4.1. **Introduction**

This chapter explains the research design, overall plan for the study. It is concerned with the Setting of the study, sampling technique, data collection technique, tool, pilot study means used to obtain the needed data and plan for data analysis.

4.2. **Scope of Management Research**

Management research is used to solve operational and planning problems that arise in the various organizations in the society or community. These may include problems related to social, economic and health aspects. Operations research involves use of mathematical, logical and analytical methods to find optimal solutions. Motivational research involves analyzing the reasons and motives behind people’s behavior. It is also used to create awareness and understanding certain issues related to social, economical and health aspect.

4.3. **Research in Human Resource**

Human resource management is concerned with human being in any organization. It reflects new philosophy, new outlook a new approach which deals with manpower as its resource. Recently human resource
management has taken new name instead of training. Today most organizations thinks in terms of HRM as creating awareness, motivating people, understanding problems, potential development and healthy working conditions. Thus HR development has become a new dimension of modern management. It empowers every individual and it is great awareness about the investment potential in training and development all over the world.

4.4. Research Design

Research design can be defined as the plan and structure of the enquiry, formulated in order to obtain answers to research questions on management aspects. The research plan constitutes the overall programme of the research process. The planning process includes the framework of the entire research process, starting from developing the hypothesis to the final evaluation of collected data.

A research design outlines the actual research problem on hand and details the process of solving it. A good research design will clearly describe the techniques to be used for selecting samples, collecting data, managing costs and other aspects that are essential for conducting management research. Decisions are taken depending on certain crucial issues like the study’s purpose and objectives, the type of data needed, the method adopted for obtaining the data and analyzing it.
4.5. **Need for Research Design**

Research design is essential because it facilitates the smooth flow of various research processes. A good design means that good research results can be obtained with minimum utilization of time, money and effort. Therefore, it can be said that design is highly essential for planning research activities. An ideal research design can be developed, if available resources such as time, money and man power are considered before beginning the design. The validity of research results is based on the initial research design. If it is not properly prepared it will jeopardize the whole research process and will not meet its purpose. Therefore research design has to be developed very carefully, as it forms the foundation for the entire research process that follows. The characteristics of efficient research design should first be properly understood.

4.6. **Characteristics of Good Research Design**

Some important characteristics of a good research design are flexibility, adaptability, efficiency and economy. A good research design should minimize bias and maximize accuracy of the data obtained and should have as few errors as possible. The most important requirement of good research design is that it should provide adequate information so that the research problem can be analyzed on a wide perspective. An ideal design should take into account important factors like
• Identifying the exact research problem to be studied
• The objectives of the study
• The process of obtaining information
• The availability of adequate and skilled man power
• The availability of adequate financial resources for carrying out research.

4.7. **Research Approach**

There are several ways to classify research designs. There are two broad categories of research approach viz. quantitative and qualitative designs. Quantitative design is selected by researcher. There are experimental and non experimental designs under this heading. The following figure 4.1 depicts the research design selected for present study. The research approach is systematic, objective method of discovery with empirical evidence. The research method adopted for the study was quasi-experimental method because the present study was aimed at development of training manual on disaster management for school teacher in Pune city and determining its effectiveness statistically. This method was widely used in management and educational researches.
4.7.1. In this design researcher is trying to establish a cause-and-effect relationship. There are some advantages to the use of quasi-experimental designs. By this method the real world is more closely approximated. This method is widely used in management and educational researches.

4.7.2. Ghosh (2006) says that "in a quasi-experimental study, one must be familiar with the subject, to determine the scope and limit of research, to clarify the concepts and to formulate the hypothesis, and the main idea is the discovery of facts and insights". Quasi-experimental method or research approach helps to obtain pertinent and precise information
concerning the current status of phenomenon and whenever possible, to draw valid general conclusions from the facts discovered.

**Example of one group pre-test-post-test design**

A one group pretest-posttest design was used by Taylor, Kee, King and Ford (2004) to study the effects of a one day educational symposium on knowledge, impact and self management of older African Americans living with osteoarthritis. Subjects were from community senior centre. Knowledge score was significantly higher after the symposium.

According to Wood and Catanzaro (1988), "quasi-experimental studies serve the purpose of scrutinizing unknown regions for the purpose of discovery".

4.7.3. Many different designs fall into the category of quasi-experimental designs. Researcher selected one group pretest-posttest design because it provides a comparison between a group of subjects before and after the experimental treatment. The Researcher, therefore, decided to carry out a quasi experimental study with one group pretest-posttest design to find out effectiveness of manual among school teachers. The interaction of Researcher with school teachers, known experts in this field and the gaps / issues identified after literature
review were taken into account for crystallization of the objectives of the study. Keeping in the view the objectives of the study, the investigator administered pre test prior to the intervention of training manual the same group was given training manual and the group was administered post test again to find out effectiveness of training manual.

