CHAPTER VI

SUMMARY AND CONCLUSION

In this chapter the chief observations of all earlier chapters are briefly summarized followed by a summary of the major findings. Brick is one of the basic materials that used for construction of building and other various types of civil works. As a commonly used building material, brick is the most remarkable and perhaps the oldest one in the history of mankind. Brick production was done manually till 1885 and by the middle of the 19th century, mechanical production of brick has been started. Rapid development of various sectors, enormous expansion of urbanization had lead to mechanized production of bricks.

A stratified random sampling technique was adopted to select the manufacturing units in three sub divisions with proportional allocation. At first stage, from the three sub divisions of Nagaon district, 40 units (comprising of 6 large units, 26 medium and 4 small units) proportionately selected. In the second stage, forty (40) owners of each selected units are selected. To collect information of laborers, a total of 410 workers are selected from each category of workers. From the published source (Voter list, 2010), total 355 villagers are selected from the villages, where the sample units are located. The data were collected through personal interview method with the help of pretested questionnaire. Pearson correlation, C-D production function, Unit Costing, Ratio analysis, Profitability analysis, and Average/Percentage analysis were undertaken to fulfill the needs of the objectives.

6.1. **Major findings of the study**

6.1.i. **Present status of brick kiln industry**

Along with other parts of Assam, the numbers of Brick kiln units are growing rapidly in Nagaon district during last decade. Majority of units are medium scale production unit and registered as Factory. By using traditional labour intensive method, all brick kiln units produce homogeneous product under constant returns to scale. The practice of Forward Trading or Advance selling is the most common practice in all units. All accounts related to costing and selling of bricks is accounted in multiple of thousand.

- 95% brick fields are owned by male entrepreneurs, and only 05% are owned by female entrepreneurs of two brick fields, but they are not directly involved in
brick field. Owners are educated up to Graduate level (Arts and Commerce
stream), but nobody possessed any post graduate or any technical education or
any training before the establishment of the industry. Owners are first
generation entrepreneur; only 5% are belonged to second generation
entrepreneur. Generally production units are run by sole proprietorship and
partnership. No any Government undertaking or any co-operative society are
found as manufacturer of bricks.

- Brick market is highly competitive. Marketing of bricks is done by the unit
  itself or by other agents, generally through Advance selling. Products are sold
  within the district but some portions of bricks are sold in nearby district and in
  other states like Meghalaya.

- Price of bricks is not depending on traditional market forces –demand and
  supply of bricks. It is depends on the previous year prices, market condition and
  the cost of the production. Each producer fixes their brick prices individually,
  but there is some uniformity found throughout the industry without any formal
  agreement among the producers.

- The overall productivity ratio of the brick units it ranges between 1.82 to 1.01
  and average overall productivity ratio is 1.34. It clearly shows homogeneity
  nature of production function. The variation of cost and selling, efficiency of
  labours and manager cum owner, scale of production etc are the responsible
  factors for such slight variation of overall productivity.

- In case of labour productivity, the ratio ranges from highest 5.21 to lowest 2.69,
  whereas the average labour productivity ratio of the sample units is 3.65.Some
  units have higher labour productivity, as the labourers of those units are
  migrated from other state. It is observed that the labour come from Bihar,
  Jharkhand, Ranchi have higher productivity than the workers come from local
  area.

- The overall productivity is depends upon the labour productivity of the units. As
  the units are labour intensive, so the efficiency of the unit is highly depend upon
  the labour productivity. Both total or overall productivity and labour
  productivity is found minimum in same unit.
The correlation matrix of output and input (raw materials, overhead cost, wages and fuel cost) clearly shows that the input factors are highly correlated.

The Cobb-Douglas production function (Multiple Regression equation) explains the intensity of factor used. The result shows that the dependence of production on independent variables is significantly established at 99% level of confidence. The value of the estimation shows that 93% of the influence of the factor intensity and indicating a best fit of the model. The total value of the coefficients of variables comes to be 1.07, so it can be concluded that the industry is running under constant returns to scale. The nature of production established the fact that the increased use of input causes a rise in output in same proportion.

6.1.ii. Cost analysis

Cost analysis is essential to know about the nature of production and estimate of financial reports which helps the producer to keep the accounts of the industry and control the whole business.

