Chapter – I

INTRODUCTION

Introduction

Agriculture is the backbone of Indian Economy. Agricultural sector plays a vital role in the development of India, with over 58 per cent of the country’s population, deriving their subsistence from agriculture. Most of the industries also depend upon the agriculture sector for their raw materials.

India ranks first in the production of milk, pulses, jute and jute-like fibres, second in rice, wheat, sugarcane, groundnut, vegetables, fruits and cotton production and it is a leading producer of spices and plantation crops as well as livestock, fisheries and poultry. The rapid growth of agriculture is essential not only for self-reliance but also for meeting the food and nutritional security of the people, to bring about equitable distribution of income and wealth in rural areas as well as to reduce poverty and improve the quality of life.

Agriculture Sector in India

In the past, agriculture had played and will continue to play a dominant role in the growth of Indian Economy in the foreseeable future. It represents the largest sector producing around 28 percent of the GDP, the largest employer providing more than 60 percent of jobs and the prime arbiter of living standards for 70 percent of India’s population living in the rural areas. These factors, together with a strong determination to achieve self-sufficiency in food grains production, have ensured a high priority for agriculture sector in the successive development plans of the country.
An important facet of progress in agriculture is its success in the eradication of its critical dependence on imported foodgrains. In the 1950’s, nearly five percent of the total foodgrains available in the country, were imported. This dependence worsened during the 1960’s when two severe drought years led to a sharp increase in the import of foodgrains. During 1966, India had to import more than 10 million tonnes of foodgrains against a domestic production of 72 million tonnes. In the following year again, nearly twelve million tonnes had to be imported. On the average, well over seven percent of the total availability of foodgrains during the 1960s had to be imported.

Indian agriculture has progressed a long way from an era of frequent droughts and vulnerability to food shortages to becoming a significant exporter of agricultural commodities. This has been possible due to persistent efforts at harnessing the potential of land and water resources for agricultural purposes. Indian agriculture, which grew at the rate of about one percent per annum during the fifty years before independence, has grown at the rate of about three percent per annum in the post independence era.

Indian agriculture broadly consists of four sub-sectors. Agriculture proper, including all foodcrops, oilseeds, fiber, plantation crops, fruits and vegetables, is the largest, accounting for nearly 70 percent of the agriculture sector as a whole. The rapid growth in this sub-sector, through exploitation of wastelands and fallows, spread of irrigation and adoption of production-enhancing technologies, was critical in transforming India from a country vulnerable to food shortages to one of exportable surplus. Although this sub-sector has made impressive progress, its share in the sector as a whole has declined from 78 percent in 1960-61 to less than 70 percent by early 90s.
Correspondingly, the share of livestock sector has increased considerably. The livestock industry has grown from Rs. 15 billion in early 1960s to Rs. 100 billion by 1980-81 and Rs. 672 billion by 1993-94. In nominal terms, the sector grew at almost 15 percent per annum during 1980s. Milk production, which was almost stagnant for two decades ending 1970, grew by over five percent per annum in the 80s. Similarly, production of eggs increased at the rate of about 6.5 percent during the same period. As a result, the share of livestock increased from about 17 percent till early 80s to 25 percent by 1993-94.

Though it plays a relatively a minor role within the sector as a whole, fishing sub-sector activities have been on the rise. The sub-sector has grown from only Rs. 3 billion in 1970-71 to nearly Rs. 90 billion in 1993-94. The growth was particularly rapid in 70s and 80s. Value added increased at over five percent per annum during this period. In real terms, forestry and logging activities have been on the decline since mid seventies. As of 1993-94, the size of the industry in terms of value of output was 103 billion.

Over the past three decades, the country has successfully transformed itself from a food deficit economy to one which is essentially self sufficient in the availability of foodgrains and other essential commodities, albeit only at the prevailing level of effective demand. Annual aggregate foodgrains production, which averaged about 82 million tonnes in 1960-61, increased to 123.7 and 172.5 million tonnes for the trienniums ending 1980-81 and 1990-91 respectively. Current (1998-99) production level is 195 million tonnes and the country has been able to accumulate substantial (35 million tonnes) stocks of foodgrains to cope up with any sudden difficulties arising from drought or a similar situation in any part of the country.
**Growth Performance of Agriculture**

The growth performance of the agriculture sector has been fluctuating across the plan periods. It witnessed a growth rate of 4.8 per cent during the Eighth Plan Period (1992–97). However, the agrarian situation witnessed a downturn towards the beginning of the Ninth Plan Period (1997–2002) and the Tenth Plan Period (2002–07), when the agricultural growth rate came down to 2.5 percent and 2.4 percent respectively. This crippling growth rate of 2.4 percent in agriculture as against a robust annual average overall growth rate of 7.6 per cent for the economy during the tenth plan period was clearly a cause for concern. The trend rate of growth during the period 1992-93 to 2010-11 was 2.8 percent while the average annual rate of growth in agriculture and allied sectors GDP during the same period was 3.2 percent.

