CHAPTER-III
RESEARCH DESIGN
The previous chapter dealt with the study of the available literature. On viewing this literature, it appears that the different studies on benefits with development of rural roads under different schemes in India a little by little description of its variety dimensions. The endeavours made so far by numerous eminent researchers encompass one or the other aspects on the subject. A study linked with the theme of performance evaluation of Pradhan Mantri Gram Sadak Yojana in respect of the State of Himachal Pradesh has not been carried out till date. The present study can be well thought-out as one among the many bricks that will be vital to bridge the space between research requirements and research efforts made so far.

Research design is the basis which helps to explore the existing research gap and provides valuable information to frame the need, scope and objectives of the present study. Further this may provide help in designing the methodologies, analytical tools, etc. along with the methodological weaknesses, if any. Consequently, it facilitates in carrying out the research plan effectively and provides with the empirical and logical basis for drawing conclusions. In this chapter need, scope, objectives, tools of analysis, hypothesis, methodology, instruments of data collection, tools of analysis, sampling and limitations of the study are presented. These discussions will definitely provide the track to be followed to complete the research project.

3.1 NEED OF THE STUDY:

During the course of civilisation, it was realised gradually that the human beings are most valuable and precious resources of the society who will play a pivotal role in nation's development. The quality of a state depends upon the efficiency and quality of its human resources. Thus numerous kinds of efforts were taken into consideration for the overall development of human being which includes his physical, social, economic and psychological development. Frequent programmes on development of specially 'Rural poor' have been taken by the government and non government organization on the basis of 'Right to Development'. But it was realised that until and unless the people become
spiritually developed the essence of development could not be achieved. Spiritually is nothing but the inherent quality and entity of the human being for knowing the self. It is one of the key ingredients for linking up physical activity of human being to become selfless, self-dependent, self-confident, self-actualized, and self-powered, which will developed and enrich his inner beliefs as well as empowered him physically, socially, economically and psychologically to act as a sound development partner, who can be yoked to serve the society, leading towards achieving the ultimate ambition of civil society.

From the initiation of Five-Year-Plans for economic development in the country has enough experience in the process of infrastructural development. A large part of the plan expenditure was diverted towards the development of roads, railways, telecommunication, power and irrigation facilities and various kinds of social infrastructure. As a consequence infrastructural imbalances and gaps were corrected to some extent and foundations for long term economic and social development were laid. Despite all this development of infrastructure during the various plans, it is not possible to say that all has gone well with the development of infrastructure in the country. Deficiencies do exist and regional imbalances could not be corrected. Quality of infrastructure has remained poor and charges for infrastructural facilities have sometimes been prohibitive. Thus the development of infrastructure in India raises certain pertinent questions and poses some problems before the research workers for further study.

Rural road connectivity is a key component of rural development, since it promotes access to economic and social services thereby generating increased agricultural income and productive employment opportunities in rural India. As a part of its poverty reduction strategy and to bring about rapid sustainable development and socioeconomic transformation in rural India, and to synergise the various schemes being implemented across the districts of the country, Pradhan Mantri Gram Sadak Yojana (PMGSY) was launched by the Government of India to provide rural road connectivity to hither to unconnected rural habitations.
By any measure, PMGSY is a very large undertaking. As originally planned, all habitations with populations exceeding 500 persons (250 in hilly and desert areas) were to be connected by 2015. At that time, about 170,000 habitations i.e. 60 percent eligible have no roads. As per information provided by the concerned State Level Implementing Authorities, Himachal Pradesh has the highest percentage of unconnected habitations i.e. about 67 per cent. Himachal Pradesh lies across the main steams of Indian commerce, both east to west and north to south. For this region, the major development in transport has so far been confined to providing through road only. It is, however, a fact that a large part of this region is still in accessible. About one fourth of its land surface is covered by green forests. It produces surplus food grains, fruits and cash crops. These factors point towards a very rich development potential of the region. The physical setup has contributed to a large extent, to the pattern of roads evolved in this region over the years. Further, the needs of hilly areas having unique physical settings, are not the same as those of the plains, in any direction whatsoever. The most important problem of India in general and Himachal in particular is that of improving the economic and social conditions of rural people who live below poverty line. They include landless labourers, small marginal farmers, artisans and other weaker sections of the society. Therefore, the present study is an attempt to provide an integrated study of rural roads (under scheme PMGSY) with reference to Himachal Pradesh. The development of Rural Roads would therefore impact large majority of the people and is critical for the overall development of the state.

