CHAPTER I
INTRODUCTION

Economic development is the concern of everybody and as such the development theory has received particular attention of economists. Economic development is a very complex process involving not only economic, but also many social, political, technological and cultural changes. One could define economic development somewhat narrowly, as the process of increasing the degree of utilisation and improving the productivity of the available resources of a country which leads to an increase in the economic welfare of the community by stimulating the growth of national income. "Economic development has historically been associated with structural changes in the national economies" (Papola, 2006). Among many structural changes, the most important is industrialization. The most important reason for the incessant craze for the rapid industrialization in the developing economies has been the identification of a positive nexus between industrialization and economic prosperity.

1.1 Industrial Development

Industrial development has become synonymous with the term 'economic development'. There is no denying the fact that effective industrial growth is very essential for successful economic development, particularly in a developing country like India.

Industrial development has a necessary and ultimately large role to play in almost every sound programme in the development of a country. Both industrial growth and the economic growth of any country are positively related. Industrialization enables a country to develop that technological
consciousness which is needed in building up a modern nation in the age of globalisation. In less developed countries, the rapid industrialization is a *sine qua non* of rapid economic development (Mezerik, 1968). Only rapid industrialization of a country can effectively solve the problems of the efficient use of the vast human and natural resources, inflation, removal of mass poverty and giving people satisfactory standard of living, above all ensuring the defence of the country.

Industrialization has been defined by Sutcliffe as a process which has invariably been the "outcome or accompaniment of economic development". In another sense, it denotes a set of policies, which more than any other set of policies, is seen as a means towards economic development (Sutcliffe, 1971).

Myrdal brought out the relationship between industrialization and economic development as an answer to the economic problem. "Manufacturing industry represents, in a sense, a higher stage of production . . . . . Industrialization and the growth of that part of the working population that is engaged in industry are, therefore, a means of raising national income per capita [...] " (Gunnar Myrdal, 1956).

Industrialization has, therefore, become one of the greatest world crusades of our time. It is an effort in which the under-developed countries place a major hope of finding a solution to their problems of poverty, insecurity and overpopulation, and ending their newly realised backwardness in the modern economy (Bryce, 1960).

Hence, there is a general consensus on the need for accelerating the pace of industrial growth as a means to achieve overall economic development of a region. Industries can broadly be divided into modern and traditional. Along with their prospects, they have their own problems also.
This study is aimed at analysing the performance of the tile industry, one of the traditional industries of Kerala.

Kerala is peculiarly suited to the development of the tile industry because of her rich resources of fine clay, her virgin forests, her backwaters and navigable rivers, her railway and shipping facilities and her potential resource of hydro-electric power to feed the wheels of this industry (Pillai, 1961). The tile industry has an important role in the housing schemes of the State. Roofing tiles and allied red clay products are the most suitable types of roofing and construction materials within the reach of the common man. The tile industry is labour intensive in nature and helps to solve the problem of unemployment. The industry requires only moderate capital and operates with locally developed technology and the various inputs of this industry are locally available.

There are about 300 industries manufacturing clay roofing tiles in the State. Production capacity of each varies from 2,000 to 40,000 tiles a day. The total annual production in 1997 was about 200 million tiles valued at Rs.32.5 crore. The total installed capacity is of the order of 400 million tiles per annum.

