CHAPTER-V

ISSUES RELATING TO PROBLEMS AND PROSPECTS OF BRICK MANUFACTURING INDUSTRY
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In a poor state like Manipur, small scale industries have a very important role to play in economic development of the state. On the basis of factor endowment and increasing demand, brick manufacturing industry may be considered as one of the most economically viable industries operating in the state. As brick industry is a labour-intensive enterprise, it will not only mobilise local resources but will also generate employment opportunity for rural and semi-urban population. Due to the lack of employment opportunity in industrial sector and inability of agricultural sector to absorb mounting up labour force, a good number of workers of the state have joined service sector bypassing commodity sector. From the analysis of sectoral allocation elsewhere it is evident that workers in industrial sector declined continuously throughout the period under discussion. It shows that industrial sector of the state is in a very backward condition leading to almost non-existence. A lot more is to be done if the state is to join or at least stand near the advanced state of the country in the field of industrial sector. Thus, development of non-farm industrial sector is very crucial for overall economic development of the state.
A close examination of the various non-farm activities in the state and the inputs they require suggests that brick industry is one of the most potential rural base industries of the state. A little effort coupled with commitment of the state Government and financial agencies would certainly enhance the pace of development of brick industry in the state. Fortunately, in brick industry there is no import of technological know-how, no huge capital investment, no elegant new organisations etc., are in valued in the whole exercise of this industry. If attention to some important aspects are given by the Government and remove the difficulties being faced by the proprietors, brick industry will flourish and will help the economy to a great extent by way of giving employment opportunities and generation of income to the rural mass. However, it cannot be ignore the fact that brick manufacturing industry in the State of Manipur used to face some problems.

Some of the main problems and hurdles for brick industries operating in Manipur may be analysed as under.

5.1 Problems in Procuring Raw-Materials:

As mentioned earlier, the basic raw material for brick manufacturing industry is clay soil. The finished product of the industry is nothing but a converted form of it. However, all the soils in the state are not uniform and suitable for making bricks. The right type of soil is available only at a few places. Now-a-days proprietors manage to collect clay soil without much difficulty. But, availability of land in the state particularly in the
valley region has become limited which may lead to extremely difficult for the brick firms in near future. To meet the constantly rising demand for the product, the proprietors have to search for the soil at places outside the area of the firms. This shall led to rise in the cost of procurement of raw-materials resulting higher cost of production. Again, most of the soil is collected from cultivated land area. Due to continuous use of chemical fertilizers by the farmers, the use of such soil has an adverse effect on the quality and durability of the bricks.

It is not only for raw-materials, area for establishing a brick industry has also become a problem. Area required for plant site, open storage for raw-materials, finished goods and other purposes, is about 3 to 4 acres. In addition, firms need more area of land for soil excavation about 10 to 40 acres of a SMBF based on 20 years planning period. Since land in valley area is quite scanty, possibility for additional land for this purpose will reduce to farther limited area.

Further, with the ever increasing population depending on forest for fuel for domestic and industrial consumption the availability of firewood has been drastically declined. Consequently, collection of firewood has become a serious problems of the firms. Long distance of the sources has created a number of problems such as short supply of firewood in time caused by disruption of transport services at some point due to heavy rainfall, landslides, bandh, blockades etc. The problem has further been aggravated by the ban imposed by the Ministry of Environment and Forest, Govt. of India on using wood as a component
of fuel. Delay in the supply of raw-materials gives rise to respite in the manufacturing operation and consequently, manufacturers have to bear the burden of substantial financial losses. Now a days coal is used extensively as fuel in baking bricks in both traditional kilns and modern HDKs by the brick firms in the state. Unfortunately, the mineral is not found in Manipur and it is imported from other states of India. While procuring it many hardships regarding transportation and many other unseen problems are frequently met.

The machines and other equipments used in SMBFs are manufactured outside the state and mainly designed by Central Building Research Institute (CBRI) Roorkee, Uttar Pradesh. Thus besides, being costly it is also not easy to contact with the firms for the machines and parts relating to the machines.