The Eleventh Plan had sought to reverse the deceleration of agricultural growth which occurred in the Ninth Plan and continued into the Tenth Plan. It has had some success in that foodgrain production touched a new peak of 250.42 million tonnes in 2011-12. Agricultural GDP growth has accelerated to an average 3.9 percent growth during 2005-06 to 2010-11, partly because of initiatives taken since 2004. As per the latest advance estimate of National Income released by the Central Statistics Office (CSO), agriculture and allied sectors are likely to grow at 2.5 percent during 2011-12 as against 7 percent during the previous year at constant (2004-05) prices. The Approach Paper to Twelfth Plan, drafted by the Planning Commission, estimated that with a revision of the farm sector GDP growth rates for 2010-11 and the expected good harvest in 2011-12, the average growth in agriculture and allied sectors in the Eleventh Plan may be higher at 3.3-3.5 percent per year against a target of 4 percent. The increasing divergence between the growth trends of the total economy and that of agriculture & allied sectors indicated under performance by
agriculture. It is also significant that unlike the overall economic growth pattern, agricultural performance in India was quite volatile (the Coefficient of Variation (CV) during 2000-01 to 2010-11 was 1.6 compared to 1.1 during 1992-93 to 1999-2000). This is almost six times more than the CV observed in the overall GDP growth of the country, indicating that high and perhaps increasing volatility was a real challenge in agriculture, which is likely to increase in the years to come in the wake of climate change.

At present, Tamil Nadu is India's second biggest producer of rice GDP of agriculture and allied sectors in India and it reached USD 151.8 billion in FY12. According to the Central Statistical Organisation (CSO), the agriculture and allied sector grew 2.8 per cent in FY12. Agriculture is the primary source of livelihood for about 58 per cent of India’s population. Total food grains production in India reached an all-time high of 259.32 million tonnes during the 12th five year plan period.

**Indian Agriculture: Performance and Challenges**

Agriculture is a critical sector of the Indian Economy. Though its contribution to the overall Gross Domestic Product (GDP) of the country has fallen from about 30 percent in 1990-91 to less than 15 percent in 2011-12, a trend that is expected in the development process of any economy, agriculture yet forms the backbone of development. An average Indian still spends almost half of his/her total expenditure on food while roughly half of India’s work force is still engaged in agriculture for its livelihood. Being both a source of livelihood and food security for a vast majority of low income, poor and vulnerable sections of society, its performance assumes greater significance in view of the proposed National Food Security Bill and the ongoing Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) Scheme. The experience from BRICS countries indicates that a one percentage growth in
agriculture is at least two to three times more effective in reducing poverty than the same growth emanating from non-agriculture sectors. Given that India is still home to the largest number of poor and malnourished people in the world, a higher priority to agriculture could achieve the goals of reducing poverty and malnutrition as well as of inclusive growth. Since agriculture forms the resource base for a number of agro-based industries and agro-services, it would be more meaningful to view agriculture not as farming alone but as a holistic value chain which includes farming, wholesaling, warehousing (including logistics), processing and retailing. Further, it may be noted that in the last two Five Year Plans, it is clearly mentioned that for the economy to grow at nine per cent, it is important that agriculture should grow at least by four per cent per annum.

Structural Transformation of Indian Agriculture

The agriculture sector in India has undergone significant structural changes in the form of decrease in the share of GDP from 30 percent in 1990-91 to 14.5 percent in 2010-11, indicating a shift from the traditional agrarian economy towards a service dominated one. This decrease in agriculture’s contribution to GDP has not been accompanied by a matching reduction in the share of agriculture in employment. About 52% of the total workforce is still employed by the farm sector which makes more than half of the Indian population dependant on agriculture for sustenance (NSS 66th Round). Within the rural economy also, the share of income from non-farm activities has also increased.

