CHAPTER III

METHODOLOGY

The review of earlier studies indicate that, there are studies on the meaning and scope of QWL; QWL and related issues and on the outcomes of QWL. These surveys try to ascertain the work content, structure, process and environment which have been used successfully to restructure the workplace and to improve both productivity and employee satisfaction. When applied to executives, the work environment, management policy and immediate work group behaviour patterns within which they work may be considered as the three major dimensions of QWL. The impact of these dimensions may be meaningfully reflected in the executives' performance, satisfaction and possibly the quality of the work done. The methodology, used to study these issues has been described in this chapter.

3.1 THE SAMPLE

The study is based on primary data comprising the perceptions of the middle-level executives, belonging to selected public and private sector enterprises within the State of Tamilnadu. The above data were collected through questionnaire administration and personal discussion. These industrial organisations were selected at random from places like Coimbatore, Trichy, Madurai, Madras, Ooty, Tuticorin, Salem, Hosur and Neyveli, where most of the industrial units of the Tamilnadu State are located. Table 3.1 presents the distribution pattern of the sample.

* Some of the relevant observations made by the executives during these discussions have been quoted at the appropriate context in this Thesis.
## TABLE 3.1

**DISTRIBUTION OF SAMPLE**

<table>
<thead>
<tr>
<th>SL No.</th>
<th>Name of the Company</th>
<th>Public/Private</th>
<th>Number of questionnaires distributed</th>
<th>Number of questionnaires returned</th>
<th>Number of questionnaires accepted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>NLC</td>
<td>Public</td>
<td>41</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td>2.</td>
<td>FIL</td>
<td>Private</td>
<td>20</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>3.</td>
<td>SITA</td>
<td>&quot;</td>
<td>10</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>4.</td>
<td>COATS</td>
<td>&quot;</td>
<td>16</td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>5.</td>
<td>MEPCO</td>
<td>&quot;</td>
<td>10</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>6.</td>
<td>TIPS</td>
<td>Public</td>
<td>30</td>
<td>23</td>
<td>21</td>
</tr>
<tr>
<td>7.</td>
<td>SPIC</td>
<td>Private</td>
<td>10</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>8.</td>
<td>COSM</td>
<td>Public</td>
<td>25</td>
<td>18</td>
<td>16</td>
</tr>
<tr>
<td>9.</td>
<td>SAKTHI</td>
<td>Private</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>10.</td>
<td>SIV</td>
<td>&quot;</td>
<td>16</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>11.</td>
<td>TANI</td>
<td>&quot;</td>
<td>12</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>12.</td>
<td>RMI</td>
<td>&quot;</td>
<td>10</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>13.</td>
<td>TEXTOOL</td>
<td>&quot;</td>
<td>15</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>14.</td>
<td>LMV</td>
<td>&quot;</td>
<td>16</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>15.</td>
<td>LAXMI</td>
<td>&quot;</td>
<td>15</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>16.</td>
<td>ELGI</td>
<td>&quot;</td>
<td>14</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>17.</td>
<td>CVL</td>
<td>&quot;</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>18.</td>
<td>SIMCO</td>
<td>&quot;</td>
<td>10</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>19.</td>
<td>TSRM</td>
<td>&quot;</td>
<td>8</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>20.</td>
<td>KEL</td>
<td>&quot;</td>
<td>30</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>21.</td>
<td>BURNS</td>
<td>Public</td>
<td>20</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>22.</td>
<td>DALMAG</td>
<td>Private</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>23.</td>
<td>SAIL</td>
<td>Public</td>
<td>25</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>24.</td>
<td>BEEDRES</td>
<td>Private</td>
<td>16</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>25.</td>
<td>TITAN</td>
<td>&quot;</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>26.</td>
<td>SKL</td>
<td>&quot;</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>27.</td>
<td>UCL</td>
<td>&quot;</td>
<td>12</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>28.</td>
<td>MRL</td>
<td>Public</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>29.</td>
<td>HML</td>
<td>Private</td>
<td>12</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>30.</td>
<td>EEC</td>
<td>&quot;</td>
<td>25</td>
<td>22</td>
<td>20</td>
</tr>
<tr>
<td>31.</td>
<td>L &amp; T</td>
<td>&quot;</td>
<td>11</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>500</strong></td>
<td><strong>430</strong></td>
<td><strong>412</strong></td>
</tr>
</tbody>
</table>
Of these 31 organisations, 6 belong to the public sector and the remaining 25 to the private sector. Totally, 500 questionnaires were distributed, out of which only 430 were received back. 18 questionnaires which were incomplete were not included for analysis and interpretation.

