CHAPTER - I

INTRODUCTION AND DESIGN OF THE STUDY

1.1 INTRODUCTION

Brick remains one of the most important building materials for construction activities in India. Brick making is a traditional industry, generally confined to rural and semi-urban areas. The Indian brick industry is the second largest producer in the world next to China, and has more than 60,000 operating units, producing about 100 billion bricks annually. Brick industry is located in clusters in different parts of the country where raw materials are available. Establishing and operating brick-industries have low requirements in terms of capital investment and labour skills. Most of the brick-works are small-scale units (production capacity of 1 million to 10 million bricks per year). Brick industry has annual gross revenue of about Rs 100 billion and employs millions of workers. However, brick making is energy intensive process as fuel costs alone accounts for almost 30% of the production cost. Thus it comes as no surprise that the annual coal consumption in the sector is estimated to be in the range of 15 and 20 million tones, placing brick industry as the third largest consumer of coal in the country next to thermal power plants and steel industry\(^1\).

\(^1\) [http://www.cosmile.org/papers/general_energyefficiencysmallscaleindustriesperspective.PDF](http://www.cosmile.org/papers/general_energyefficiencysmallscaleindustriesperspective.PDF)
Brick making is one of the most ancient industries, and is as old as the Indus Valley Civilization (2500-1500 BC). Fired bricks were also used by the ancient people of the civilizations of Egypt and Mesopotamia for building tombs and temples. Although the design, shape and weight of bricks have undergone numerous historical changes, the production technology has experienced very limited changes. Bricks are prepared, processed and baked at the brick kiln.

The present work culture of our brick industry is no different from the one that existed in Europe during 19th century as the majority of the units still employ age-old hand-molding. Sun-drying and clamp, scone or moving chimney kiln burning methods. Use of roller crushers, extruders and Hoff Mann Kilns for brick making has remained restricted to the Mangalore and Calicut coastal belt only while use of fixed chimney Kilns and high-draught kiln is mainly prevalent in the northern, north-eastern and some southern states.

Importance of brick as a primary material in the construction industry need not be ever emphasized. The brick units are also important from another angle namely employment potential. Brick manufacturing is a labour intensive activity which provides abundant employment opportunity to the rural people both skilled and unskilled. There is a sizable increase in employment opportunities generated by brick units. Apart from labour intensiveness, limited investment, unskilled nature of production, sizable demand etc., are some of the direct factors which contribute to the development of this industry. There are two types of bricks viz., country brick and chamber brick. Country bricks
production is highly labour intensive. These brick units have sufficient demand. The demand is increasing year after year due to various factors.

Brick making has undergone several changes, so as to make the process and output cost effective and efficient in usage. With an aim to reduce carbon emissions, United Nations Development Program's Global Environment Facility (UNDP-GEF) is supporting a project on manufacture of energy-efficient bricks. The Punjab State Council for Science and Technology (PSCST), which is the local resource Centre for North India, provides technical guidance to about 5,000 kilns in Punjab and Haryana. The Union Ministry of Environment and Forests is the implementing agency and The Energy and Resource Institute (TERI) is a partner in the project. One of the important components in this project is enhancing public awareness through holding of workshops on promotion of Resource Efficient Bricks (REBs).

In Europe and other developed countries, transition from conventional solid bricks to perforated hollow bricks has already taken place. REBs have several advantages like less consumption of top soil and coal (estimated to be about 20 per cent), reduced carbon dioxide emissions, more strength and reduced water absorption, resulting in reduced (estimated to be 7 per cent) cost of construction, besides reduced (estimated to be 5 per cent) power bill due to better insulating property.

In India, with the entry of international brick manufacturers like Wiesenberger, mechanisation of brick kilns and better products may soon see the light of the day. Most of the brick kilns produce hand-molded bricks. The use of fly ash, produced in large quantity, has assumed importance and is in use for manufacture of cement, bricks and
embankments. The Ministry of Environment and Forests has made it mandatory for all brick kilns located within 50 kms radius of thermal plants to use fly ash in the production of bricks. Bricks produced in a conventional kiln by mixing fly ash with clay are certainly better in strength, size and have least water absorption property.

