CHAPTER-I
INTRODUCTION

Agricultural diversification is an important instrument for economic growth. Diversification largely depends upon the opportunities and responsiveness of farmers to technological breakthrough, consumer demand, government policy, trade arrangements and development of irrigation, roads and other infrastructure. Changes in cropping patterns are responsive to these factors. The aggregate cropping patterns of the country are represented by the gross cropped area allocation among different crops and commodity groups. India has practiced a significant degree of crop diversification in term of changes in the area under various crops since the Green Revolution which was largely in favour of food grains to meet the objective of self-sufficiency and country’s food security. In past one decade, the changes in cropping pattern are more towards the horticulture sector and commercial crops.

Horticulture crops play a vital role in economic development as its significant contribution to GDP in India. With a production of 76.4 million tonnes, fruits accounts for about 30 per cent of the total production of horticulture crops. The area under fruit crops during 2011-12 was 6.6 million ha, which is almost 29 per cent of area under horticulture in India. The area under fruit crops has increased from 4.0 million ha in 201-02 to 6.7 million ha in 2011-12 with corresponding increase in production from 43.0 to 76.4 million tonnes. A large variety of fruits are grown in India. Of these, banana, mango, citrus, papaya, guava, grape, sapota, pomegranate, pineapple, aonla, litchi, pear, plum, walnut, etc are important. India accounts for 13 percent of the total world production of
fruits and leads the world in the production of mango, banana, papaya, sapota, pomegranate, acid lime and aonla.

The leading fruit growing states are Maharashtra which accounts for 16.0 per cent of production followed by Andhra Pradesh (13.0 per cent), Gujarat (10.0 per cent), Karnataka (9.0 per cent), Uttar Pradesh (8.0 per cent), Tamil Nadu (7.0 per cent) and Bihar (5.0 per cent) altogether contributes for about 68.0 percent of the total fruit production in the country. Banana is the major fruit accounting for 35 per cent of total production followed by mango (4.0 per cent), citrus (11.0 per cent), papaya (6.0 per cent), others (17.7 per cent) in the country.

India has higher national average productivity in banana and sapota compared to world average productivity, while in citrus, mango, apple, guava, pineapple, papaya; India has substantially low productivity in comparison to the world average. Mechanization, diversification and commercialization of agriculture resulted in shifting of cropping pattern from traditional crops to new crops, which had contributed to the increased area and production under Mango. Changing demand pattern also contributed significantly to shifting of more area under production of mango.

**Botanical Name of Mango and Its Cultivation**

The Mango, Mangifera indica L, which belongs to the family of Anacardiaceae, is one of the most important tropical and subtropical fruits of the world and is popular both in fresh and processed forms. It is called as the king of fruits on account of its nutritive value, taste, attractive fragrance and health promoting qualities. In many languages it is called the mother of all tropical fruits and is the national fruit of India. Mango has
been in cultivation in Indian subcontinent for well over 4,000 years and has been the most favorite fruit since ages. Historical facts revealed that mango was introduced to India archipelago from the main land. The mango (*Mangifera indica*) is native to Asia, occurring from northern India to the Malay Peninsula.

**Mango in Sanskrit Scriptures**

Mango has been portrayed in the ancient paintings and sculptures, Hindu folklore and mythology, legends and in the sacred Sanskrit scriptures dating back to 2000 BC. Mango continued to be grown as a seedling tree until the establishment of the Moghul rule in India. During the Moghul period seedling trees were designated as distinct varieties and attempts were made to promote vegetative propagation. Akbar, the great Moghul emperor (1556 to 1605), planted mango orchards of 0.1 million trees near Darbhanga in Bihar. This was the time when mango actually got royal patronage. In India the first systematic record of varieties of mango was available in “Ain-e-Akbari”, the biography of Akbar, AD 1590, by Abul Fazl. However, mango orchard remained the prerogative of the “Rajas and Nawabs” for a very long time. Mango cultivation has now been taken up commercially.