1.2 Significance of the Study

Kerala has been enjoying the monopoly of tile production in the country ever since this industry started to appear on the map of the State. The German Basel Missionary Society established the first tile factory in Mangalore region in the year 1865. Subsequently Kerala became the heartland of tile industry. The roofing tiles manufactured in Kerala were of international standard. Kerala had the monopoly of tile manufacturing industry till 1965. The products of the industry enjoyed good demand in the internal and external markets.
Kerala's commanding role in tile production began to dwindle after 1965. Tile manufacturing units were started in States like Tamil Nadu, Andhra Pradesh, Orissa, Maharashtra and Gujarat, and hence Kerala's external market share declined considerably. Today, the century-old tile industry faces a number of severe problems. Competition from substitutes and the increasing cost of tile roofing are mainly responsible for a decline in the demand for tiles. Moreover, the chief raw-material required for the industry, viz., clay, became scarce, costly and inferior in quality. There is an acute shortage of firewood and steep rise in its price. Besides, there is an abnormal hike in the transportation costs also. Further, problems like under utilisation of installed capacity, low productivity, non-upgradation of technology, change in the attitude of the people towards house construction and the abnormal increase in cost of production also account for the declining trend of tile industry in Kerala.

The situation changed for the worse in the 1990's. With the onslaught of the culture of concrete buildings, the demand for roof tiles drastically declined. Being an industry set up mostly by people without much financial resource base and modern entrepreneurial capabilities, initiatives for technological upgradations and product diversifications were lacking in this sector. But the most important factor that threatens the tile industry, in general, is the uncertainty about the availability of clay. With the rise of environmental consciousness in the State, there is an increasing protest against the removal of clay from paddy fields. Various factors have forced the closure of many of the tile factories in the State and the industry is now confined to the three districts - Kozhikode (Feroke), Trichur, and Ernakulam (Alwaye).

The majority of tile manufacturing units located in these three districts differ drastically in terms of organisational forms, technology adoption,
resource base, capacity utilisation, entrepreneurial capabilities, physical performance and marketing strategies. These variations in input base and production pattern are reflected in the diverse performance of the tile manufacturing units located in these three regions. A meaningful analysis of the performance of this traditional industry in the changed industrial scenario of Kerala warrants an in-depth analysis of the different tile units in terms of the indices like location, technology adoption, capacity utilisation, physical and financial performance, production pattern and capital structure. Therefore, an exhaustive analysis of this traditional industry located in the three districts of Kerala, viz., Calicut, Trichur and Alwaye (Ernakulam) is imperative for deriving a meaningful conclusion about the overall performance and problems of this industry. Against this backdrop the present study is conducted. The study attempts to investigate the major profiles of tile industry in terms of different indices determining its overall performance. The empirical part of the study is designed by investigating the profile of sample tile units drawn from the three regions - Calicut, Trichur and Alwaye - where there is a major concentration of tile manufacturing units with diversified profiles.

Studies on tile industry and its related problems are very few in the State of Kerala. The few studies which were conducted mainly examined the growth, problems and prospects of this industry. But no exhaustive research work has so far come out giving more importance to the examination of the extent and causes of underutilisation of installed capacity and financial performance of tile manufacturing units. In addition, no study has come up taking into account the different levels of technology followed by various tile factories. The proposed study is the first of its kind, which focuses on the economics along with the physical and financial performance and capacity utilisation of tile factories in Kerala. The present study also takes into
account the impact of different levels of technology, especially in the field of productivity. Thus, this study assumes significance in this context.

1.3 Review of Literature

The tile industry has been a subject of study for many. A number of researchers, institutions and agencies have studied the various aspects of the tile industry. A review of them would be helpful in directing the present study properly. Here, we make a chronological presentation of the available literature.

Ceramics is an old industry. Ceramic products were manufactured and used for centuries. The first knowledge about the art of ceramics is available from the Vedas, especially, the Atharva Veda, Rig Veda and Yajur Veda. Of the different ceramic products, the most popular are decorative tiles and bricks.

Edward Dobson's (1889) \(^7\) attempt to analyse the tiles and bricks, was acclaimed the first work of its kind in the English language. The work was entitled “A Rudimentary Treatise on the Manufacture of Bricks and Tiles.” In this work, he explained in detail the importance of tiles in the ancient period, and how this formed an important part of monuments in different parts of the world. The use of high quality bricks and tiles was prestigious to decorate monuments and other important public institutions. The book also gives a detailed account of different designs that existed in olden days.

