CHAPTER - V
SUMMARY OF FINDINGS AND CONCLUSION

5.0 INTRODUCTION
Local materials traditionally utilised for permanent construction viz., timber and stones have become very scarce, the modern building materials like cement and steel are more expensive and are often short supply in many developing countries. Clay based materials like bricks can be appropriately and effectively used as a main alternative material for low cost permanent construction both in rural and urban area for housing as well as public buildings. Brick production provides opportunities for rural employment, due to its localised nature as clay excavators, brick workers, traders, bio-fuel producers and suppliers. The external capital and technical inputs in brick making are further relatively low. Despite its development advantage, there are also number of constraints and issues in the brick industry. These constraints are related to the technology, the institutional environment, the cost and supply of energy, socio-economic and financial condition of the brick makers. However, there are also other factors outside the industry which play a role. These include institutional and policy constraints and competition from manufacturers of other modern building materials. Inspite of these constraints, the brick industry has been continuously growing due to the continuous expansion of construction activities in the urban and rural areas. Hence, an analysis was made to understand the problems of brick industry aiming at offering constructive suggestions based on field work. This chapter summarizes the inferences drawn from the field survey and concludes by offering suggestions.

5.1 SUMMARY OF INFERENCES
This section presents the major findings from the analysis and discussion of data collected from 307 traditional brick unit entrepreneurs in aspects such as socio-economic characteristics of traditional brick unit entrepreneurs and problems in the functional areas of management of brick units such as material management, production management, financial
management, labour management, energy management, environmental management, marketing management and risk management.

5.1.1. SOCIO-ECONOMIC CHARACTERISTICS OF BRICK UNIT ENTREPRENEURS

Gender

90.6 per cent of brick unit entrepreneurs are male entrepreneurs and remaining are female entrepreneurs. It implies that the traditional brick unit is male dominated industry.

Predominance of backward Community

83.06 per cent of the brick unit entrepreneurs belong to backward and most backwards communities and 16.94 per cent of the brick entrepreneurs are from the schedule castes. It is interesting to note that Kulala Chettiar community were the pioneers in establishing the brick units in Tamil Nadu. Earlier main profession of this community was manufacturing mud pots of different varieties. They produced mud pots and other articles made out of clay, and marketed the products through periodical visits to the villages. Rural people also showed much interest in purchasing mud pots, which were generally used for cooking, storing water and grains. Moreover, these products were marketed mostly on the basis of barter system. After the introduction of monetary economy, the social custom of the rural masses changed. They started using articles made out of aluminium, silver, plastic etc., for domestic use. Hence, the demand for pottery products declined. Moreover, the womenfolk of the Kulala Chettiar community had to collect dung cake from the field, and some times the farmers prevented and abused them for collecting dung cake from their field. All these forced the people of Kulala Chettiar community to find an alternative profession. So they started producing traditional bricks in Tamil Nadu. Later, those communities who had a close association with Kulala Chettiar community learned art and methods of brick production either by experience or by observation. This is the reason for the predominance of BC and MBC communities among brick unit entrepreneurs.
Age at the Time of Commencement of brick units

It is observed from the field that 83.71 per cent of the brick unit entrepreneurs started their brick units when they were at 20-35 years of age. This is the suitable age for any entrepreneurial activity. As the brick units often rely on locally available raw materials, simple technology and low investment, and above all they are marketed locally. Thus, it attracts the local people, especially the youth even without much experience to establish the brick units.

Educational status of brick unit entrepreneurs

Regarding their educational status, 84.40 per cent of the brick unit entrepreneurs are literates and rest of them are illiterates.

Family System of brick unit entrepreneurs

79.0 per cent of the brick unit entrepreneurs have adopted nuclear family system and 21.0 per cent of them belong to joint family system. The brick units provide entrepreneurial abilities and they feel proud as owners of brick units. This enhances their social status and gives them economic advantages in terms of employment and income. Further, the joint family system, directly or indirectly, helps them to effectively involve themselves in the brick manufacturing.

Reasons for starting brick units

43.0 per cent of the brick unit entrepreneurs stated that they established the brick units mainly for earning more income and 37.0 per cent of them reported that the brick units have created self-employment opportunities. Hence, brick units play a dual role of providing self-employment and generating income within a short period of time.

