3i} + b_4X_{4i} + \ldots + b_kX_{ki} + u_i \]

Where:

\[ b_1 = \text{Intercept term} \]
\[ b_i = \text{Partial regression coefficients} \]
\[ Y_i = \text{Values of dependent variable} \]
\[ X_i = \text{Values of independent variables} \]
\[ u_i = \text{Stochastic disturbance term.} \]

The partial regression coefficients measure the change in the average value of \( Y \) with the per unit change in one of the independent variables keeping the other independent variables as constant. The intercept term gives the mean or average value of \( Y \) when all the \( X_i \) are set equal to zero. The stochastic variable shows the influence of excluded variable from the regression model. To obtain the ordinary least square estimates of partial regression coefficients, the \( K \) variable sample regression function can be written as follows:
\[ Y_i = \hat{b}_1 + \hat{b}_2 X_{2i} + \hat{b}_3 X_{3i} + \hat{b}_4 X_{4i} + \ldots + \hat{b}_k X_{ki} + \hat{u}_i \]

Where \( \hat{b}_i \) are the estimated values of partial regression coefficients. This equation can be written concisely in matrix notation as:

\[ Y = X\hat{b} + \hat{u} \]

From this regression model, the partial regression coefficients \( \hat{b}_s \) are calculated with the help of following formula:

\[ \hat{b} = (X'X)^{-1} X'Y \]

Where:

\[ \hat{b} \] = Estimated values of partial regression coefficients  
\[ X' = \text{Transpose of } X. \]

(ii) **Standardising the Regression Coefficients**

As the independent variables are measured at different units, therefore, the partial regression coefficients are also standardised to compare the strength of the relationship between dependent and independent variables. This is done by standardizing the coefficients with the help of the formula \( \beta_i = b_i \times \frac{SD_x}{SD_y} \), where \( b_i \) are the unstandardised regression coefficients; \( \beta_i \) are the standardised coefficients; \( SD_y \) is the standard deviation of regression equation; and \( SD_x \) are the standard deviation of the independent variable. These standardised coefficients will help in comparing directly to determine which variable has the largest impact on the dependent variable.

(iii) **Coefficient of Multiple Determination (R^2)**

\( R^2 \) is also known as the measure of goodness of fit. This shows the percentage of total variations of the dependent variable \( Y \) that are explained by the changes in the independent \( X \) variables. Since the explanatory variables explain a part of the total variations of the dependent variable, so \( R^2 \) is calculated as a ratio of explained variations of \( Y \) to the total variations of \( Y \). The coefficient of determination assumes the values lying between 0 and 1.

\[ 0 \leq R^2 \leq 1 \]

The value of \( R^2 \) is calculated as follows:
The t-test is also applied to find out the significance of the coefficients of independent variables in explaining the variations of the dependent variable. Here, t is the ratio of estimated coefficients to their standard errors.

\[ t = \frac{\hat{b}_i}{SE \hat{b}_i} \]

Where:

\( SE \) = Standard Errors
\( SE \hat{b}_i \) = Diagonal elements of variance-covariance matrix \( \hat{b} \)

Variance-covariance matrix \( \hat{b} = \frac{Y'Y - \hat{b}'X'Y}{n-k}(X'X)^{-1} \)

1.5.5 Poverty Measurement Indexes

(i) Headcount index (Incidence of poverty)
(ii) Poverty gap index (Depth of poverty)
(iii) Squared poverty gap index (Severity of poverty).

(i) **Head Count Index**: The head count index (HCI) measures the proportion of the population whose income is below the absolutely defined poverty line.

\[ HCI = \sum_{i=1}^{N} I(Y_i < Z) \]

Where:

\( I \) = Indicator function
\( Y_i \) = Actual income of \( i^{th} \) household
\( Z \) = Income at the poverty line
\( N \) = Total number of households.

The indicator function \( I \) is 1 if \( Y_i < Z \) is true and 0 otherwise. So, if actual income \( Y_i \) is less than the poverty line income \( Z \), then \( I \) is equal to 1 and the household would be counted as poor.

(ii) **Poverty Gap and Poverty Gap Index**: The Poverty Gap \( (G_i) \) measure provides information regarding how far off households are from the poverty line. The
poverty gaps \((G_i)\) are the differences between the poverty line \((Z)\) and the actual incomes \((Y_i)\) for poor households.

\[
G_i = (Z - Y_i)I(Y_i < Z)
\]

Where, \(I\) is the indicator function. It is equal to 1 if \((Y_i < Z)\) is true and it is 0 otherwise.