The origin and development of tile industry in India was the result of the pioneer activities of Basel Mission. The Basel Mission also contributed to the entire development of northern Kerala. The various ventures undertaken by the Mission were well explained by H. Hofmann (1913) \(^8\) in his book "The Basel Mission Industries." The socio-economic conditions then existing and the rationale of undertaking the industrial ventures were explained in this
book. The Mission established the first tile factory at Mangalore. The object of starting the first tile factory was to provide livelihood to Christian converts. Availability of quality clay, firewood and the presence of natural humid climate contributed to the growth of this industry. Further information regarding the origin and development of tile industry is available from the work of Appaswamy et al. (1948), Bose (1948), Chandler (1949), Chaudhury (1949), and Duby (1950).

Karat (1955) did the first research on tile industry in India. He examined the factors responsible for the concentration and development of tile industry in Mangalore. He held the view that the availability of good quality clay, cheap labour and good demand for the product was the chief factors responsible for the concentration of the industry in Mangalore. He also contended that the industry would have a bright future if timely modernisation and product diversification programmes were implemented.

The Department of Industries and Commerce, Government of Madras, (1957) evaluated the merits and defects of different building construction technologies. The survey carried out in Madras city led the team to conclude that tiled roofing is comparatively cheap and ideally suited to Indian climatic conditions in comparison to reinforced cement roofing.

An early evaluation of the tile industry in Kerala is available from the "Report of the Minimum Wage Committee for Employment in Tile Industry" headed by Pillai (1961). The Report closely examined the extent of labour absorption in the industry and also pointed out that the extent of labour absorption is coming down over the years.

National Council of Applied Economic Research (1962) in their report "Techno-Economic Survey of Kerala" narrated the factors responsible for the development of tile industry in Kerala. The team also examined the
market potential of the products. They found that the demand for tiles and other products is much influenced by the high quality of the product and the brand name and reputation of the industrial unit.

The problems of tile industry in Kerala were examined by Poornam (1962)\textsuperscript{18} in his article "Common Tile Factory in Kerala." He was of the view that modernisation is the only remedial measure to revive the industry in the State. Outdated technology, obsolete production design and machinery are prevailing in almost all units in Kerala. Unless the manufacturers are convinced of the urgent necessity of modernisation, the industry would continue in its sickness.

Bhaskaran (1963)\textsuperscript{19} was of the opinion that modernisation is inevitable. He examined the important structural ratios and stated that the role of tile industry is declining in the industrial map of Kerala. Menon (1963)\textsuperscript{20} also believed that the tile industry can survive only if the industry goes for modernisation. As a first step, he suggested that the industry can think of producing glazed tiles.

The tile industry in Kerala had a glorious past. But the situation started deteriorating by mid-1960s. This aspect was discussed in detail by Lokanathan (1965)\textsuperscript{21}. According to him, the major factors responsible for the decline were the falling external market, high labour costs and non-availability of good quality clay.

The problems of small-scale tile factories in Madras, Andhra Pradesh and Kerala were identified by Maheswary (1966)\textsuperscript{22}. The major problems identified by him were: (i) Unsatisfactory preparation of clay mix, (ii) Lack of driers fitted with humidity and temperature controllers, (iii) Excessive breakage during drying, (iv) High fuel consumption,
(v) High percentage rejects of tiles from kilns, (vi) Very low percentage of first quality tiles, and (vii) Lack of adequate technical know-how.

Contractor. D. Sorabji (1966) stated that the deterioration in the quality of tiles adversely affected the foreign exchange earning capacity. The various bottlenecks of the industry are: (i) Overcharging and liberalised factory rules, (ii) Heavy taxation and new levies, and (iii) Restriction and paucity of power, clay and fuel. It is suggested that only a concerted effort by Government, manufacturers and labourers can overcome the problems of the industry.

Devaraj Iyer (1966) examined the origin and development of the industry in Trichur district. He stated that it was the engineer in-charge of the construction of Manali river bridge who discovered the suitability of soil around the Manali river for manufacturing tiles. It was the turning point for setting up tile factories in the district.