5.2 Power Constraints:

The consumer is the real boss. There is no business without buyers and consumer’s satisfaction matters the most. The increasing consumers’ preference for machine made bricks and subsequent

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obsolescence of the traditional manual making bricks firms are compelled to change their method of production from manual to machine which entirely depends on power supply i.e. electricity. Electricity is the cheap and best source of power. It should be made available without interruption to run the machines. However, the supply of power in the state is exiguous and irregularly regular. Any small barrier in the supply of power disturbs the smooth functioning of manufacturing process of the power using firms. Lack of power supply is one of the major problems being faced by the brick firms operating in the state.

Installation of the BEMs along with other implements not only incurs huge finance but also confronts many problems while assembling and maintaining it. Firms which cannot afford to have their own generators have to suspend their production processes when there is power cuts which is very common in the state due to its shortage. It creates many hardships such as labour lay off, delay in production, late delivery etc., and hence lost in their production and confidence of the customers.

5.3 Financial Constraints:

Finance is regarded as lubricant to the process of production. SMBFs well exemplify how an adequate supply of finance promotes it. Despite many sources of funds, most of the firms operating in Manipur

are confronting the financial problems. The problem is more concomitant to TBFs than that of SMBFs. These firms used to take every measure to increase standard of production, productivity and income returns by their own sources, but they are not in a position to arrange sufficient fund from their own resources. To operate a BEM, delivery trucks, construction of HDK, firm houses, making and drying sheds, provision of improved amenities and facilities to workers, storage of raw-materials and finished products, connection of power and other utility lines, putting other inputs etc., requires huge amount. Due to time consuming process for formal gestures to be furnished and cumbersome in applying institutional loans and least access to the sources of the funds TBFs have been confronting the real and acute problem of inadequate working capital to ensure smooth functioning of their business. Thus, TBFs are still facing acute financial problems to enhance quality of their products and are running intermittently. In this connection it may be mentioned that out of 21 SMBFs 10 firms accounting for 47.62 per cent are getting institutional loans whereas, out of the 42 TBFS only 7 firms i.e. 16.67 per cent received institutional loans from Urban Co-operative Bank Ltd., Manipur Rural Bank Ltd., MANIDCO, DIC’s etc.³. Thus, the circumstances support Galbraith J.K. like many Marxist arguments that the relationship between Govt. and Big business is close and the two support each other. The basic close reason for low percentage of getting institutional loan by TBFs is supposed to be high risk involved in

³ Information Collected by the researcher from firm proprietors.
financing them, because small firms are vulnerable to environmental pressure and many other reasons. Further, it can not assured for repayment of the loan and it is revealed that there is a heavy dependence upon borrowing (Table 5.1). Borrowing from money lenders and loans from financial institutions together constitutes 76.19 per cent of the total sources of initial finances of brick firms in the state.

Table 5.1 shows the sources of initial capital of brick firms in the state as on 2004.

**Table 5.1**

**Sources of Initial Capital of Brick firms of Manipur**

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Source of Initial Capital</th>
<th>No. of firms</th>
<th>Percent to total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Own capital</td>
<td>13</td>
<td>20.63</td>
</tr>
<tr>
<td>2.</td>
<td>Participation on with borrowing from friends / relatives / money lenders etc.</td>
<td>31</td>
<td>49.21</td>
</tr>
<tr>
<td>3.</td>
<td>Loan from Financial Institutions and Banks</td>
<td>17</td>
<td>26.98</td>
</tr>
<tr>
<td>4.</td>
<td>No response</td>
<td>2</td>
<td>3.17</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>63</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

*Source: Computed from primary data collected for the study.*

5.4 Marketing Constraints:

Generally bricks are marketed at their own factories in cash or on credit. Some newly established firms which are located at remote and far-flung areas find mostly the cheap buyers, and therefore, their market share is very low. Sometimes large quantities of bricks are left unsold for a long time. Sometimes, due to high transportation cost, they cannot attract large number of customers. However, in order to survive and promote their firms they resort to discount or credit sales of their products whoever the customers come to their firms. Ultimately, they face the problem of collecting the dues. Sometimes it induced to loss\textsuperscript{6} and distress.

Again, new firms are unable to attract the bulk purchasers like government contractors and locked into continuing less volume of production to avoid credit sales. Nearness to urban area usually implies broadened opportunities for more sales\textsuperscript{7}. Admittedly, the problem of marketing the bricks by the firms located at the far-flung areas are very likely to thwart their endeavour as the bricks consumers are stationed far-off in urban and semi-urban areas. Above all, marketing management skill of the proprietors is very poor.

