CHAPTER I

INTRODUCTION AND RESEARCH DESIGN
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1.1. Introduction

“Small Scale Industry” today constitutes a very important segment of the Indian Economy. It may sound small but actually it plays a crucial part in the overall growth of an economy. The development of this sector came about primarily by the vision of our late Prime Minister, Jawaharlal Nehru, who sought to develop core industry and to have a supporting sector in the form of small scale enterprises. Small Scale Sector has emerged as a dynamic and vibrant sector of the economy.

The role played by small scale industries in the economies of advanced industrialized countries like Japan, Germany, Great Britain and the United States of America is significant. Many nations, both developed and developing, see in the small industry sector as a useful vehicle for growth; in the former as complementary to large industries: and in the latter as generators of new employment opportunities.¹

The development of a country depends mainly on the level of industrialization. Industrialization is a process, which accelerates economic growth and effects structural changes in the economy. Jawaharlal Nehru emphasized that real progress must ultimately depend on industrialization. For

rapid industrialization, existence of both large scale and small-scale industries are necessary.

Industrialization has a major role to play in the economic development of underdeveloped countries. The gap in per capita income between the developed and underdeveloped countries is largely reflected in the disparity in the structure of their economies; the former have a large industrial economy, while in the latter production is confined predominantly to agriculture. Industrialization is the only effective answer to the problems of the underdeveloped countries.\(^2\)

The process of industrialization is associated with the development of mechanical knowledge, the attitude and skills of the industrial workers, the experience of the industrial management and other attitudes of a modern society, which in turn, is beneficial to the growth of productivity in agriculture, trade, and distribution and other related sectors of the economy. Due to these factors, any successful transfer of labour from agriculture to industry contributes to economic development. Industrialization is thus inseparable from substantial and sustained economic development.

1.2. Statement of Problem

The development of small scale industries is hampered by a diversity of problems. There are certain problems common to all types of cottage and small scale industrial units. In this context, the present chapter is devoted to a

detailed study of the problems of the small scale industrial sector. It also helps to suggest remedial measures. The basic requirement for the industrial development of a region is the presence of entrepreneurship in that area.

The non availability of adequate finance, paucity of raw materials, absence of technical and managerial guidance, and non availability of industrial accommodation and marketing facilities are the other major problems facing the small scale sector. The slow growth of industries in Tamil Nadu has been due to lack of entrepreneurship, which performs the function of initiating, establishing and organizing industries. The people of Tamil Nadu, in fact lack enterprising character as compared with people in other states. Under the circumstances, the state Government entered the economic field and established important industries in the public sector. Without private participation, it is very difficult for an under developed state to active industrialization. Therefore, the development of local private talent is highly essential. In this connection, it should be kept in view that entrepreneurship talent is not the monopoly of any particular race.

Entrepreneurship can be developed by proper education, training, and provision of necessary cost and market data. It also requires complete reorientation of the curriculum so that young people are provided with opportunities to develop new skills and attitudes that would turn them into entrepreneurs. The provision of proper training facilities helps in the development of entrepreneurship. Proper training, persuasion, guidance and assistance can bring about radical change. The self employment schemes in the
state can be made successful by the formulation of gainful schemes of industries mainly based on local factors, endowments and demand conditions.

1.2.1. **Problems of Small Scale Industries**

In this section problems faced by the small scale industrial units are discussed. Problems related with marketing, Labour, Production, Finance, Technology and Management are ranked and the scores are taken for analysis. Plan for expansion of the units are also assessed in this section. The problems of small scale industries are classified as external and internal. External problems are those, which are beyond the control of the industrialists, such as the availability of power, and other infrastructural facilities required for running the units. Contrarily, the internal problems are those which are not influenced by external forces like problems involved in organization, structure, and production process, channel of distribution, technology, knowhow, training, industrial relations and inadequacy of management.