It is generally perceived that the Indian brick industry has missed the bus of technological development and the environmental consciousness that follows it. One such innovation is the development of Vertical Shaft Brick Kiln (VSBK) in China. VSBK technology is very popular in rural China for small-scale production of bricks. It is estimated that around 50,000 VSBKs are operating in China. Since 1990 the kiln has been demonstrated in Pakistan, Nepal, India and some countries of Africa. It is energy efficient and environment friendly. It consumes 40 per cent less energy and emits 90 per cent less pollution (TSP) compared to traditional brick kilns. It is estimated that each individual in Asia consumes about 250 bricks. If all brick kilns in Asia can be shifted into VSBK technology, it could save almost 72 million tonnes of CO2 annually in addition to the cleaner environment it provides.

In 1995, the Swiss Agency for Development and Cooperation (SDC) launched an Action Research Project aimed at improving efficiency of brick kilns in India. As a part of this project it was decided to field test the techno-economic feasibility of VSBK technology under Indian conditions. For this purpose, four VSBK pilot plants were constructed. The first VSBK pilot plant became operational in May 1996. The design and construction work of the VSBK pilot plants was carried out under the guidance of experts from Energy Research Institute of China.
The VSBK technology brought with it two major advantages like less fuel consumption and lower SPM (Suspended Particulate Matter) emissions. Moreover, the VSBK could be operated perennially, as the kiln's roof protected it from the vagaries of weather. With minimum land usage, development of multiple-shaft production units actually enhanced the ratio of land used to production output and even better quality.

Brick making is not going to be the traditional labour-intensive, energy guzzling sector for long. It is transformed into more efficient, mechanised, fuel-efficient and environmental friendly with the onset of improved technology, alternate fuels and efficient kiln designs. Already many manufacturers are following in total quality management and statistical control programmes.

Bricks though vary considerably in their properties and appearance, have the following advantages in construction.

Attractive appearance which mellows with age, economical, durable, structural strength, fire resistance, sound insulation, low thermal conductivity, resistance to adverse climatic conditions, flexibility in application and minimum maintenance.

Employment generation is yet another significance of brick units. The construction industry is largely dependent on bricks. Further developmental activities such as, construction of bridges, canals, dams etc., also depend on Brick industry.

1.2 REVIEW OF LITERATURE
Chopra (1972) studied the bondage of brick kiln workers of Muzaffarnagar district of Uttar Pradesh and found out that bulk of such labourers were scheduled castes and over 75 per cent of them were illiterate and bonded. Out of the sample of 340, 69 workers reported having rebelled against the bondage. In case of women, there were cases of their being sold into slavery to prostitutes².

James Keddle and Cleghorn (1980) point out that labour input in the more mechanised brick works is small and often not very sensitive to the scale of output. But in the more labour intensive brick works, they are employing men, women and children for a variety of tasks. Wages vary widely from country to country in tune with the stage of economic development. The lower rates of pay for rural brick makers are based on the observed variations between wages for permanent and casual low – skilled workers in mechanised units. In the case of seasonal production, it gives employment for works for 36 weeks and in the case of all – year production it provides employment for 50 weeks. Seasonal pattern of production is labour intensive requiring low investment costs. Brick workers in both developed and developing countries typically work for only a single shift each day.

Leela Gulati (1981) pointed out that in brick industry there is a very rigid compartmentalization of work on the basis of sex. Women are used exclusively for unskilled job of carrying head loads. They do not have the access to any of the other

jobs like molding, shopping, stacking and arranging bricks in the kiln. Women are the most exploited category. They hang on to their job because of (a) uncertainty of work opportunity elsewhere and (b) the continuity of brick work in terms of labour employment. One molding team of 3 men consisting of ‘masonry’ and 2 helpers can turn out 2600 bricks a day. Number of a bricks carried per day by a woman varies between 500 and 700. Wage depends on distances she covers and the number of bricks she carts in the course of the day. Brick making is usually undertaken after paddy cultivation is over\(^3\).

Lim (1981) have over ambitiously examined the nature, scope and significance of brick industry in term of their coverage, technology and employments in industry\(^4\).