The suggestions and recommendations that are made on the basis of empirical research are also of some help to the Government of the India and specially the State. The Programme Implementation Units, the implementation authorities can obtain benefit from this study. The study will encourage the villagers and Gram Panchayats to observe the things in appropriate angle. Further, this study is an attribute to the cumulative existing literature in the respective field which will certainly prove to be of help in providing a path and serve as a guide to the researchers.
3.2 STATEMENT OF THE PROBLEM:

The present study is focuses on the impact of all-weather rural roads on development of rural masses in Himachal Pradesh. The problem is titled as below:

"PERFORMANCE EVALUATION OF PRADHAN MANTRI GRAM SADAK YOJANA (PMGSY) IN HIMACHAL PRADESH"

3.3 SCOPE OF THE STUDY:

The present study aims to evaluate whether the rural connectivity under PMGSY able to promote access to economic and social services and facilitates the growth processes in rural economy of Himachal Pradesh. Transport, the backbone of a dynamic economy, has been constantly eluding the planners and researchers. Transport arteries provide the medium through which economic vitality of any region may flow smoothly. The present work is an attempt to provide an integrated study of the Rural Roads under PMGSY with special reference to Himachal Pradesh. Rural road connectivity is a key component of rural development, since it promotes access to economic and social services thereby generating increased agricultural income and productive employment opportunities in rural India. As a part of its poverty reduction strategy and to bring about rapid sustainable development and socioeconomic transformation in rural India, and to synergise the various schemes being implemented across the districts of the country, Pradhan Mantri Gram Sadak Yojana (PMGSY) was launched by the Government of India to provide rural road connectivity to hither to unconnected rural habitations. It has been felt proper and appropriate to conduct an empirical study of the roads constructed under PMGSY in Himachal Pradesh and to find out whether the impact of all-weather roads on the living standard of villagers are being developed as visualised by the Government of India. Rural Development covers wide variables making it difficult to study each and every aspect of Ministry of Rural Development. Hence the scope of study has been focused towards few parameters such as awareness and implementation of the scheme as well as quality and maintenance of the all weather roads. Its impact on farm and off-farm employment, easy accessibility to medical/
veterinary centres, increase in education and income level, elevation in status in society and over all change in pace of life. Further, the study is restricted to a period 2000 to 2012.

3.4 UNIVERSE OF THE STUDY:

The universe of the study undertaken is the state of Himachal Pradesh.

3.5 SAMPLING FRAME AND UNITS:

The study has been carried out in three districts of Himachal Pradesh namely Bilaspur, Mandi and Shimla. From each district two blocks and from each block two villages have been selected for the purpose of survey. The present study is an attempt to look into the performance of PMGSY. The districts have been selected by taking state average of eligible habitations under rural roads as stratifying parameter – district above state average, district equal to average and another below state average i.e. district Bilaspur has 71 per cent connected villages. District Mandi has road connectivity 56.68percent whereas district Shimla connectivity status is 41.35 per cent which is below the State average (56.09)(as given in Table 3.1).

