

CHAPTER-1
INTRODUCTION

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Agriculture is the mainstay of Indian economy as about 65 percent of Indian population depends directly on agriculture. India needs to support 17 per cent of the population with only 2.3 percent of the geographical area and 4.2 percent of the water resources. The net sown area is 140 million hectare and gross cropped area is 192.2 million hectare. Agriculture development is a necessary condition for the over-all development of the economy. A progressive agriculture has potential of achieve constant economic growth. It helps in achieving the developmental goals of eradication of poverty and modernization of society. The development of agriculture seems to hold the key progress to our economy as a whole. India's food grains production has increased from 94.9 million tonnes to 205.2 million tonnes in the almost four decades 1971 to 2009. The production of the food grains is possible with the Agricultural Strategy applied in 1966-67 and also some economic reforms in the country.¹

There is uneven growth of food grains since independence across different states of India during the period 2002 to 2011, the three states; Uttar Pradesh, Madhya Pradesh and Punjab altogether had, on an average, produce 42% of the total food grains production of the country. Only five states have exceeded their food share production. Moreover, impressive growth of food-grains and agricultural output has profound implications in terms of rural income and employment generation.

1.1) Growth of Indian Economy

During the 1980s, the process of diversification produce fast growth in non-food grains such as fishery, milk, vegetables and fruit which also helps to accelerated agricultural growth. The

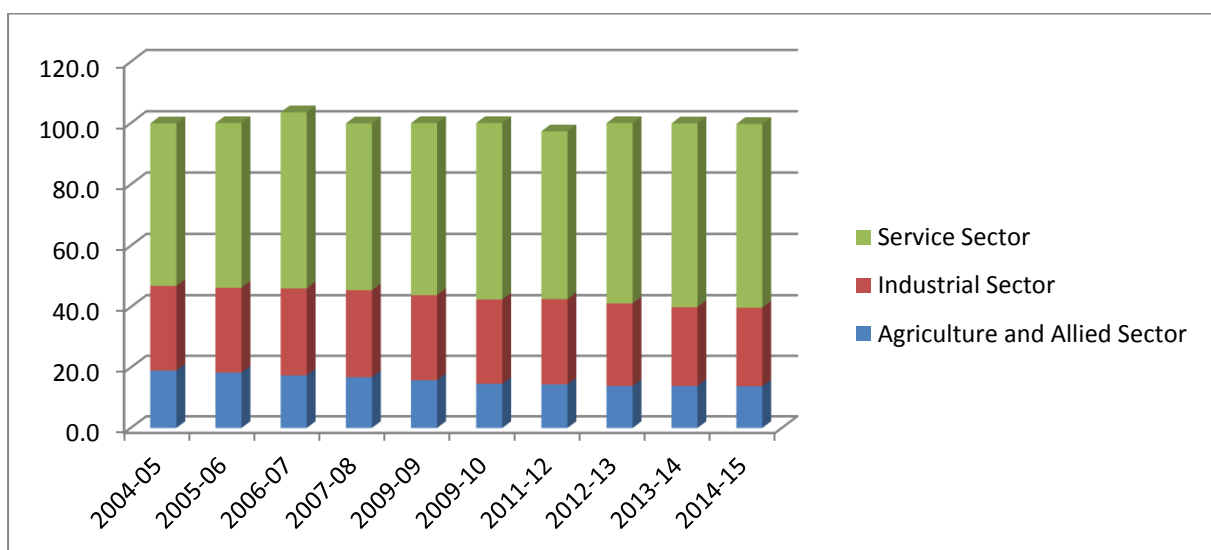
¹ Chaterjee, T. (2014). Spatial convergence and growth in Indian agriculture: 1967-2010. *Indira Gandhi Institute of Development Research* , 1-24.

GDP of agriculture increased annually at more than 3 percent during the 1980s which was considered a reasonably satisfactory performance of this sector. But this pace of growth in agriculture sector couldn't be maintained subsequently during the process of economic reform. During 1991, the country initiated economic restructurings that focused on extensive changes in regulations, policy on fiscal as well as trade, exchange rate, and private sector participation, government controls and market interventions.

The contribution of agricultural sector to GDP has declined over the years, whereas other sectors, particularly services, as increased. Agriculture sector contributes almost 17.2 percent of India's GDP, while the secondary sector contributes almost 26.4 percent of GDP and provides employment to about 14 percent of the population during the period 2015-16. The tertiary sector contributes almost 57.2 percent of the nation's GDP, employing about 34 percent of the population during the period 2015-16. The agriculture slowdown may seriously impede the employment generation and poverty alleviation in India (Mellor, 2000, and Singh, 2003).