Brick industry has very less amount of fixed costs and high amount of variable costs in every production year. The cost on kiln and areas are required in the initial stage of production. Such cost percentage is very low in every succeeding year. In every year, some repairing has to be done before the manufacturing has started. The cost of raw materials (soil & sand) is high in Nagaon and Hojai subdivisions than in Kaliabor sub-division. Again, the wage rate of migrant labour is higher than the local labours (that have less bargaining power). The percentage of fuel cost is high than the other production costs (more than 30% of total cost), and it is less in large units than the small and medium units due to the economies of scale. In case of other overhead cost, there is a homogeneity found among the units, as all units are situated in cluster in one area, and their production and marketing procedures is identical.

The average costs of raw materials, wages, fuel and other overhead cost of the sample units are 22.02%, 19.61%, 31.73% and 26.53% respectively.

The average cost of production in per 1000 bricks is the highest in small production units than medium and large units.
There is linear relationship between variable costs and final output, as the industry run under constant returns to scale and the rate of fixed cost is nominal.

Observed profit-volume ratio indicates that some units earn higher profit and some of them procure lower ratio. The P/V ratio is ranges between 42.4% - 7.14% with an average of 24.9%. It is clear that the industry could earn a handsome profit as the fixed cost in the industry is comparatively low.

The profit of the brick industry depends on sale. Many sample units have low level breakeven point. The large production units procure high amount of profits. They have many scopes to increase their sale. But the medium and small units have faced the problem of high production costs.

Margin of safety is an important indicator of the strength of a business. The excess of actual or budgeted sales over the break-even sales is known as the margin of safety. The highest margin of safety comes out 92.9%, and the lowest one is 25.1% with an average of around 78.3% indicates the financially sound position of the industry.

6.1.iii. Income and Employment generation of the industry

This industry has followed a very traditional labour intensive method. A strong division of labour is observed in the production process.

- Prevailing wage rate is different in all units for the same type of works. Comparatively the large production units pay high wage than other medium and small units.
- Migrant labourers are paid high wage than the local labourers.
- There is no any discrimination of wage rate in regarding the gender. Both male and female are paid at same rate in piece rate system.
- Sufficient profit is one of the basic criteria for production unit to survive and grow over a long period of time. The large production units earn higher amount of profit than the medium and small units. The production costs of large units are less than the small and medium units, and they have wide range of market for sale.
- The high gross profit ratios of the sample units indicate about the good financial position of the owner, who can make sufficient arrangement for fixed and working capital. It is a sign of good management. On the other hand, few units
procure low gross profit ratio, which indicate higher cost of production or low selling prices or less in market demand.

- The gross income generation of the Brick Kiln Industry in Nagaon district in that specific year is very high.
- All units are homogeneous and every unit earns a sizeable amount of profit. But due to its location, seasonal nature of production and low level mechanization never indicate a good status.

6.1.iv. Socio- economic condition of brick kiln workers

These seasonal brick industries have high employment potentiality but the employment is uncertain as it is either casual or seasonal. Due to the nature of the industry, the employment and income generation of the workers is undetermined. There is no any type of guarantee about the perfect income or regular earning of the workers, and the workers have to work in an uncertain employment and income condition. Such workers are not officially registered; hence they are unorganized in nature. Their physical appearance, working and living condition in the kiln proved that the workers are very poor people, though their contribution is very high to the brick production.

The numbers of male workers are much higher than the female workers and majority of the workers are belonged to young age group. The kiln works require high physical strength, so the majority of workers are belonging to comparatively young age group. The female workers have joined the work after their marriage at early age. Due to heavy workload and the responsibility of household works and looking after their children, the female workers are unable to continue their works for years in brick field.

It is observed that 80% of the workers are married. Most of the workers live in the worksite and the whole family works in the brick field. To support the family, both male and female workers got married at an early age. The numbers of unmarried, divorce and widow / widower are very few. Most of the brick kiln workers have large families. In addition to their wife and children, sometimes their old parents, widowed mother and unmarried sisters and brothers also reside with them. Worker have minimum 4 to 9 number of children as the workers are either illiterate or educated at lower level and they are very poor.

- Education is measured in terms of percentage of literacy. The literacy percentage of kiln workers was found 37.9 for male workers and 31.7 for
female workers. It is far behind than the district, State and all India level according to 2011 census report. The educational status of workers is confined only to the lower level of education.