Table 3.1

District wise Status of villages Connectivity with Roads as on 31.3.2012

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of District.</th>
<th>Total Nos. of Villages</th>
<th>No. of Villages Connected with Road.</th>
<th>No. of Villages Un-connected with Road.</th>
<th>Percentage of Connected Villages.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bilaspur</td>
<td>962</td>
<td>683</td>
<td>279</td>
<td>71.00</td>
</tr>
<tr>
<td>2</td>
<td>Chamba</td>
<td>1113</td>
<td>527</td>
<td>586</td>
<td>47.35</td>
</tr>
<tr>
<td>3</td>
<td>Hamirpur</td>
<td>1634</td>
<td>1129</td>
<td>505</td>
<td>69.09</td>
</tr>
<tr>
<td>4</td>
<td>Kangra</td>
<td>3614</td>
<td>2295</td>
<td>1319</td>
<td>63.50</td>
</tr>
<tr>
<td>5</td>
<td>Kinnaur</td>
<td>233</td>
<td>59</td>
<td>174</td>
<td>25.32</td>
</tr>
<tr>
<td>6</td>
<td>Kullu</td>
<td>172</td>
<td>120</td>
<td>52</td>
<td>69.77</td>
</tr>
<tr>
<td>7</td>
<td>Lahaul &amp; Spiti</td>
<td>284</td>
<td>126</td>
<td>158</td>
<td>44.37</td>
</tr>
<tr>
<td>8</td>
<td>Mandi</td>
<td>2823</td>
<td>1600</td>
<td>1223</td>
<td>56.68</td>
</tr>
<tr>
<td>9</td>
<td>Shimla</td>
<td>2515</td>
<td>1040</td>
<td>1475</td>
<td>41.35</td>
</tr>
<tr>
<td>10</td>
<td>Sirmour</td>
<td>966</td>
<td>651</td>
<td>315</td>
<td>67.39</td>
</tr>
<tr>
<td>11</td>
<td>Solan</td>
<td>2378</td>
<td>1100</td>
<td>1278</td>
<td>46.26</td>
</tr>
<tr>
<td>12</td>
<td>Una</td>
<td>755</td>
<td>458</td>
<td>297</td>
<td>60.66</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>17449</td>
<td>9788</td>
<td>7661</td>
<td>56.09</td>
</tr>
</tbody>
</table>

Source: HPPWD
These districts have also been selected due to the social and economic diversity amongst these districts which represents the different geographic, climatic, livelihood patterns and road connectivity in the state. From each district two blocks, three villages were selected for the purpose of survey. Thus, data have been collected from the beneficiaries of these roads, village Panchayat representatives and officials of the implementing agencies.

3.6 SAMPLE DESCRIPTION:

A multistage sampling has been used for the selection of districts, blocks, roads, habitations and beneficiaries.

At the first stage, districts of the State have been divided into three categories. First category includes those districts which have percentage of connected villages by more than the average percentage of connected villages of the State, second category includes those districts which are approximately equal to the percentage of entire State. The district which have percentage of connected by roads below the overall percentage of the State are put in the third category. Thus, district Bilaspur (above the state average connectivity), district Mandi (equal to the state average connectivity) and district Shimla (below the state average connectivity) have been selected also keeping in view the districts social, economic, geographical and climatic features.

In the second stage, two administrative blocks i.e. one less developed and one more developed in terms of road connectivity have been selected. Thus, the study has been conducted in six administrative blocks of the State.

At the third stage, roads and habitations have been selected in such a way that the total length of each road is more than 3 kms and are covered under the phase 1 and phase 11 of their construction. Three habitations from each administrative block connected with such blocks have been selected for the sample. Thus, the sample constitutes 18 habitations connected with all weather roads under PMGSY. Finally, 30 local people from each habitation have been included in the sample keeping in view their representation to the population. Thus, the sample size for public is (30x18) 540 respondents. To cross check m the views of the beneficiaries, another sample from Panchayat representatives
from each habitations were sought which constitutes a sample of (18x8)144 respondents. Further, to know about the problems being faced in the implementation of this scheme, information from 2 officials of the implementing agencies of each road were obtained. Thus, a separate sample of (18x2)36 officials has been used in the present study.

3.7 OBJECTIVES OF THE STUDY:

No matter how systematically a project is planned, there would still be deviations between what is intended and what is actually achieved. The deviations may be in terms of time schedule or resource use or flow of benefits from project. The present study has been conducted with a view to throw light on the development of rural roads under Pradhan Mantri Gram Sadak Yojana in Himachal Pradesh and its impact on the living standard of villagers are being developed as visualised by the Government of India. This objective has been achieved with the help of the following sub-objectives spelt out as under:

1) To analyze the physical and financial achievements of the programme PMGSY in the state of Himachal Pradesh.

2) To assess the impact of PMGSY on social, economic, cultural and physical environment of rural habitations provided with road connectivity under the programme.

3) To study the resource mobilization and allocation under the study scheme.

4) To find out the constraints in implementation of the program and suggestions thereof for strengthening the working of PMGSY in particular and other schemes in general.

3.8 HYPOTHESIS:

While conducting research, one cannot think of proceeding further in total ignorance and lack of research knowledge. The researcher must have some vision about the new facets that are likely to be revealed. This makes easier for one to proceed further to find out whether the ideas visualized are true or not. Hence, in the light of the overall objectives of the study and after reviewing the
existing literature on the subject, the following hypotheses have been developed for the purposes of testing:

1. There is no significant change in the socio-economic condition of rural people with the implementation of Pradhan Mantri Gram Sadak Yojana (PMGSY) in the state.