Small-scale industries in India could not progress satisfactorily due to various problems that they are confronted with while running enterprises. In spite of having huge potentialities, the major problems, small industries face are:

1.2.2. **Problem of Skilled Manpower**

The success of a small enterprise revolves around the entrepreneur and its employees, provided the employees are skilled and efficient. The inefficient human factor and unskilled manpower create innumerable problems in the Small Scale Industries. Non-availability of adequate skilled manpower in the rural sector poses problem to small-scale industries.
1.2.3. Inadequate Credit Assistance

Adequate and timely supply of credit facilities is an important problem faced by small-scale industries. This is partly due to scarcity of capital and partly due to weak creditworthiness of the small units in the country.

1.2.4. Irregular Supply of Raw Material

Small units face severe problems in procuring the raw materials whether they use locally available raw materials or imported raw materials. The problems arise due to faulty and irregular supply of raw materials. Non-availability of sufficient quantity of raw materials, sometimes poor quality of raw materials, increased cost of raw materials, foreign exchange crisis and above all lack of knowledge of entrepreneurs regarding government policy are other few hindrances for small-scale sector.

1.2.4 Absence of Organized Marketing

Another important problem faced by small-scale units is the absence of organized marketing system. In the absence of organized marketing, their products compare unfavourably with the quality of the product of large-scale units. They also fail to get adequate information about consumer's choice, taste and preferences of the type of product. The above problems do not allow them to stay in the market.

1.2.5 Lack of Machinery and Equipment

Small-scale units are striving hard to employ modern machineries and equipment in their process of production in order to compete with large
industries. Most of the small units employ outdated and traditional technology and equipment. Lack of appropriate technology and equipment create a major stumbling block for the growth of small-scale industries.

1.2.6 Absence of Adequate Infrastructure

Indian economy is characterized by inadequate infrastructure which is a major problem for small units to grow. Most of the small units and industrial estates found in towns and cities are having one or more problems like lack of power supply, water and drainage problem, poor roads, raw materials and marketing problem.

Thus the absence of adequate infrastructure adversely affects the quality, quantity and production schedule of the enterprises which ultimately results in under-utilization of capacity.

1.2.7 Competition from Large-Scale Units and Imported Articles

Small-scale units find it very difficult to compete with the product of large-scale units and imported articles which are comparatively very cheap and of better quality than small units’ product.

1.2.8 Other Problems

Besides the above problems, small-scale units have been constrained by a number of other problems also. They include poor project planning, managerial inadequacies, old and orthodox designs, high degree of obsolescence and huge number of bogus concerns. Due to all these problems the development of small-scale industries could not reach a prestigious stage.
1.3 Objectives of the Study

1.3.1. General Objectives

General objectives of the studies to identify the problems faced by the small scale industries, and also to analyze the prospective areas of Small Scale Industries in Tirunelveli District.

1.3.2. Specific Objectives

i. To find the demographic profile of the entrepreneurs who commence in Tirunelveli District.

ii. To find the factors that motivated to start Small-Scale Industries.

iii. To identify the factors to motivate to choose the location of industries.

iv. To study the subsidy received by the SSI Units from the Government.

v. To study the internal problems faced by Small Scale Industries

vi. To study the external problems faced by Small Scale Industries

vii. To analyze the prospective areas of Small Scale Industries.

viii. To offer the suggestions to overcome the problems of SSI.

1.4 Hypothesis of the Study

In order to fulfill the above objectives the following null hypotheses were framed in this study.

$H_{01}$: There is no significant difference between the opinion of urban and rural SSI Units on the adequacy of assistances offered by the government to the SSIs.

$H_{02}$: There is no significant difference among the SSI entrepreneurs of different demographic conditions such as location of the industry,
annual earning of the business, occupational background of the family, type of industry, size of the industry, amount of capital invested and the type of capital invested based on the opinion of various internal problems.

