Chapter 3 – Research Methodology

3.1 Statement of problem

In many parts of the India environmental problems has revealed to create a great challenge. This is especially witnessed in the section of solid waste management in different cities of country. While the quantity of waste generated in cities, continue to increasing day by day, but the effectiveness of the means of handling waste in terms of collection and disposal remains undesirably low.

Waste generation therefore tends to increases with an increase in population and economic growth, which together adds up to the problem of waste management posed potential threat not only on the environment but also on the public health.

Waste management is a bigger problem of today because it is directly linked with protection of health, safety of public and the environment. The management techniques, approaches and methods and employed in waste management have been unsuccessful. If we compare with other public sectors it has been observed that sectors dealing with waste management have received little attention from the governments.

Waste management is an important aspect of urban governance because it reflects not only on the consequences of the authorities dealing with waste but also the responses of the society on the performance of the systems used by these authorities. The success of the authorities implies good governance and therefore the state gains trust from the public. The commercial aspect of waste provides a employment to so many peoples and decreased the effect of waste on environment and also increases capital for economic development. Considering these entire aspects researcher found that little attention is given on study of commercial aspects of waste management in Gwalior city and identified a gap on research in this topic and selected this area for her study.
3.2 Objectives of the study

Every research work has predetermined objectives. To start any research work it is important to know why research work is has to be done. What are the objectives to achieve, the research should be done systematically for solid waste management in Gwalior the researcher had determined the following objectives.

1. To analyse the present status of solid waste management in Gwalior.

2. To find out factors affecting waste management in Gwalior.

3. To examine the commercial aspects of waste management in Gwalior.

4. To suggest various parameters for improvement in commercial aspects of waste management.

3.3 Hypothesis of study

H01: There is no significant impact of service quality provided by Municipal Corporation on solid waste management.

H02: There is no significant impact of financial capability on solid waste management

H03: There is no significant impact of cooperation activities on solid waste Management

H04: There is no significant impact of material resources on solid waste management

H05. There is no significant relations between service quality and financial capability
H06: There is no significant relationship between cooperation activities and financial capability.

H07: There is no significant relationship between material resources and service quality

3.4 Conceptual Framework of the study

- Service Quality
- Financial Capability
- Cooperation activity
- Material Resources

H01: Solid Waste Management
H02
H03
H04
H05
H06
H07
3.5 Research Design

Research design is a master plan specifying the methods and procedures guiding researcher to collect their data and analysis for their research. Research is empirical in nature.

A sample is a part of the population, which is studied in order to make inferences about the whole population. If the sample is adequate, it will have the same characteristics of the population (Zikmund, 2003) and the findings are usually used to make conclusions about the population.

Sampling Technique

Simple random sampling technique was used to identify the respondents of the study.

Population

The population for the study will include Gwalior city of Madhya Pradesh and the targeted population for the study is 1455. 22% of target population has been taken as sample size.

Sample Size

Sample size has an effect on how the sample findings accurately represent the population (Burns & Bush, 2010). The larger the sample is, the more likely that the generalisations are an accurate reflection of the population (Saunders, Lewis & Thornhill, 2009). The sample size is assumed as 22% of targeted population. The sample size of the study is 320 respondents including employees, planning experts of MNC and rest are the members of different wards.

Sampling Elements

Employees, planning experts, from MNC and members of different wards are the sampling elements of the study.
3.6 Sources of Data

Data sources are classified into primary sources or secondary sources. A source is primary if the data collector is the one using the data for analysis. A source is secondary if one organization or individual has compiled the data to be used by another organization or individual. Both primary and secondary data has been collected in this research. Primary data was collected by means of a structured questionnaire that was developed by the researcher based on the literature review on the relevant topics. On the other side secondary data has been collected from published thesis works, unpublished thesis works, websites and research articles from journals.²

3.7 Measurement of scale:

Questionnaire is a collection of written queries, which is arranged putting all the essential variables for the research and can be completed by the respondents in presence, in absence, directly or indirectly. The questions in a questionnaire are the key to the survey research. Therefore, it must be developed with caution and be vital to the survey also, the questionnaire has to keep short or otherwise it would confuse the respondents.