2. Pradhan Mantri Gram Sadak Yojana is not effectively working in the state.

3.9 RESEARCH METHODOLOGY:

Research methodology is a plan according to which observations are made and data is collected. It provides the empirical and logical basis for drawing conclusion and gaining knowledge. The application of correct method and the adoption of the scientific form of mind are essential requirements of the scientific study. Keeping the said assumption in view, methodology of data collection and analysis of data has been discussed in the forthcoming pages. In the present study three districts of Himachal Pradesh has been selected for evaluation of Pradhan Mantri Gram Sadak Yojana (PMGSY). A research design is a plan according to which observations are made and data is assembled. It provides the empirical and logical basis for drawing conclusion and gaining knowledge for accomplishing the objectives of the study, both secondary and primary data have been used.

3.9.1 Sources of Data:

The objectives as stated previously have been accomplished by making use of primary data to a large extent along with some secondary data. The present study has been for the most part a primary probe based on the sample survey of the benefited habitants of different villages of sample districts with the help of the questionnaire. The details of each of these have been as follows.

A. Secondary Data:

In order to evaluate the performance of PMGSY in the state of Himachal Pradesh, district wise concentration of the all weather roads, year wise and district wise details of PMGSY roads, amount of investment, length of roads, habitations benefited, etc. the secondary sources have been used. The secondary data has been collected from various sources, namely office records, published
and unpublished documents, various web sites etc. These have been mainly gathered from the following:

1. Annual Reports, Ministry of Rural Development, Government of India.
4. Himachal Pradesh Public Works Department.
6. Various magazines, journals and books.
8. Existing literature and other scholarly work.
9. www.planningcommission.nic.in
10. www.pmgsy.in
11. www.omms.in
12. www.hppwd.in.
13. www.indiastat.com
15. www.hpgov.in
16. Certain data collected by different agencies for other than present purpose have also been used. This type of data has been collected.

B. Primary Data:

Primary data has been used to study the beneficiaries’ perception regarding impact of all weather roads on life of villagers and to examine the implementation of the scheme. The background of the beneficiaries, the purpose of the scheme and impact on rural development (social-economic, and infrastructure development of rural areas) are important aspects covered in the questionnaires. It has been collected with the help of questionnaire filled in by the benefited habitants.
In order to get first-hand information on various aspects of objectives of the study, the most important primary data has been collected with the help of following instruments.

The data has been collected by administering a structural schedule of questions. Three questionnaires have been designed to collect information from the beneficiaries, village Panchayat representatives and officials associated with implementation of the PMGSY scheme.

1. **Questionnaire**:

The most important primary data has been collected with the assistance of questionnaires to be filled up by the respondent i.e. benefitted habitants, Gram Panchayat representatives and officials of Programme Implementation Units of the PMGSY. Data has been collected to study the beneficiaries' perceptions towards the level of satisfaction and to find out whether the all weather road connectivity with main road able to promote access to economic and social services and facilitates the growth processes in their villages. Views of Gram Panchayat representatives has also been incorporated. To know about the achievements and the problems on implementation of PMGSY, the officials associated with implementation of the PMGSY scheme has been contacted. Following has been the highlights of the questionnaire/schedule:

- So as to acquaint ourselves with the demographic profile of the sample benefitted habitants under study, data in respect of the following has been collected from the respondents: Occupation, age, gender, category, qualifications, Marital status, and size of family.
- To know about the level of awareness and satisfaction level regarding the PMGSY, the respondents have been asked questions relating to the following:
  1. From where initially come to know about PMGSY.
  2. Support of Government functionaries in the implementation of PMGSY.
  3. Alignment of rural road according to the practical needs of the society.
  4. Before the construction of road, is the information regarding their needs, acquisition of land and related to environment has been collected.
5. Usage of roads for work related activities and frequency of usage.
6. Improved access to social services, health facilities and markets.
7. Distance get shortened and accessibility has increased happiness and sharing
8. Increase in education level, income level and reduction in poverty

- With the aim of assessing the quality and maintenance of rural roads, the questions with reference to the implementation of the scheme have been put to the respondents:
  1. Regarding features of roads constructed under PMGSY.
  2. Regarding the execution of PMGSY and responsibility of maintenance of roads.
  3. Role played by the community.
  4. Regarding element of corruption.