3.2 INSTRUMENT DESIGN

A questionnaire was prepared to ascertain the perceptions of individual executives on the different aspects of the study. The text of the questionnaire used is provided in Appendix A. The questionnaire contains four sections as detailed below:

Section A was meant for knowing about the personal profile of the executives. Section B was subdivided into 4 parts viz., D1 to D4. D1 comprises 12 statements to be answered on a 5 point Likert type scale. These statements, taken together, deal with 12 significant facets of managerial or executive work. The executives have to answer these questions expressing the degree of importance given by them to each facet of work. The responses, taken together, help to determine the quality of the work done by the executives.

The second part viz. D2 contained 13 statements the responses to which are to be marked on a five point Likert type scale. These statements relate to the work environment of the executives. D3, the third part, comprised 10 statements pertaining to the management policy of the company to which they belong. And the fourth part D4 had 11 statements about the immediate work group to find out the extent of favourableness of the work group in their work
life. In all, 34 statements were framed covering the 3 dimensions of the quality of work life (QWL) for the purposes of the study.

Section C was devoted to rating the performance of the individuals. This section had 12 aspects of performance to be rated by the executives on a 5 point scale. And the last section, Section D was meant for measuring the level of satisfaction they get in the prevailing working climate and performance. This Section comprised 11 factors relating to job satisfaction.

3.3 PRE-TESTING

Pre-testing of the draft questionnaire was undertaken to know the adequacy, relevance and clarity of the contents of the questionnaire. The questionnaire was personally administered to 20 executives belonging to two companies. In the light of the suggestions given by the respondents, a few modifications were made and the final questionnaire was then drafted. The contents of the questionnaire may be described now.

3.4 CONTENTS OF THE QUESTIONNAIRE, SCALING AND SCORING

As already noted, the questionnaire was designed to cover (i) Quality of Work, (ii) QWL, (iii) Performance and satisfaction. These designs are detailed below.
D1 Work - its nature

This section contains 12 facets of work given in the form of statements. These facets are also considered as the requisites for a qualitatively better work for a middle-level executive. The quality of his work is presumed to be determined by these components/facets of work - their perceptions on which are relatively more important are to be ascertained by the present study. The executives were asked to respond to a set of 12 statements on a five point scale, the degree of importance given by them to each facet of work they perform everyday. These facets of work include:

- Accuracy/perfection
- Skill/knowledge
- Thoroughness
- Acceptability
- Authority given
- Creativity/newness
- Dedication/commitment
- Accountability
- Economy of resources used
- Strain or Labour required
- Effort in routine jobs and
- Efforts in special jobs.

Suitable statements were framed for each one of the above facet of work.

For each statement, the degree of importance given by the executives would be
the response in a five point scale viz. Highest (5 points), High (4 points), Moderate (3 points), Low (2 points) and Very Low (1 point).

D2, D3 and D4 - Quality of Work life (QWL)

The three major dimensions of QWL which were considered for the study comprise D2 Work Environment, D3 Management Policy and D4 Immediate Work Group.

D2  Work Environment

The following 13 factors were taken as affecting the work environment of the executives either in a favourable or unfavourable manner.

- Physical conditions in the work place
- Welfare schemes and retirement benefits
- Profit sharing
- Training provided
- Career prospects/opportunities for growth
- Pay and other compensation package
- Nature of leadership
- Skills of subordinates/competence of team members
- Trustworthiness of the subordinates
- Targets/standards set for performance
- Role clarity
- Openness in communication
- Assurance of continued job.
D3  Management Policy

Ten management policies/practices were listed out for the purpose of the study. In the context of the job, these practices may be either favourable or unfavourable to the executives. These practices include:

- Pay and perks received in relation to one's knowledge and experience.
- Free and frank exchange of views between the executives and the top management.
- Responsive grievance handling.
- Clarity in defining the roles of management and that of the executives.
- Fairness in the company procedures and policy concerning all employees.
- Ethical and moral standards set by the management.
- Recognition for good performance.
- Congruence between company's goals and personal goals.
- Maintenance of good quality in the goods and services sent out.
- Feedback on customer satisfaction.