The average size of operational holdings in India has diminished progressively from 2.28 ha in 1970-71 to 1.55 ha in 1990-91 to 1.23 ha in 2005-06. As per the Agriculture Census 2005-06, the proportion of marginal holdings (area less than 1 ha) has increased from 61.6 percent in 1995-96 to 64.8 percent in 2005-06. This is followed by about 18 percent small holdings (1-2 ha.), about
16 percent medium holdings (more than 2 to less than 10 ha.) and less than 1 percent large holdings (10 ha. and above).

**Agriculture contribution of Tamil Nadu**

Tamil Nadu possesses the second largest economy (2011–12) among States in India, after Maharashtra. It is the second most industrialized State next to Maharashtra. As of 2010–11, Tamil Nadu had a per capita GDP of $1,622, the sixth highest in India. Tamil Nadu's gross state domestic product for 2011–2012 was 4.28 trillion or $145,868 million. The State recorded a growth of 9.4% in 2011–2012.

At present, Tamil Nadu is India's second biggest producer of rice GDP of agriculture and allied sectors in India and it reached USD 151.8 billion in FY12. According to the Central Statistical Organisation (CSO), the agriculture and allied sector grew 2.8 per cent in FY12. Agriculture is the primary source of livelihood for about 58 per cent of India’s population. Total food grains production in India reached an all-time high of 259.32 million tonnes during 12th five year plan period.

Tamil Nadu has historically been an agricultural State while its advances in other fields launched the State into competition with other areas. Even so, Tamil Nadu is a leading producer of agricultural products in India. It is also the leading producer of kambu, corn, rye, ground nuts, oil, seeds and sugarcane in India.

**Strategies of Tamil Nadu Vision 2023**

The Tamil Nadu Vision 2023 has a three pronged strategy for improving productivity and thereby sustaining growth in agriculture production so as to meet the growing demand for the agricultural produce as well as ensuring food security.
• Improving productivity by introducing scientific agricultural methods and building an institutional network to support the continued adoption of the same.

• Ensuring timely irrigation by intelligent use of available water by adopting effective recharging mechanisms, drip/sprinkler irrigation systems, timely cleaning and deepening of tanks and canals, and adopting appropriate cropping pattern based on water availability.

• Developing suitable post harvest infrastructure to maximize the benefits of value addition and timely marketing of produce. The State will also extend agricultural extension activities to cover the entire farming community.

**Appearance of Agricultural Production**

The overall agricultural production in the State had gone up at an annual average growth rate of 7.29 percent during the 10 Five Year Plan Period (2002-2007). This accomplishment was mainly due to the increase in the yield rate of crops. There was an overall decline in area by 0.42 percent in this period. During this Plan Period, the production of food crops fared better than non-food crops. Turning to 11 Five Year Plan Period (2007-2012), the overall agricultural production in the State declined by an annual average rate of 2.37 percent. The fall both in area and yield rate of crops was mainly responsible for this decline during the 11 Plan Period. Between food and non-food crops, even though the latter registered a growth of 0.33 percent, the decline in the production of food crops by an annual average of 3.08 percent, engendered the fall in the overall agricultural production in the State. In the case of food crops, both area and yield rate witnessed negative growth in this Plan Period. In respect of non-food crops, only the area under the crops registered a fall and the increase in yield rate of
crops compensated the fall in area and contributed to the overall increase in production.

**Declining Agriculture Production in Tamil Nadu**

A combination of factors such as increasing industrialization, urbanization, housing activities and infrastructure development triggered the conversion of agricultural land into non agricultural uses. This has resulted in a decline of the area under cultivation. The scope for expansion of the area available for cultivation is also very limited. The pattern of land ownership imposes limitations on the models that can be adopted for agricultural development. As per the latest Agricultural Census of 2010-11, marginal and small holdings of less than two hectares accounted for 92.0 percent of the total holdings and 61.0 percent of the total operated area. They, in turn, unsuitable for conventional technology and machinery use to boost agricultural production.

The agricultural sector witnessed a severe drought, impacting the area, yield and production of all important crops in the State during 2012 – 13. This brought about a steep fall of 13.04 percent in the Gross State Domestic Product (GSDP) of the agricultural sub sector between 2011 – 12 and 2012 - 13. As a result, the relative share of the sub sector in the primary sector declined from 83.0 percent in 2011 – 12 to 80.0 percent in 2012 – 13 and in overall State’s GSDP from 7.4 percent to 6.2 percent.