Suneeth Choprn (1982) in his study reveals that there is bonded labour in the brick industries the owners reap enormous profits from the industry. The average wage for bonded labourer in U.P. is Rs.355 per annum. 34% of the women and 68.1% of the children are paid less than one rupee per day. A specific feature of this area is high percentage of Muslim weavers working as kiln labourers, 75% of the kiln workers are illiterate and 55% of the rest have studied only up to class eight\(^5\).

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Malini Varadarajan (1982) in his paper analysed the working capital and different aspects of management of a very small sample size of brick units. The formal study was related to ten small scale units and the latter related to only eight large scale units.

Randeria and Yagnik (1983) in their article expressed concern over non-implementation of labour laws in brick kilns of Gujarat. It was primarily because the brick kiln workers are unorganized as the kilns are scattered all over the countryside in the state. Secondly, since most of these workers in this industry are migrant labourers and they feel isolated in terms of language and other socio-cultural variables.

Puri (1983) in his article based on the proceeding of the historic meeting of 4000 employers and workers representatives of the 30000 brick kilns employing nearly 30 lakh laborers held at the Asian Games Village in Delhi in 1983 ,brings forth the conflicting claims of the two parties. While, the owners were sour at the lack of government support in the form of credit facilities, the allocation of coal at economical prices and the low support price for the bricks, the workers stressed for the proper implementation of labour laws.

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7 Randeria, “Employment Potential of Brick Industry” Yojana,

Shymala (1983) has done some work, on brick industry in which she has traced the history and development of brick industry, economic analysis of chamber brick, production.\(^9\)

Breman (1985) states that brick units in Western India lie along the river which offer work to approximately 700 workers in the dry season. The workers belong to the tribal castes and they are contracted in the monsoon period by a broker on the owner’s commission. Each team makes between 2500 –3000 bricks a day and for this earns Rs.17 per 100 bricks. A team member’s daily earnings vary between Rs.4 and Rs.5.50. women who carry head loads get Rs.2.30 – Rs.3 for every 1000 bricks transported which works out at a daily wage of about Rs.4 for this heavy and filthy work. Labourers from outside village are secured in advance by credit for the duration of the season.\(^10\)

Sinha Manju’s (1987) in her study based on a survey conducted in the month of March, 1987 in four brick kilns of Alipore situated at about 20 kilometers away from the main city of Calcutta in India aimed at highlighting the extent of applicability of the labour legislations relating to the women in brick kilns, and also the procedures of recruitment, working conditions, wage structures and welfare measures for these women. The main findings were that these women face exploitation. They are not

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\(^10\) Breman.J,“ Rural Labour Circulations and Capitalist Production in Western India”, Oxford University press, Delhi 1985,p.288
aware of their rights and privileges in relation to their service and situation in which they work. They live and work in hazardous conditions\textsuperscript{11}.

The survey of the Labour Bureau, (1987) Government of India, carried out in 1988, in north Indian states of Punjab and Haryana, found out that the women workers employed in the brick kilns were mostly migrant labourers brought from areas either within or outside the state of the kiln. Women do not do the work like earth digging, transportations of mud and preparation of mud mixture for molding. Brick kilns had no fixed working hours and usually spread over to 11 to 12 hours a day. Most of the women in this industry were found residing in temporary hutment which were erected out in and around in kiln with the help of the material supplied by the employers. The facilities of separate kitchen, bathrooms, crèche or latrines were nonexistent\textsuperscript{12}.

Anandhy (1988) in her study mainly concentrated on labour management, labour welfare and problems and the other dimension of brick units such as investment and production and costs were not thoroughly examined in her study\textsuperscript{13}.

C. Pandi (1989) analysed in his study entitled production and marketing of bricks with reference to selected villages in Madurai District studied the production techniques and problems of brick units. The marketing system and marketing problems of brick

\textsuperscript{11} Sinha, Manju Lata, “Conditions of Women Workers in the Brick Kilns”, Man in India, vol. 74(1), March 1987

\textsuperscript{12} Labour Bureau, Ministry of Labour, Government of India, “Survey of Socio-Economic Conditions of Women Workers in Unorganized Industries” 1988

\textsuperscript{13} Anandhy, “Some Aspects of capital and Labour in Brick Industry-A Case study of Melapuram Block in Kanyakumari District, Unpublished M.Phil Dissertation, Jawaharlal Nehru University, New Delhi, 1988
units were studied. The researcher selected 10 chambers and 20 clamp units for his study\textsuperscript{14}.