**Important Characteristics of Mango**

The mango tree is a large branched perennial tree with height of 30- 40 m and a crown radius spreading about 10 m. The flowers are produced in terminal panicles of 10-40 cm long and each flower has 5 petals of 5-10 mm long. After flowering, the fruit, which is a drupe, takes three to six months to ripe. The Mango fruit varies considerably in size, shape, color, presence of fiber, flavor, taste and several other characters.
The shape of the fruit varies from round to ovate-oblong or longish, with the length ranging from 2.5 to 30 cm in different varieties. The weight of mango goes up to 2.5 kg for some varieties. However, the average size of mango available in India marked weighs about 200-350 grams. The ripe fruit is yellow, orange or red in color; usually reddish on the side facing the sun. Mango is well adapted to tropical and sub tropical climates. The ideal temperature ranged for mango is 240 to 300°C during the growing season, along with high humidity. A rainfall ranging from 890 mm to 1015 mm in a year is considered to be ideal for growing mangoes. Dry weather before blossoming is conducive to profuse flowering. Mangoes, ripe or unripe, are widely used as a fresh fruit. It is also used to make juice, milk shake, pulp, jam, jelly, pickle, and chutni. Ripe mango is often cut into thin layers, desiccated, folded and then cut and sold as mango chewy bars. Pieces of the fruit can be mashed and used in ice-cream. Dried unripe mango, mainly amchur is used as a spice in India.

Global Mango Production and Trade

The total global area under mango is 43.69 lakh ha and the global production is to the tune of 312.51 lakh tonne. India ranks first among world’s mango producing countries accounting for about 46 per cent of the global area and 40 per cent of the global production. Other major mango producing countries with their percentage share in the global production include China (11.8 per cent), Thailand (5.8 per cent), Mexico (5.4 per cent), Pakistan (5.1 per cent), Indonesia (4.5 per cent), Brazil (4.3 per cent), Philippines (3.2 per cent), Nigeria (2.6 per cent) and Egypt (1.2 per cent). Worldwide production is mostly concentrated in Asia, accounting for 75 per cent of the global production. The world trade in
mango consists of an export of 9.29 lakh tonne valued at 6189.17 lakh US$ and imports to the tune of 7.93 lakh tonne estimated at 7592.35 lakh US$. Among internationally traded tropical fruits, mango ranks only second to pineapple in quantity and value. Major markets for fresh and dried mangoes are Malaysia, Japan, Singapore, Hong Kong and the Netherlands and canned mangoes are Netherlands, Australia, United Kingdom, Germany, France and USA.

Southeast Asian buyers consume mangoes all year round. Their supplies come mainly from India, Pakistan, Indonesia, Thailand, Malaysia, Philippines, Australia and most recently from South Africa. Within international trade, fresh mango is one of the main products. It possesses a fifth place on total fruit crop production globally, accounting for over one-third of the worldwide production on tropical fruits. Mangoes are grown on all continents; at least 87 countries were involved in mango production by the year 2000. Around 25 million tons have been grown in 2000 of which three-quarters in Asian countries. The total world production of mango was 255.63 lakh tones in the year 2003-2004. The major mango producing countries in the world are China (34.13 lakh tones), Thailand (17.50 lakhs tones), Mexico (15.03 lakh tones) and Pakistan (10.36 lakh tones).

Mango accounts for more than one third of total area under fruit crops and about 20 per cent of total fruit production in 2008-09. It is commercially grown in about 83 countries in the world. The total world production during 2010 was estimated at 34,750 thousand MT where India enjoys the top slot (13,056.22 thousand metric ton) followed by China (4,657.42 thousand MT), Thailand (2,222 thousand MT), Mexico
(1,925.15 thousand MT). When compared to world average yield (7,202 kg per hectare), India’s productivity (7065 kg/ ha in 2010) is low. Brazil ranks first in productivity (12,394 kg per hectare).