$H_{03}$: There is no significant variation between SSI Units located in urban and rural areas based on the opinion of latent problems

$H_{04}$: There is no significant difference among the SSI entrepreneurs belonging to different demographic conditions such as location of the industry, annual earning of the business, occupational background of the family, type of industry, size of the industry, amount of capital invested and the type of capital invested, based on the opinion of various financial problems.

$H_{05}$: There is no significant difference among the SSI entrepreneurs belonging to different demographic conditions such as location of the industry, annual earning of the business, occupational background of the family, type of industry, size of the industry, amount of capital invested and the type of capital invested based on the opinion of various production problems.

$H_{06}$: There is no significant difference among the SSI entrepreneurs belonging to different demographic conditions such as location of the industry, annual earning of the business, occupational background of the family, type of industry, size of the industry, amount of capital invested and the type of capital invested based on the opinion of
problems relating to labour.

\( H_0.07: \) There is no significant difference among the SSI entrepreneurs of different demographic conditions such as location of the industry, annual earning of the business, occupational background of the family, type of industry, size of the industry, amount of capital invested and the type of capital invested based on the opinion of various problems relating to technology.

\( H_0.08: \) There is no significant difference among the SSI entrepreneurs of different demographic conditions such as location of the industry, annual earning of the business, occupational background of the family, type of industry, size of the industry, amount of capital invested and the type of capital invested, on the opinion of various marketing problems.

\( H_0.09: \) There is no significant difference among the SSI entrepreneurs of different demographic conditions such as location of the industry, annual earning of the business, occupational background of the family, type of industry, size of the industry, amount of capital invested and the type of capital invested based on the opinion of issues relating to government policies and procedures.

\( H_0.10: \) There is no significant variation among the SSI Units under different demographic conditions such as location of the industry, annual earning of the business, occupational background of the family, type of industry, size of the industry, amount of capital invested and the type
of capital invested based on the opinion of various problems relating to infrastructure.

$H_{011}$: There is no significant difference among the SSI Units under different demographic conditions such as location of the industry, annual earning of the business, occupational background of the family, type of industry, size of the industry, amount of capital invested and the type of capital invested based on the opinion of various Government assistances.

$H_{012}$: There is no significant variation on the opinion of various financial prospects among the SSI Units under different demographic conditions such as location of the industry, annual earning of the business, occupational background of the family, type of industry, size of the industry, amount of capital invested and the type of capital invested.

$H_{013}$: There is no significant variation on the opinion of various Government facilities among the SSI Units under different demographic conditions such as location of the industry, annual earning of the business, occupational background of the family, type of industry, size of the industry, amount of capital invested and the type of capital invested.

$H_{014}$: There is no significant variation on the opinion of various subsidies among the SSI Units under different demographic conditions such as location of the industry, annual earning of the business, occupational background of the family, type of industry, size of the industry, amount of capital invested and the type of capital invested.
$H_0_{15}$: There is no significant variation on the opinion of various subsidies among the SSI Units under different demographic conditions such as location of the industry, annual earning of the business, occupational background of the family, type of industry, size of the industry, amount of capital invested and the type of capital invested.

$H_0_{16}$: There is no significant variation on the opinion of various marketing assistances among the SSI Units under different demographic conditions such as location of the industry, annual earning of the business, occupational background of the family, type of industry, size of the industry, amount of capital invested and the type of capital invested.

$H_0_{17}$: There is no significant variation on the opinion of various export assistances among the SSI Units under different demographic conditions such as location of the industry, annual earning of the business, occupational background of the family, type of industry, size of the industry, amount of capital invested and the type of capital invested.

$H_0_{18}$: There is no significant variation on the opinion of various technical assistances among the SSI Units under different demographic conditions such as location of the industry, annual earning of the business, occupational background of the family, type of industry, size of the industry, amount of capital invested and the type of capital invested.
H_{019}: There is no significant variation on the opinion of employment generation features among the SSI Units under different demographic conditions such as location of the industry, annual earning of the business, occupational background of the family, type of industry, size of the industry, amount of capital invested and the type of capital invested.