1.2) Sector wise Shares in GDP of India

Figure 1.1 Sector wise Shares in GDP of India (2004-05 to 2014-15)



Source: Central Statistical Organisation

Figure 1.1 shows the share of agriculture & allied Sector in the GDP has also decreased from 19.0 percent in 2004-05 to 13.8 percent in 2014-15 whereas the share of services has increased from 53.0 percent in 2004-05 to 59.9 percent in 2014-15. Industrial sector decreased from 27.9 percent in 2004-05 to 26 percent in 2014-15.

The area under food grains is recorded to be 41.34 lakh hectares in 2016-17 as against 41.36 lakh hectares in 2015-16, showing a marginal decline of 0.05 percent .The total production of food grains in 2016-17 is estimated at 156.85 lakh tonnes while it was 143.78 lakh tonnes in 2015-16 showing an increase of percent. However, since the early 1990s, liberalization and globalization have become core elements of development strategy of the government. “These measures would create a potentially more profitable agriculture, which would be able to bear the economic costs of technological modernization and expansion” (Singh, 1995)². The reforms have been improved terms of trade in favour of agriculture but growth in agricultural sector has been fallen short of targets and has been well below that of non-agricultural sectors and the gap between rural and urban incomes has been widening.

1.3) Growth of Agriculture & Allied Sectors of India

Economic growth is related to a quantitative sustained increase in the country’s per capita output or income accompanied through expansion in its labour force, consumption, capital, and volume of trade. The growth of GDP agriculture sector was decreased with 5.10 percent in 2004-05 and 4.75 percent in 2014-15, whereas, overall GDP was 9.50 percent in 2004-05 and 4.71 in 2014-15. Performance of agriculture also provides employment and food security in India. Agriculture sector provides employment about 52 percent workforces. All India compounded annual growth of employment was 1.6 percent. Annual growth of employment

²Singh(1995), The Interaction between social protection and agriculture, *Indian Journal of Agricultural Economics* .

was highest in Punjab with 2.6 percent and lowest in Haryana with 0.6 percent in comparisons to India during the same period.

	Land	India rank in world production
Arable land (in million hectare)	151	2
Irrigated Land (in million hectare)	55	1
Wheat (in million tonnes)	72	2
Rice (in million tonnes)	124	2
Coarse grains(in million tonnes)	29	3
Milk (in million hectare)	91	1
Fruits (in million hectare)	47	2
Vegetables (in million hectare)	82	2
Edible oilseeds	25	3
Pulses (in million tonnes)	15	1
Sugarcane (in million tonnes)	245	2
Tea (in million hectare)	85	1
Source : Ministry of Agriculture, Government of India		

The table 1.1 shows area and production of different agriculture products along with its India's rank in the world population. India total arable land is 151 million hectare where its rank is 2nd and data shows that India stands at 1st rank on Irrigated land production. India's stand on 1st rank in the production of milk, pulses and tea worldwide where its total area for these commodities is 91, 15 and 0.85 respectively. On the other hand for India is at 2nd rank in the production of wheat, rice, sugarcane and cattle in the world. Total area under the production of fruits is 47 hectare and areas under production of vegetables are 82 hectare with 2nd rank.

Table 1.2 Production of principal food grain crops in India (Million tonne)						
Years	2004-05	2010-11	2011-12	2012-13	2013-14	2014-15
Rice	83.10	96.00	105.30	105.20	106.70	104.80
Wheat	95.00	120.00	127.30	123.30	127.10	118.10
Total cereal	185.20	226.30	242.20	238.20	245.80	235.50
Pulses	3.10	18.20	17.10	18.30	19.30	17.20
Total food grains	198.40	244.50	259.30	257.10	265.00	252.70
Oilseeds	243.50	324.80	298.00	309.40	327.50	266.80
Source: Ministry of Agriculture, Government of India						

The table 1.2 shows production of food-grains crops in India. Production of rice is increased 83.10 to 106.70 lakh million tonne between 2004-05 to 2013-14. Production of wheat and total cereal also increased between 2004-05 to 2013-14. Production of pulses increased 3.10 lakh million tonne to 19.30 lakh million tonne between 2004-05 to 2013-14; it was decreased by 17.20 lakh million tonne during 2014-15. Total food grains production increased 198.40 to 265 lakh million tonne during 2004-05 to 2013-14.

1.3.1) State-wise production of principal food grains & non food grains crops

Total food grains production of Haryana was 16293 thousand tonne during the period 2015-16 which is 15236 thousand tonnes higher than that of the last year production. Production of rice was 4145 thousand million tonnes, 11352 thousand tonnes. Oilseeds production during 2015-16 was 855 thousand tonnes, sugarcane production is estimated at 7169 thousand tonnes and cotton production is recorded at 993 bales (170 kg. each bale).

