CHAPTER IV

METHODOLOGY

This chapter explains the methodology of the study. In this chapter, the population and sample of the study, sampling technique, data collection, statistical tools and terminology and concepts used in this study were discussed.

Population and Sample of the Study

The usual purpose of research is to learn something about a large group of people by studying a much smaller group of people. The large group we wish to study is called ‘population’ whereas the smaller group the ‘sample’.¹

A population is any group of individuals that have one or more characteristics in common that are of interest to the researcher. The population may be all the individuals of a particular type or a more restricted part of the group.² A sample is a small proportion of a population selected for analysis. By observing the samples certain inferences may be made about the population.³

Sampling means selecting a given number of people from a defined population, also called the universe, that is all the members of a real or hypothetical set of people, events or objects for which the results can be generalised. If sampling is done properly, the researcher can reach conclusions
about an entire population that are likely to be correct within a small margin of error by studying a relatively small sample.\(^4\)

The four major steps of sampling as suggested by Van Dalen are: A researcher must

- define his population,
- procure an accurate and complete list of the units in the population,
- draw representative units in the lift and
- obtain a sufficiently large sample to represent the characteristics of the population.

The size of the sample is an important problem to be decided in case of sampling. This is because the size has a direct bearing upon accuracy, time, cost and administration of the survey. Large samples are generally hard to manage and are unfit for detailed study, but that may be essential for representatives. According to Parten – “An optimum sample in survey is one which fulfils the requirements of efficiency, representativeness, reliability and flexibility”. The sample should be small enough to avoid unnecessary expenses and large enough to avoid intolerable sampling errors.

For this study Hi Tech Aray limited, Madurai was taken as the universe. This study is mainly related to the H.R. functions, and investigation was carried out through the perception of the employees to investigate whether QC is
motivating the employees in the organisation. So the various activities of QC in the organisation were analysed to find out how far the QC motivates the employees. The employees including permanent and other temporary/casual labourers were also considered as samples for this study.

Since most of them are casual labourers temporary employees were continuously working with a little gap, it is presumed that they must have the work knowledge and skills to perform the work. Eventhough, they were not entitled to avail some of the benefits, rewards and awards, their contribution to the organisational development could not be set aside. They may also be considered as knowledge workers along with permanent employees.

**Sampling Techniques**

The basic idea of sampling is that by selecting some of the elements in a population, we may draw conclusions about the entire population. A population element is the subject on which the measurement is being taken. It is the unit of study. In this study the population is the organisation. The sampling frame is closely related to the population. It is the list of elements from which the sample is actually drawn. The employees affiliated to the organisation formed the sampling frame in the study.
In this study, the investigator defines the population sample as the employees that are workers, supervisors, managers, at all levels and the administrative staff of the organisation including the casual and temporary labourers.

The researcher has adopted stratified random sampling technique for this study. The whole population is stratified according to cadres, sex, age, experience, income, marital status. The data were analysed according to the stratified segmentation.

The size of the sample of the study constitutes 132 (44.0) production workers including temporary employees and casual labourers, 46 (15.3) office/administrative employees, 19 (1.3) supervisors and 103 (34.3) technicians of the organisation.

The present study is an empirical survey for the purpose of selection of employees whose response form the core of the investigation. The research study is limited to the only one organisation that is Hi Tech Aray Limited, Madurai. No other organisation is compared because this study is considered to be a case work. In total, 300 respondents were selected for this study through stratified convenience random sampling technique as detailed below.
TABLE 4.1

CLASSIFICATION OF RESPONDENTS

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Sample</th>
<th>Total Number of Respondents</th>
<th>Selected Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Production workers</td>
<td>132</td>
<td>(44.00)</td>
</tr>
<tr>
<td>2.</td>
<td>Office workers</td>
<td>46</td>
<td>(15.30)</td>
</tr>
<tr>
<td>3.</td>
<td>Supervisors</td>
<td>19</td>
<td>(6.30)</td>
</tr>
<tr>
<td>4.</td>
<td>Technical persons</td>
<td>103</td>
<td>(34.30)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>300</td>
<td>(100.00)</td>
</tr>
</tbody>
</table>

Source: Primary.

Note: 1) Figures in brackets indicate percentages.
2) Production workers include the casual labourers also.

Data Collection

The study depends both on primary and secondary data. The primary data were collected through interview schedule to obtain the perceptions of the employees. The secondary data were collected from the records of the organisation. The documents used for the secondary data are the annual reports and audit reports of various years of the organisations. The data were classified according to the analysing objectives. The variables relating to receipts (income) and expenditures have been measured in lakhs of rupees. The productivity is measured in terms of thousands.
Research Tool Construction

The interview schedule used in this study was designed and constructed by the researcher herself. This section deals with the development of tools of research employed in this study. Early in the planning stage of the research project, an investigator weighs the merits of various procedures for collecting evidence. After determining which approach yields the form and kind of data necessary to test, he examines the available tools and chooses the ones that are most appropriate for his purpose. If the existing research tools do not meet his specific needs, he supplements or modifies them or constructs his own.

A great variety of research tools have been developed to aid in the acquisition of data. These tools are of many kinds and employ distinctive ways of describing and quantifying data. Each tool is particularly appropriate for certain sources of data, yielding information of the kind and in the form that would be most effectively used. Like the tools in the carpenter’s chest, each is appropriate in a given situation. Hence, the researcher has to select from among the available tools.

The investigator has structured a tool for investigation on his own incorporating all the information he needed as statements. The tool has 21 main factors which were considered to be some of the important ones. Every main factor has some supportive factors. These have also been given as statements.
There are positive as well as negative types of statements to assess the perception of the respondents correctly and accurately.