- In order to study the extent of development of the rural masses and the creation of rural assets, questions related to the subsequent areas have been taken into account in the schedules prepared for the Gram Panchayat representatives.
- To facilitate the study in respect of the provisions of PMGSY, its achievements and problems in implementation, the questions that have been put to the Officials of PIU through the questionnaire. The detailed questionnaire has been appended in the last of the thesis an annexure

2. Reliability of Questionnaire:

The Test-Retest method is the feasible approach to the working out the reliability of questionnaire. Besides consistency to question responses, the accuracy of the question responses to the interview may also be taken note of while talking of the reliability of the questionnaire Reliability of questionnaire may be inferred by second administration of the instrumental, comparing the responses with those of the first. In order to test the reliability of the questionnaire it was administrated on a sample of 50 respondents. After a gap of fifteen days the respective questionnaire was again administrated on the same
sample. The responses given by the respondents in the second administration was compared with that of first and it was found that the percentage of responses nearly similar to the first. Thus, the reliability of the questionnaire was taken to be satisfactory.

3. **Informal Discussions**

With the intention of being acquainted with the ground reality in a better way, personal visits to all-weather roads have been made. Interviews with the authorities have been carried out. To obtain first hand information and to comprehend closely the inner feelings and problems, informal discussions have also been made with the benefited habitants. Informal discussions have also been held with some of the officials from department of HPPWD and Gram Panchayat Pradhans, UP-Pradhans, members of benefited villages. This helped in getting hold of some additional and relevant information related to the present study.

4. **Personal Observations**

Certain information cannot be obtained through questionnaire /schedules and personal interviews. The same has been obtained by means of direct personal observations made during the course of visits to villages connected with roads constructed under PMGSY. Sometimes, the respondents do not disclose the answers to many questions honestly. In such cases, observations from a close angle of the ground realities help to solve the problem logically and scientifically. Additional data has been obtained by the in-depth interview with the officials of all level Himachal Pradesh Public Works Department in and Panchayats of villages of sample districts. Government officials of Ministry of Rural Development (MoRD), department heads who are involved directly or indirectly with the implementation of PMGSY scheme

3.10 **ANALYSIS AND INTERPRETATION OF DATA**

For accomplishing the objectives of the study, the data drawn from the primary source have been classified and tabulated in one or more forms according to the requirement of analysis. Moreover, there can be many interpretations and explanations to the data collected. The present study makes
available the elucidation as has been understood by the researcher only. The information collected has been analysed and interpreted with the help of the following methods:

A. Statistical Methods
B. Diagrammatic and Graphic Methods.

A. **Statistical Methods**:

Statistical methods make available necessary and indispensable tools for collecting, organising, analyzing and interpreting the information expressed in numerical terms. The statistical methods used have been as follows:

1. Descriptive Statistical Measures
2. Non-Parametric Tests

1. **DESCRIPTIVE STATISTICAL MEASURES**:

These are used to explain the characteristics of the sample taken from the population in totality. They limit generalisation to the particular group of individuals observed/studied. The statistical analysis based on the computation of descriptive statistical measures is by and large applied in action research and endows with precious information with reference to the nature of the particulars have been employed in the present study.

• **Measures of Central Tendency or Average**:

  The single value that describes the characteristics of the entire mass of unwieldy data is called the central value or an ‘average’. The measures of central tendency used in present study are arithmetic mean and mode.

  ➢ **Arithmetic Mean**:

  Arithmetic mean has been used to observe the benefited habitants opinions towards the extent of satisfaction regarding all-weather roads constructed under PMGSY. In addition it has been used to analyse the beneficiaries perceptions regarding their awareness about the scheme, quality of roads, economic development, socio-cultural development, infrastructure development and improvement in rural development schemes etc. It is the most
popular and widely used measure of representing the entire data by one value. It can be defined as the value which is derived by dividing the total of the values of various given items in a series by the total number of items. The formula for computing the simple mean is as follows:

\[
\bar{X} = \frac{\sum fX}{N}
\]

Where,

\(\bar{X}\) = Arithmetic mean,

\(F\) = Frequency,

\(X\) = The variable in the equation

\(N\) = Total number of observations

**Mode:**

The mode or the model value is that in a series of observations which occurs with the greatest frequency. It is the value which has the peak frequency density in its immediate neighbourhood area. In the present study, mode has been calculated by inspection and/or grouping method and has been used to compute coefficient of skewness.