The major problems of brick and tile industry in India were examined by Jain and Jain (1966). The major problems facing the brick industry pertain to increasing production, stabilising prices and improving quality. Increase in drying cracks and warps, rough appearance, warped surface, crooked alignment, air bubbles, blocked holes, etc. are some of the defects of Indian tiles.

John et al. (1966) highlighted how scientific knowledge can be used for developing tile industry. He observed that one of the drawbacks of the roofing tile industry is the absence of technological innovation.

In the paper prepared by the Economic Research Department of the Syndicate Bank (1968), it was pointed out that the modernisation programme is delayed due to the problem of finance, particularly working capital. It was suggested that, the survival of the industry is possible, only if
the banks and other financial institutions come forward to liberalise conditions. It was also pointed out that 23 per cent of the rural houses in South Kanara district were made of tiles, as per 1961 census.

Nair (1968) made a study on roofing tile industry in Kerala as the fourth series of progress and productivity study sponsored by Small Industries Service Institute, Trichur. The main findings of the study were: (i) Returns on investment are very low, (ii) High quality tiles have good demand and fetch high prices. (iii) Installed capacity of the industry is not exploited. (iv) The installation cost of timber frame is very high.

John Thomas Chirayath (1969) made a study on the tile industry in Kerala. Apart from tracing the origin and growth of the industry, this study also includes a number of statistical data and other structural ratios.

Ayyappan Nair (1973) in his article on clay deposits warned that our clay deposits are fast declining and adequate supply of clay deposits will be a problem in the immediate future.

Ananthan (1975) examined the origin, history and features and problems of tile industry in South Kanara district. Most of the factories were not dependent on banks for long term or short term financial assistance. He found that most of the tile units were not able to take advantage of the facilities of small-scale industries, for they were not registered as small-scale industries due to the ignorance of the entrepreneurs.

The new trends emerging in tile industry were examined in detail by Karunakaran (1975). He recommended that the tile manufacturing process should be changed to suit the new trends in construction. A detailed account of different types of kilns, their relative merits and demerits was provided by Sreedharan Nair (1975).
National Productivity Council (1978)\textsuperscript{34} Bangalore, made a productivity study in selected tile factories in Kerala under the modernisation programme of Small Industries Service Institute. The object of the study was to recommend ways and means of improving the productivity of tile industry in the State, particularly in the areas of industrial engineering, fuel efficiency and marketing.

A comparative study on different construction methods was made by Anto (1979)\textsuperscript{35} with the help of social cost-benefit analysis. He came to the conclusion that RCC roofing is not preferable under Kerala conditions.

Small Industries Service Institute (1980)\textsuperscript{36} Trichur, prepared a Status Report of Mangalore Type Roofing Tiles. The study stressed the need of using de-airing pug mill and revolving press to reduce labour costs and to improve the quality of tiles. Mechanisation is required for material handling also. It is noted that fuel is the biggest problem of the industry. It is also suggested that furnaces have to be scientifically designed.

Aminya Rao (1981)\textsuperscript{37} surveyed the pathetic condition of the tile industry workers in Gujarat. He opined that the workers were not organised and hence they were being exploited by the rich class.

Aravindakshan (1982)\textsuperscript{38} examined the structure of tile industry in Kerala, giving particular importance to Trichur district. He classified the factories into large units and small units. The main conclusions of this study were the following: (i) There is housing shortage in Kerala, especially in the rural sector, due to low income and low savings of the rural people. (ii) There is technological stagnation in the industry. Hence, there should be modernisation agencies. (iii) Preference for tile roofed houses is fast declining. (iv) The industry has to diversify. (v) More units are becoming
sick because of the high production cost. (vi) There should be Governmental assistance to the industry.