Sources of motivation

It is noticed that 38.0 per cent of the brick unit entrepreneurs were motivated by their own family members to start the brick units and 36.0 per cent of them started the brick units on their own initiatives.
Previous Occupation of the brick unit entrepreneurs

36.0 per cent of the brick unit entrepreneur’s earlier occupation was farming and 22.0 per cent had worked as agricultural labourers. Thus, more than 58.0 per cent of the brick unit entrepreneurs have emerged from the agricultural sector.

Nature of ownership of brick units

It is found that 94.0 per cent of the brick units are run on sole proprietorship basis and 6.0 per cent of them on partnership basis. The traditional brick unit, in general, is highly suitable for the sole proprietorship form of ownership since it requires only a less capital investment.

Unregistered brick units

The study reveals that 96.0 per cent of the brick units have not registered themselves with the District Industries Centre (DIC). The reasons for the non-registration of the brick units are the unorganized nature of the functioning and the lack of awareness about the DIC.

Insurance

It is found that none of the brick unit entrepreneurs had insured their brick units and they are not familiar with the procedure and formalities in insuring their brick units with insurance companies.

Brick Production : Primary and Secondary Occupation

64.0 per cent of the brick unit entrepreneurs have taken up brick making as their primary occupation and the rest of them consider it as their secondary occupation. The brick units not only provide employment opportunities to the family members but also yield quick returns on investment.

Period of Establishment of brick units

The majority of the brick units (64.17 per cent) were established during 1993-2003. This significant growth rate was noticed during this period because the Government of India had declared 1990-2000, as the decade of housing and shelter. Further, after long gap, elections to Panchayat Raj
Institutions (PRIs) were conducted in Tamil Nadu. The local bodies (PRIs) were intensively engaged in development activities like provision of infrastructure facilities and this created more demand for bricks. This is yet another cause for the growth of small and traditional brick units in the district.

Awareness about brick Kiln Smoke

Regarding their awareness about the impact of brick units on the surroundings, 85.0 per cent of the brick unit entrepreneurs did not know about the impact of brick kiln smoke on the environment and only 15.0 per cent of them were aware of the impact on the environment and they remarked that over exploitation of soil from land, river, ponds, could lead to soil degradation and soil erosion.

5.1.2. BRICK UNITS THEIR LOCATION AND PRODUCTION OPERATIONS

Location of the brick units

The location of the brick units has been determined by various factors such as the availability of raw materials, labourers, assured markets for bricks etc. Among them easy availability of raw materials and the marketing of bricks are the key factors in determining the location. It is observed that 85.34 per cent of the brick units are located on lands owned by the entrepreneurs themselves and 12.38 per cent on rented land and 2.28 per cent on common (poorambokku) lands such as irrigation tank, river and ponds.

Taluk-wise location of the brick units

The taluk-wise location of the brick units in Madurai district shows the following results: Madurai South Taluk has the maximum (17.6 per cent) brick units; Madurai North has 15.6 per cent; Melur has 14.0 per cent; Vadipatti has 13.4 per cent; Usilampatti has 15.6 per cent; Thirumangalam has 11.6 per cent and Peraiyur has 12.1 per cent of the brick units. It could be seen that mostly small brick units are located in almost all the taluks of Madurai district. Medium and large brick units are located in Madurai South and Madurai North taluks. It is an established fact that the availability of raw materials, assured markets and comparatively lesser transport cost are the major factors that generally determine the size and location of the brick units.
Production size-wise classification of brick units

All 307 brick units are classified according to their production size, i.e. the number of bricks produced per firing. Accordingly, 32.3 per cent of the brick units produce 15-30 thousand bricks per firing; 28.0 per cent of the brick units with 31-45 thousand bricks per firing; 21.5 per cent of the brick units produce 46-60 thousand bricks per firing; 9.1 per cent of the brick units produce 61-75 thousand bricks per firing and the remaining 9.1 per cent of the brick units produce 76-80 thousand bricks per firing.

It is found that the number of brick units under 76-90 thousand bricks per firing is only 28 units and they enjoyed larger quantity of brick production (3.94 lakhs bricks per annum and 0.82 lakhs bricks per firing per unit). This is due to operation of economies of scale.