Deliege (1989) in his study, highlighted the particular perspective of job mobility in relation to the community of brick makers. According to the author brick making work is carried out by a team of two workers who can be a husband-wife, father-son, brother-sister and the like. The study also explains the backing and transporting operations in the kilns and underlines that the work in brick kilns is very hard. The working conditions are harsh and workers work under the burning sun\textsuperscript{15}.

Saran and Sandhwar (1990) has listed in that most of the migrant labourers in brick industry are treated as bonded labourers and they are neither allowed to communicate with their family members nor permitted to go back to their native places during mid season. All sorts of inhuman measures like physical and mental torture, sexual abuses and kidnapping of kids etc. are adopted by the employers. The maternity benefits are not paid and no medical assistance is provided to them for common diseases. There is no compensation paid to injured, deceased or their dependents. Living condition of these women workers is extremely inhuman\textsuperscript{16}.


\textsuperscript{15} Deliege, Robert, “Job Mobility among the Brick Makers of South India”, Man in India, 1989.

\textsuperscript{16} Saran, A.B. and Sandhwar, “Problems of Women Workers in Unorganized Sectors in Northern Book Centre”, New Delhi, 1990
Lingam (1990) in his study has made an analysis on the structure of brick units in Thovalai Taluk in Kanyakumari District in Tamil Nadu and carefully analysed the capital structure of the brick units. He has examined the cost structure, employment pattern, the components of working capital, wage structure and methods of sales, strategy adopted by brick units in order to promote the sales volume and sales value of bricks in the study area\textsuperscript{17}.

Mathur (1990) in his article stressed the need of manpower planning in brick kiln industry because the industry has been facing shortage of skilled labourers such as molders and firemen. To cater to the needs of this industry and to increase productivity, it is necessary to make an assessment of the availability and the demand of manpower for operating this industry. Training is required for inculcating requisite types of skills and to orients the skilled workers to newer skills\textsuperscript{18}.

Stephen Joseph (1990) in his article concluded as rural brick factories are an important industry that provides construction materials made from local raw materials and that they provide rural employment, especially for women. However, he also indicates that the brick industry is facing a major hardship.


Upadhye-Chavan (1991) in his study provides extensive review of studies in migration besides finding out the reasons of low living standards, poverty, indebtedness, illiteracy and unemployment of the workers in brick kilns industry\textsuperscript{19}.

Aranga Ezhillarasan (1995) undertook a study on the production and marketing of chamber bricks at Virudhachalam, South Arcot – Valalar District. In this study he analyses process of manufacturing bricks, the production and marketing functions of the sample brick units\textsuperscript{20}.

Dharmalingam (1995) in his paper stated that the wage of the main worker is determined by the number of bricks made, but the wage of the coworker was fixed by the main worker on the basis of the capacity of the co-worker. If the rain destroys the laid out bricks then the main worker has to forgo his wage and the wage of his coworker\textsuperscript{21}.

Narayana Samy. P (1995) in this article has explained the cost of production of bricks in 50 chamber brick industry in Dindugal district. He further stressed that the average cost of production of chamber brick is Rs. 0.83 of the total cost (chamber bricks), fixed cost is contributed by 7.0 percent and variable cost represented by 93.0


percent. In this paper it is stated that firewood and labour cost are the major variable costs in brick production\textsuperscript{22}.

N. David (1997) in his study focused on marketing of bricks in Radhapuram taluk, the mode of sales, the promotional measures and the relationship between selling price and various factors having relationship with selling price\textsuperscript{23}.

Manoharam E (1998) in his study has studied the scale of technology and efficiency of brick industries in Tamil Nadu. He has chosen two districts for his research study viz, Chengalpattu and Dharmapuri. The study revealed that there is a close relationship between the size of the unit and technology adopted and efficiency in terms of operation and economics of scale in production. This study has confirmed a fact that whenever the size of the unit is large, automatically modern technology could be used which in turn lead to an increase in production through improvement in efficiency. Further the study has failed to discuss the environment and working conditions of labourers in general and particularly marketing problems faced by the brick industries\textsuperscript{24}.