John Thomas Chirayath and S. Krishna Iyer (1983) examined the problems of tile industry in Kerala. During the post II World War period, Kerala possessed a monopolistic position in the supply of roofing tiles in India. They recalled that once Kerala exported tiles to Burma, Malaysia, Singapore, Sumatra, Ceylon, Africa and even Australia.

The Government of Gujarat (1984) published a report on the tile industry in Gujarat, concentrated in Morvi. It was observed that the problems prevailing in the State were quite similar to those in Kerala.

Thomas (1986) mentioned the urgency of modernising the tile factories in Kerala to recapture their earlier eminence in tile production. Ananthasubramanian (1986) held the view that modernisation is delayed due to the paucity of finance. Modernisation is possible only if banks and other financial institutions come forward to finance the industry.

National Productivity Council (1987) made an attempt to measure the productivity of tile industry in Kerala. The study revealed that, even though the number of tile factories in Kerala increased, the capital and labour productivity had declined particularly since 1975, mainly due to higher labour cost and raw-material cost.

According to Kotti Reddy (1987) it is necessary that all tile units in Kerala State should immediately form a single organisation to represent their problems to the government and take necessary steps to solve marketing and technical problems collectively, in association with various research bodies and other agencies.
Hajela (1988) critically examined the problems and approaches for the modernisation of clay roofing tile industry. The major factors responsible for slow modernisation, according to him, are: (a) Industry is small-scale, labour intensive and rural based, (b) Lack of research and development facilities. He also suggested the following areas where modernisation is required.

(i) Standardisation of products, (ii) Diversification of kiln design and (iii) Introduction of semi-mechanisation at various stages of clay preparation.

A vivid account of the level of modernisation required at different levels is available from the work of Balachandran (1988). He pointed out that the cost of production of tile has been increasing which can be controlled only if modernisation is introduced at different levels.

'A Report on Tile Industry' was prepared by the State Bank of Travancore (1989). It examined the market potential, manufacturing process, input and the incidence of sickness. It is observed that the products are primarily sold in the local market, which is also stagnating. The productivity of workers in Quilon and Calicut is low. The market share in the neighbouring States has come down as they establish factories in their own States where cost of production is moderate.

Kulkarni (1989) made an analysis of the present status of ceramic industry in Uttar Pradesh. He pointed out that there is good future for ceramic industry in the State because the Government gives very high priority to housing.

Lelitia Moneteiro (1989) analysed the growth potential of tile industry in Dakshina Kannada. The major findings of the study were:
(i) The inflow of gulf money shifted the attitude of the rural people from tiled roofs to Reinforced Cement Concrete (RCC). (ii) There is labour
absenteeism in the tile industry. (iii) There is no market research centre. (iv) There is no accounting system in the tile units. (v) The managements have not taken any care to study the problems confronted by the units and there is deficiency of management skill.

Mani (1990)\textsuperscript{50} in his Thesis examined the economics of tile industry in Kerala. The objectives of his study were: (i) To study the economics of the tile industry in Kerala. (ii) To examine the regional variations in the economics of the industry. (iii) To identify the major problems and constraints faced by the tile industry in Kerala, and (iv) To examine the prospects of tile industry in Kerala. He examined the economics of tile production in Kerala and also in four regions. The major findings of his study were the following: (a) Sixty per cent of the sample units had a rural location. (b) Significant changes had not taken place in the composition of fixed capital. (c) Among the regions, rise in input cost was the maximum in Quilon region. (d) Among the products, roofing tiles had the pre-eminent position. (e) Among four regions, Calicut enjoyed better margin, and productivity of Calicut region was found to be higher. He concluded that the prospect of roofing tile industry was very bleak.

Arunkumar (1994)\textsuperscript{51} examined the structure and pattern of growth of tile industry in Kerala. He also examined the important problems that this industry faces today. The possibility of product diversification has been the thrust area of his study. He stated that the tile units do not face any demand problems of a permanent nature. He concluded by saying that product diversification is the best strategy for the survival and growth of the industry.