The adverse effect of the drought got reflected in the reduction in gross area sown by 12.7 percent, gross area irrigated by 15.0 percent and increase in fallows by 17.3 percent in 2012 – 13 as compared to 2011 – 12. The cropping intensity declined from 118.1 percent in 2011-12 to 113.1 percent in 2012-13.
Air Pollution and Environment

Environment is a major issue which confronts industry and business in today’s world on a daily basis. Different industrial activities are degrading various environmental components like water, air, soil and vegetation.

The fact that air pollution is hazardous to human health, is well known. World Health Organisation (WHO) estimates that worldwide, at least two million people every year die prematurely due to health effects caused by a lack of clean air. Air is the basic necessity of human life but the quality of air is deteriorating continuously and it is being constantly polluted from different sources. Major sources of air pollution are automobiles and industries and as per estimates, vehicular pollution is the primary cause of air pollution in urban areas (60%), which is followed by industries (20-30%).

Cement industry is one of the most important industries which is involved in air pollution. The aerial discharge of cement factories consists of particulate matter, sulphur dioxide and nitrogen oxides producing continuous visible clouds which ultimately settle on the vegetation, soil and pollutes the whole biotic life around and as a result, the whole ecosystem around the cement factory is subjected to extraordinary stress and abuse.

Nature of Cement Industry

Cement industry is one of the key industries in India. It plays a dominant role in the national economy. From the point of view of economic development of the country, Cement industry ranks second immediately after Iron and Steel industry. Cement is indispensable in construction works and its production and consumption to a large extent indicate a country's progress.

Cement industry is one of the 17 most polluting industries listed by the Central Pollution Control Board (CPCB). It is the major source of particulate
matter, SOx, NOx and CO2 emissions. Cement dust contains heavy metals like chromium, nickel, cobalt, lead and mercury pollutants hazardous to the biotic environment, impacting vegetation, human health, animal health and ecosystem. The cement industry is involved in the development of structures in this advanced and modern world as is the basic ingredient of concrete used in constructing modern edifices and structures. In fact, life without cement in this 21 century is inconceivable. Cement, however, generates dust during its production.

Impact of Cement Industry

Nowadays, cement industry causes environmental pollution problems. The pollutants from the cement industry cause adverse impact on air, water and land. Cement is a fine, gray or white powder which is largely made up of Cement Kiln Dust (CKD), a by-product of the final cement product, usually stored as wastes in open-pits and landfills. Exposure to cement dust for a short period may not cause serious problem. However, prolonged exposure can cause serious irreversible damage to agriculture and animals. Cement dust of sufficient quantities have been reported to dissolve leaf tissues Other reported effects of cement dust on plants include reduced growth, reduced chlorophyll, clogged stomata in leaves, cell metabolism disruption, interrupt absorption of light and diffusion of gases, lowering starch formation, reducing fruit setting (Lerman, 1972), inducing premature leaf fall and leading to stunted growth, thus causing suppression in plants and animals. It leads to various respiratory and hematological disease, cancer, eye defects and genetic problems (Ogunbileje and Akinosun, 2011). Besides gaseous and particulate pollutants, there are also enhanced levels of toxic heavy metals in the environment of cement factory like cobalt, lead, chromium, nickel, mercury, posing very potential hazard for all living organisms (Lewis and Mcintosh, 1989). Increased concentrations of the
above pollutants cause progressive reduction in the photosynthetic ability of leaves, mainly a reduction in growth and productivity of plants.

**Impact of Cement Industry and Human Health**

Since early 1980s, it has become clear that air pollution affects the health of human beings and animals, damages vegetation, soils and deteriorates materials and generally affects not only the large metropolitan areas but also the medium sized urban areas. Air pollution has great impact on human health, climate change, agriculture and natural ecosystem.

Mushrooming of cement factories has resulted in the environmental deterioration and in turn, degrades the human health status in the whole world. Many studies have shown adverse respiratory health effects in the people exposed to cement dust, exemplified in increased frequency of respiratory problems (Al-Neaimi et al., 2001). It has also been revealed that people in the cement dust zone are badly affected by respiratory problems, gastro intestinal diseases etc.