D4  Immediate Work Group

The immediate work group has a substantial influence on the Quality of Work Life. If the members of their work group has a high sense of job responsibility and work as a team, it may increase efficiency and productivity.
Team building is therefore taken up as a part of training in many organisations. The executives in a team, work as facilitators and thereby help, guide, direct and support the team, without the need for controlling. Such groups provide a stress-free environment to work in. To know the characteristics of the work group that would matter in work accomplishments, the following eleven characteristics of the group members were included in the questionnaire.

- Commitment to organisational goals
- Involvement in the job
- Willingness to take responsibility
- Skill and knowledge relevant to the job they perform
- Acceptance of goals set for the team
- Cohesiveness of the team
- Quality consciousness
- Trust and confidence the members of the team have with each other
- Ethical and moral values of the members of the work group
- Participation in the decision making process
- Sharing of information between group members.

For all the above 34 statements scores were assigned on a five point scale to elicit the perception of the executives, as given below:

| Very high | 5 |
| High      | 4 |
Medium 3
Low 2
Very low 1

Taken together, it means that there are three dimensions to QWL and the level of QWL can be determined by the degree of importance one gives to the presence of these factors in their work situation or organisation. The next section of the questionnaire was meant for self-evaluation of performance.

D5 Self Evaluation of Performance

Measuring an individual's performance is like throwing a few pebbles into the water and watching how the ripples interact. An earnest attempt has been made covering various aspects of individual performance and thereby make the executives come out with (their own) self performance rating. The following were the aspects covered in measuring performance:

- Effort
- Quality of output
- Utilisation of resources
- Training provided to others
- Motivating others
- Innovations introduced
- Knowledge possessed
- Crisis management
- Inter-personal relationship
- Initiative
- Competency in the view of the management and
- Stress/strain encountered.

D8 Satisfaction in the Job

As suggested by Peter F. Drucker\(^1\) we live in a turbulent time, not because there is so much change, but because it moves in so many different directions. In this situation, the effective executive must be able to recognise and run with opportunity, to learn and constantly to refresh the knowledge base. Thus in a given environment and performance, how satisfied an executive is, relates to his ability to be 'on the run'. The following factors were included to indicate the level of satisfaction of the executives. These factors include:

- State of inter-personal relations
- Prevailing pay structure
- Authority given by the management
- Level of productivity
- Interest in the job they perform
- Sense of accomplishment
- Recognition for work done
- Leadership
- Personal growth in knowledge and skills
- Fairness and equity in the reward

\(^1\) Peter F. Drucker, Managing For the Future, World Executive Digest, Sept. 1992, p. 21.
Challenges in the job

The same scoring pattern adopted for measuring the dimensions of QWL have been followed for self-evaluation of performance and satisfaction at the job.

Based on the scoring obtained, the total score for each respondent and the average score for each variable were calculated. To obtain classification on the basis of overall QWL, scores of executives whose total scores are between 137-170 are placed in 'high' category; between 103-136 in 'medium' category and less than 102 in 'low' category.

Scores for Work Environment (D2)

Less than 39 - Low
40 - 52 - Medium
53 - 65 - High

Scores for Management Policy/Practices (D3)

Less than 30 - Low
31 - 40 - Medium
41 - 50 - High

Scores for Immediate Work Group (D4)

Less than 33 - Low
34 - 44 - Medium
44 - 55 - High
Scores for Self Evaluation of Performance (D5)

Less than 36 - Low
37 - 48 - Medium
49 - 60 - High

Scores for Satisfaction in The Job (D6)

Less than 33 - Low
34 - 44 - Medium
45 - 55 - High

3.5 INSTRUMENT RELIABILITY

When a measuring instrument is reliable, the result provided is consistent. If the reliability is satisfied by an instrument, then while using the instrument one can be confident that the transient and situational factors are not interfering.\(^1\) There are two theories of measurement of error: (a) the theory of parallel tests and true and error scores and (b) the theory of domain sampling.

The Spearman Brown formula of the theory of Domain Sampling has been used to compute the reliability of a K - item test.

\[
\text{Reliability co-efficient} = \frac{K\hat{r}}{1+(K-1)\hat{r}}
\]

A major assumption is that the sum of any row in the correlation matrix is equal to the sum of any other row and also equal to the sum of any other column. Dividing either a row or a column total by "n" will give the mean inter-correlation between a given item and all other items. It is so, because the mean inter-correlation of an item with all other items is the same for any item. It follows that the mean inter-correlation, of all of the items in the domain, will also be equal to the mean correlation of an item with all others.