4.8. Research Statement and Objectives

4.8.1. Research Statement
"A study to develop and assess the effectiveness of training manual on Disaster Management in terms of knowledge and self expressed practices among teachers of selected schools of Pune city during 2009-11"

4.8.2. Objectives Of The Study

1. To assess the knowledge of the secondary school teachers regarding disaster management before administration of training manual.

2. To assess self expressed practices of secondary school teachers regarding disaster management before administration of training manual.

3. To find out effectiveness of training manual among the secondary school teachers regarding disaster management in Pune city

4. To associate the knowledge of secondary school teachers regarding disaster management with self expressed practices
5. To co-relate the findings with selected demographic variables.

4.9. Hypotheses

Following hypotheses were formulated by the Researcher for study

a. There is no significant difference in the level of knowledge among the school teachers of Pune City after administration of disaster management training manual.

b. There is no significant difference in the self expressed practices among the school teachers of Pune City after administration of disaster management training manual.

c. There is no correlation between knowledge and self expressed practices of Secondary School Teachers regarding disaster management.

d. There is no association of knowledge of secondary school teachers regarding disaster management with demographic variables

e. There is no association of self expressed practices of secondary school teachers regarding disaster management with demographic variables
4.10. **Period of the study**

The period of the research work started in March 2009 and closed in November 2010. Period of data collection started from June 2010 till November 2010. Period for collection of reference material considered was from 2001 till date.

4.11. **Operational Definitions**

**Definitions of terms and variables—**

**Assess:** According to Oxford dictionary assess means appraisal or evaluation.

In this study assess means appraisal of knowledge of school teacher regarding disaster management.

**Effectiveness:** According to Oxford dictionary: effectiveness means having desired effect.

In the study effectiveness means having desired effect of manual for improving the knowledge of school teachers in relation to disaster management.

**Knowledge:** According to Oxford dictionary:

Person’ range of information. Sum of what is known.

According to researcher knowledge is the information given to the school teachers on disaster management.
Manual: According to Oxford Dictionary refers to book containing information or practical instructions (on a given subject)

In this study: Manual means a booklet, which will guide and extend the knowledge of schoolteachers regarding disaster management.

Disaster: According to WHO Disaster is any occurring that causes damage, economic disruption, loss of human life and deterioration in health services on a scale sufficient to warrant an extraordinary response from outside the affected community area

In this study: selected disasters like earthquake, fire, floods and Epidemics and road accidents.

Management: according to Oxford dictionary control and organization of event and skill in dealing with people

In this study: skillful handling of selected disasters like earthquake, fire, floods etc

School: Institution for educating children

In this study: Secondary schools in Pune city (Pune Municipal Jurisdiction only)
4.12. Settings of the study

‘Setting’ refers to the area where the study is conducted. To give justice to the study and to get reliable information in the desired time-frame, the Researcher restricted his attention to the secondary school teachers, teaching in schools located in Pune Municipal Corporation area only. Serious efforts were made to cover schools from various locations, having various types of management, with various mediums of teaching and adopting various teaching patterns. The investigator did not encounter any difficulty in gaining access to it, to conduct his study. There are 306 secondary schools in Pune city under Pune Municipal Jurisdiction. Researcher divided the Pune city in five regions viz. East, West, South, North and Central. A random method was used to select the 30 schools for the research. This was done to ensure that participating schools were sufficiently representative of each region, programme level (State Board, CBSE, and ICSE) and language of instruction. The distribution of the schools in each of geographical area is outlined in Table 4.1, 4.2, 4.3. page 158, 159.

4.13. Selection of the Schools

4.13.1. Schools from PMC Area

Names of schools teaching up to 10\textsuperscript{th} standard or above were collected from various official sources. Researcher firstly prepared a database of schools falling within PMC area. By making various
permutations and combinations, random sample from out of database was designed in such a manner that it will try to maintain similar percentage of above mentioned criteria, viz., medium of teaching, geographical location and examining body, to represent the population of secondary schools in Pune city area.

**Figure 4.2**

Map of Pune city showing five regions
4.13.2. Sample of 30 schools from out of 306 schools, i.e about 10% was selected. From each of the schools, 18 teachers were planned to be selected.