\textsuperscript{6} Soundarapandian, M., Rural Entrepreneurship Growth and Potential, 1\textsuperscript{st} Edn., New Delhi, p.218.
\textsuperscript{7} Ram Bharat, Glimpses of Industrial India, Published by Ajoy Kumar Jain, New Delhi, 1\textsuperscript{st} Edition, p.78.
Any business requires proper customer relationship management but proprietors operating brick firms in Manipur are not taking care of this aspect.

5.5 Technological Constraints:

One of the major constraints involved in the development of bricks firms in the state is poor technology adopted so far. A large number of firms are still practising under TM. Research studies have indicated that traditional techniques are inferior\(^8\). In our present study, 21 firms out of 63 i.e. 33.33 per cent are found practising under semi-mechanized method of firming and we are still dependent on TM of firming. In TM brick making is done in the open field manually and are dried up by natural process i.e. in sunlight. Therefore, during winter, it takes time in drying while during summer the outer layer get dried quickly leaving moisture in the inner layers and results in high rate of breakage in kiln itself\(^9\).

With low technology some firms resort to produce crude, unattractive and low quality product. Poor quality products have low crushing strength, high water absorption, bad finishing, incorrect dimension and also looks bad. Consequently customers dislike such products. Further, most of the workers in the TBFs are casual. Generally, casual workers are less efficient and have less incentive to be efficient than workers on long term engagements\(^10\).

8. Ram, Bharat, op.cit., p.78
Most of the firms in the state can produce hardly 40.00 per cent of the total production as First Class brick due to technological constraint.

5.6 Problems of Rising Raw-material Prices:

With the increasing population, demand for firewood is increasing day by day and hence the availability of firewood has drastically declined leading to increasing prices of firewood. The cost of firewood per truck load of 9 tonnes during 1980-81 was Rs. 5,000/- but it rose to Rs.13,500/- for the same during 2003-2004\(^{11}\) i.e. an increase of 170.00 per cent in 23 years. Similarly, the prices of coal also has increased from Rs.24,500/- per truck load of 11.5 tonnes to Rs.45,000/-\(^{12}\) But brick cannot be made economically unless there is adequate cheap fuel\(^{13}\). Since fuel is the most important input, no firm can produce quality bricks without adequate firewood at reasonable price.

The price of a BEM which cost Rs.7,00,000/- (Rupees seven lakhs) two years ago has now increased to Rs.9,00,000/- (Rupees nine lakhs) i.e. an increase of 28.57 per cent. The wages (making charges) of worker for 1000 raw bricks under TM was Rs.150/- during eighties but it has increased to Rs.290/- these days\(^{14}\).

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As a result, the price of a brick has been risen from Rs.1.50/- during 1980 to Rs.3.40/- during 2004 (Factory price). The rate of increase is 113.33 per cent. Rising cost of raw-materials and wages is responsible for rising prices of bricks in the state.

5.7 Problems of Transportation:

Another serious bottleneck of brick firms operating in Manipur is transportation for both raw-materials and finished products. The state has no rail-lines till date and any sort of transport is done by trucks. Thus, transportation of heavy raw-materials and finished products of the firms are carried out mostly by trucks which is considerably expensive. As a consequence, production costs are very high which leads to higher price of the final products. Part time and seasonal nature of TBFs could not posses costly trucks. They hire trucks only when trucks are required. During their peak season trucks are available very rarely and losing many opportunity of production and selling of bricks. Frequent bandh, blockade, strikes, agitations, heavy rainfall and landslides on hill tracks, restriction of transport service during night time etc., in the state have also been disturbing to a great extent in transporting raw materials from different sources and sending the products to consumers as well.