- **Measure of Dispersion:**

  Dispersion measures the extent to which the items vary from the central value. Since they give an average of the differences of various items from an average, they are called averages of the second order. Standard deviation has been used to study the dispersion.

- **Standard Deviation:**

  Standard deviation has been used to find out absolute dispersion in the beneficiaries perceptions towards the extent of satisfaction regarding all-weather roads constructed under PMGSY. In addition it has been used to analyse the beneficiaries perceptions regarding their awareness about the scheme, quality of roads, economic development, socio-cultural development, infrastructure development and improvement in rural development schemes.
The standard deviation is the most common used indicator of degree of dispersion and is the most dependable estimate of the variability in the population from which the sample came. It is also known as root mean square deviation for the reason that it is the square root of the mean of the squared deviations from the arithmetic mean. The standard deviation is a kind of average of the deviation from the mean. The fundamental formula for computing this index of variability in the sample is as follows:

\[ \sigma = \sqrt{\frac{\sum fx^2}{N}} \]

where,

- \( \sigma \) = Standard Deviation
- \( f \) = Frequency
- \( x = (X - \bar{X}) \) i.e. deviations from the mean.
- \( N \) = Total number of observations

The standard deviation measure the absolute variability of distribution. The greater the standard deviation, the greater has been the magnitude of the deviations of the values from their mean or its vice versa.

- **Measure of skewness or Asymmetry**:

  Measure of skewness tells about the direction and the extent of asymmetry in a series, and permits the comparison of two or more series either in absolute terms or in relative terms. In a symmetrical distribution the mean, median and the mode are identical. The more the mean moves away from the mode, the larger is the asymmetry or skewness. In the present study, skewness has been calculated by means of Karl Pearson’s Coefficient of Skewness.

- **Karl Pearson’s Coefficient of Skewness**:

  It has been used to study the direction (either towards the lower side of mean score or towards the higher side of the mean score) and the extent of asymmetry in the responses of benefited habitants for each individual item of beneficiaries perception towards satisfaction, awareness or development, as the case may be. Skewness is a measure of asymmetry and shows the manner in which the items are clustered around the average. In a symmetrical distribution,
the value of mean, mean and mode coincide. The items show a perfect balance on either side of the mode. But in a skewness distribution, the mean and the median fall at different points and the balance or centre of gravity is shifted either to the right side or the left side. The amount by which the balance exceeds on one side measures the skewness of the series. The positive skewness is denoted by Mode<Median<Mean. In case of negative skewness is denoted by Mean<Median<Mode. It has been calculated with the help of following formula:

\[ Sk_p = \frac{\text{Mean} - \text{Mode}}{\text{Standard Deviation}} \]

Where, \( Sk_p \) = Karl Pearsons coefficient of skewness.

In practice, the value given by this formula is rarely very high and usually lies between ± 1. When a distribution is symmetrical, the coefficient of skewness is zero. The coefficient of skewness will have a plus sign if the distribution is positively skewed and will have a minus sign if the distribution is negatively skewed.

The coefficient of skewness has been used in studying the concentration of responses of the respondents either on the lower side or on the higher side of the mean score with respect to their opinion on different statements. In the case of normal distribution, the value of skewness will be zero.

2. NON-PARAMETRIC TESTS:

In non-parametric tests, no assumption about the population from which the samples are drawn are made. Originated in sociological and psychological research, non-parametric tests today are very popular in behavioural sciences. The test used in the present research has been Chi-square Test.

• Chi Square Test:

Chi square Test is an important non-parametric test and as such no rigid assumptions are necessary in respect of the type of population. It require only the degree of freedom for using this test, as a non-parametric test. Chi square Test can be used (i) as the test of goodness of fit, (ii) as a test of independence. In the present study, Chi square Test is applied to study the relationship between qualitative variable and for analysing the opinion of the respondents regarding different factors. Moreover, it has also been used to study the relationship
between views of beneficiaries in respect of awareness about the Pradhan Mantri Gram Sadak Yojana; significance of performance appraisal, extent of development through Ministry of Rural Development.