Table 4.1.
Selection of the School from different regions

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of schools</th>
<th>Percentage (%)</th>
<th>Schools included in study</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>East</td>
<td>112</td>
<td>36.60</td>
<td>11</td>
<td>36.66</td>
</tr>
<tr>
<td>West</td>
<td>32</td>
<td>10.46</td>
<td>3</td>
<td>10.00</td>
</tr>
<tr>
<td>South</td>
<td>42</td>
<td>13.72</td>
<td>4</td>
<td>13.34</td>
</tr>
<tr>
<td>North</td>
<td>32</td>
<td>10.46</td>
<td>3</td>
<td>10.00</td>
</tr>
<tr>
<td>Central</td>
<td>88</td>
<td>28.75</td>
<td>9</td>
<td>30.00</td>
</tr>
<tr>
<td>Total</td>
<td>306</td>
<td>100</td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 4.3

Region wise distribution of Schools (30)
Table 4.2.

Selection of schools from different boards

<table>
<thead>
<tr>
<th>Boards</th>
<th>Number of schools</th>
<th>Percentage (%)</th>
<th>Schools included in study</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Board</td>
<td>263</td>
<td>86</td>
<td>26</td>
<td>86.6</td>
</tr>
<tr>
<td>CBSE</td>
<td>34</td>
<td>11</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>ICSE</td>
<td>9</td>
<td>3</td>
<td>1</td>
<td>3.4</td>
</tr>
<tr>
<td>Total</td>
<td>306</td>
<td>100</td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 4.4

Break up of school according to the examining body

Distribution of Schools as per Examining body (30)
Table 4.3
Medium wise selection of school

<table>
<thead>
<tr>
<th>Medium of Instruction</th>
<th>Total Number of schools</th>
<th>Percentage (%)</th>
<th>Schools included in study</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>129</td>
<td>42</td>
<td>13</td>
<td>43.33</td>
</tr>
<tr>
<td>Marathi</td>
<td>177</td>
<td>58</td>
<td>17</td>
<td>56.67</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>306</strong></td>
<td><strong>100</strong></td>
<td><strong>30</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Table 4.4
Medium wise selection of school

<table>
<thead>
<tr>
<th>Location</th>
<th>Number of Schools</th>
<th>Percentage</th>
<th>Medium of Teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>English</td>
</tr>
<tr>
<td>Central</td>
<td>9</td>
<td>30 %</td>
<td>4</td>
</tr>
<tr>
<td>North</td>
<td>3</td>
<td>10 %</td>
<td>2</td>
</tr>
<tr>
<td>South</td>
<td>4</td>
<td>13 %</td>
<td>1</td>
</tr>
<tr>
<td>East</td>
<td>11</td>
<td>37 %</td>
<td>5</td>
</tr>
<tr>
<td>West</td>
<td>3</td>
<td>10 %</td>
<td>1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>30</strong></td>
<td><strong>100 %</strong></td>
<td><strong>13</strong></td>
</tr>
</tbody>
</table>

The data was sorted according to various parameters required for the study. Major highlights of information on Secondary Schools in Pune city are presented in subsequent paragraphs.
### Table 4.4
Detailed breakup of Schools

<table>
<thead>
<tr>
<th>Region</th>
<th>Maharashtra Board</th>
<th>C.B.S.E</th>
<th>I.C.S.E</th>
<th>TOTAL</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>English</td>
<td>Marathi</td>
<td>English</td>
<td>English</td>
<td>English</td>
</tr>
<tr>
<td>CENTRAL</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>NORTH</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>SOUTH</td>
<td>1</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>EAST</td>
<td>3</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>WEST</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>9</td>
<td>17</td>
<td>3</td>
<td>1</td>
<td>13</td>
</tr>
</tbody>
</table>
4.14. Population under study

According to Talbot, ‘A population is a portion of the population that has been selected to represent the population of interest. By observing the characteristics of the sample, one can draw inferences about the characteristics of the population from which it is drawn. In a statistical investigation the interest usually lies in the assessment of general magnitude and the study of variation with respect to one or more characteristics relating to individuals belonging to a group. This group of individuals under study is called population.

According to guidelines issued by NCERT, study of disaster management is made mandatory to students of secondary school i.e. up to 10th class. The universe or population under study consists of all secondary school teachers teaching from standard VIII to standard X irrespective of their medium of teaching, type of school etc.

Economics & Statistics Bureau of Govt. of Maharashtra, publishes statistical information on various subjects. According to this official source, there were 1988 Secondary School Teachers in Pune City in the year 2008 – 09. Also according to Zilla Parishad, Pune Zilla – another local body of Govt. of Maharashtra - there were 306 Secondary Schools, during the same period, in the jurisdiction of Pune Municipal Area(PMC).
This basic information was collected from above mentioned official sources. The information was then compiled to yield meaningful classes useful for further selection. This data, therefore, was compiled for various parameters such as geographical location of Pune, medium of instructions and examining body. viz., Maharashtra Board for Secondary Schools, CBSE and ICSE.