H_{020}: There is no significant variation on the opinion of contribution towards the nation among the SSI Units under different demographic conditions such as location of the industry, annual earning of the business, occupational background of the family, type of industry, size of the industry, amount of capital invested and the type of capital invested.

H_{021}: There is no significant variation on the opinion of utilization of resources by the SSI Units under different demographic conditions such as location of the industry, annual earning of the business, occupational background of the family, type of industry, size of the industry, amount of capital invested and the type of capital invested.

1.5 Operational Definition of Concepts

In this research work, the researcher has used some of the terms which require explanation for better understanding. However, meaning has not been given for standard terms. Some of the terms are used with a specific meaning and operational definitions for such terms are given below.

1.5.1 Small-Scale Units

Small scale industry is defined as a unit in which investment in original value of plant and machinery should not exceed ₹ 1.5 crore. However, to
facilitate technology upgradation and enhance competitiveness, the investment limit has been raised to ₹ 5 crore in respect of 71 high tech export oriented items in drugs, pharmaceuticals, hand tools and knitwear sectors, etc.

1.5.2 Entrepreneur

Entrepreneur is a business leader and the functions performed by him in relation to the business in entrepreneurship. An entrepreneur is always action oriented. He has the ability to visualize the necessary steps involved from idea generation to its actualization. He is both a thinker and doer; planner and worker. He accepts risk and manages it. The Entrepreneur is an initiator of action, stimulator of social economic change and harnesser of resources.

1.5.3 Entrepreneurship

Entrepreneurship means the function of foreseeing investment and production opportunity, organizing an enterprise to undertake a new production process, raising capital, hiring labour, arranging for the supply of raw materials and selecting top managers for the day to day operation of the enterprise.

1.5.4 Subsidy

A Subsidy is a government payment or grant to a private enterprise or institution for the good of the public. In India, subsidy is offered by the government to attract industries to backward regions, to develop certain specific category of industries and also to give employment to women workers.

1.5.5 Capital Subsidy

Under this scheme, subsidy is made available to all the eligible SSI Units engaged in manufacturing and non – manufacturing activities except iron
and steel, aluminum, smelting, and calcium carbide. In backward blocks the subsidy is 15 percent on the total investment in fixed asset subject to a ceiling of ₹15 lakhs in respect of units located in 216 backward blocks in Tamil Nadu.

1.5.6 Incentive

The term ‘incentive’ means stimuli for action. The stimuli motivates entrepreneurs start and run small-scale units. The government offers various incentives to entrepreneurs to set up small scale units and run them efficiently. The nature and number of incentives have been diversified and multiplied over the years.

1.5.7 Tax Concessions

Tax Concession means any complete or partial exemptions from taxes enjoyed by legal and physical persons. In India the tax concessions are given either by Local authority or State or Central Government in order to promote the industrial development.

1.5.8 Grants

Grants are non-repayable funds disbursed by one party (grant makers), often a government department, corporation, foundation or trust, to a recipient, often (but not always) a nonprofit entity, educational institution, business or an individual.

1.5.9 DIC (District Industries Centre)

The establishment of District Industries Centre in 1978 was a landmark in the development of small and cottage industries in India. The Industries Policy Resolution, 1977 proposed the setting up of District Industries Centre in
the headquarters of each district in India. DIC was set up to provide under single roof all the services and support required by small and village entrepreneurs. The entrepreneurs had to go to different agencies before for assistance, finance, training, technical advice etc. would now be provided with all these services in one place. At present there are 422 DICs operating in 431 districts of our country.