Sivalingam (1994)\textsuperscript{52} elucidated the crucial issues afflicting tile industry in Kerala. The major objective of his study was to provide a detailed account of modern methods of working for small-scale roofing tile manufacturing units. Special emphasis had been laid on energy conservation, pollution
control and quality control, besides appropriate technology for clay handling, mixing, pressing, drying and firing.

Small Industries Service Institute (1994)\textsuperscript{53} in its report, "Study Report of Cluster Group of Industries on Roofing Tiles" stressed certain measures meant for the survival of this industry. These measures include energy conservation, cost reduction, modernisation and technology development.

Johnson (1998)\textsuperscript{54} examined the various issues relating to tile industry in Kerala. The main objective of his study was to examine the marketing problems of tile products. Besides, he examined the productivity of labour in tile industry. K.G.K. Nair (1999)\textsuperscript{55} in a report analysed the product range of the tile sector, salient features of the existing industrial units and procurement problems of raw-materials. He put forward certain recommendations for the revival of this industry, of which the most important one is product diversification and Research and Development.

Maleeha Raghaviiah (2001)\textsuperscript{56} examined the basic problems that the tile industry in Kerala faces today. The most serious problem of tile industry is the non-availability of clay. Singh Mor (2003)\textsuperscript{57} looked into some of the aspects relating to housing, health, safety, education and welfare facilities of women workers of the brick kiln industry. The study concludes that these workers come from the poorest section of the society, especially from Scheduled Castes and Scheduled Tribes, earning meagre income. They are deprived of good living as well as working conditions. There are no fixed working hours. Unauthorised deductions and untimely payments are a common feature. The study concludes by stating that there is an urgent need of advocacy roles so that the Government and policy-makers can take some concrete steps for ameliorating the socio-economic conditions of these workers.
The Friday review of The Hindu (2003)\textsuperscript{58} examined the problems of tile factories in Kerala under the title "Crisis in Tile Industry Continues". This report stated that the traditional industry of the region would disappear, if the Government did not protect it through concessions granted to similar industries such as cashew.

Ramavarman (2004)\textsuperscript{59} examined the origin, phase of decline and rising costs of tile industry in Kerala. According to him various factors have forced the closure of many of the tile factories in the State and the industry is now confined to the four districts, viz., Kozhikode, Trichur, Ernakulam and Kollam.

Naresh Kumar and Sidhu (2005)\textsuperscript{60} made an attempt to identify the push and pull factors which influence the brick kiln worker's inter-state migration on the basis of perception of workers. According to the study lack of development, inadequate agricultural land and poor economic conditions of family and so forth forced labourers to migrate. The study further found that economic factors have emerged more significant as compared to non-economic factors in the process of migration.

Though a number of studies were carried out by different individuals and agencies, majority of them except a few suffer from the following shortcomings. (i) No systematic methodology is adopted to carry out the studies, (ii) The areas of modernisation, diversification and capacity utilisation are not dealt with, and (iii) Earlier studies are partial in the sense that the different economic aspects of the industry, viz., production, input, output, productivity and related problems are not dealt within a single study.

It is against this backdrop that the present study is carried out. It is an improvement over the earlier studies in the sense that it examines the economics of tile industry in Kerala by choosing samples from three regions
which together account for 85 to 90 per cent of the tile factories in the State. This study also attempts region-wise analysis of capacity utilisation, productivity and financial performance of tile units in Kerala.

1.4 Objectives of the Study

The general objective of the study is to analyse the region-wise economics, capacity utilisation, productivity and financial performance of tile units in Kerala. The specific objectives of the study include:

i. To examine the economics of the tile industry in Kerala.

ii. To analyse the financial performance of tile manufacturing units in Kerala, and

iii. To identify the problems and constraints of the tile industry in Kerala.