As the whole population cannot be studied for lot of practical difficulties, a small group representing the population, is studied which is popularly known as ‘sample’. According to ‘Talbot’ larger the sample more representative of population and smaller is the sampling error. As mentioned in earlier paragraphs, Researcher focused his attention to school teachers of schools falling under Pune Municipal Corporation limits.
Figure 4.6
FLOW CHART OF STUDY DESIGN

Quasi – Experimental Study  (One Group Pre Test Post Design)

Settings of the Study  
Secondary Schools of Pune City

Population  
Secondary School Teachers of Pune City

Sampling Technique  
Simple Random Method

Secondary Schools  
Total – 306

Secondary School Teachers  
Total - 1988

Schools included for study  
Total – 30

Teachers Included for study  
Total - 540

Pre Test Conducted

Administration of Manual

Post Test Conducted

Result
4.15. **Sampling Technique**

100% inspection of population is practically not possible due to administrative, financial implications and time factor and hence we take the help of ‘sampling’. A finite subset of individuals in a population is called a sample and the no. of individuals in a sample is called ‘sample size’. The sample size for the research was 540. The individuals in the sample are observed.

Types of sampling: Some of commonly known and frequently used types of sampling are:

- Purposive sampling
- Random Sampling
- Stratified Sampling
- Systematic Sampling

- Stratified Sampling: Here the entire heterogeneous population is divided into a number of homogeneous groups usually termed as ‘strata’ which differ from each of these groups is homogeneous within itself.

Then units are sampled at random from each of these stratum, the sample size in each stratum varies according to the relative importance of the stratum in the population. The sample which is
aggregate of sampled units of each of the stratum is called ‘stratified sample’ and the technique is known as ‘stratified sampling’.

Such a sample is by and large is the best and can safely be considered as the representative of the population from which it has been drawn.

Researcher has given justice to all five regions. 18 teachers from each school were selected in the study by simple random method. While selecting the schools researcher ensured that equal percentage was maintained between English and Marathi medium schools. The state board schools, CBSE schools and ICSE schools were also given equal representation. Total 540 teachers across the city from 30 schools (on an average 18 teachers from each school by simple random method) were included in the study. In order to collect the necessary data to assess the effectiveness of the training manual on disaster management,

4.16. Design of Questionnaire

Questionnaires are the most frequently used ‘data collection method’ in educational and evaluation research. Questionnaires help to gather information on knowledge. Attributes, opinions, behavior, facts and other information. Development of a valid and reliable questionnaire is
a must to reduce ‘measurement error’. Groves (1987) defines measurement error as the “discrepancy between respondents’ attributes and their survey responses”

Development of a valid and reliable questionnaire involves several steps consuming considerable time. Each step depends on fine tuning and testing of previous steps that must be completed before the next step. The major steps involved in development a questionnaire as under:

Step – 1 - Background
Step – 2 - Questionnaire Conceptualization
Step – 3 - Format and Data Analysis
Step - 4 - Establishing validity
Step – 5 - Establishing Reliability

4.16.1. Description of The Tool -

The structured questionnaire was prepared for assessing the knowledge regarding disaster management, for the secondary school teachers in Pune city.

Structured Questionnaire

The structured questionnaire included three sections,
Section I consisted items on demographic data such as age, education, experience

Section II comprised of items to assess knowledge of teachers about disaster management. It comprises questions on following broad aspects

- Basic concepts of disaster management
- Various Do’s and do not’s during disasters
- First Aid skills

Section III includes checklist to assess self expressed practices of the teachers in relation to the disasters and its management

4.16.2. Grading Section II of the questionnaire, written response of the teacher was taken in the form of multiple choice, correct answer carries one mark and wrong answer carries zero mark.

4.16.3. For assessment of the self expressed practices checklist was prepared of each statement is scored in terms of ‘yes’, ‘no’ and ‘do not know’ correct statement carries one mark other responses were given no marks Negative statements have reverse scoring. There are 45 items in the final tool. (30 items on knowledge and 15 items on self expressed practices)
4.16.4. Training Manual (Copy enclosed in Appendix)

The researcher developed training manual which was aimed to provide better understanding about various aspects of disasters and its management. This training manual is designed specially for school teachers. Training Manual was prepared in English and Marathi version. The language of the manual was kept as simple as possible. Factors taken into consideration while preparing the manual were interest building, attractiveness, attention span and age of the samples. Opinions and suggestions of experts in the field and the exposure of investigator in the area of research were considered.