The impacts of cement industry are countless and it even did not spare humans from its deteriorating impacts and have adversely impacted human health in the area. Exposure to cement pollution has been linked to a number of different health outcomes, starting from modest transient changes in the respiratory tract and impaired pulmonary function, continuing to restricted activity/reduced performance, emergency room visits and hospital admissions and to mortality.

Besides human health, air pollutants have shown more adverse impacts on livestock (Schwabe, 1984), affecting gross domestic product (GDP) of the precious wealth of livestock in the form of cattle, buffalo, sheep, goats, poultry etc. The cattle and poultry amongst all the livestock are considered the most
important tool for the development of the rural economy. The various diseases such as respiratory infections and various other pollution related problems are arising among livestock at an alarming rate in the areas.

Public Report by the Tamil Nadu Pollution Control Board

Accordingly, Tamil Nadu Pollution Control Board (TNPCB) has issued Public Notices in a Tamil daily, “Daily Thanthi” and in English daily, “The New Indian Express” on 13.10.2012, regarding the scheduled public hearing for this project with the concurrence of the district collector. It was further informed that necessary press release was again issued in Tamil daily newspaper, Daily Thanthi and in Dinakaran, on 16.11.2012, regarding the scheduled public hearing on 17.11.2012 at 10.30 A.M. and venue. It was further stated that no written complaints/suggestions have been received by TNPCB from the public for the proposed expansion, after the issue of press release. Then the District Environmental Engineer informed the public to give their opinion one by one after the presentation and requested the project proponent to explain about the proposed activities.

The agriculture field and poultry in that area are affected due to dust emission arising from movement of cement dust and also the public are suffering from asthma and liver cancer due to dust emission from the cement factory. The district collector informed that the plenty of limestone is available in this area which leads to installation of more cement plants, but no concession on the cement price was given to the surrounding village people. He informed that the agriculture activities and the public around 10 km will be incredibly affected due to extraction of ground water and also informed that the industry has proposed to establish a power plant for the captive use of cement plant. The agriculture field and poultry in that area are affected due to dust emission arising from movement of heavy vehicles and also the public are suffering from asthma and liver cancer
due to dust emission from the cement factory. He further stated that most of the employees, working in the industry, are from other States and the unit authority has not considered the local public.

**Scope of the Study**

Several attempts were made in India and foreign countries to assess the impact of pollution on the environment. Most of them had concentrated on one aspect or the other of pollution impact like the impact of effluents on health, or the impact of a chemical industry’s pollution on vegetation and so on. They were all mostly micro-studies in nature and hardly any work was done on the socio-economic impact of pollution by cement factories on the people and on their living conditions. Even in the few attempts made at micro-level, they had not been systematic as to correlate pollution with economic and social losses of farmers. These studies, at least a majority of them, have not projected the impending threat of the pollution menace, calling for immediate remedial measures.

Cement industry is also contributing towards air pollution by way of dust and particulate emission. The deposition of cement dust on the plants prevents sunlight on the leaves which is very much essential for the growth. The collection of cement dust on the agricultural lands after a long period may change the nature of the soil and may make it unsuitable for certain crop cultivation. It will in the long-run affect the agricultural income.

The present study analyzes the pollution related problems in the study area. The impact of growth of cement production on the farming operation, has been measured with various components such as reduction in the fertility of the soil, changes in the nature of the soil, fall in crop-yield, reduction in the quality of yield, reduction in the area of cultivation, sale of land, increase in cost of
cultivation, dust impact on pump sets, dust impact on cattle-breeding, change in the pattern of manure, reduction in agricultural income, low standard of living and difficult ploughing operation.

**Statement of the Problem**

Cement industry caused environmental pollution problems, and the pollutants of the cement industry produce adverse impact on air, water and land. During the last decades, the emission of dust from cement factories has been increased alarmingly due to expansion of more cement plant to meet the requirement of cement materials for construction of building. In comparison with gaseous air pollutant many of which are readily recognized as being the cause of injury to agriculture crops, the visible injury such as reduction in growth and productivity, observed due to cement dust, is greater. The cement dust decreased the productivity and concentration of chlorophyll in a number of crops. The direct effects of the cement dust pollution are alkalization of the ecosystem and the changing of the chemical composition of the soil. The pollutant particles can enter the soil as dry, humid or occult deposits and can undermine the physico-chemical properties. Hence contaminated soil can adversely affect the agricultural yield. Relatively little known and limited studies have been carried out on the effect of cement dust pollution on the growth of plants grown in and around the cement factory area of Ariyalur district of Tamil Nadu.