5.1.3. VOLUME OF PRODUCTION OF BRICKS

Madurai South and North taluks are located very near to Madurai city. Hence, they produce 161.90 lakhs (20.0 per cent) and 132.65 lakhs (16.0 per cent) bricks respectively per year. Usilampatti taluk produces the largest volume of bricks - 186.58 lakhs (22.0 per cent) and there is no competition from the chamber brick units in this taluk, Melur taluk accounts for the lowest brick production (69.80 lakhs, i.e 8.0 per cent) because this taluk is located very near to Madurai South and Madurai North taluks where many large-scale chamber brick units produce standard size and good quality bricks. Further, the majority of the consumers in Melur taluk often purchase chamber bricks for their use. This is one of the main reasons for low quantity of brick production in Melur taluk.

Annual Number of firings

It is observed that a brick unit burns bricks 7 times per year on an average. Among the brick units under study, 19.5 per cent of the brick units (60 units) produce bricks 5 times per year and only two brick units (0.6 per cent) produce bricks more than 14 times per year. It is reported by the brick unit entrepreneurs that they prefer to establish smaller size brick units,
because, they require minimum investment, yield quick returns and avoid major risk and uncertainties.

Volume of Production and Qualities of bricks

Of the total annual production of 835.40 lakhs bricks, 92.0 per cent of bricks are rated as first class bricks; 4.0 per cent as second class bricks, 3.0 per cent as broken bricks and 1.0 per cent is treated as waste.

The highest volume of first class bricks (20.31 per cent), second class bricks (1.1 per cent), broken bricks (0.22 per cent) and waste bricks (0.2 per cent) are found in Usilampatty taluk. The lowest volume of first class bricks (7.52 per cent), second class bricks (0.45 per cent), broken bricks (0.21 per cent) and waste bricks (Mill) are found in Melur, Thirumangalam, Vadipatti and Peraiyur Traluks respectively. Generally, the quality of bricks depends upon soil quality and the work experience of moulders and firemen, who play a significant role in the manufacturing of bricks.

Sources of Raw Materials

In the case of raw materials such as soil (red, alluvial, sand etc.) 58.0 per cent of the brick units collected red soil from cultivable lands, 23.0 per cent from ponds and 19.0 per cent from irrigation tanks. It is reported that only 69.0 per cent of the brick unit entrepreneurs used alluvial soil for brick making; 73.0 per cent of them collected sand from rivers and the rest of them collected sand from nearby areas where soil/sand deposits due to wind erosion also to available for brick production.

Mode of transport used for procuring Raw Materials

The majority of the brick units (81.0 per cent) used tractors on rental basis to collect soil from tanks, river and their own lands and the rest of them used bullock carts-the traditional and most popular mode of transport in rural India.

Distance between brick yard and Raw Material Stock

One of the factors that determine the volume of brick production is the average distance between the stock of raw materials and moulding brickyard. Whenever the distance is less productivity will be more and vise versa. The
average distance between the stock of raw material and brick moulding spot (yard) is about 18 feet in the study area.

Time required for drying bricks

It is observed from the brickyard that on an average 23 hours are required for the drying (under the sun) of the green bricks during summer and 38 hours during winter. The taluks under study in Madurai district enjoy a good measures of solar radiation almost throughout the year.

5.1.4. COST FUNCTION

Cost - function

The cost function (cost-output relation) data show that the cost of production of 1000 bricks ranged from Rs.722 to Rs.788. For the brick industry as a whole, the average fixed cost and the average variable cost for 1000 bricks are Rs.49 and Rs.711 respectively. Thus, the average cost of production is Re.0.76 per brick in Madurai district.

Investment components of brick units

The total fixed cost invested by all 307 brick units in Madurai district was Rs.40.54 lakhs, of which 74.2 per cent account for thatched shed, 10.4 per cent for moulding frame, 6.1 per cent for trally, 4.1 per cent for thatches, 2.5 per cent for tarpaulin, 1.1 per cent for iron plate, 1.0 per cent for spade, 0.40 per cent for crowbar and 0.2 per cent for leveling frame. That is, of all the total fixed cost, the cost incurred on thatched shed accounts for the major components of the total fixed cost of the brick units.