Using Spearman - Brown Reliability Test, the mean inter-correlation and the reliability co-efficient for the 6 parts of the questionnaire and the overall reliability have been computed using the above formula. The results obtained are as follows:

**D1 - WORK - ITS NATURE**

- Mean Inter-correlation = .3680523
- Reliability co-efficient = .8748266

**D2 - WORK ENVIRONMENT**

- Mean Inter-correlation = .1330611
- Reliability co-efficient = .6661425

**D3 - MANAGEMENT POLICY**

- Mean Inter-correlation = .4149807
- Reliability co-efficient = .8764434
D4 - IMMEDIATE WORK GROUP
Mean Inter-correlation = .5945569
Reliability co-efficient = .9416256

D5 - SELF EVALUATION OF PERFORMANCE
Mean Inter-correlation = .5988459
Reliability co-efficient = .9655524

D6 - SATISFACTION IN THE JOB
Mean Inter-correlation = .4949365
Reliability co-efficient = .9151063

OVERALL RELIABILITY
Mean Inter-correlation = .5514585
Reliability co-efficient = .8806211

A reliability coefficient of 0.6 and above is generally considered to be acceptable. The reliability test results show that the questionnaire designed for the present study is highly reliable with respect to all the 6 sections and in its totality.

3.6 STATISTICAL ANALYSIS USED

The following are the different types of statistical techniques used other than simple percentage analysis and Chi-Square tests.
3.6.1 Kendall's Coefficient of Concordance

Represented by 'W' Kendall’s Coefficient of Concordance is an important non-parametric measure of relationship. It is a measure of the relation among (K) several ranking of N objects or individuals. 'W' expresses the degree of association among K such variables. When perfect agreement exists between the respondents (executives) in their rankings 'W' equals 'One'. When maximum disagreement exists 'W' equals 0 (zero). Kendall's Coefficient of Concordance (W) is an index of divergence of the actual agreement from perfect agreement.

'W' is obtained by first ranking 'N' objects by all the 'K' respondents and later put in the form of K by N matrix; for each response (R_j) the sum of ranks is determined by the K respondents; Having obtained R_j, then the value of S is obtained by using

\[ S = \sum (R_j - \bar{R}_j)^2. \]

The value of 'W' is worked out by using the formula:

\[ W = \frac{S}{1/12 K^2(N^3-N)} \]

A Correction factor is used, when there are ties in the ranks, for each set of calculated ranks. The Correction factor is the same as the one used in Spearman's rank correlation.

\[ T = \frac{\sum(t^3 - t)}{12} \]
Having incorporated the ties, Kendall's Coefficient of Concordance is

\[ W = \frac{1}{12} K^2(N^3-N) - K \Sigma T \]

In the present study, Kendall's Coefficient of Concordance has been used to find out the association between quality of work and personal factors; quality of work and dimensions of QWL; quality of work and overall performance, quality of work and satisfaction and quality of work and overall quality of work life.

3.6.2 Principal Component Analysis

Principal Component Analysis helps in data reduction. When a set of observed variates are interrelated it is frequently found that the first few components derived from them account for a large part of the variance so that without serious loss of information, the observed variates may be replaced by a smaller set of derived variates.\(^1\) A Principal Component Analysis is straightforward in the sense that no distributional assumptions need be made about the observed variates, nor is it necessary to rotate to try to interpret the components derived from them.\(^2\)

The Principal Components are the Eigen vectors of the variance covariance matrix. The Eigen values are computed for the corresponding


Principal Components. The procedure adopted in finding the factor loadings are as follows:

First calculate the simple correlation coefficients between the $K$ explanatory variables and arrange in a correlation matrix. Then the sum of each column or row of the correlation matrix is found, thereby getting $K$ sums of simple correlation coefficients i.e.

$$
\sum_{j} r_{x_i x_j} = \sum_{i} r_{x_j x_i}
$$

Estimates of loading for the first principal component $P_1$ is obtained by dividing each column (row) sum by the square root of the grand total i.e.

$$
\sum_{j=1}^{K} r_{x_i x_j} / \sqrt{\sum_{i=1}^{K} \sum_{j=1}^{K} r_{x_i x_j}}
$$

The sum of the squares of the loadings of each principal component is called the latent root or eigen value of characteristic root of the component and is denoted by $\lambda_i$.