**Research Questions:**

1) What is the impact of cement industries on the farming operations in the study area?

2) What is the impact of cement industries on the living conditions of the people?
By arriving at an answer to the above two questions, the impact of cement industry on the agriculture yield in the Ariyalur district, can be demonstrated. The present study analysed the impact of cement dust deposition on soil and over the vegetation and its consequent effect on agriculture yield in Ariyalur district, Tamil Nadu.

**Objectives:**

The objectives of the study are given below.

1. To find out the impact of cement industrial pollution on socio, economic and living conditions of farmers in Ariyalur district.

2. To study the growth and development of cement industries like the number of units, installed capacity and production of cement in India.

3. To analyze the impact of expansion of cement industries on agricultural land in the study area.

4. To identify and analyse the correlation between cement industrial pollution and various problems of agriculture in the study region.

5. To find out the impact of emission and dust from the cement industries on the farming operation in the sample area.

6. To analyze the impact of cement industrial pollution on the selected crops in the Ariyalur district.

7. To suggest suitable measures and the possible steps to bring down the effect of emissions from the cement industry and to combat the problems experienced by the farmers.
Hypotheses:

The study tested the following hypotheses.

1. There is no association between socio-economic profile and agriculture yield in the study areas.

2. There is no significant correlation between educational qualification and nature of work in the cement plant of Ariyalur block.

3. There is no association between expansion of cement industries and acquisition of agriculture land.

4. There is no significant relationship between growth of cement production and low quality of agriculture yield.

5. There is no significant relationship between growth of cement industries and various problems of agriculture cultivation in the study areas.

Methodology of the Study

The present study is based on both primary and secondary data. The present study was chosen from Ariyalur district. This district is considered as the study area due to the concentration of cement industries and it has got significant impact on agricultural yield, human and animal health. The primary data were collected from two major zones having 300 samples. The first zone refers to cement air pollution affected areas of Ariyalur block from which 200 (out of 600 households) samples were collected from three villages, namely, Kayarlabath, Chanthirapalayam and Thamaraikulam. The second zone is pollution non-affected areas of Sendurai block from which 100 (out of 300 households) samples were collected from one village, namely, Sendurai. The period of study was one year (2010 – 2011). The field survey was carried out from April 2010 to
March 2011 for the collection of primary data. The researcher interviewed 300 farmers and employed the convenience sample method for the present study.

**Method of Data Collection and Tools of Analysis**

The present study was based on both primary and secondary data. Secondary data were gathered from reliable government agencies like District Statistical Department, District Hand Book of Ariyalur, District Industries Centre (DIC), District Revenue Department and Join Director of Agriculture Department in Ariyalur District, Tamil Nadu Cement Corporation Ltd, Indian Minerals Year book 2011, Ministry of Mines, Government of India.

The researcher collected the primary data by using a well structured interview schedule for the purpose of the present study. The data obtained during the study were tabulated, analyzed and interpreted, with the help of statistical tools like standard deviation, correlation, t-test, F-test, chi-square test, to verify the validity of the data and inferences, beside percentages and charts. Tests of significance at 5% and 1% levels were taken in the study as the basis for interpreting data.

**Limitations of the Study**

The study suffers from certain limitations. For example, the study was limited to only select villages. The study period was limited to only one year. All the limitations, applicable to statistical tools employed in the study, are applicable to this study also.
CHAPTER SCHEMES OF THE STUDY

Chapter-I

The First Chapter deals with the introductory aspects such as impact of cement industrial pollution on agriculture yield, background of the study, significance of the study, statement of the problem, objectives and hypotheses, plan of the research, limitations of the study and chapterisation of the study.

Chapter-II

The Second Chapter has concepts, definitions and review of related literature for the study.

Chapter-III

The Third Chapter deals with the profile of the study area such as physical and geographical features, administrative set up, agriculture growth in national, state and regional level, cement industrial scenario, district wise, taluk wise and block wise, entrepreneurial activity, etc.

Chapter-IV

The Fourth Chapter studies the data analysis and interpretations of the objectives of the study, with the help of statistical tools based on qualitative and quantitative methods.

Chapter-V

This Fifth Chapter furnishes the major findings, suggestions and conclusion.