Share of fixed cost

The share of fixed cost to the total cost is higher (32.0 per cent) in Usilampatti taluk, because huge investment on the thatched shed and Peraiyur Taluk shows a low share of fixed cost (2.0 per cent) because there was no investment on thatched shed and the brick units here are small in size.
Share of variable cost

In brick units, the variable cost is the major factor that deciding about cost of production of bricks, it is calculated that brick units spend Rs.594.11 lakhs annually, towards the variable cost, of which the cost of firewood constituted a major share (42.0 per cent), followed by labour (29.4 per cent), raw material (sand, soil, water, etc.) at 28.3 per cent and miscellaneous expenses account for 0.3 per cent.

The variable cost varies with the volume of output. It is evident that Usilampatti taluk has contributed 22.0 per cent of bricks to the total volume of brick production which incurred a variable cost of Rs. 139.59 lakhs in a year; whereas Melur taluk contributed only 8.0 per cent of the total volume of brick production and spent Rs.49.98 lakh as variable cost.

The total cost (152.27 lakhs) average cost per brick unit (Rs.3.17 lakhs) and 0.43 lakhs per firing are the highest in Usilampatti taluk. This is chiefly due to the investment on thatched shed, high raw material cost and separate payment of wage for stacking of bricks. The average cost per unit is the lowest in Melur taluk due to the low volume of production. The average cost per firing is the lowest, due to the low raw material cost.

Cost of production of bricks

The cost of production of bricks varied from one taluk to another taluk and it varied even within the taluk, because of price variation of various inputs like firewood, labour, raw material and miscellaneous items. The average cost of production per 1000 bricks is found to be the highest (Rs.818) in Usilampatti taluk. This is because of high expenses on fixed assets and additional payment made to workers for stacking of green bricks. The lowest cost of production i.e. Rs.700 (per thousand bricks) is reported in Peraiyur taluk. This is due to the lowest investment on fixed assets and the efficiency of the brick workers who produce bricks without any waste.

The total cost of production for producing 835.40 lakhs bricks by all the brick units is Rs.634.65 lakhs, of which the total fixed cost is Rs.40.54 lakhs (6.4 per cent) and the total variable cost is Rs. 594.11 lakhs (93.6 per cent). The total fixed cost and the total variable cost are found to be very high in the
brick units which produce 46-60 thousand bricks per firing. This is due to the higher investment made on thatched shed (fixed cost) and the higher price of firewood, soil and sand (variable cost). About 40 brick units in Usilampatti Taluk comes under 46-60 thousand production size, and therefore, the total cost found to be higher in these brick units. The average fixed cost and average variable cost are low in the brick units producing 15-30 thousand bricks per firing. This is mainly due to the fact that many of the brick units under this category did not invest more on thatched shed (fixed cost). Moreover, the labour cost and the raw material cost are quite low, because all facilities needed for producing bricks are available within the brickyards.

5.1.5. LABOUR AND WAGE STRUCTURE

Labour in brick units

Out of the total labour employed, Madurai South taluk has employed 22.0 per cent of the labourers due to average production per firing is high (0.58 lakhs of bricks) while Thirumangalam taluk employed only 8.0 per cent of the labourers, due to average production per firing is less (0.25 lakhs of bricks).

Distribution of wage

Regarding the taluk-wise wage distribution for different activities, Usilampatti taluk is the highest wage distributing taluk with 24.0 per cent, Madurai South with 17.0 per cent and Madurai North with 16.0 per cent. The reason for the higher wage distribution by these taluk is due to the large quantity of brick production which normally requires more labourers. The lowest wage distributing taluk is Melur which accounts for 8.66 per cent of the total wage paid in this district. The reason for the low distribution of wage is due to the low volume of brick production and relatively the employment of less number of labourers.

Labour cost

The labour cost in terms of wage is an important variable cost in the brick units. It constitutes 29.4 per cent of the total variable cost. The brick units in the study area spent Rs. 174.83 lakhs towards labour cost. Of this,
62.70 per cent of wage is paid to the labourers who are involved in brick moulding, followed by 26.33 per cent of wage paid for arranging the green bricks in the kiln, 6.81 per cent for stacking the bricks and 4.16 per cent for firing the bricks.