**Current Mango Production Situation in India**

Mango, called the king of fruits in India, was chosen as the product for the case study. It accounts for 40 percent of the national fruit production in the country and 42 percent of the country’s land under fruit cultivation. India is estimated to account for about 60 percent (9.5 million tonnes) of the world’s mango production of 15.7 million tonnes. In terms of exports, India exported 79,060.88 million tonnes of fresh mangoes, with a value of P141.93 crore (US$31.48mn) in 2006-07. Further, West Bengal is one of the top-ten mango producing states in India, which constitutes 22.3 percent of the total fruit production in the state during 2005-06. Mango (Mangifera indica Linn) is the most important fruit of India and is known as “King of fruits”. It is estimated that mango is cultivated in the largest area i.e. 2,312 thousand ha and the production is around 15.03 million tons, contributing 40.48 per cent of the total world production of mango. It is interestingly noted that out of the total mango production in India, 23.86 per cent of mango production are from in Uttar Pradesh 22.14 per cent in Andhra Pradesh, 11.71 per cent in Karnataka, 8.79 per cent in Bihar, 6 per cent in Gujarat and 5.09 per cent in Tamil Nadu. Other growing states include Goa, Kerala, Madhya Pradesh, Punjab, West Bengal, and partially in Haryana, Orissa and Rajasthan (APEDA, 2000). The total area under mango cultivation is estimated to be 1,283,030 hectares with an estimated annual production of 10,810,957 metric tonnes (MTs).
Export of Mangoes from India

India is the largest producer of mangoes in the world, producing over 65 per cent of total world production. India exports fresh mangoes to over 50 countries. The major importers of fresh Indian mangoes are Gulf countries such as the UAE, Saudi Arabia, Kuwait, Bahrain, Qatar and Yemen. Other countries such as Bangladesh, the United Kingdom (UK), France, Belgium, Germany, the Netherlands, Spain, Israel, Singapore, Sri Lanka, Malaysia, Hong Kong and China, Canada and the United States are also important markets. UAE, Saudi Arabia, Kuwait, UK, Bahrain, Qatar, Bangladesh, Singapore and Malaysia together account for 97.17 per cent in total exports of fresh mangoes from India.

Progress in Mango Pulp Exports

India has exported fresh mangoes and its pulp to the tune of Rs 127 crores and Rs 510 crores, respectively in 2007-08. Share of Mango pulp in agri-exports increased from 0.48 to 0.96 per cent during 1995-96 to 2007-08. In the total processed fruits and vegetables export, the quantity share of pulp exports increased from 18.62 per cent to 21.52 per cent. In value terms the share increased from 17.12 per cent to 20.8 per cent. Annual growth rate of Mango pulp export was 16.03 per cent during 1993-94 to 2007-08.

Mango Production and Trade in Tamil Nadu

Mango is one of the trinity of fruits in Tamilnadu and is a seasonal one. It is generally grown under rain-fed conditions in the state. The area under the crop during 05-06 is 125104 ha it has increased to 170105 ha in 2012-13 in the State. Tamil Nadu accounted for 4 to 5.6 per cent of the total Indian mango production in recent years. The number of farms in
Tamil Nadu was 7,858,887 in 2000 with an average farm size of 0.89 ha; the vast majority was small scale farms. Since the mid-nineties an expansion of the area under mango cultivation was recorded to the double by 2005-2006, in the same time span productivity was lowered by 27 per cent and this resulted in a total production increase of 50 per cent in 2005-06. As results, the total production of mango recorded in 1058676 MT in 2012-13 with average productivity of 6.22 per cent.

Mango is generally grown all over the state and concentrated specifically in the districts of Krishnagiri, Dindigul, Vellore, Tiruvallur and Dharmapuri that together accounted for 63.9 per cent of the total area under this crop during 2012-13. In Krishnagiri district, the total areas under mango cultivation accounted for 40594 ha with the total production of 373541 MT tonnes and the productivity capacity recorded at 9.20 tonnes per ha whereas the Dharmapuri districts accounted for 11737 ha of mango production with total production of 87427 MT tonnes per ha and the productivity recorded at 7.45 tonnes per ha. As regards to mango production, the total area recorded at 18153 ha Dindigul districts with the total mango production of 94076 MT tonnes and the productivity was 5.18 tonnes per ha.

As far as the thiruvallur district is concerned, the area of mango production was 12685 ha and production recorded at 32302 MT tonnes with productivity of 2.55 tonnes per ha while in Vellore district, the area of mango production covered at 15863 ha and the production was 90629 MT tonnes with average yields of mango wa 5.71 tonnes per ha. As consequences the share of mango production to total, the Tamil Nadu has significantly contributed from the various states.
Mango Varieties

**Alphonsa:** This is the leading commercial variety of Maharashtra and Tamil Nadu state and one of the choicest varieties of the country. The fruit of this variety is medium in size, ovate oblique in shape and orange yellow in color. The fruit quality is excellent and keeping quality is good. It has been found good for canning purpose. It is a mid season variety.