1.6 Area of Study

The study is conducted among the SSI Units located at the Urban, Semi-urban and Rural area of Tirunelveli district. The Tirunelveli District consists of one Municipal Corporation, seven Municipalities and thirty six Town Panchayats. The district is divided into 19 blocks for administrative purposes. The 19 blocks are namely, Palayamkottai, Manur, Melaneelithanallur, Sankarankovil, Kurivikulam, Cheranmahadevi, Ambasamudram, Pappakudi, Palayamkottai, Manur, Melaneelithanallur, Sankarankovil, Kurivikulam, Cheranmahadevi, Ambasamudram, Pappakudi, Kadayam, Kalakadu, Alangulam, Vallioor, Radhapuram, Nanguneri, Vallioor, Radhapuram, Alangulam, Vasudevanallur, Tenkasi, Shencottai, Kadayanallur and Keelapavoor.

Tirunelveli District is one of the developing districts in Tamil Nadu blessed with good basic infrastructural facilities and resources, which could contribute to the process of development of the industries in the area and in particular to the development of the small-scale industries. But the pace of development in Tirunelveli district is found to be relatively slow. The majority of the working population depends on agriculture. This is the main reason for the
stagnation in the industrial development of Tirunelveli district. The Government of India had declared almost the entire Tirunelveli district as an industrially backward area under the 'B' and 'C' category. More than 400 Small Scale Industries are located in this district and most of the SSIs are facing various problems to run their units into a successful one. The Researcher is insisted to identify and analyse the reasons for facing the problems by the SSI Units and find the remedial measures to overcome these problems in an effective way. Therefore, the Researcher selects this district as the Area of Study.

1.7 Period of the Study

The period of the study pertains to the financial year 2013-2014. The primary data were collected from the selected SSI Units from April, 2013 to March 2014. The data relating to the problems and prospects of small-scale industries had been obtained for the period of five years from 2009-2010 to 2013-2014.

1.8 Research Methodology

This research work was conducted on the basis of scientific methods through the following sequence of activities.

1.8.1 Type of research

This research is empirical research in nature. This type is useful when a problem cannot be studied in laboratory settings. In this type of research, empirical evidences can be analysed quantitatively as well as qualitatively. Empirical data have been collected through a well constructed questionnaire in order to achieve the objectives. Explicit hypotheses were also framed and tested depending on the research problem.
1.8.2 Data used

In this study, both the secondary as well as primary data have been used. The secondary data have been used for gathering the theoretical and conceptual background on the study area. Published and unpublished sources of information have been used for the secondary data. The primary data have been used in order to fulfill the objectives of research work.

1.8.3 Collection of data

The secondary data were collected from various books, journals, magazines, theses, newspapers, study papers, Government Reports and websites. The primary data have been collected through a well constructed questionnaire. The questionnaire was finalised after making a pretest through the pilot study.

1.9 Pilot study

Prior to the commencement of this research work, a pilot study was made to have the better knowledge on the statement of problem of the study. In order to make the pilot study, initially a questionnaire was constructed with fifty-five questions categorised into five different heads and the questionnaire was pretested. The pretest of questionnaire was made with fifty respondents of sample study area. After the pretest, the questionnaire was compartmentalized into four sections and questions are renumbered according to the sections.

1.10 Sampling Technique adopted

In this research work, the combination of purposive sampling and snowball sampling technique has been used. In purposive sampling, purpose is considered. We usually have one or more specific predefined groups we are
seeking. Purposive sampling can be very useful for situations, where we need to reach a target sample quickly and where sampling for proportionality is not the primary concern. With a purposive sample, we are likely to get the opinions of target population and we can also identify subgroups in the population.

In snowball sampling, few respondents who fulfill the criteria for the study were identified. Then they were asked to recommend others, whom they may know meeting the criteria. Although this method would hardly lead to representative samples, there are times when it may be the best method available. Snowball sampling is especially useful when we are trying to reach populations that are inaccessible or hard to find.