Jayati Gupta (2003) in his article stated that the kiln operations are carried on under largely unregulated manner in the informal sector and remain outside the


purview of work place laws with workers bound to contractors and owners by the system of advance payments. Several committees have made recommendations to improve working conditions\textsuperscript{25}.

Selvachandra (2004) in his article entitled “Brick Industries A Rural Employment Generator” discussed both direct and indirect, employment and also anlayised the significance of brick making in construction work\textsuperscript{26}.

Raja alias Piranmalai (2004) in his study focused the socio economic status of traditional brick units, optimum production, cost of brick production, and labour wage structure\textsuperscript{27} were also analysed.

Muhammad Javaid Iqbal (2006) in his paper explored the nature and extent of bonded labour in the brick kiln sector and analyzes its repercussions on children and women of the bonded families. It also examines the legal remedies available for tackling bonded labour. Finally, the paper proposes a comprehensive scheme to ameliorate the concerns of bonded families and ways to eradicate the menace from the industry\textsuperscript{28}.

Guerin Isabella, Bhukuthi Ausendra, Parathasarathy, Venkatasubramanian.G. (2007) in their article stated that workers of the brick kiln sector in Chennai are in a mild


\textsuperscript{28}Muhammad Javaid Iqbal, “Bonded Brick labourers in Pakistan”, The Labour Economics, 2006
situation of debt bondage, have to work for long hours and very often put their children to work as well. However, they are paid wages as in the area very close to the rates fixed by the government and the system of advance payment is endorsed by both workers and kiln owners and the former see it as a means to social mobility. Hence it is concluded that employers, unions, NGOs, public authorities and job brokers can help to break the debt bondage of brick workers.\footnote{Guerin Isabella, Bhukuthi Ausendra Parathasarathy, Venkatasubramanian.G, “Labour in Brick Kilns-A case study in Chennai”, Economic Political Weekly, 2007}

1.3 STATEMENT OF THE PROBLEM

Brick Industry is a small scale and traditional industry. The brick making activities are carried out in rural and semi-urban areas and even in the outskirt of metropolitan cities. The raw material and labourers are drawn from rural areas. The chamber units are mostly located near the city outskirts. The demand for brick has been ever increasing with the greater speed of urbanization and expanding housing needs of rural mass. House construction companies, Government housing schemes and housing loans
by commercial banks and by insurance companies have really increased the house building activities.

The significant feature of this industry is that it provides good employment opportunity for women, especially rural women folk. In rural areas the agricultural labourers are provided employment only for 4 to 6 months and are left unemployed and fully idle during the rest of the year. For them, the brick industry provides alternative employment to earn their livelihood. Brick units provide a profitable business proposition to the agro based rural investors.

Further, the locational advantage of the industry in the study area is the availability of clay and sand on the banks of the cavery river which has increased the production activities of bricks. At the same time, the demand is also increasing due to the urbanization at Namakkal and other small towns and villages in the district. The availability of water and cheap rural labour force, semi-skilled labour for moulding of bricks drawn from nearby village are the other favourable factors. The families drawn from other districts and workers engaged from the nearby villages depend on these units for their livelihood.

Brick as a chief component of the construction industry has lot of problems. The problems in the Brick industry include, inadequate availability of raw material, frequent labour turnover, Lack of Technical knowhow, strict government rules on establishment, seasonal nature of production, Lack of managerial guidance of brick owners, increasing
transport, raw material and labour cost, increased credit sales, wastage of raw material, inadequate place of production, pilferage and theft employing leased land for production and unhealthy competition among the brick production units which all affects the brick production.

The problems of production and marketing of brick are the real threat to the survival of the brick units. In this context, the present study fulfills this lacuna. The study also focuses on the problem of the labourers associated with the units. The study attempts to focus on the issues relating to production and marketing of bricks in the registered brick Industries in Namakkal district and the perception of both owners and labourers engaged in these industries.