**Banganpalli:** It is a commercial variety of Andhra Pradesh and Tamil Nadu and also known as Chapta, Safeda, Baneshan and Chaptai. Fruit is large in size and obliquely oval in shape. The color of the fruit is golden yellow. Fruit quality and keeping quality are good. It is a mid season variety and is good for canning.

**Bangalora:** It is a commercial variety of south India. The fruit size is medium to large, its shape is oblong with necked base and color is golden yellow. Fruit quality is poor. Keeping quality is very good. It is widely used for processing. It is a mid season variety.

**Neelum:** This is a commercial variety indigenous to Tamil Nadu. It is an ideal variety for transporting to distant places owing to its high keeping quality. Fruit is medium in size, ovate oblique in shape and saffron yellow in color. Fruit quality is good and keeping quality is very good. It is a late season variety. These varieties are predominantly grown in the studied area.

**Problems of the Study**

India is the largest producer of mango in the world, contributing to nearly 46 per cent of the total world production. India has a periphery over other countries when it comes to mango production. India has the right soil, climatic condition and other required resources to produce mango. In
fact the Indian ‘Alphonso’ is the most sought after fruit in the world – known popularly as the ‘king of all fruits’. Despite all this mango growers of India are facing crucial challenges including high cost of production, non-availability of labourers, middle men menace, huge post harvest loss, lack of support by the concerned nodal bodies, poor profitability and seasonality of the processing activity. It had resulted to face the marketing problems. Main causes for ill growth of this industry include: non availability of right varieties of mangoes, lack of necessary infrastructure; lack of cooperative effort amongst processing community; and lack of integration of all the activities starting from farm gate till final consumers. Mango is a biennial bearer. The tree gives good yield in the first year, which slightly declines in the ensuing year. Because of severe water shortage and successive monsoon failure it lost a major portion of their crop.

To overcome this problem, they thought of planting alternative crops, which would require less water unlike rice and decided to plant mango in his field. Traditional planting method, poor management of the orchard, low or no use of plant nutrients, improper irrigation or no irrigation, use of low yielding old varieties, problems of alternate bearing of mango trees, etc are some of the important reasons of declining mango productivity in the country. There is a lack of adoption of proper harvesting techniques among the mango farmers. Therefore they have to be trained to adopt the proper methods of harvesting. There is a shortage of cold storage to store mango. The main weaknesses include a lack of marketing, low innovatively produce, few processing varieties. To sum up, when the mango growers face these problems it will discourage to
increase the mango production at large scale. To concentrate on a few of the issues, the study provides importance to explore the problems of mango growers, mango processors and exporters.

**Significance of the Study**

Chand (1994) argues that production of fruit orchards like citrus and mango is distinguished annual crops by the long gestation period, an extended period of outflow and varying stages of productivity over the lifetime. Therefore it is more difficult to determine the economics of mango production as compared to the annual crops. A large variety of factors influences the economics of mango production but the main factors are yields, prices and cost production. These factors are also influenced by other variables like soil, climates and market conditions. In India a little research work has been conducted on finding out mango production. Farmers and other individual know very little about the growing of mango production. Therefore the farmers need information regarding investment and returns from fruits gardening business.

The role of horticulture crops should not be undervalued in the development of process as they generate more employment and income. Major horticulture fruit crops viz., mango, banana, papaya, grapes, citrus, guava, apple and pineapple are very important in economic development, as they are economically and politically associated. Horticulture continues to be the major source of income for most of the population, and crucial dependence of its rural labour force on vulnerable agriculture less likely to reduce in the near future. The growth of the Mango production in Tamil Nadu will bring large benefits to the people by way of employment and income. Economics is the major consideration for the farmers while taking
a decision regarding the adoption of a new technology, hence the cost of cultivation, gross income, net income and benefit cost ratio were computed for different treatments. An economic analysis detailing variable, fixed and capital costs, including a gross margin sensitivity analysis. The study attempts to examine the performance including the growth and instability of important fruit crops in the light of shrinking resource base and risky horticulture. Keeping in views the importance of mango in terms of areas, production and foreign earnings from the export, the present study aims at determining the cost of production and profitability of growing an orchard.