Wage level

In the study area, the average wage per worker is Rs.78 per day. It is the highest (Rs.100 per worker per day) in Usilampatti Taluk. This is so because, separate wage is paid in this taluk for stacking of green bricks; but in other taluks, no such additional payment is made. The average wage per worker is the lowest (Rs.65 per worker per day) in Madurai South taluk, where a large number of poorly paid unskilled and semi-skilled workers are employed.

Labour productivity

The labour productivity is found to be the highest in Usilampatti taluk where the productivity is 449 bricks per labour per day followed by Peraiyur taluk (435 bricks). The lowest labour productivity (347 bricks per day) is reported in Madurai South taluk. The reasons for the high labour productivity in Usilampatti taluk are: the availability of adequate raw material supply, water, provision of trally and other facilities provided to the labourers. In Peraiyur taluk, the high labour productivity is attributed to the specialisation in brick production processes and the higher efficiency of the labourers, as brick production is the traditional profession of the brick labourers in Peraiyur taluk. The low productivity among the labourers in Madurai South may be attributed to the relatively longer distance between brick moulding sites and the place of raw material stock (more than 40 feet). In addition, the skilled labourers were attracted by chamber brick units located in Madurai South taluk where higher wages and other material benefits are offered to them. Hence, unskilled and semi-skilled workers are available and employed in the traditional brick units located in Madurai South taluk.

In the study area, a brick unit provides employment to 110 labourers per firing and 730 labours in a year. The average labour productivity per firing is 373 bricks per day. The average labour productivity is the highest (408
bricks per labourer/ per firing) in those brick units (Usilampatti) whose production size is 46-60 thousand bricks.

Bearing Damage Cost

The brick unit face risk during the rainy season and brick firing. After moulding the brick, if it is damaged due to natural calamities, the cost of damage is equally shared between the employers and the employees and this is a long standing custom in brick units. In some cases the cost of damage is exclusively borne by employer and in some cases this is borne by the labourers. Out of the total 307 brick unit entrepreneurs, 70.0 per cent of the entrepreneurs accepting the cost of damage occurred due to natural calamities; whereas 17.0 per cent of the brick unit entrepreneurs transfer the damage cost to the labourers, and the remaining 13.0 per cent of the brick unit entrepreneurs sharing the damage cost with labourers equally.

5.1.6. PRODUCTION OPTIMIZATION IN BRICK UNITS

Sales value of bricks

The sales value of brick is the highest (Rs.167.7 lakhs) in Madurai South, because it is located very near to Madurai city and the price is also higher; but the sales value is lower (Rs.62.01 lakhs) in Melur taluk where the production is also low. The average sales done by a brick unit per firing is Rs.0.39 lakh value of bricks and it is Rs.2.61 lakhs in a year.

Sales value of bricks according to quality

Out of the total brick production, about 99.0 per cent of the bricks are available for sale in different qualities. Based on the quality, the bricks are classified into (i) First class bricks that fetch the sale value of Rs.782.83 lakhs; (ii) Second class bricks that yield the sale value of Rs.18.38 lakhs; and (iii) Broken bricks that provide the sale value of Rs.2.70 lakhs. The aggregate sale value of these three kinds of bricks is Rs.803.91 lakhs. The average annual sales value of bricks per unit in the study area is Rs.2.61 lakhs and the annual average sales value of bricks per firing is Rs.0.39 lakhs.
Price of bricks

The average price of the first class bricks is higher (Rs.1020 per thousand bricks) than the price of second class bricks (Rs.490 per thousand bricks). The broken bricks are sold on the basis of per load (2800 kg) which cost about Rs.300.

It is also found that the average price of a first class brick is Rs.1.02; a second class brick is Re.0.49 and a broken brick is Re.0.11.

Profit of brick units

The average profit earned per brick unit is Rs.0.55 lakh in a year and per firing is Rs. 0.08 lakh. It is found that except Madurai South and Madurai North taluks, all other taluks earned a less than average profit. The brick units in Madurai South and Madurai North taluks located mostly on the Vaigai river banks and close to Madurai city, enjoy a better market potential. Hence, these two taluks are in an advantageous position and earn high profits.

Marginal cost analysis

It is found from the marginal cost analysis that those brick units with 46- 60 thousand bricks production capacity and above per firing are found to be more profitable and have more 'cushion' in the form of margin of safety than the smaller ones. Even small size brick units found to be more suitable for small investors than the medium size brick units in which the break-even sale is high and the margin of safety is comparatively less.