- Majority of workers are belonged to the general caste. Among the workers 184 (44.9%) are general caste, 100 (24.4%) are SC, 48 (11.7%) are belonged to ST category. Another group of workers 57(13.9%) are come from the Tea-tribe groups and 21(5.1%) are belonged to other backward class. Analysis reveals that among the general caste, majority of workers belong to the Muslim community.

- Different religious people are working in different brick fields. Out of 410 sample workers (including all categories of laborers), majority of workers are Hindu 219 (53.4%), followed by Muslims 148(36.1%) and only 43(10.5%) are Christian.

- 50% workers are local worker, who come from nearby villages or from some distance place within the district. Another 50% workers are (interstate and inter district) migrant workers. 30.7% migrant workers come from Bihar, Ranchi, Jharkhand, Chatisgarh. 19.9% workers are originated from other district like Dhubri, Kokrajhar, and from Tezpur, Dhekiajuli, Bishanath Chariali etc.

- No uniform work schedule is followed by the owner or by the workers. The working hours vary according to the types of workers or the work pressure and the daily schedule is more than eight hours. Workers are appointed on piece rate system, so they always try to make more quantity by working long duration.

- In brick industry, both time and piece rate wage system are prevailed. But 86.6% workers work on piece rate system and only 13.2% workers work on monthly payment system. But 100% female workers work on the piece rate system. The usual deduction for debt servicing is going on every weekly payment i.e. Rs 40 to Rs 100 per thousand of bricks. At the end of each month, it is customary to inform verbally about the size of outstanding debt. Some kinds of bonus like clothes and utensils are given to only migrant labourers at the time of their departure.

- Most of the workers are indebted through “Dadan” at their place, which is given on personal guarantee and without interest to the head of the family for entire
members. Fresh loans are also offered during the course of work and the cycle continues till the workers are completely trapped. It is very difficult to the families to get rid of the debt and they have to continue their work for long period under same Sarder or kiln owner.

- The average value of debt depends on the category of workers. Kiln workers accept loan in a verbal contract without any written document. The kiln owners also bound to invest such money without interest due to the expertise of the labourers. Workers “Physical Labour” is the only ‘guarantee’ or collateral of such type of contract or advance payment. The average value of debt is ranges minimum 10000-20000.

- Workers never feel bonded and accept such advance payment voluntarily as a traditional system. As their earning sources are not regular, the illiterate, poor and unorganized worker accepts Dadan to meet their needs like marriage, illness or family subsistence. One of the most significant observations is that Banks and other institution are yet out of their reach.

- Most of workers come from distance places with their family and live in the work site for whole production period. The kiln owners provide some temporary huts close to work site as free. The workers have to live in sub-human conditions without any facility of proper ventilation, sanitation, cooking place, bathing, drinking water, electricity and so on. For the women workers, there is no any privacy for bathing and other needs.

- As a seasonal labour the workers have to live 5-6 months in both work site and native place. So they are unable to avail voting power in both areas and labourers are not organized for the development and protection.

- Brick industries are running, without any provision of holidays with pay. “No work no pay” rule is strictly followed in brick industries. Due to this reason, the workers never observe any holiday or festival. Kiln workers avail only one weekly holiday (local market day).

- The question of maternity leave does not arise due to many reasons. Firstly, the workers are always appointed as temporary basis without following any rule and regulation. Secondly, all workers work in the industry as seasonal workers,
only for 4-5 months. Besides it, the poor, illiterate women workers are not aware about this.

- Workers face various thermal and physiological stresses due to extremely unhygienic conditions prevailing in the kilns. Dust concentration is usually very high which may cause irritation of skin and eyes etc. Brick making involves manual handling of heavy weights of mud and green bricks, long working hours with awkward posture, monotonous and repetitive work and other risk factors which involve extensive use of hands, shoulders, back muscles and joints and many workers have suffered knee pain (Patheras) and chest, back pain etc. Due to lack proper drinking water and sanitation and work site unhygienic condition many workers suffer indigestions (Dysentery) and chronic fever and cough, respiratory problems like asthma, affected by malaria, skin disease like scabies, or have cuts and bruise.