OBJECTIVES OF THE STUDY

The present study was taken up with the following specific objectives.

1) To analyze the growth patterns in area, production and productivity of mango in India and Tamil Nadu.

2) To investigate cost of production, and returns per acre over the life time of mango trees.

3) To collect data on the socio-economic structure of mango cultivators in Krishnagiri and Thiruvallur districts

4) To identify the reasons for the choice of mango cultivation in Krishnagiri and Thiruvallur districts

5) To examine the techniques for improving mango production in the study area.

6) To identify the constraints of mango cultivation and suggest remedial measures.
HYPOTHESES OF THE STUDY

The study has been formulated the following hypotheses on the basis of specific objectives.

1) There is a direct relationship between area and productivity of mango production.

2) The export of mango products are positively correlated to the Gross Domestic Product in India.

3) The cost of production of mango cultivations are negatively correlated to the export of mango.

4) Literacy Rate is significant related to the awareness of mango production.

5) Higher level of participation in mango production and lower level income earned by the sample respondents.

Methodology

Data Collection

The study is based on both primary and secondary data. Secondary data was collected mainly from published sources of State Governments, Government of India. Publications from Agricultural and Processed Food Products Export Development Authority (APEDA), Annual Reports of National Bank for Rural Agricultural Development (NABARD) National Horticulture Board (NHB), Department of Marketing and Directorate of Economics and Statistics (DoES), State Governments, Websites of different organizations and institutions were made use of. Information was also obtained from nurseries, Farmers’ Clubs, Mandis, Mango Growers Associations and transport agents. Statistics were compiled from other input suppliers, units involved in postharvest handling.
Primary data was collected through direct interview method using pre designed survey schedules/structured questionnaires. The actual investment cost for establishment of the orchard was collated items wise from the sample farmer. Such items include land preparation, pitch digging, blasting cost of plant, propping, compost, fertilizers, chemicals, irrigation, fencing around the orchard, watch and ward, etc. The expenses incurred during the initial five years of plantation were taken in the investment cost. Annual maintenance cost included all the cultivation expenses (paid out cost + imputed value of inputs, including family labor). Availability of planting materials and other inputs was ascertained from progressive farmers, nurseries, inputs agents, research centers and government departments. The package of farming practices was also confirmed from the research centers and Agriculture Departments as also infrastructure for post-harvest management of mango.

The data on prevailing practices, constraints and the scope for processing of mango were ascertained from a few food processing units. The marketing cost data covering plucking, packaging, transport to the market, market fee, etc. were obtained from farmer. These details were also cross checked with the information gathered from the transport operators and commission agents.

Some of the wholesalers/commission agents purchased good quality mangoes for exports directly from farmers while a few of them were engaged in graded mangoes for exports by purchasing the same from the markets. Such exporters were interviewed for ascertaining
various costs, formalities, quality norms and price realized by them. The
data on requirement of bank credit for mango cultivation and its
availability was ascertained from bank branches and controller of some
banks. The views of District Development Manager (DDMs), NABARD
and the Lead District Manager (LDM) of the respective districts on credit
related matters were also considered.

**Sampling Design**

In Tamil Nadu, production of mango is concentrated in some of the
districts like Krishnagiri, Dharmpur, Salem, Theni and Thiruvallur districts.
This study is based on multi-stage proportionate random sampling
method. In the first stage, With a view to harnessing the growth and
export potential of mangoes produced in the districts, **Krishnagiri** and
**Thiruvallur** districts as the sample districts are purposively chosen, since
they are predominantly occupying considerable size of areas of mango
cultivation in Tamil Nadu where the there are significant variations in the
mango production and exports. In the second state, two taluks were
selected from each sample districts viz., Pochampalli and Uthukkotai and
the total samples were collected from 295 in Pochampalli taluk and 213
samples from Uthukkottai. These taluks have the highest acreage under
mango than other blocks of the district. At the third state, six villages
were purposely selected based on the area under mango. The details of
the selection of the sample respondents are presented in Table.I.1. A
sample of 508 mango cultivators was selected randomly from the
identified six villages. The three sample villages were selected from each
taluks viz., Bommepalli, Keelkuppam and veeramalai from the
Pochampalli taluk and Alapakkam, Perandur, and Thimmaboopalapur
from Uthukkottai taluk. According to the Primary Census Abstract, 2001, out of the total cultivators in sample areas, 16 per cent of sample respondents have been taken as sample respondents in the study areas.