The variables are:

1. Service Quality
2. Financial Capability
3. Cooperation Activity
4. Material Resources

The questionnaire used in the present study consisted of three sections A, B and C. Section A dealt with demographic information of the participants. Section B consist of the question related to various functions carried out by MNC and C
consisted of 26 items measuring factors related to waste management process in MNC.

Self-design questionnaire was used to measures all the variables. The data was collected on the scale of 1-5 Likert’s scale, Ranking Scale, and choice type (Y/N). The scaling is: 5 for strongly agree, and 1 for strongly disagree.

**3.8 Software Uses for Statistical Analysis**

Collected data was analysed with the help of different statistical calculations using SPSS software. Statistical package for social science (SPSS) version 20.0 for windows seven was used for data analysis and hypothesis testing.

Collected data was also analysed with the help of various types of pie chart, graphs, bar charts etc. by using Microsoft Excel 2010, for windows seven.

**3.9 Tools for Data Analysis**

1. **Validity**

   Validity is a criterion, which indicates the degree to which an instrument measures what is expected to be measure by it. There are three types of validity (1) Content validity (2) criterion related validity (3) construct validity.

2. **Reliability**

   Reliability is a test of sound measurement. A measuring instrument called reliable if it gives consistent results. The reliability is tested by the item to item correlation method. It expresses the consistency of various items used in questionnaire. The reliability of undertaken research is calculated with the help of software SPSS and all the items were found highly correlated and consistent by examining the value of Cronbach’s Alpha. Any scale is called reliable if the value of Cronbach’s Alpha is. 06 or greater than that. The results of reliability test is shown in the table which greater than .06 and acceptable. It also shows the high degree of internal consistency and reliability of data. Cronbach’s
Alpha reliability coefficient normally ranges between 0 and 1. However, there is actually no lower limit to the coefficient. The closer Cronbach’s Alpha Coefficient is to 1.0 the greater the internal consistency of the items in the scale. Based upon the formula

**Cronbach’s Alpha Coefficient** \( r = \frac{rk}{1 + (k - 1)r} \)

Where \( k \) is the number of items considered and \( r \) is the mean of the inter-item correlations the size of alpha is determined by both the number of items in the scale and the mean inter-item correlations.

3. **Factor Analysis**

- Factor analysis is used to find latent variables or factors among observed variables. In other words, if the data contains many variables, factor analysis can be used to reduce the number of variables. Factor analysis groups variables with similar characteristics together. With factor analysis we can produce a small number of factors from a large number of variables which is capable of explaining the observed variance in the larger number of variables. The reduced factors can also be used for further analysis.

  There are three stages in factor analysis:

- First, a correlation matrix is generated for all the variables. A correlation matrix is a rectangular array of the correlation coefficients of the variables with each other.

- Second, factors are extracted from the correlation matrix based on the correlation coefficients of the variables.

- Third, the factors are rotated in order to maximize the relationship between the variables and some of the factors.

- KMO Barlett test is applied in the study to know whether the data is suitable for factor analysis.
4. Regression Analysis

Regression analysis determines the relation between two variables. There are two variable are; dependent variable and independent variable. It explains the effect of independent variable on dependent variable. The relationship between variables can be express in such a way.

\[ Y = a + bX \]  
(Regression equation)

Where, \( X \) = Independent variable and \( Y \) = Dependent variable

Multiple Regressions: multiple regressions describe the relationship between one dependent and two or more than two independent variables.

\[ Y = a + b_1X_1 + b_2X_2 \ldots \]  
(Multiple Regression equation)

Parametric test have been applied in Regression Analysis.

5. Correlation

If two variables are correlated, the change in one variable is accompanied with change in other variable and vice-versa. There are two types of correlation positive and negative. When the increase in one variable result increase in the corresponding variable such type of correlation is called positive correlation and in contrast of this, increase in one variable decrease in corresponding variable, called negative correlation. Karl Pearson co-relation is used in the study.

Here in this study all these tools have applied for data analysis and different tests have been also applied for data analysis.
REFERENCES