6.1.5. Impact of Brick Kiln Industry

All the sample units are located in villages, by using local resources. Many villagers are directly employed in brick kiln industry. But the percentage of involvement of villagers, directly or indirectly with the industry is minimum. Though the industry depends on the locally available resources, but the income generation of the villagers (having brick kilns) from the industry is not significant.

- Directly or indirectly, Brick kiln units create several economic opportunities for the local people. Many people sell the top soil 1-1.5ft and get instant cash and more money at a time than they get from agriculture. People can supply vehicles like Truck, Lorri, thela or mini truck etc. to the kiln for transportation of bricks to the market, carrying raw materials to the kiln or transporting labours from distance place.

- The industry opens some livelihood for the local people like opening up small shops, eateries, tea-stalls etc. The workers live at work site also increase the demand for local products such as milk and vegetables etc. and the villagers indirectly benefitted by the industry.

167
Besides it, the agricultural fertile land degradation is a serious problem as the Brick kilns are destroying large areas of such lands. Huge amount of soils are removed in every production season which loss the productivity forever.

Many people work together for a long time in an open field in unorganized form. Again, at the time of selling the bricks to its customer, when trucks or other vehicles are loaded or unloaded with coal or soil –sand, it create unbearable noisy situations to the villagers.

The only road of the village is totally damaged by the brick transporters because the heavy trucks carrying coal, soil and bricks are running many times through the roads and the administration do not take any measures to protect the road. Moreover, the sub-ways constructed to the kiln through the paddy field also destroy the agriculture production of the nearby areas.

For the inhabitants of nearby brick kilns the problems of cattle rearing is one of the important problem Because, bricks are made by collecting soil from a depth of about 1-2 m in agricultural land of nearby or surrounding areas of brick kiln. After, the top soil quarried from the nearby areas, that area become fully degraded, unleveled and left as wasteland. The nutrient elements and soil biota are destroyed through brick burning. Most of the farmers face the problem of cattle rearing as the kilns and the field becomes dangers for them.

Besides the economic and environmental effects on the village economy and ecology, the brick industries also affect the society in many ways. The migrant kiln workers come from different places and live the work site in a very poor condition. They live nearly 5-6 months in the village. The problem of robbery and theft is increasing during the brick manufacturing time. But in some villages such problems decrease as the many unemployed people get their livelihood from the brick industry. In some villages, some poor, illiterate guardians want their children to work in the brick fields instead of going to school.

But the serious social problem arises from the kiln workers in the villages are that the problems of drugs, local liquor (Sulai). Production and selling of Sulai is becoming a serious threat to the villagers and the village economy than the land degradation or any other problems created by the kiln industries.
The people, who live near the kilns, are more likely to suffer from illness caused by kilns pollution, comparing those people who are living without brick kilns. Diseases like allergic base skin diseases, asthma, T.B. frequent cough and fever, snoring (especially in case of minor children) are very common diseases during the production season.

The qualities of surrounding soils of the kiln are affected by kiln activity. It is found that the soils located near the kilns are more acidic than the soils located at a distance place.

All samples of nearby kilns exhibit in the normal range of moisture contain which are found as 5%-35%. The moisture content of the soil located at distance places from the kiln is higher than the nearest place. So burning of coal do not affect the soil moisture content capacity and there is no any reduction in the productivity of soil.

The soil temperature is not affected by the firing of bricks. Though the temperature is high in nearest place of kiln, but such soil temperature is not harmful for rice production. Besides it, both brick and rice production is performed in two separate seasons, so the effect of kiln thermal do not affect in rice production.

The results of the Electrical conductivity indicate about good soil productivity and enough ground water contribution in different soil samples. So the kiln activity (continuous burning of coal for 5-6 months) is not a hindering factor for plant growth and do not affect the EC level of surrounding agricultural land.

But the brick manufacturing process is reportedly a threat to nearby land and vegetation as the photo synthesis process of plants is affected by dust particles. Such dust particles, fly ash and waste product create many problems to the habitants of nearby areas.