15. Singh Birjit, op.cit.
5.8 Problems of Labour:

Role of skilled labours is very important in promoting brick firms. Knowing their importance, some key labours sometimes take advantage by demanding advance payment of their wages, incentives, borrowing etc. After getting some financial advantages they used to run away from one firm to another which led the firm unrest. It could be the main reason why most of the firemen, the key employees of the firms are selected from the non-Manipuris coming from the State of Uttar Pradesh, Bihar, Assam, etc. Some local workers come late and work fast without caring quality of their product. Management of local labours coming from different family backgrounds is another serious problem of the firms. As brick industry is labour-intensive, it is not possible to hire all the workers, who are comparatively sincere. To face the challenges and persuading the labours for smooth running of the business is really a great art.

5.9 Underutilisation of Capacities:

One of the main growth constraints of brick industry in the state is underutilization of capacities. There are many causes of underutilisation of capacity of brick industries of the state but some major causes may be mentioned viz. (i) unavailability of modern machines and spare parts in the state. Due to inadequate spare parts many machines are utilised below its average production capacities. Maintenance of machinery is
found to be very poor and get break down very frequently. Costly machines in many cases are lying idle due to lack of repairing. Absence of training for operators also leads to unnecessarily high damage to machines. (ii) Irregularity and poor power availability such as load-shedding and power cuts are normal and usual phenomenon which put a serious break on production process. (iii) Land scarcity, during rainy days due to limited space grounds for drying firms are compelled to produce low volume of production.

5.10 Problems of Air Pollution and Soil Erosion:

The fume emitted by chimneys which contain substantial quantities of Sulphur dioxide, dust particles and other impurities due to mineral exploitation causes respiratory diseases\textsuperscript{16}. Most of the firms in the state are found as located at fertile area of the cultivable land of the state. The fertility of the soil may go down partly because of the drop outs of the atmospheric impurities emitted by chimneys on the ground area\textsuperscript{17}. Again, extraction of top soil during the excavation for raw-material is also another factor for loosing fertility of the land. Opening of brick firms are frequently opposed by the local people. For the fear of pollution created by such firms the local people and students complain bitterly against the firms adopting traditional kilns which emitted the fume.

\textsuperscript{16} Saxena Aruna, Perspectives in Industrial Geography, Concept Publishing Company, New Delhi, 1989, p.212.
\textsuperscript{17} Ibid., p.215.
This causes an emotional set back to settle the business and the willingness to work more for flourishing their firms.

5.11 Burdens of Unauthorized Local Taxes:

The present law and order problem of the state is another serious problem of the bricks firms. Most of the firms are located at outskirts where security coverage is almost absence. At the same time, brick industry cannot run behind closed doors. Any organisation operating under different forms and ideology used to collect money from every section of our society for their organisation and bricks firms are their soft target. Many organisations imposed heavy subscriptions to every firm irrespective of size of firms. Such system of activities prevailing widely in the state not only hikes the cost of production but also discouraging the endeavor of the proprietors for promoting their firms. Ultimately, proprietors are compelled to treat these expenditure as cost of production which leads to increase price of their products. Thus, bricks firms operating in the state are facing financial hardship and discouraged.

5.12 Natural Hindrance:

Climatic condition has pervasive effects on human physiology which also may affect economic performance\(^\text{18}\). Extreme cold or hot and excessive dryness or humidity produce negative effects on the

productivity of the firms because of the unpleasantness of working\textsuperscript{19} In this connection it is worthwhile to mention that the state has sub-tropical temperate climate and its normal rainfall is 2000 mm\textsuperscript{20}. During rainy days (May to September) TBFs suspend manufacturing operations due to lack of adequate sheds for making, drying and roofed kiln. Excessive rains, sometimes in June, July or August adversely affect the efficiency of transport services so severely that the firms remain cut off from the different sources of raw-materials and thus hampers the smooth and regular arrival of raw-materials. This results in a great loss to the firms. Therefore, the requirements of the firms shall have to collect in the days of February, March and April as additional stock for rainy months. Sometimes the temperature of the day reaches about 34° C. In such climatic conditions workers have low physical capacity for continuous and sustain work. During winter due to excessive cold working hour is very short reducing from 10 to 11 hours during a day to 7 to 8 hours. For comfort, the air temperature should be about 21° C ± 1° C. The range (of moisture content) for comfort is quite variable around a relative humidity of about 35 - 55 per cent\textsuperscript{21}. The minimum and maximum humidity in percentages in Manipur are 70 and 99\textsuperscript{22}. Excessive rain not

\textsuperscript{19} Stone, op.cit., p.151.
\textsuperscript{20} Government of Manipur, Directorate of Economic and Statistics, Economic Survey Manipur, op. cit. p.i.
\textsuperscript{22} Govt. of Manipur, Metrology Dept., Imphal.
only hinder the manufacturing process directly but also affects the sale proceed of the finished goods of the firms. During rainy season construction work is comparatively low due to rains. So, extreme climatic conditions have a significant influence on industrial efficiency and productivity.