1.10.1 Sample size

Statistical populations of this research are the registered SSI Units in Tirunelveli District. In Tirunelveli both the registered as well as unregistered SSI Units are functioning. Since there is no published data on the unregistered SSI Units, only the registered SSI Units alone are targeted for the study. The volume of statistical population of the registered SSI Unit as on 31-07-2008 is 16,672. It would not be possible to cover the entire population thus the researcher has selected a sample of the total population for this study. However, in order to ensure scientific determination of the sample size, Cochran formula has been applied, which is given below:

\[
n = \frac{Nt^2 \ pq}{Nd^2 + \ t^2 \ pq}
\]

Where \( n = \) sample size

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N = Volume of the statistical population

t = number of table (t) for 95 percent confidence interval t=1.96

p = supposed ratio of satisfied person p=0.5

q = supposed ratio of unsatisfied person q=0.5

d = distance of assurance d=5/100

The targeted sample population has been calculated on the basis of above formula and the sample size has been decided in the following manner.

\[
\begin{align*}
n &= \frac{Nt^2pq}{Nd^2 + t^2pq} \\
    &= \frac{(16,672) (1.96^2) (0.5) (0.5)}{(16,672) (0.05)^2 + (1.96^2) (0.5) (0.5)} \\
    &= 375.5075 \approx 376
\end{align*}
\]

The Cochran formula has provided that for the population of 16,672 Registered SSI Units in Tirunelveli District i.e. the statistical population, the targeted sample size is 376 SSI Units. The researcher found at the time of the pilot study that the expected non-response sample would be 10 percentage, thus in order to gather sufficient number of samples i.e. 376, as per the Cochran formula the researcher has added 10 percentage to the targeted statistical population. Therefore, the targeted sample size was 420 expecting the non-response cases. But the researcher could collect data from 380 respondents with the response rate of 90.48 percent. Thus the sample size of this study is 380 SSI Units functioning in the 19 Blocks of Tirunelveli District.

1.11 Statistical Tools applied

Response collected from every sample SSI Units has been fed into SPSS and some of the relevant statistical tools were applied. The panel data contains general information about the SSI Units, Industry related data, opinion of the respondents on the problems and Prospects relating to SSI Units. Throughout
the questionnaire the Likert’s Five Point Scale has been applied at appropriate questions. The research design is made in such a manner that the researcher would be able to compare the opinion of SSI Units from different demographic points of view. In this study the following statistical tools were applied.

1.11.1 Mean

In many parts of this study different types of arithmetic mean were applied. In case of questions based on Likert five point scale, simple weighted arithmetic mean had been applied using the following formula.

\[
\bar{X}_w = \frac{\sum WX}{\sum W}
\]

Where \( \bar{X}_w \) = Weighted arithmetic mean
\( X \) = Variable values, i.e., \( X_1, X_2, X_3, ..., X_n \)
\( W \) = Weights attached to variables values, i.e., \( W_1, W_2, W_3, ..., W_n \), respectively

In case of data having continuous frequency distribution, the arithmetic mean was calculated using the following formula.

\[
\bar{X} = A + \frac{\sum fd}{N}
\]

Where \( \bar{X} \) = Arithmetic mean
\( A \) = Assumed mean
\( d \) = \( X - A \)
\( N \) = Total number of observations

1.11.2 One-way Analysis of variance (ANOVA)

The ANOVA is used to know the presence of variations between two different groups. Normally, this test is applied to know existence of the differences between mean of various groups (more than two groups). The one-
way ANOVA is used to assess whether the opinion of Urban SSI Units and Industrial Units located in the rural areas.

In a research work, we cannot analyse the entire population, thus we take few groups for the analysis. Thus we must know whether the mean of the taken population is similar or there exists any significant differences between them. It is also called as $F$-test. This $F$-test is made with help of a null hypothesis. In this research work many hypotheses have been framed to know the similarity of the mean. In order to make the $F$-test in one-way ANOVA, the following set of formulae is used.