Table I.1. Details of Selection Sample Villages

<table>
<thead>
<tr>
<th>Name of the Villages</th>
<th>Name of the Taluk</th>
<th>Main Cultivators</th>
<th>Sample Cultivators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pochampalli-Taluk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bommepalli</td>
<td>480</td>
<td>77</td>
<td></td>
</tr>
<tr>
<td>Keelkuppam</td>
<td>595</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>Veeramalai</td>
<td>770</td>
<td>123</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1845</strong></td>
<td><strong>295</strong></td>
<td></td>
</tr>
<tr>
<td>Uthukkottai-Taluk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alapakkam</td>
<td>490</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>Perandur</td>
<td>209</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Thimmaboopalapuram</td>
<td>635</td>
<td>102</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1334</strong></td>
<td><strong>213</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3179</strong></td>
<td><strong>508</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Primary Census Abstract, 2001, Note: Number of Cultivators

It is mentioned that out of the 480 main cultivators, 77 mango cultivators were selected from Bommepalli village, of the 595 cultivators, 95 mango cultivators were purposely chosen from Keelkuppam village and 123 mango cultivators were selected from Veeramalai village among the 770 cultivators. It is contrast to that of the 490 cultivators, 78 mango cultivators have been selected from Alapakkam village, 33 respondents selected from Perandur villages and 102 samples were chosen from the Thimmaboopalapuram. In order to give equal proportion to all the sample villages, the sample respondents have been chosen according to the concentration of the cultivators in the sample areas.

**Statistical Tools**

The study has been used suitable statistical tools in order to test the primary data and the data have been analysed with the application of appropriate statistical models. These include ratio analysis, diagrammatic
representation, descriptive statistics, t-test, Chi-square test, ANOVA, Benefit Cost Ratio (BCR) and regression model.

**Limitation of the Study**

The main intention of the study is to examine the socio economic conditions of mango growers in study area. For this purpose, data regarding area under details of area of mango production, productivity, cost and marketing information of mango have been gathered from the sample mango cultivators. These data are expected to be accurate based on which the analysis is done. Moreover, the sample mango growers were not quite forthcoming in providing data regarding their occupation, income and employment etc., for obvious reasons and the study is not covered with technical aspects of mango production. Time and monetary factors constrained, the study are not able to cover all the variables which related to the sample households, it covers only economic views of the households.

**Chapter Outline**

The scheme of thesis will divided in seven chapters.

The **first chapter** deals with introduction, problems and constrains facing in the mango production in India and rest of the world, significance of research work, choice of study area, objective of the study, hypotheses of study, source of data and information as well as methodology limitations of the study and chapter outline of the research work.

The **second chapter** assesses the existing detailed studies which related to the mango production, marketing, exports and constrains, and socio and economic background of the mango growers. It includes area of mango production and productivity, cost and benefits, marketing, and
constrains of mango production. It also covers education occupations, employment and income of the respondents. The chapter also covers the local, national and international studies.

The third chapter focuses role of mango production in economic development in India and the world economy.

The fourth chapter deals with profile of the study area. It includes the socio and economic conditions of the sample districts of Krishnagiri and Thriuvallur districts and also includes the sample areas of the study.

Fifth Chapter is concerned with the analysis of the sample respondents who have undertaking the mango production in the study areas. It also discusses socio-economic characteristics of the sample households inclusive of their housing characteristics. The aspects covered are the demographic and general characteristics of the sample households, economic condition of households, housing conditions with respect to various facilities, education and cultural interests. It also estimates the occupation and income changes due to cropping patterns.

The factors determining of economic mango production in the sample areas have been discussed in the Sixth Chapter. It analyses the total area of cultivation of mango trees, total production, yields, cost of production, and management of orchards. The chapter also examines the reasons for the increase the demand for the mango production and exports in the international market and also analyse income and employment status of the respondents.

The final chapter ends with the summary and the finding of the study. It also gives valuable suggestion to improve economic conditions of the mango cultivators.