6.2 Major constraints of the industry

In the study area, 85 per cent of the sample units belong to small and medium category of production. So the production units face the problem of diseconomies of scale. On the basis of the findings of the study, the following major constraints are identified.
(i) **High cost of Fuel**

Coal is the only fuel used in brick industry and every unit has to store huge amount of coal for uninterrupted burning of bricks for the whole production season or even before the production has started. In study area, every unit has to collect coal from Meghalaya by road transport, which makes the fuel cost excessively high. Besides it, supply of coal in huge quantity also requires huge amount of money, which is blocked for a considerable time period. From the study it is found that the fuel cost, is highest among the other cost, which make high price of bricks.

(ii) **Problems of labour**

Irregular labour supply is one of the most affecting problems of the brick kiln industry. The entire brick production process has done manually. So the producers have to depend upon the labour in every stage of production. Especially preparation and making green bricks in right way is the key to produce superior quality of bricks. It requires expert workers, but there is acute shortage of such labours in study area. So the producers are compelled to continue the system of Advance payment and commission system for regular supply of labour as the local people are not interested to work in the brick industry due to the laborious type of work and the worst work site conditions. The casual local labourers are most irregular as they are not recruited by advance paying system.

(iii) **Scarcity of raw materials**

Availability of good alluvial soil is one of the basic conditions for establishing a brick production unit. But constant and continuous demands for soil raise the price and scarcity in that area. The owners are compelled to collect raw materials from a distance place and as a result the cost of production increases. Again the quality of soil degraded due to massive practice of chemical fertilizers in agricultural product. Complete absence of Soil Testing method and practice in brick industry is another important hindrance of brick production. As a result, the quality of superior bricks deteriorated constantly. Acute competition among the manufacturer and non availability of substitute raw material, increasing soil price are the major constraints of brick production.
(v) Technological constraints

Brick industry follows a very traditional method of production. Whole production system is inefficient and labour-intensive. Due to non-availability of technically efficient modern production method, the producers have to practice old one. In some places of India like Punjab, Haryana, Karnataka modern technology like VSBK, HABLA etc are used to some extent. But the producers of the study area are not aware of modernization or any type of changes in production system. According to some owners, if they introduce some machine, the price of the bricks may rise, which is already a serious problem for them.

(vi) Financial constraints

The smooth flow of credit during production period is an important criterion for the success of a business. Requirement of huge working capital for the payment of wages in every weekend, continuous supply of coal and soil, compel the owners to take loans from indigenous money lender with high interest rate and have to make some arrangement for pre-production advance sale. The owners have to sell the product at a low price than the prevailing market price by the Advance selling process. All producers have faced such problems. Though the Banking institutions are available in the study area, but surprisingly the owners are not interested to take bank loans.

(vii) Psychology of the owners

The psychology of the owners of brick kiln units in Nagaon district is very traditional. Neither they want to make any change in production system nor adopt any modern technology. Most of the owners are first generation producer. They are educated from high school level to degree level without having any technical degree or training. Their mindset is very traditional and always guided by immediate profit. Most of the owner told that they have not heard about the Vertical Staff Brick Kiln (VSBK), High Draught and Hoffman kiln or any other developed brick making system. Without any innovation or development, the industry runs in very low standard categories which seriously affect the production and industry status.

(viii) Problems related to weather

Brick production is mainly depends on the weather. Green bricks in huge quantities are placed in a very systematic way to dry in open field for long time. Bright Sun-light is a basic requirement for the production. But due to environmental changes,
untimely and prolong rain (till October) and heavy cold etc become very common in recent years in North-Eastern region, which seriously affect the brick production.

(ix) No recognition of Industry

One of the basic constraints of the brick industry is that due to its seasonal nature without any modern technical support, it never gets any recognition from the public as well from the government as “Industry”. Due to its production process and requirements, all units have to operate at a distance place as isolated. So the industry remains as traditional one and the workers are unable to avail the minimum benefits of different wage laws.