The poverty gap index \((P_1)\) measures the extent to which individuals fall below the poverty line (the poverty gaps) as a proportion of the poverty line. The poverty gap index \((P_1)\) may be written as:

\[
P_1 = \frac{1}{N} \sum_{i=1}^{N} \frac{G_i}{Z}
\]

(iii) Squared Poverty Gap Index: Squared poverty gap index \((P_2)\) measures the severity of poverty. It is the average of the “weighted sum” of the individual poverty gaps where the weights are the proportionate poverty gaps themselves. In other words, the \(G_i\) is squared. The act of squaring the \(G_i\) gives greater weight to the poorest households since their \(G_i\) will be larger:

\[
P_2 = \frac{1}{N} \sum_{i=1}^{N} \left( \frac{G_i}{Z} \right)^2
\]

1.5.6 Measurement of Inequality in Income Distribution

(i) Lorenz Curve

The Lorenz Curve is a graphical representation of the proportionality of a distribution. It represents a distribution of statistical values which is commonly used in the analysis of inequality. In this study, Lorenz curve is used for the analysis of income inequality. It is a graph showing the proportion of the income distribution assumed by different proportions of population. The cumulative percentage of population is plotted on the X-axis and the cumulative percentage of income on the Y-axis. In this graph, a straight line represents same income for every person that is called the line of perfect equality. While another curved line that shows the actual income distribution is known as Lorenz curve as shown in Figure 1.1. The difference between the line of perfect equality and the Lorenz curve shows the inequality in the income distribution.
(ii) Gini Coefficient

The Gini coefficient is the quantitative measurement of income inequality from the Lorenz curve. It is the ratio of the area that lies between the line of perfect equality and the actual Lorenz curve. The Gini coefficient can range from 0 to 1. A low Gini coefficient indicates a more equal distribution, with 0 corresponding to perfect equality, while higher Gini coefficients indicate more unequal distribution, with 1 corresponding to perfect inequality. In this study, it is used to find out the inequality in the income distribution among the participant and non-participant households.

\[
Gini\ Coefficient = 1 - \sum_{i=1}^{N} (X_i - X_{i-1})(Y_i + Y_{i-1})
\]

Where:

\(X_i\) = Cumulative percentage of population
\(Y_i\) = Cumulative percentage of income.

When there are \(N\) equal intervals on the X-axis this simplifies to

\[
Gini\ Coefficient = 1 - \sum_{i=1}^{N} (Y_i + Y_{i-1})
\]
1.6 Scheme of the Study

The study is framed with the following chapter scheme:

**Chapter 1** deals with the introduction, objectives, hypothesis, sample selection, methodology and various statistical techniques used in the study.

**Chapter 2** is focused on the review of literature related with impact of microfinance programme.

**Chapter 3** is divided into three sections. The first section discusses about the necessity, meaning and origin of microfinance, its delivery models and its growth in India and Punjab. The second section deals with various problems in the field of microfinance in India. The third section highlights the prospects of microfinance.

**Chapter 4** consists of three sections. The first section explains the geographical location and analysis of the sample districts. The second section deals with the socio-economic profile of sample households. The third section is related with the general characteristics of self-help groups in the study area.

**Chapter 5** is divided into two sections. The first section shows the impact of microfinance on income, income inequality and vulnerability of the programme participants. The incidence, depth and severity of poverty are also measured to find out the impact of microfinance programme on BPL households. The impact of maturity of self-help groups is also discussed in this section. A composite poverty index is prepared to show the overall impact of microfinance programme on various dimensions of poverty. In order to determine the factors affecting the poverty level a linear regression equation is used. In the second section, the employment status, employment generation and nature of economic activities of the participants have been discussed. Impact of occupational training and maturity of self-help groups on employment is also discussed in this section. A linear regression equation is used to determine the factors affecting the employment level of the participants.

**Chapter 6** consists of three sections. The first section explains the concept and indicators of empowerment. The second section deals with the impact of microfinance programme on various domains of women empowerment. A composite empowerment index is prepared in order to quantify the level of women empowerment. The third section explores the factors which influence women empowerment.

**Chapter 7** concludes with the main findings of the study and its policy implications.
The Millennium Development Goals are eight international development goals agreed by the United Nations with a view to tackling global poverty. These Goals are, Eradicate extreme poverty and hunger, Achieve universal primary education, Promote gender equality and empower women, Reduce child mortality, Improve maternal health, Combat HIV/AIDS, malaria and other diseases, Ensure environmental sustainability and Develop a Global partnership for development.

Notes
[1] The Millennium Development Goals are eight international development goals agreed by the United Nations with a view to tackling global poverty. These Goals are, Eradicate extreme poverty and hunger, Achieve universal primary education, Promote gender equality and empower women, Reduce child mortality, Improve maternal health, Combat HIV/AIDS, malaria and other diseases, Ensure environmental sustainability and Develop a Global partnership for development.

References