Table 1.1

**Formulae for calculating $F$ value in One-way analysis of variance**

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Degrees of freedom (df)</th>
<th>Sum of squares ($SS$)</th>
<th>Mean square ($MS$)</th>
<th>$F$ ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Samples (C)</td>
<td>$K - 1$</td>
<td>$SSC = \sum_{k=1}^{K} \frac{T_k^2}{n_k} - \frac{T^2}{N}$</td>
<td>$MSC = \frac{SSA}{K - 1}$</td>
<td>$F = \frac{MSC}{MSE}$</td>
</tr>
<tr>
<td>Within Samples (E)</td>
<td>$N - K$</td>
<td>$SSE = SST - SSC$</td>
<td>$MSE = \frac{SSE}{N - K}$</td>
<td></td>
</tr>
<tr>
<td>Total (T)</td>
<td>$N - 1$</td>
<td>$SST = \sum_{i=1}^{n} \sum_{k=1}^{K} X_i^2 - \frac{T^2}{N}$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Where $K =$ The number of samples  
  $N =$ The total number of all the observations

After forming the variance analysis table, the calculated $F$ value must be compared with Table value of $F$ which is computed as $(K-1)$ and $K (n-1)$ at the significant level of 0.05. If the calculated value of $F$ is bigger than the table value of $F$, the Null hypothesis ($H_0$) would be rejected. It means that groups Mean have difference with each other. At the same time, if the calculated value
of $F$ is smaller than table value, Null hypothesis ($H_0$) will be accepted; it means that group Mean do not have difference with each other.

### 1.11.3 Garrett Ranking Technique

This technique is used when a question is based on the rank orders. In this study, respondents were asked to rank the factors that motivated to choose a particular location for the SSI, Factors that motivated to commence an SSI Unit and problems faced by the SSI Units. The Garrett ranking is done with the help of the following formula.

\[
100 \left( \frac{R_{ij} - 0.5}{N_j} \right)
\]

Where \( R_{ij} \) = Rank given for the \( i^{th} \) variable by the \( j^{th} \) respondent

\( N_j \) = Number of variables ranked by the \( j^{th} \) respondent

The percentage position of each rank obtained was converted into scores by referring to the table given by Henry Garrett. Then for each factor the scores of individual respondents were added together and divided by the total number of respondents for whom the scores were added. These mean scores for all the factors were arranged in the order of their ranks and inferences were drawn.

### 1.11.4 Factor Analysis

Factor analysis is primarily a data reduction and summarization technique. Problems and prospects relating to SSI Units may occur due to several factors. We cannot attribute one single factor either for the success or failure of an SSI Unit. Many numbers of factors have been put forth in front of the SSI entrepreneurs and responses have been collected, but too many data
will not provide a concrete solution rather it may perplex the reader. Thus these variables have to be correlated and they have to be reduced to manageable level for convenience and better analysis. In order to accomplish this, factor analysis is used to establish relationships among sets of many interrelated variables in terms of few factors. As the factor analysis will provide a meaningful conclusion, this tool has been applied by the researcher. The factor analysis model in matrix rotation is given as

\[ X = Af + e \]

Where \( X = [X_1, X_2, X_3, \ldots, X_p] \)
\( f = [f_1, f_2, f_3, \ldots, f_m] \)
\( e = [e_1, e_2, e_3, \ldots, e_p] \)

\( M = \) number of factors
\( P = \) number of variables

**1.11.4.1 Principal Component Analysis (PCA)**

A principal component can be defined as a linear combination of optimally weighted observed variables. The general form for the formula to compute scores on the first component extracted (created) in a principal component analysis is given below:

\[ C_1 = b_{11} (x_1) + b_{12} (x_2) + \ldots + b_{1p} (X_p) \]

Where \( C_1 =\) the participant’s score on principal component 1 (the first component extracted);
\( b_{1p} =\) the regression coefficient (or weight) for observed variable \( p\), as used in creating principal component 1;
\( X_p =\) the participant’s score on observed variable \( p\).
However, the PCA results have been suppressed and the main results have been taken in the Factor Analysis.