5.2 Prospects of Brick Manufacturing Industry:

The major issue of housing in the state is not of homelessness but of poor standard, small size, and congestion. Almost all households use to live in their own respective houses, while majority of the houses are of kutcha and semi-pucca. As mentioned elsewhere the materials used for construction of houses in the state were mud, stone, bamboo, wood, thatch etc. The traditional house which is known as Yumjao (big-house) is still available in rural areas of Manipur. In fact, the traditional house, though not suitable to the modern life style, is quite comfortable as it protects from hit during summer and cold during winter. However, due to increasing shortages of traditional material people shall have to replace thatch by roofing CI sheet. It is considered to be more lasting though the first time cost is higher. At the same time, mud wall with bamboo, thick mud wall and raw brick wall which were used extensively have been gradually replaced by fired brick. As a result of this, in the recent trend we could observe increasing demand for brick in the state for housing purposes.
We are now in an industrial civilisation\textsuperscript{23}. Every nation plans to set-up more and more industries so as to remove poverty and raise standard of living of its people by increasing per capita income and to gear up its prestige which can be attained only through development of the industrial sector\textsuperscript{24}.

The New Industrial Policy, 1996 of the state has laid emphasis on rapid industrialization through provision of various growth inducing factors based on locally available raw-materials\textsuperscript{25}. For this purpose the State Government has made persistent efforts by offering attractive package of incentives and concession to invigorative industries\textsuperscript{26}. But due to lack of initiative, entrepreneurship, ownership and efficient management, some of the public sector industries have become sick and ultimately the Government has decided to wind-up the sick industries\textsuperscript{27}.

However, brick manufacturing industries running under the individual proprietorships are growing rapidly and playing very important role in producing bricks, improving the economic standard of rural workforce engaged in the firms by providing maximum days of assured employment and earning considerable income.

\textsuperscript{23} Prashad, op.cit., p.1.
\textsuperscript{24} Sinha, N.K.P. & Singh, M.B., Perspectives on Industrial Development in India, Rawat Publications, Jaipur, 1993, p.VIII.
\textsuperscript{25} Govt. of Manipur, Directorate of Economics and Statistics, Economic Survey Manipur, op.cit., p.102.
\textsuperscript{26} Ibid.,p.102.
\textsuperscript{27} Ibid., p.103
Although prospects may not be depicted the exact picture, the present study can project for holding very bright future of the industry with mass employment potential and generation of regular income.

5.3 Prospects of Employment:

Since brick industry is a labour intensive enterprise it can provide large number of employment opportunities for rapidly growing labour force in the state. A large number of surplus workers in agriculture may be utilised in brick firms. Wage in brick firms is not comparatively low, and work is also not hard, complex, dirty, unrespected and uncomfortable and therefore rural worker are ready to joint the brick firms. Any worker irrespective of sex, skill and educational level can join brick firms as a worker.

In spite of shortage of working capital and consequent intermittent running of the firms, the proprietors have the strong desire and willingness to renovate their firms as soon as they have the capacity to run with their own savings and borrowed funds from others. Their vision will turn into reality because modernisation is a continuous process. Since the number of SMBFs are increasing, and at the same time TBFs are modernising there is a considerable potential for providing substantial employment opportunities to rural labour force by this industry. Technological development is always associated with increase in
production and decrease in the number of workers required\textsuperscript{28}. But in brick industry there is positive relationship between technological development and increase in the number of workers required. This is a distinctive characteristic of brick industry/industries.

Despite the continuous increase in production, the aggregate demand for bricks are found to have always exceed the aggregate supply during dry season. In such a situation, some leading firms take the opportunities of advance booking for 50.00 per cent from the consumers for a minimum of 15 to 30 days or so. One of the means to keep pace with more demand during peak season is to employ more workers in the short run. Thus, brick industries will also absorb a good number of unemployed youths in the state, and will help to minimise unemployment problem to a certain extent.