**Scoring Procedure**

The statements are analysed on a five-point scale. The respondents were asked to go through the statements. Since the investigator himself collected the responses from every sample and meeting them in person, it was easy for him to explain some of the statements to the respondents on their request. So, the correct perception of respondents could be obtained. The investigator took care, that no statement should be left out unrated. The respondents were asked to make a tick according to the intensity of their perception of the statement with marks 5 to 1. The maximum score (strongly agree) was 5 and the minimum score (strongly disagree) was 1.

**Validation of the Tool**

Sound measurement must meet the tests of validity and reliability. In fact these are the major considerations one should use in evaluating a measurement tool. “Validity refers to the extent to which a test measures what we actually wish to measure. Reliability has to do with the accuracy and precision of a measurement procedure... ”.
Validity is the most critical criterion and indicates the degree to which an instrument measures what it is supposed to measure. In other words, validity is the extent to which differences are found by using a measuring instrument. There are other relevant evidences which validate one’s assessment. Relevant evidence often depends upon the nature of the research problem and the judgement of the researcher. But one can certainly consider three types of validity in this connection (1) content validity, (2) criterion-related validity and (3) construct validity.

In this study, the researcher has validated her tools by means of content validity. Three experts from Human Relations Management area were requested to go through the relevance of the statements designed for measuring. Their judgement on the relevance of statements was taken as an index of content validity. Their suggestions were incorporated in the tool.

**Statistical Tools Used**

The statistical tools like, One-Way Anova, Factor Analysis and Semi-log trend model were used in this study at appropriate places
Anova

To find out the important variables perceived by the employees and also the individual group of employees namely, workers, supervisors and managers, the test of Analysis of Variance was employed.

Factor Analysis

To group the factors dimension-wise, Factor Analysis Model was used.

Compound Growth Rate

The trend of the growth in production of the milk and its products from the four FBDs over the time was ascertained using the following model:

\[
\text{Log } Y = a + b T
\]

Where,

\[Y = \text{ Dependent variable}\]

\[T = \text{ Time and}\]

a and b trend coefficients to be estimated.

\[\text{Compound Growth Rate (CGR)} = (\text{antilog } b - 1) \times 100\]

‘t’ Test

The ‘t’ test employed to find out the significance of difference between the means of different variables was used in the study. The variables related to are before joining Q.C. and after joining QC. If significant difference is observed,
then it can be concluded that the employees’ various skills and work knowledge were improved after joining the Q.C.

\[ t = \frac{X_1 - X_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}} \]

Where

\( X_1 \) = Mean score of the first group.

\( X_2 \) = Mean score of the second group.

\( S_1 \) = Standard deviation of the first group.

\( S_2 \) = Standard deviation of the second group.

\( N_1 \) = Size of the first group.

\( N_2 \) = Size of the second group.

**Correlation Study**

To find out the relationship between the criterion variable and the correlates, the following Pearson product – Moment Correlation formula was used for calculating the co-efficient of correlation.

\[ r = \frac{N \Sigma XY - \Sigma X \Sigma Y}{\sqrt{(N \Sigma X^2 - (\Sigma X)^2)(N \Sigma Y^2 - (\Sigma Y)^2)}} \]
Where,

\[\begin{align*}
X &= \text{Criterion variable and} \\
Y &= \text{Correlates (or) Predictor Variable.}
\end{align*}\]

**Terminology and Concepts Used**

**i) Terminology Used**

For some of the general terms used in this study, the definitions are given below:

**Quality** : (As per ISO 8402) “Comparative Sense or 1 degree of excellence”\(^7\)

“The totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs”\(^8\).

**Total Quality Management (TQM)**

“TQM is a philosophy that involves every one in an organisation in a continual effort to improve quality and achieve customer satisfaction”\(^9\).

**Quality Control Circle (Or) Quality Circle**

“An approach to improve the quality of work life, in which small groups of volunteers meet regularly to identify and solve problems related to the work they perform and the conditions under which they work”\(^10\).
“A work group of employee who met regularly to discuss their quality problems, investigate causes, recommend solutions, and take corrective actions”.

Organization

“A structured social system consisting of groups and individuals working together to meet some agreed-upon objectives”.

“A Consciously co-ordinated social unit, composed of two or more people, that functions on a relatively continuous basis to achieve a common goal or set of goals”.

Globalisation

“The process of inter connecting the world’s people with respect to the cultural, economic, political, technological and environmental aspects of their lives”.

Organisational Change

“Planned or unplanned transformation in an organisations’ structure, technology, and/or people”.
**Human Relations Movement**

“A perspective on organisational behaviour that rejects the primarily economic orientation of scientific management and recognises, instead, the importance of social process in work settings”.  

**Motivation**

“The forces within a person that affect his or her direction, intensity and persistence of voluntary behaviour”.  

“The processes that account for an individuals’ intensity, direction, and persistence of effort toward attaining a goal”.  

**Employees**

All the cadres of employees including production workers, office workers, supervisors and technicians.  

**Factors**

The selected major variables (macro variables) which motivate and influence an individual or group or productivity. These are
Product

The products manufactured by the organisation. These are O’ Rings, Reed Valve Assemblies.

The Period of Study

Ten years from 1997-98 to 2006-07.

Statements

Variables within the factors, that is micro variables or independent factors, which act upon the dependent variables.

Decision Making

“The process of making choices from among several alternatives”.

Problems

The study was investigated and analysed with the help of the interview schedules and statistical tools as detailed above.
REFERENCES