5.2 GENERAL PROBLEMS AND SUGGESTIONS

Highly Decentralized and Unorganized Units

The study reveals that generally the entrepreneurs of traditional brick units do not register their units with District Industries Centre (DIC) because they are mostly unorganized and moreover there is no restriction, no policy and no control from the Governments (Central, State and Local) or any other agency in terms of entry and exit. Hence, most of the traditional brick units are not under the purview of Government rules and regulations.
Dearth of Raw materials

The high cost of raw materials, particularly the cost of soil, is a major problem faced by the brick unit entrepreneurs. Nowadays, the government officials, especially Revenue officials, impose fines on sand quarrying and for taking soil from common properties such as tanks, ponds, rivers, etc. Thus, there is high restrictions from the Government towards regulating the supply of raw materials like soil, sand and fuel (firewood) to the brick units.

Dearth of capital

The majority of the entrepreneurs of traditional brick unit borrowed capital from unorganised financial institutional agencies such as private financial institutions and money lenders at a high rate of interest, because brick making is an unorganised industry, and entrepreneurs are unable to avail credit facilities from the institutional agencies like banks which generally give loan at a low rate of interest under the priority sector lending schemes.

Lack of S&T and R&D

The non-availability of scientific and systematic preparation of bricks, lack of Science and Technology and Research and Development in the areas of brick firing are crucial scientific problems faced by the traditional brick units and therefore there is a need for knowledge support system and knowledge centre for brick industry.

Highly risk oriented

The brick industry is risk oriented; it is open to damage caused by natural calamities like wind, rainfall, and fire accident which, some times, result in an unbearable loss to entrepreneurs of brick units.

Marketing problem

Few problems associated with the marketing of bricks are identified. The crucial problems are: difficulties in arranging transport and lack of storage facilities which force the brick unit entrepreneurs to dispose the brick stock immediately after the bricks are burnt, without waiting for a favourable and remunerative price. Moreover, the holding capacity of the brick entrepreneurs is generally poor and they have to sell the bricks soon after the firing is over.
Fluctuation of price

The price of bricks frequently fluctuates, even within the location, because there are no associations for traditional brick unit entrepreneurs to share their views on common cause like price determination and marketing of bricks.

Problems in cost reduction

Most of the entrepreneurs faces disparities in cost reduction due to seasonal as well as temporal variations in the cost of raw materials particularly the cost of fire wood and labour which aggregates the problem of cost.

Poor working environment

The labourers serving in the brick yard are exposed to the environmentally poor working conditions and moreover, there is a wage discrimination based on gender differences found in this industry.

5.3 SUGGESTIONS

The following are some of the suggestions to solve the problems faced by the traditional brick units in the study area:

Planning and implementation of schemes and programmes for the benefit of brick industry

Since the brick industry play a major role in providing employment, income and entrepreneurial ability to rural people, there is need for data base about brick industries operating in the study area. Moreover identification of problems of brick industries and executing welfare schemes and programmes including the financial intervention of the organized banking sector need authentic data base about production and marketing of traditional brick units. In this connection, the District Industries Centre (DIC) may take up the responsibility of creation of data base at the district level. Moreover such an effort may facilitate for sustainable development of brick units and increased employment generation for women and youth in villages.
Brick units under KVIC purview

The Khadi and Village Industries Commission (KVIC) must incorporate traditional brick units under mineral based industry and should take efforts to render all assistance for promoting the brick industry. Periodic and regular management training on brick industry may be imparted to the brick unit entrepreneurs by KVIC.

Need for brick unit entrepreneurs association ,,

Non-Governmental Organisations (NGOs) may be help to form an associations for brick units which will enhance co-operation and co-ordination between different the brick unit entrepreneurs. This will help them in determining a uniform price for bricks and will eliminate unnecessary marketing competition among the brick units. It will also strengthen the unity of the brick entrepreneurs for common causes. It reduces frequent price fluctuations and avoids cutthroat competition.

Regulate the supply of Inputs

The Government should take efforts to regulate the supply of raw materials like soil, sand and fuel (firewood) to the brick unit entrepreneurs as per their requirements.