In brick industry, good relationship between the proprietors and the employees are commonly found. It seems there is no discontent among the employees for their wages. Most of the proprietors used to delegate a selected few of their employees with certain discretionary power for other works of the firms to enable them to work smoothly and thereby enhance their initiative and enthusiasm. Most of the employees have good sense of ownership which is one of the most

\textsuperscript{28} Dave, V. Nalini, Industrial Sickness and Key Area of Management; DEEP & DEEP Publications, New Delhi, 1987, p. 91.
important considerations for developing industry. According to Bill Gates, founder and chairman of Microsoft (Gates present worth is US 29 billion) all the success and millions he has earned is “just not my hard work. What really matters is the hard work of people who come to work with me”. Really, it is just not the proprietors’ hard work which makes their dreams come true. For it is the outcome of the team effort of the whole employees. As most of the proprietors and their employees have good understanding and co-operation, thereby created healthy working environment which increase productivity and efficiency, the prospect for development with more employment is quite guaranteed.

5.4 Prospects of Income:

In maintaining secrecy of their private business, most of the proprietors are reluctant to disclose their annual income. However, from the responses with regard to their seasonal or annual production capacities and its cost of production, it could be affirmed clearly that brick industry is one of the most prominent and highly income generating business in the state. Following arguments supports the proclamation.

5.4.1 Requisite Sources of Raw Materials:

The soil available in the valley of the state are carried down by big rivers and its tributaries from the surrounding hills and deposited over low-lying areas of the valley. The soil contains a high proportion of clay and mainly composed of sand, clay, silt etc. It is best suited for making good quality bricks as recommended by CBRI Roorkee UP. According to Geological Survey of India during 1969, the thickness of soil of the Central plain of Manipur varies from 106.68 to 152.40 metres\(^{30}\).

Since early days brick industries have been using firewood as a convenient fuel. There are two types of wood: (1) soft wood and (2) hard wood. Soft wood is not only cheap and easily available but also gives long flame which is very advantageous to the traditional kiln. On the other hand, hard wood gives a better result as far as higher temperature is concerned. Where coal is not easily available, use of hard firewood to obtain a temperature of about 1000\(^\circ\)C. is very suitable. According to Forest Survey of India-1997, forest covers an area of 17,418 Sq. kms. which is about 78 per cent of the total geographical area of the state\(^{31}\).

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State forest is providing good source of firewood. There will be no interruption in the manufacturing operation due to shortage of firewood, which may affect manufacturers to suffer considerable financial losses. As suitable clay combined with adequate cheap fuel is available in plenty help to run brick industry.

5.4.2 Accessibility of Requisite Manpower:

There is no dearth of labours for brick industry in the state. As making brick is easy and simple, rural manpower of raw-hands can be employed for the purpose. They are quite acquainted with the job who have no other alternative job for higher return in short period without investing any capital of their own. Many cheap but skill labours in the art of making bricks are also found migrating from other states of India. Even tender girls are enjoying to work in these firms delightfully.

5.4.3 Adequate Sources of Fund:

For a well established brick firm, there is no scarcity of the sources of funds. Many funding agencies of private institutions and other public sector institutions are inviting the potential firms for providing credit facilities. Above all, many professional money lenders are also coming forward.
5.4.4 Market Potential:

