ECONOMICS OF TILE INDUSTRY IN KERALA

Synopsis

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. 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.

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 the 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 the 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.

**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.

**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.
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.

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.

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.
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 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.
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.

**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.

**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.
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 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.

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.

Five important aspects under investigation in the study are: (i) a descriptive analysis of different aspects of manufacturing process of tile industry, (ii) a detailed discussion of the economics of the tile industry in terms of fixed capital, productive capital, working capital, invested capital, gross profit, value-added and so on, (iii) analysis of trends in labour productivity and total factor productivity with the help of simple measures (iv) capacity utilisation analysis with the help of installed capacity approach, and (v) financial performance appraisal with the help of ratio analysis and Multiple Discriminant Analysis.
Chapterisation

The study is presented in eight chapters. The introductory chapter introduces the topic; 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. The economics of tile industry in Kerala is analysed in the third chapter. The fourth chapter analyses trends in productivity, especially labour productivity. The conceptual and empirical contours of capacity utilisation are presented in the fifth chapter. Financial performance of sample units using certain ratios is done in the sixth chapter. 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.

The summary of major findings emerged from the study are the following.

Capital Structure

Examination of the capital structure points out that significant changes have not taken place in the composition of fixed capital. Analysis of trends in the composition of working capital revealed that most of the factories raised much of their working capital through loans and advances. Though the industry is labour intensive in nature, the number of people employed in this industry has been decreasing. Analysis of the cost structure reveals that, it varies among regions depending upon the nature of technology chosen. A close examination of the cost structure of selected tile units in Kerala shows that input cost as a proportion of total cost rose from 47.97 per cent in 1996-97 to 53.26 per cent in 2005-06. This data very clearly proves that labour cost does not cause a serious problem to tile manufacturing units in Kerala. Among the three regions, the rate of increase in input cost is high in Alwaye region and low in Trichur region.
Products

Different tile factories in Kerala produce different types of clay products, of which, the most important one is roofing tiles. The results of the study adequately support the hypothesis that the economics of tile industry exhibits fluctuations over the period and it has been becoming unfavourable over the years.

Profit

Tile factories in the State are susceptible to periodic fluctuations in the volume of profit earned. These fluctuations are attributed to fluctuations in sales, input costs and in selling price.

Value-added

We can notice fluctuations in value-added also which may be due to the variations in input cost, and sales proceeds.

Structural Ratios

1. During the period under study, fixed capital-invested capital ratio and fixed capital-productive capital ratio were found to be low. This is an indication of high labour productivity.

2. Invested capital-output ratio most often recorded a rising trend in all the regions, particularly in Alwaye region owing to accumulation of materials, semi-finished goods and finished goods.

3. Input-output ratio remained more or less constant in Calicut and Trichur regions but increased in Alwaye region.

4. Value-added-input ratio and value-added-invested capital ratio recorded fluctuations over the years.
5. Input per-worker, output-per-worker and value-added per-worker increased during the period under study. This may be attributed to price increase (raw-materials as well as finished goods) over the years.

**Physical Performance**

The physical performance of the selected samples is evaluated with the help of productivity analysis. The most important findings of this analysis are as follows:

- **a)** Labour productivity is, in general, low in tile industry.
- **b)** The mean annual output per worker is more in continuous kilns.
- **c)** The mean output per rupee of wages is the highest in continuous kilns.
- **d)** Region-wise analysis of productivity indicates that mean output per worker and value-added per worker are higher in Calicut and Alwaye regions.

**Capacity Utilisation**

On the whole, all the regions recorded gross underutilisation in its capacity. The study indicates that there is no close association between size and capacity utilisation but there exists a positive correlation between capacity utilisation and profit and also between market demand and capacity utilisation.

**Financial Performance**

Therefore, an attempt has been made to assess the financial performance of selected samples. The overall financial performance is analysed with the help of Altman's model. From the analysis of financial performance, the following conclusions are drawn:
a) Financial performance of the tile manufacturing units in Kerala is not satisfactory, but it shows signs of improvement in recent years.

b) The overall performance of the tile industry is good as indicated by the average 'Z' score.

**Problems and Constraints**

Examination of the problems facing the tile units shows that the major problems are: marketing, technological, raw-material, managerial, labour, financial, quality, research and development, and so on.

**8.7 Major Recommendations**

The following suggestions emerge from the findings of the study which can be used for the proper development of the tile industry.

(1) Modernisation, (2) Cluster approach and (3) Flexible Specialisation

**Conclusion**

In short, it is possible to bring up the tile factories to a reasonable level, if not to its earlier glory, if a pragmatic strategy is worked out. The most important component of such a strategy should be modernisation of existing units and diversification into value-added products.
ECONOMICS OF TILE INDUSTRY IN KERALA

Synopsis
of the Thesis Submitted to the
University of Calicut
for the Award of the Degree of
DOCTOR OF PHILOSOPHY IN ECONOMICS

By
MOHANADASAN N.

DEPARTMENT OF ECONOMICS
UNIVERSITY OF CALICUT
DR. JOHN MATTHAI CENTRE
ARANATTUKARA, THRISSUR