1.4 OBJECTIVES OF THE STUDY

The specific objectives of the study are

1. To study the production process.

2. To study the production and marketing of Bricks in Namakkal District.

3. To study the Socio Economic status of Brick workers and their perception on the industry.

4. To Analyse the perception of the manufacturers on the problems in the industry.

1.5 SCOPE OF THE STUDY

The present study analyses the production and marketing of bricks with regard to registered brick industries in Namakkal District which include the method of production, investment, pricing, cost of production, channels of distribution, and the problem of
brick industries Similarly, the opinion of brick workers on the production and marketing of bricks in Namakkal District has also been analysed in this study.

1.6 METHODOLOGY

The study is based on both primary and secondary data. The secondary data were collected from various reports, journals, published and unpublished thesis, newspapers and websites. Primary data were collected from brick producers and workers with the help of interview schedule. In order to test the validity of interview schedule, 10 brick units in Namakkal District were surveyed as pilot study. Based on the experience gained from the pilot survey, the schedules were prepared exclusively for both the bricks industries and their workers in Namakkal district.

1.7 SAMPLING

In Namakkal district there are 61 registered brick industries according to the District Industries report. The researcher has taken all 61 brick industries under census method to analyse their production and marketing practices. In each of 61 brick units, approximately 50 workers are employed for production of bricks in various processes. The researcher has selected 10 percent of labourers constituting 300 brick workers by giving equal representation for gender based on convenient simple random sampling method to collect the requisite data for the study.
1.8 PERIOD OF THE STUDY

The primary data were collected through interview schedules from October 2010 to March 2011.

1.9 HYPOTHESES

To give a specific focus to the objectives, the following hypotheses have been formulated to analyse the opinion of the brick workers on their socio economic status

1. There is no relationship between age of the brick workers and income from brick works
2. There is no relationship between Sex of the brick workers and Income from brick works
3. There is no relationship between Marital Status of the Brick Workers and Income from brick works
4. There is no relationship between Nature of Brick Workers and Income from brick works.
5. There is no relationship between experience of Brick Workers and Income from brick works
6. There is no relationship between Education of Brick Workers and Income from brick works

Further, the researcher has framed the following hypotheses to analyse the opinion of the brick manufactures on the problems in brick units.
1. There is no difference in the ratings given by the brick manufacturers on the statement “Inadequate availability of raw material affects brick production”

2. There is no difference in the ratings given by the brick manufacturers on the statement “Frequent labour turnover affects brick production”

3. There is no difference in the ratings given by the brick manufacturers on the statement “Lack of technical knowhow affects brick production”

4. There is no difference in the ratings given by the brick manufacturers on the statement “Strict rules and lack of supports of government affects brick production”

5. There is no difference in the ratings given by the brick manufacturers on the statement “Lack of managerial guidance affects brick production”

6. There is no difference in the ratings given by the brick manufacturers on the statement “Seasonal demand affects brick production”

7. There is no difference in the ratings given by the brick manufacturers on the statement “Increasing transport and raw materials cost affects the price of bricks”

8. There is no difference in the ratings given by the brick manufacturers on the statement “Increasing credit sales of bricks affects further production of bricks”

9. There is no difference in the ratings given by the brick manufacturers on the statement “Inadequate availability of place for storage affects production of bricks”

10. There is no difference in the ratings given by the brick manufacturers on the statement “Wastage of raw material affects production of bricks”
11. There is no difference in the ratings given by the brick manufacturers on the statement “Lack of finance affects production and marketing of bricks”

12. There is no difference in the ratings given by the brick manufacturers on the statement “Pilferage and theft affects production and marketing of bricks”

13. There is no difference in the ratings given by the brick manufacturers on the statement “Employing leased land for establishment of brick units and for storing of raw materials increase the cost of brick operations”

14. There is no difference in the ratings given by the brick manufacturers on the statement “Increasing wage of labour leads to poor return to brick units”

15. There is no difference in the ratings given by the brick manufacturers on the statement “Unhealthy competition among brick units creates the problem of price discrimination for bricks”