Housing holds a paramount place in social security measures. Owning a house is everybody’s vision. Therefore, the Government of India is giving a measure of incentives for construction of dwelling houses. Income tax exemption on interest on housing loans, tax relief on deposits in National Housing Bank and construction of housing projects under World Bank are some of the measures taken up by the Government to encourage “Own a House Scheme”. Moreover, the infrastructure development programme shall be continuing under various plan budgets of the Government. Thus, the demand for brick may grow. It is also found that wooden structure houses are disappearing due to a number of reasons while brick houses are coming up in Manipur. Thus, the market is not a constraint of a brick industry which indicates that brick manufacturing industry is one of the successful and flourishing industries in Manipur. Further, this is also a fact that increasing population shall need additional dwelling houses, workplaces, hospitals, educational institutions, factories and other buildings to be used for producing goods and services, cultural centres, social and commercial buildings etc. Above all, large scale renovation and maintenance works also likely to be necessary if much of the older buildings are to continue to give useful life. Thus, brick product may progress well in the coming years in view of growing demand for bricks in the state and there is good scope for future expansion of brick marketing.
With the application of new tools and implements, availability of latest technical know-how and innovation in this field from the Research Centres along with proprietors’ close personal supervision the quality of bricks manufactured in the state have improved. Since transportation of brick is very expensive because of their bulky and weight, no one is willing to buy from other states. Hence, there is no scope of external inflicting injuries to discourage and repress to the industry directly or indirectly. Moreover, with the application of modern HDKs the problems of air pollution and erosion of soil have also been curved to a great extent.

With the improvement of the standard of material life there has been an increasing change in building materials in the state particularly after 1980. In most of the constructions for various purposes of public and private development taken up by individuals, local authorities and public agencies, the traditional indigenous materials are widely replaced by bricks. As a matter of fact the main reasons for obsolescence of traditional indigenous materials and using bricks extensively in most construction forms in Manipur could be rapid growth of population, urbanisation and agglomeration of semi-urban areas of the state. Construction of multi-storey buildings in urban areas are mostly used brick as raw-material instead of wooden structured buildings.
Secondly, the supply of wood viz. Pinus insularis (local name Uchan), Castonopsis hystrix (local name Sahi), Albizia lebbek Benth, Cendrela foota (local name Tairen), Phoebe hainesiana etc. which are traditionally used in building houses are diminishing sharply in the market and seems to be extinct from the state forest due to imbalance between felling and replanting where these trees were grown. Consequently, the prices of these trees are also rising rapidly. The present market prices of Pinus insularis in Imphal is Rs. 165/cubi ft. which cost Rs. 60/cubic ft. during 1980 i.e. an increase of 175 per cent.

Thirdly, brick buildings are more durable and can last much longer than ordinary wooden structured ones. It is known that if they are properly maintained, they can often last longer. It is also more secure from natural disasters such as thunder storm, cyclonic rain, floods etc. Moreover, it has the advantage of space economy and can save cost of land where price of land has become exorbitant high. Modern costly machines and other valuable assets will call for first class brick building structure instead of wooden structured buildings. Fourthly, mushrooming growth of brick firms has been providing adequate supply of bricks in the state. It is also a fact that due the implementation of social housing scheme, HUDCO, a premier techno-financing institution for housing and urban development sector increase assistance of loan facilities. Thus, the middle class families can afford for construction of brick houses. Again, the rising demand for brick should not be attributed to the preferences of
people with higher standard of living alone as the use of brick is increasingly being taken to be a low cost input of housing project. The growing change in the pattern of household from temporary structure to semi-permanent one and subsequently to permanent one has become possible because brick is now considered to be economical input.

Agricultural being a seasonal characterised by low wage profession, it has no attraction for rural labours. Besides, due to the introduction of new machines and new method of production with HYVs demand for agricultural labour has declined considerably. Other development in the ownership pattern and use of the land itself were also forcing the subsistence cultivator off the land. It is also worthwhile to mention that the growth and subsequent expansion of brick manufacturing industry results in relative increase in number of days assured for employment. Development of the industry shall provide direct, indirect and induced employment to a very large number of workers in the state especially to the rural labour force. The trend of increasing wage earners could develop a more diversified economy which enable a shift from subsistence economy to surplus one and thus facilitate to reduce poverty that will help improve the standard of living, housing condition etc.

32. Ghoshal, P.K., Prospects and Problems of Brick Industry, Mittal Publications, New Delhi, 2008, p.60
Further, rising income will generate productive thinking capabilities thereby accelerating investment in core sector of the economy which will lead to the way of self-sustaining economy. There are considerable opportunities for upward social mobility on the basis of wealth and mass education which are the most vital force for over-all welfare of a society. Giving employment opportunity to the rural and urban poor is the only means to bring a peaceful and welfare society in a poor state like Manipur.