The objectives of the training manual

1. To create awareness on hazards pertaining to the locality.
2. To impart knowledge on disaster risk reduction
3. To understand disaster management plan for school
4. To make the teachers capable of training the students
5. To spread the culture of disaster preparedness

While preparing the manual expert’s opinion was sought. The manual prepared was based on questionnaire prepared for data collection. Chapters of the manual was kept follows

1. Basic Concept of Disasters and its Management
2. Various Do’s and Donot’s
3. First Aid Skills and School Disaster Management Plan
4.17. Establishing Validity and Reliability

As a result of steps 1-3 above, a draft questionnaire is ready for establishing validity. Basically validity is the amount of systematic or built-in error in measurement (Norland, 1990). Validity is established using a panel of experts and field tests. Which type of validity to use depends upon the objectives of the study. The following questions are addressed in ‘Establishing Validity’.

- Is the questionnaire measuring what it intended to measure?
- Does it represent the content?
- Is it appropriate for the sample?
- Is the questionnaire comprehensive enough to collect all the information needed to address the purpose and goals of the study?
- Does the instrument look like a Questionnaire?

The validity of the instrument is determined by expert in the field of Management, Disaster management, Education and social sciences. Researcher ensured that the expert identified were PhD qualified.
4.17.1. Establishing Reliability

Reliability is defined as “Yielding the same or compatible results in different trials”. In normal language, we use the word reliable to mean that something is dependable and it will give same outcome every time. The use of reliability types (test-retest, Split-half, alternate form, internal consistency) depends on the nature of data. To assess reliability of knowledge questions, test-retest or split – half is appropriate.

Reliability is established using a pilot test by collecting data from 60 subjects which were not included in the study. Data collected form pilot test is analyzed using a computer software package such as SPSS (Statistical Package for Social Sciences). Reliability and validity of tests are ‘Twin Pillars” which support the entire testing procedure. It must be noted that Reliability is ‘Not calculated’ but ‘Estimated’. The reliability coefficient calculated was 0.8430 (84 %) which indicated that instrument designed for data collection was highly reliable.
4.18. Pilot Study

Pilot study is an exploratory study done preliminarily, to help in refining the problem, develop or refine hypothesis, or test and refine the data collecting methods. According to William (2002), a pilot study is one that tests procedures or tools. The tool is tested in a pilot study, which is an important step in the development of a new tool or making the necessary changes in the same tool and increase its reliability and validity. After permission was sought, a pilot study was undertaken. A pilot study was conducted by the investigator in secondary schools in June 2010 to test the practicability of this tool.

Pilot study was conducted on 60 school Teachers to test the feasibility of the study.

Objectives of the pilot study were

- To assess the feasibility of the tool
- To test the tool for content and language
- To assess the time taken for the study
- To identify the problems faced during the date collection.

Sixty teachers were selected according to the criteria laid down for the sample selection. They were explained about the purpose of the study and the procedure of data collection. Data was collected as per the respondents’ availability and convenience, and their responses were
recorded. They were assured about the confidentiality of the information collected. Training manual was given post-test was administered on 7th day.

4.19. Data Collection

Data was collected by using the tool.

- Questionnaire was introduced to identify responses.
- Identify the level of knowledge and practices of school teachers
- Training Manual was Provided to the school teachers in relation to the disaster management
- Evaluated the difference between knowledge of school teachers before and after administration of manual
- Administrative permission was procured formally from the school authorities
- The actual data collection started from the July 2010 and ended on 20th November 2010, on all days, except public holiday. They were explained about the purpose of the study and assured about the confidentiality of the information between the investigator and the respondent only. Their willingness was sought for.
- The respondents were all very interested and enthusiastic to answer. A short discussion was held with the respondents to converse and ask if there were any queries concerning to topic.
4.20. **Data Analysis**

The data collected was interpreted using tables and figures. The data was analyzed using statistical tools. Differential and inferential statistics will be used to interpret the data. The investigator decided to analyze the data using descriptive and inferential statistics and presented them in tables, graphs and figures. The following plan of analysis was made with consultation of statistical expert.

1. The items in the demographic data variables will be computed in the terms of frequency and percentage.
2. Bar graphs will be plotted to compare the distribution of pre-test and post-test knowledge score.
3. Mean, standard deviation of pre-test and post-test knowledge score will be calculated and compared.
4. ‘t’ test will be applied to determine the significance of mean difference between mean pre-test and mean post-test knowledge score.

4.21. **Data Dissemination And Utility**

The findings of the study will be presented in conferences and group meetings and a copy will be circulated to all the schools, administrators, educators and education authorities for their commitment and improvement and standardization can be undertaken.