1.5 Hypotheses

Based on the objectives of the study, the following hypotheses have been framed.

i. The economics of the tile industry is becoming unfavourable over the years.

ii. The financial feasibility of the tile industry is becoming unfavourable over the years.

iii. Modern technology based tile factories achieve higher level of productivity.

1.6 Research Design and Methodology

This study is based on both primary and secondary data. Primary data have been collected from the sample tile units selected through the scientific method. The research design and methodology adopted for this study are given below.
1.6.1 Sample Design

A list of the total number of registered units engaged in the production of tile products was obtained from the Office of the Directorate of Industries, and District Industries Centres. It indicated that there are 283 large and small tile manufacturing units in the State. This study is confined to Kerala. This is a sample study. A representative part of these tile units were selected for intensive analysis. A two-stage random sampling technique was used to select the samples. In the first stage, the regions in which the tile units are concentrated were identified. In the second stage, sample tile units were selected from these regions at random.

1.6.2 Selection of the Sample Regions

There are 283 tile manufacturing units in Kerala as on 31st December, 2006. The main concentration of the industry, however, was in three districts, namely, Kozhikode, Trichur and Ernakulam (Alwaye). These three districts together account for about 90 per cent of the total tile manufacturing units in Kerala. Hence, Kozhikode, Trichur and Ernakulam were selected as the sample districts. Each district is designated as a region for the purpose of the study. Thus, the sample regions are Calicut region, Trichur region and Alwaye region. Therefore, it has been decided to consider the units located in these regions as the universe for selecting sample units.

1.6.3 Selection of the Sample Units

In the second stage, sample units were selected. Random sampling was used in selecting the sample units from the sample regions. Six sample units were selected from Calicut region, 30 sample units were selected from Trichur region and 6 sample units from Alwaye region. Thus a total of 42 units were selected for the study. While drawing the samples, more consideration was given to the magnitude of concentration.
Since the population is relatively less in Calicut and Alwaye regions, about 50 and 60 per cent respectively of the population was included in the sample. But from the Trichur region, only 12 per cent of the population was included in the sample, as the population is fairly large. In the selection of sample units it is difficult to keep the proportionate sampling technique and hence the non-proportionate sampling technique was followed. The samples selected account for 16 per cent of the population of the sample region and 15 per cent of the universe of the State of Kerala. The list of sample units surveyed is given in the Appendix I.

The tile industry in Kerala makes use of different levels of technology. In the context of this study it is assumed that the level of technology is determined on the basis of the type of kilns used by the sample units. The kilns in operation include the Down-draught Intermittent Type, the Semi-continuous Type and Hoffmann Continuous Type. Sample units of down-draught kiln are treated as traditional technology-based units, samples of semi-continuous kiln are treated as intermediate technology-based units and the sample units of continuous kiln are considered as modern technology-based units. Since all the three types of technology-based units are operating in the sample region, the samples selected from these regions represent the three levels of technology also. Therefore, the samples selected qualify both the regional representation as well as technological specificities.

A classification of the selected samples on the basis of region and nature of technology is shown in Table 1.1.
The Table reveals that out of 6 sample units of Calicut region, 3 units follow continuous kiln, 2 units use semi-continuous kiln and 1 unit uses down-draught kiln. Out of the 30 units selected from Trichur region, 15 units belong to down-draught kiln, 9 units follow semi-continuous kiln and 6 units use continuous kiln. Out of the 6 units selected from Alwaye region, 3 units follow down-draught kiln, 2 units belong to semi-continuous kiln and 1 unit is of continuous kiln. As regards the nature or level of technology, out of the total 42 sample units drawn from three regions, 45.24 per cent belong to down draught kiln group, 30.95 per cent follow semi-continuous type kiln and 23.81 per cent are from the continuous kiln group. Out of 19 down-draught type kiln, the share of Trichur region is 78.95 per cent and that of Calicut and Alwaye regions are 5.26 per cent and 15.79 per cent respectively.