For projecting the future production possibility for the years 2005 and 2011 AD the past data from 1990 to 2004 are shown in Table 5.2.
<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Firms</th>
<th>Production</th>
<th>Production (Bricks in lakhs)</th>
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<td></td>
<td>TBF</td>
<td>SMBF</td>
<td>TBF</td>
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<td>(1)</td>
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<td></td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
</tr>
</tbody>
</table>

|      | 1990         |            |                             |
|      | 14 (93.33)   | 1 (6.67)   | 15 (100)                    |
|      | 117.862      | 26.126     | 143.99                      |
|      | (81.85)      | (18.15)    | (100)                       |
|      | 1992         |            |                             |
|      | 23 (95.83)   | 1 (4.17)   | 24 (100)                    |
|      | 151.537      | 26.841     | 178.38                      |
|      | (84.95)      | (15.05)    | (100)                       |
|      | 1994         |            |                             |
|      | 21 (80.77)   | 5 (19.23)  | 26 (100)                    |
|      | 176.793      | 104.545    | 281.34                      |
|      | (62.84)      | (37.16)    | (100)                       |
|      | 1996         |            |                             |
|      | 28 (77.27)   | 6 (22.73)  | 34 (100)                    |
|      | 202.049      | 130.682    | 332.73                      |
|      | (62.36)      | (37.64)    | (100)                       |
|      | 1998         |            |                             |
|      | 34 (77.27)   | 8 (22.73)  | 42 (100)                    |
|      | 303.073      | 182.954    | 486.03                      |
|      | (62.36)      | (37.64)    | (100)                       |
|      | 2000         |            |                             |
|      | 39 (76.47)   | 12 (23.53) | 51 (100)                    |
|      | 328.329      | 287.499    | 615.83                      |
|      | (53.31)      | (46.69)    | (100)                       |
|      | 2002         |            |                             |
|      | 39 (66.67)   | 20 (33.33) | 59 (100)                    |
|      | 329.027      | 496.589    | 825.62                      |
|      | (39.85)      | (60.15)    | (100)                       |
|      | 2004         |            |                             |
|      | 42 (66.67)   | 21 (33.33) | 63 (100)                    |
|      | 352.750      | 599.30     | 952.05                      |
|      | (37.05)      | (62.95)    | (100)                       |

Note: Figures in the parenthesis indicate percentages.

Source: Computed from primary data for the study.

An examination of Table 5.2 shows that the production advances by unequal increments and jumps suddenly from one period to another. So, Langrange’s method is being selected for the purpose of future projection of brick production in the state.
Lagrange’s formula is

\[ Y_x = Y_0 \frac{(X_0 - X_1)(X - X_2)(X - X_3)}{(X_0 - X_1)(X_0 - X_2)(X_0 - X_3)} + Y_1 \frac{(X - X_0)(X - X_2)(X - X_3)}{(X_1 - X_0)(X_1 - X_2)(X_1 - X_3)} + Y_2 \frac{(X - X_0)(X - X_1)(X - X_3)}{(X_2 - X_0)(X_2 - X_1)(X_2 - X_3)} + Y_n \frac{(X - X_0)(X - X_1)(X - X_2)}{(X_n - X_0)(X_n - X_1)(X_n - X_2)} \]

Where \( Y_x \) is the figure to be extrapolated and \( x \) is the given value in \( x \)-variable corresponding to which \( y \)-variable is to be extrapolated. And that the estimate the production possibilities of bricks for the year 2005 the production data in Table 5.2 is modified as in Table 5.3

### Table 5.3

**Production of Bricks in Manipur (1992-2004)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Production (Bricks in lakhs)</th>
<th>( Y )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>( X_0 ) 178.38</td>
<td>( Y_0 )</td>
</tr>
<tr>
<td>1996</td>
<td>( X_1 ) 332.73</td>
<td>( Y_1 )</td>
</tr>
<tr>
<td>2000</td>
<td>( X_2 ) 615.83</td>
<td>( Y_2 )</td>
</tr>
<tr>
<td>2004</td>
<td>( X_3 ) 952.05</td>
<td>( Y_3 )</td>
</tr>
</tbody>
</table>

Now, applying the Lagrange’s Formula the production possibility for the year 2005 & 2011 by using the data presented in Table 5.3 we get, 1035.54 lakh bricks and 1371.38 lakhs bricks respectively.