1.11.4.2 Exploratory Factor Analysis (EFA)

Factor analysis (FA) and Principal Components Analysis (PCA) are the techniques used, when the researcher is interested in identifying a smaller number of factors underlying a large number of observed variables. Variables that have a high correlation between them and are largely independent of other subsets of variables are combined into factors. A common usage of PCA and FA is in developing objective instruments for measuring constructs which are not directly observable in real life.

Factors are produced by FA, while components are produced by PCA. Both FA and PCA essentially are data reduction techniques. Mathematically, the difference is in the variance of the observed variables that is analyzed. In PCA, all the variance in the observed variables is analyzed whereas in FA, only shared variance is analyzed. Even though PCA is different from other techniques of FA, at many places it is treated as one of the FA techniques. For this reason, the word components and factors are interchangeably used in this study.

1.11.4.3 KMO Test

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is an index for comparing the magnitudes of the observed correlation coefficients to the magnitudes of the partial correlation coefficients which is used to examine the appropriateness of data for factor analysis. High values (between 0.5 and
1.0) indicate factor analysis is appropriate. Values below 0.5 imply that factor analysis may not be appropriate.

1.11.4.3 Bartlett's Test of Sphericity

It is one of the statistics associated with factor analysis. It is a test statistic used to examine the hypothesis that the variables are uncorrelated in the population. The Bartlett’s test of sphericity is to test the null hypothesis that the variables are uncorrelated in the population. In other words, the population correlation matrix is an identity matrix. An identity matrix is the matrix in which all of the diagonal elements are 1 and all off diagonal elements are 0. Thus Bartlett's test of sphericity examines the suitability of data for the factor model.

1.12 Limitations of the Study

The study is subjected to some limitations. The study was conducted among the various entrepreneurs those who are running small scale industries in Tirunelveli District. Tirunelveli District is divided into 19 Blocks. The data were collected from the Small Scale Industries that belongs to Tirunelveli District only. This study was conducted based on the secondary data collected from the period of 2009-2014.

1.13 Chapter Scheme

This research work has been divided into nine sections. Each section is organized as a chapter and following is the chapter scheme.

The first chapter is entitled as “Introduction and research design”. It states the way in which the research work is done. It provides the statement of
problem, the objectives, hypothesis framed and analyzed, research methodology used, sampling method followed, statistical tools applied for analyzing the data, period of study and chapter scheme.

The second chapter is given the title “Review of Previous Studies”. It encompasses the literary review of previous studies. The researcher has focused mostly on the studies done during the past ten years. All the previous studies were reviewed chronologically starting from 2003.

The third chapter is entitled as “Small-Scale Industries – An Overview”. This chapter focuses on the origin, development, functions of the Small Scale Industries. It also indicates the role of SSIs in the economic development of the county and also the various government schemes provided by the State and Central Govt.

The fourth chapter holds the title “Industrial Profile of Small-Scale Industries in Tirunelveli District”. This chapter analyses the geographical as well as the industrial profile of Tirunelveli District during the past few years.

The fifth chapter is entitled as “Demographic Profile of the Small Scale Industries in Tirunelveli District”. This chapter elaborates the profile of small scale industrial entrepreneurs and their industrial background in Tirunelveli District.

The sixth chapter is entitled as “Problems of Small-Scale Industries in Tirunelveli District”. This chapter analyzes the various problems faced by the Small-Scale Industries. In this chapter the problems are analysed under ten different broad headings.
Small-Scale Industries. In this chapter the problems are analysed under ten different broad headings.

The seventh chapter is entitled as “Prospects of Small-Scale Industries in Tirunelveli District”. This chapter is aimed at knowing the opinion of SSI Units on prospective aspects of SSI Units in Tirunelveli District.

The last chapter is summation of the research work and it is entitled as “Summary of Findings, Conclusion and Suggestions”. This chapter provides findings of the research work. Based on the findings, conclusion has been drawn and relevant suggestions are given for the development of Small-Scale Industries in the study area. In addition, scope for further research is also given in this chapter.