The first principal component $P_1$ would have higher latent root than the second; the second principal component $P_2$ would have higher latent roots, or eigen values become smaller and smaller for subsequent $P_i$ as the principal component method extracts the maximum possible variance for each $P$ in turn.
In the study, Principal Component Factor Analysis has been used to identify the variance of the first Principal Component which explains maximum about the Work Environment, Management Policy and Immediate Work Group of the total variability in the response pattern of the executives.

3.6.3 Correspondence Analysis

Correspondence Analysis is a metric multidimensional scaling (MDS) method that has been associated mainly with the French School (Benzecri 1969, 1973) of data Analysis. It has been used primarily to analyse two-way and sometimes higher way contingency tables of frequency data, so that squared distance between certain number of points in the derived space bear simple relationship of the original tabular entries.¹ The objective of (two-way) Correspondence Analysis is to portray data geometrically as a set of row and column points in, say two-dimensional space for ease of visualization. By this, the relationship between two row (column) points that are ‘close’ in the geometric configuration to the input data is established. And, the relationship (if any) between row and column points that are close in the geometric configuration to the input data are obtained.

A central objective of Correspondence Analysis is to find a set of coordinates (denoted by x,y) representing the row of the two-way contingency table F, so that squared euclidean distance between the rows of x correspond in a straightforward way to squared distance between rows in F. Benzecri has

referred to these distances as "Chi-Square" distances, a rationale for this term is given by Gifi (1981, p.136).¹

The data when plotted in a figure, would enable one to compare row, column, and row-column distance, breaking them into clear clusters. Such a visual representation would unfold comparable within set and between set distances to understand row and column relationships of contingency tables. This is an advantage over the traditional, or French School method. The present study has adopted the method suggested by Douglas Carrol, Green and Schaffer. This method is called as CGS² method.

CGS method of the Correspondence Analysis has been used in the present study to find out the clustering of different variables viz. QWL and personal factors; Performance and personal factors; Satisfaction and personal factors and to ascertain the interlinkage between QWL - Performance - Satisfaction among the middle level executives. Hence, while using Chi-Square test to find out the overall relationship between variables, and if it does not establish any group relationship, Correspondence Analysis could be used to find out whether any relationship among groups could be clustered even if there is some relationship.

¹ J.Douglas Carrol et al., Op.cit

7 LIMITATIONS OF THE STUDY

1. Perceptions of a sample of 412 middle-level executives in 31 organisations in the state of Tamil Nadu form the basis of analysis. These data have been collected through questionnaire administration. The questions in the questionnaire were self-explanatory and the respondents are presumed to have answered reflecting their own perceptions. As such the limitations applicable to this method of data collection are applicable here also. Besides, the executives represent only a cross section of executives. Instead of confining to one organisation, the study has provided an overview to test the general trend. This may be a serious limitation, but has its own merit when a broader view on quality of work life of middle-level executives in the corporate sector in the State is required.

2. The study takes into account the perceptions of middle-level executives and since the blue-collar employees have not been considered, the findings cannot be generalised even for the respective organisations.

3. Several factors like personality, competence, motivation and leadership are considered to be the contributing factors in determining either one's attitude to work, or performance and satisfaction. These are only presumed to be reflected or to have moderated the perceptions which are under study.

4. Measurements of QWL, quality of work, performance and satisfaction are based on self-ratings which are likely to be biased and subjective but
due to the varieties of statements under each category it is presumed that the findings are sufficiently reliable.

5. The variables contributing to QWL are only representative in nature. But these variables have been carefully selected and tested for their reliability on a smaller sample.

6. Data collection from the 31 business oriented organisations was done during June - September 1992, which may even reflect the influence of the country's overall economic policy.

7. It is recognised that QWL as such may not be directly associated with performance. The association of QWL with quality of work examined in the study is only an exploratory attempt.

8. Questionnaire approach may be often criticised for generating subjective information. Perhaps, the institutional method should have also been adopted.

Taking an overall picture, and in view of the fairly large sample (number of executives) and the nature of the analysis, it is hoped that, inspite of the limitations, some of which are inherent to all behavioural studies, the study would provide some reliable conclusions regarding the QWL and related aspects of the middle-level managerial personnel in a cross-section of industrial organisations in the State of Tamil Nadu.