On the basis of status, tile manufacturing units in Kerala can be classified as small, medium and large units. However, while selecting samples for the purpose of this study status-wise classification is not considered.
1.7 Data Source

The methodology for an empirical analysis necessarily involves the use of extensive primary and secondary data. The present study comes under descriptive survey method. Both primary and secondary data have been used for the study. However, this study is mainly based on primary data. A well structured questionnaire was circulated among the units under study for the collection of primary data. Necessary information was also collected from the managers and employees of tile manufacturing units.

Secondary data were collected from various publications of the State Planning Board, Directorate of Economics and Statistics, National Productivity Council, Small Industries Service Institutes and so on. Secondary information was also gathered from books, reports, articles, working papers, published and unpublished works.

1.8 Tools of Data Analysis

The statistical tools used for data analysis include Arithmetic Mean, Analysis of Variance (ANOVA), Time Series Analysis, Critical Difference Analysis, Percentages, Ratios and 'Z' Score.

1.9 Pilot Study

Before finalising the questionnaire, it was considered necessary to rehearse the questionnaire under actual field conditions. For this purpose, a pilot study was initially carried out. For the pilot study, an unstructured interview schedule was used which helped to improve the quality of interview schedule. The pilot study was carried out in Calicut and Trichur regions by choosing 5 samples each. Necessary changes and modifications were effected in the interview schedule in the light of the pilot study. A pre-test of the scheduled was also executed.

Interview schedule (Appendix II) was finalised after making necessary corrections, deletions and additions in the light of experience gained through
pre-test. In the present study, a pre-test was conducted among five sample units in Calicut region.

1.10 Field Work

Field work was conducted from April 2006 to December 2006. The respondents were interviewed at their manufacturing units using a well structured schedule.

1.11 Scheme of the Study

The study is presented in eight chapters. The introductory chapter introduces the topic and explains the significance of the study, review of literature, methodology and data source, sample design and also the limitations of the study. The origin and development of tile industry is provided in the second chapter. An attempt has also been made to discuss the manufacturing process of tile units in Kerala.

The economics of the tile industry in Kerala is analysed in the third chapter. This is done by analysing the capital structure, input cost, labour cost, product mix, gross profit, value-added and similar parameters of the sample units. Structural variations are also examined with the help of selected structural ratios. Similar analyses are done at the regional level also.

The fourth chapter analyses trends in productivity, especially labour productivity. After explaining theoretical issues relating to the concept of productivity, we measure labour productivity and total factor productivity of the sample tile units.

The conceptual and empirical contours of capacity utilisation are presented in the fifth chapter. The empirical part of the study pertains to region-wise analysis of capacity utilisation, size and capacity utilisation, capacity utilisation and profit, market demand and capacity utilisation and so on.
Financial performance of sample units using certain ratios is done in the sixth chapter. The overall performance assessment of tile units with the help of Altman’s model is also presented here. The problems and constraints of the tile manufacturing units are discussed in the seventh chapter. The last chapter gives the summary of findings, conclusions and suggestions.

1.12 Limitations of the Study

As in the case of any social science research, this study has also some limitations.

First of all, most of the tile factories do not maintain proper records of their day-to-day activities. In the absence of proper records, the required data was gathered from the entrepreneurs and managers of the sample units through discussions. Hence, the reliability of the data depends to a greater extent on the information supplied by them. Secondly, besides roofing tiles, tile factories also produce various other clay products. But in this study major thrust is placed on roofing tiles. Thirdly, while selecting the samples, classification based on location and size is to be considered. But the samples for the present study were drawn on the basis of location and the selected samples were arranged on the basis of technology (nature of kiln). Fourthly, the economic variables included in the study were examined in current prices. Despite these limitations, maximum care has been taken to present the subject of research in a scientific manner.
Notes and References


21. Lokanathan (1965), Industrial Programmes for the Fourth Five Year Plan; NCAER, New Delhi.


58. Staff Reporter (2003), "Crisis in Tile Industry Continues", The Hindu, August 1, p. 4.