6.3. Suggestions

Based on the findings of the study, following policy implications were drawn which may be considered for the development of the industry along with the development of the socio-economic conditions of the labour. The concerned department of the Government should make strict observation about the implementation of different existing laws of Labourers and Pollution control. The State Government, as well as the concerning authority and the owners of the kiln can consider the following suggestions to bring a massive change to the industry in the ways of production, employment and income generation and as whole overall scenario of the industry.

i. The seasonal nature of production is one of the major constraints of the brick kiln industry as the entire production process lying idle for long time. So efforts should be made to operate year-round production in permanent status with modern structures which may motivate the local surplus labour to the industry and thereby reduce the problem of irregular supply of labour and high cost of production. It will be helpful for both the employee and employer and it will increase the productivity of fixed capital by using for the whole year.

ii. The constantly rising price of fuel and raw materials of bricks are very important constraints of brick production. So government should control such price rise situation. Alternative fuel or cost-effective process should be introduced by the Government as well as by the owners in
their own efforts. Again instead of good fertile soil other alternative like fly ash, paddy-husk, red mud etc should be used.

iii. Government should control the prices of bricks as the fixation of brick price of every grade in every season is depends upon the decision of the owner.

iv. Efforts should be made to protect agricultural land of nearby areas of brick fields as the owners always collect raw materials locally and increase the areas of brick fields in every succeeding year. Quarried top fertile agricultural soil by the villagers of nearby areas for instant cash should be strictly banned by the Government. Awareness program should be oriented on environmental issues among the villagers.

v. In every production season, some new kiln has started to manufacture and occupy the surrounding areas in every succeeding year either by purchase or taken on lease, which becomes a serious threat to the environment. Government should strictly monitor the pre-requisite conditions for setup a unit. The Government should strictly ban the sale and purchase of agricultural land as brick field and should restrict the area of brick field within a specified radius. Again to avoid the scarcity and competition, there should be minimum 5km distance between two brick manufacturing units.

vi. It is very much essential to change the mindset of the owner to adopt modern technology. Simple mechanization can be helpful to minimize the production cost and increase the volume of output and profit. “Brick Field Owners Association of Nagaon” can provide much information in respect of modern technology, marketing etc. An institution like Central Building Research Institute may be set up by the Government of Assam to provide technical guidance to the industry. Both Government and non–governmental agencies should make suitable incentives to provide technical, financial and marketing guidance to promote the overall development of the industry.

vii. In case of kiln workers, increase wage rate without Dadan and better living condition with proper sanitation and drinking water, school for
children should be provided. Government should fix unique piece rate system under Minimum wage rate Act for all workers with a provision to pay individually for the members of the family.

viii. Production related health hazards should be prevented by introducing compulsory uses of protective equipments like musk, gloves for the workers who work in the kiln. Proper care of health and hygiene should be provided by the owner and awareness programs should be taken up by different government authority and NGO also. The owners should strictly implement different health insurance schemes for the workers. Again the owners should provide suitable accommodation with basic needs in worksite.

ix. There is a need of regulation of working hour of workers. Due to prevailing piece rate system, the illiterate, less efficient poor workers always work for long time without any protective measure in very unhygienic working condition. They are highly vulnerable to exploitation, lack of effective voice and bargaining power. Government should make obligatory to follow the rules and regulations regarding the workers welfare.

x. Bonded labour is a dominant feature in brick kiln industry. The system of advance payment (Dadan) traps the labour into bondage with strong physical, economic and psychological exploitation. Such vicious cycle of bondage cannot be broken down by the poor, illiterate workers in spite of their hard work. So the “Bonded Labour System (Abolition) Act 1976”should be followed in brick kiln industry .It will be helpful for both employer and employee.
6.4 Conclusion

The above analysis of constraints and suggestions indicates that the constraints faced by the kiln owners and the villagers can be overcome through proper policy measures and effective implementation of Government rules and regulations. The change of entrepreneur mindset to adopt modern technology for year round production and raise the awareness of villagers to the environmental effects of the brick industry are most important one.

Brick industry plays a significant role by providing basic construction material and providing employment opportunities to many people directly and indirectly of the society. With a developmental scope, the industry can be uplifted to an organized sector with permanent set up. This sector is yet to be considered as an industry from both society and government. Therefore, there is a growing need for gathering information about detailed economic performance of the industry to enhance productivity with less cost of production (both economic and social cost). Research on this aspect is very limited, which creates the necessity of conducting research on detailed economic indicators not only profitability, but also input, prices, factor market, product market etc.

The present study is confined only to Nagaon district of Assam. Similar studies can be carried out in other districts to study the different aspects of the industry. Research can be conducted by the students of Medical science on the health issues of the brick manufacturing. Different issues like soil effect, crop and vegetable production of the area where the kilns are located can be studied by the students of Agriculture and Life science.