The Chi square test is one of the simplest and most widely used non-parametric test in statistical work.

**Chi square Test of Independence:**

This test has been used to study the relationship between demographic variables of respondents and objectives of PMGSY, and change in life style etc. It describes the magnitude of difference between observed frequencies and the expected frequencies under certain assumptions. It is used to estimate the likelihood that some factors other than the chance account for the observed relationship. Since the null hypothesis states that there is no relationship between the variables under study, the chi-square test merely evaluates the probability that the observed relationship resulted from chance factor. The equation for chi-square is as follows:

$$x^2 = \sum \frac{(O - E)^2}{E}$$

Where,

- $x^2$ = Chi-square,
- $O$ = Observed frequency
- $E$ = Expected frequency.

**Chi square Test of Goodness of Fit:**

Chi square Test of goodness of fit enables to ascertain how appropriately the theoretical distribution such as Binomial, Poisson, and normal etc. fit into empirical distribution. It is used to know the impact of PMGSY Roads in rural development of Himachal Pradesh.

- **Tabular Analysis**: In tabular analysis, percentages are calculated to draw the inferences. It is scientific and perfect analysis. In the present study, it has been used to support the inferences draw from above statistical analysis because non parametric analysis is not useful as parametric test.
Diagammatic and Graphic Methods: The data collected has been analysed as per the requirements of the study with help of charts such as column chart (clustered cylinder), pie chart, etc.

3.11 FORMAT OF REPORTING:

The present study has been divided into seven chapters. The first chapter deals with the introduction and conceptual framework of rural roads in India special reference to All-weather roads constructed under Pradhan Mantri Gram Sadak Yojana in Himachal Pradesh. In the second chapter efforts are made to review the available literature. Research design, which deals with need, scope, objectives, sample design, research methodology and limitations of the study, has been presented in the chapter third. Chapter IV helps acquaint us with the demographic profile of the benefited habitants. Attempt has been made to throw a beam of light on the nature of the benefit from all-weather roads and extent of satisfaction and awareness of the targeted group regarding PMGSY scheme.

Chapter V covers issues related to implementation of the PMGSY scheme and the flaws detected in its implementation. Also it talks about the quality, maintenance and condition of the all-weather roads. Chapter VI explains how the socio-economic upliftment of the beneficiaries has taken place. It gives the views of various village representatives and officials of implementing agencies on the scheme and its benefits.

The finishing chapter i.e. chapter VII has been committed to the summary of findings, conclusions and suggestions with a notion to emphasize numerous ideas talked about at a number of places so that the study becomes useful and carries great weight. Bibliography is also incorporated for consultation on the related topic. The appendix consists of the questionnaire, which enables one to verify the matching questions and their interpretation.

3.12 LIMITATIONS OF THE STUDY:

To know the extent of reliability of the study, it is important to state the limitations under which it has been carried out. The main limitations of the present study have been as follows:
1. The study has been accomplished with the help of primary data which is collected at random. For that reason, the results are likely to be affected by sampling errors.

2. This study has also been carried out with the help of secondary data collected from various sources. The limitations of these data add to the limitation of this study.

3. Collecting first-hand information from the sample benefited habitants of three districts Shimla, Mandi and Bilaspur have been studied to evaluate the performance of PMGSY roads under study was a difficult and time-consuming activity mainly on account of geographic locations of villages connected with all-weather roads. Due to non-availability of transport facilities, had to traverse long distances in the hills on foot.

4. Some of the respondents during the investigation were found reluctant to disclose the desired information.

5. The study restricted to a period from 2000 to 2012.

6. The study is confined to three district of Himachal Pradesh.

7. Villagers were reluctant to disclose anything about the financial gains accrued directly or indirectly as a result of the roads.

The study could not work out comparison of the conditions prior to implementation of the scheme with the present scenario due to non-availability of reliable information. Due to non-availability of consistent and reliable data the report has been finalized after incorporating the comments and suggestions that came up during discussions with the public representatives from different sections of the society. Project impact evaluation is distinct from cost-benefit or cost-effectiveness analysis. The objective of the latter is to compare alternative interventions on the basis of costs and benefits or on the basis of differential costs to produce a given result. Furthermore, time and cost factors resulted in keeping the scope of the study limited.