Need liberal credit facilities

Commercial banks should come forward to lend liberal credit facilities to the traditional brick units as is done for other industries.

Encourage Self Help Groups

The Governments (State and Central) and NGO’s can encourage and motivate the Self Help Groups (SHGs) to start brick units for which, Women Development Corporation and District Industries Centre (DIC) can play a major role.

Provision of modern equipments

In order to facilitate the sustainable operation of brick production, modern equipments like trally, plastic moulding, gloves and uniforms can be provided to brick workers, who are exposed to sun, rain, wind and cold.
Offering these facilities would enhance the efficiency and productivity of the brick workers.

Require appropriate Insurance schemes

Since it is a risk-oriented industry, some times fire accident may occur while converting green bricks into burnt bricks. The Government can take appropriate steps for compulsory insurance cover to all bricks units, and brick workers. This may help the entrepreneurs to avert the risk and uncertainty due to natural and manmade calamities.

Insurance coverage for brick workers

The Insurance Companies/ Corporation can come forward to extend insurance services to brick unit workers under their insurance schemes and policies for which, a nominal amount can be collected from the brick workers and the brick unit entrepreneurs.

Improve the working environment of brick workers

Efforts should be taken immediately to improve the working environment of the brick workers. Equal wage should be given to workers as per the Equal Remuneration Act, without any gender bias.

Create awareness on protection of environment

Awareness programme on the impact of smoke from brick units on the environment and the exploitation of top soil leading to soil erosion and soil degradation. So that, these problems could be considerably reduced in the near future.

Encourage R&D for design of bricks

Research and Development (R & D) may be encouraged to design and develop machines and equipments which can measure the energy requirement of brick kilns to burn green bricks, so that a considerable amount of energy can be conserved / saved.

Evolve appropriate marketing strategies •

The bricks can be marketed through associations. It will help all brick unit entrepreneurs to get a uniform price in all seasons. The associations can
also create common facilities/services like tractors, lorries and vans which can be supplied to brick unit entrepreneurs on hire basis, whenever they need them for collection of soil, loading and unloading of bricks to different marketing points.

School for brick worker’s children

The Government and NGOs can establish creche and primary school for the children of the brick workers.

5.4 AREAS FOR FURTHER RESEARCH

The thrust areas identified for further researches are:

1. Energy use pattern in brick industry;
2. Energy audit in brick industry;
3. Production and Marketing of bricks- problems and prospectus; and
4. Environmental Health of brick workers.

5.5 CONCLUSION

A perusal of the various findings of this study leads to a number of important conclusions. Brick industry (a group of brick units) is basically mineral (soil) based industry, provides employment opportunities to the village craftsmen, rural artisans, women and children. Brick units located in the outskirts of urban areas in a decentralized manner all over India, have uniformity in the matters of location and operation. These units require only a small investment but provide employment to many illiterate brick labourers and also promote entrepreneurial opportunities to the rural people, especially farmers. The women labour force participation is high in the brick units in different stages of brick manufacturing process and works rendered by the women are generally invisible. The work is seasonal and brick industry attracts migrant labour force from surrounding rural areas. Workers with the brick industry constitute one of the poorest and weaker sections of the rural society. The entire family comprising husband, wife and children move to the
brickyard and work as one unit for the through out the season in operating kiln. They generally would receive advance from the brick industry entrepreneurs and use the advance either to build a house or to make any plans themselves and their children. The advance paid to the workers is adjusted at the end of the season. Low wages, inhuman living conditions, lack of social security and health facilities, long hours a work on an average of 12 to 16 hours a day, loss of freedom of movement, loss of right to sell labour at prevailing market rate, etc, are the general problems of the brick workers. In this context brick workers are to be covered under various welfare schemes and programmes of the governments. Moreover, the functioning of the brick industry is often unnoticed by the governments (central, state and local). Thus it needs the immediate attention of the governments so as to control and regulate the functioning of brick industry. Government must evolve appropriate and sustainable policy support for strengthening the brick industry. Brick industry is one of viable rural industries which have so far been escaped from the competitions of the multinational companies. It is responsible of the governments to protect the rural based, employment oriented brick industry from the global competitions. The brick industry has a great future and offers opportunity to millions of our countrymen and women to satisfy their cherished dream of having a ‘house’ of their own.