1.10 FRAMEWORK OF ANALYSIS

The researcher has used Garret’s ranking technique to rank some of the identified factors that influence the brick manufacturers and the workers to involve in the production and marketing of brick business. Similarly, the Chi – square test has been used to analyse the hypotheses. The weighted Average score analysis is made mainly to assess the level of the opinion of the brick manufacturers regarding the problems in brick industry and opinion on facilities in brick industry for the brick workers. The Mean, Standard Deviation and Karl Pearson’s Co- efficient of variation were also used to analyse the average production of bricks per day and year, sales capacity, income of the
brick manufacturers and income of male and female workers in brick industry. Further, for the purpose of analysing the importance of ratings given by the brick manufacturers on various statements relation to problems, null hypotheses have been formulated. The formulated hypotheses have been tested with the help of the kolmogorov Smirov test (KS test). Similarly the researcher has used the marginal costing technique and ratio analysis to analyse the cost and margin earned by brick industry under study.

1.11 LIMITATIONS OF THE STUDY

A research study of an unorganized sector like brick industry is a difficult task. The main difficulty is the collection of information for the study. The brick producers have not maintained proper records. They provided information only from their memory. Besides, the Namakkal District Brick Producer’s Association is also not in a position to provide any authentic information. Further, as there is limited publication in this field relating to Namakkal District, it was very difficult to collect secondary data too. In spite of these difficulties, the collected information were properly tested with the reliable supplementary sources to ensure accuracy before they were used for analysis.

Since the study is based on the opinion of the brick producers and brick workers in Namakkal district, the information given by them may be sometimes biased as the researcher could collect information by interview schedule. Further the findings of the study relating to production and marketing of bricks may be applicable to Namakkal district only and not to the whole of Tamilnadu due to varying locational factors.

1.12 OPERATIONAL DEFINITION

1. Brick
Brick is important raw material of the construction industry viz., building channel etc., A building owner’s 20 percent of the expenses is to pay for the bricks.

2. **Clay and sand**

   The sand has plastic, porosity and flexibility and can be used for the production of bricks is known as clay.

3. **Green Brick**

   This type of brick is ready for burning and the brick worker makes shape formation by mixing clay and sand and water. The next stage is to keep for drying in working and the dried bricks are fired.

4. **Moulder**

   They prepare the pits, dig the raw earth and make the dough by continuously sprinkling water on the earth and shape the rounds of mud into brick with the help of wooden moulder provided by the brick manufacturer.

5. **Loader**

   They carry the unbaked dried bricks to the kilns for this purpose they use their own bullock cart or small trolley for carrying the bricks.

6. **Stacker**

   One who arranges the bricks in the kiln for firing.

7. **Fireman**
These workers fire the brick in the kiln and watch continuously if the bricks are properly baked.

8. **Unloader**

They are employed to take out the baked bricks form the kilns and sort and stack them according to the grade of bricks.

9. **Channel of distribution**

The brick manufacture uses the different kind of channels. The channel of distribution means a path traced in the direct transfer of brick as it moves from brick manufacture to ultimate users.

10. **Brick Manufacturer**

The brick manufacturer is one whose primary occupation is brick production and he receives more than 50 percent of his annual income from brick production.

11. **Seasons of brick production**

The brick manufacturer produces bricks between and 7-9 months and the remaining period of the year brick production is stopped.

12. **Brick production and marketing expenses**

It presents the sum of all expenses incurred in the various stages of brick production and marketing which includes raw material purchase transport expenses and labour wages.

13. **Brick Marketing**

Brick marketing refers to all those activities related to buying and selling.
14. Profit of brick manufacture.

In this study the term profit of brick manufacture is obtained from the difference between price for brick paid by the building owners and it received by the brick manufacturer.

1.13 CHAPTER SCHEME

The present study is designed into six chapters

First chapter portrays the introduction of the study, review of literatures, statement of the problem, objectives of the study, scope, methodology, sampling, period of study, frame work of analysis, limitation and the chapter scheme.

Second chapter elaborates the history of bricks and its production process and type of bricks and kilns, profile of the study area and the profile of brick industry in Namakkal district.

Third chapter summarizes the production and marketing practices of brick manufacturers in Namakkal District.

Fourth chapter deals with the socio economic status of the workers and their opinion on the brick industry in Namakkal district.

Fifth chapter deals with the opinion of brick Manufacturers on the problems of production and marketing of bricks in the Namakkal district.

Sixth chapter deals with Summary of findings, suggestions and conclusion.