The share of rice production is higher in Andhra Pradesh, Punjab, Uttar Pradesh, and West Bengal with 12.1 percent, 9.2 percent 12.5 percent and 14.7 percent respectively among the all states during the period. The share of wheat production was noted in Haryana, Punjab and Uttar Pradesh with 11.5 percent, 20.4 percent and 33.4 percent respectively. The higher share

in crop pulses was in Maharashtra, Madhya Pradesh and Uttar Pradesh. Whereas the higher share in food grain production was noted by, Andhra Pradesh, Madhya Pradesh, Punjab and Uttar Pradesh among the all states with 16.3 percent, 8.3 percent, 11 percent and 19.6 percent respectively.

The cotton and sugarcane are important cash crops in the nation recorded positive but broad disparity compared to other crops. The Gujarat, Maharashtra and Punjab were recorded highest share in cotton production with 22.8 percent, 20 percent and 14 percent. These three states were producing 67 percent production out of total cotton production. The Uttar Pradesh, Andhra Pradesh, Maharashtra, and Tamilnadu were recorded higher percentage share in sugarcane.

1.4) Determinants of Agricultural Disparities

Regional disparities refer to unequal growth of primary, secondary and tertiary sectors in a nation, state or district. A number of factors are affecting the disparities such as market, agronomic conditions, and availability of fertile soil, irrigation facilities and climate conditions. Moreover, agro economic conditions and technical availability are the more important factors which facilitate crop disparities.

In this study, the most of the determinants responsible for disparities are included such as total cultivated area; annual rainfall, Irrigation facilities, and pesticides, fertilizers used per hectare, tractors and agricultures credit. Fertilizers are substances containing a chemical element that improves the growth of plants. Pesticides increased economic potential and also improved the vector-borne diseases, and it resulted the serious health implications to man and his environment. Most rain water is used in agriculture for crop production.

Three major channels for disbursement of formal credit include commercial banks, cooperatives and micro-finance institutions (MFI) covering the whole length and breadth of the country.

1.5) Concept of Agricultural Productivity

Agriculture productivity is a relationship between the quantity and quality of goods and services produced and the quantity of resources used to produce. (Prokopenko, 1987). The concept of productivity has two measurements: total factor productivity (TFP) and partial productivity. The total factor productivity is the relationship between output produced and an index of composite inputs; meaning the sum of all the inputs of basic resources particularly labour, capital goods and natural resources.

Krugman (1990) asserted that “productivity is not everything, but in the long run it is almost everything”.³

Productivity = total output/total input which is identical to total results achieved/total resources consumed or effectiveness/efficiency.

1.6) Profile of Haryana

The state of Haryana was a major contributor to the “HaritKranti”, so called “Green Revolution” which was a good merged of traditional and modern culture, situated in the northern part of India. Haryana is bound by Uttar Pradesh in the east, Punjab in the west, Himachal Pradesh in the north and Rajasthan in the south. The geographical area of the Haryana is 44212 sq k.m which is 1.34 percent of the total geographical area of India. At present there are only three rivers in the state the Yamuna, the Ghagar, the Markanda. The growth rate of agriculture sector in the State income grew after independence on this sector. Further, the green revolution took place in the State giving a major help to the growth of

³Krugman, P. (1990) “The Age of Diminished Expectations” MIT Press, Cambridge, Mass., p.9.

agriculture sector (Government of Haryana, 2013-14). Wheat, rice, cotton, bajra, maize, gram and jowar are the main crops of Haryana.

Population of Haryana was 25351462 persons in 2011. The relative share of rural population and urban population to the total population were 65.20 percent and 34.79 percent respectively for the year 2011. The density of population was 570 persons per sq. k.m. In the social indicators of the State in 2011, the birth rate in rural and urban areas was 22.6 and 19.2 per thousand while combined birth rate of rural-urban was 21.6 per thousand. Whereas the birth rate of rural and urban areas of India was 23.7 and 18.0 per thousands and combined birth rate of rural and urban were 22.1 per thousand. The literacy rate was 75.55 percent and separately for male and female literacy rate was 85.38 percent and 66.77 percent respectively which more is as compare to literacy of India. The infant mortality rate of the state is 42 per thousand as compared to 47 per thousand at India level. The sex ratio of Haryana was 879 females for per thousand males, which is lowest in the country

1.6.1) Physical Features of Haryana

Haryana can be divided into two regions, the plains and hills. The plains covers the entire state except the southern part of Mahendergarh district, the south western part of Gurgaon district and north – eastern part of Panchkula district. The arawali range is narrow ridge stretching into Haryana for 90 kms. In the northeast and south west directions up to Delhi. It covers the southern parts of Mahendergarh and adjoining areas of Gurgaon district. In the south western part of Haryana plains a great deal of wind blows and sands pile up in the form of sand.

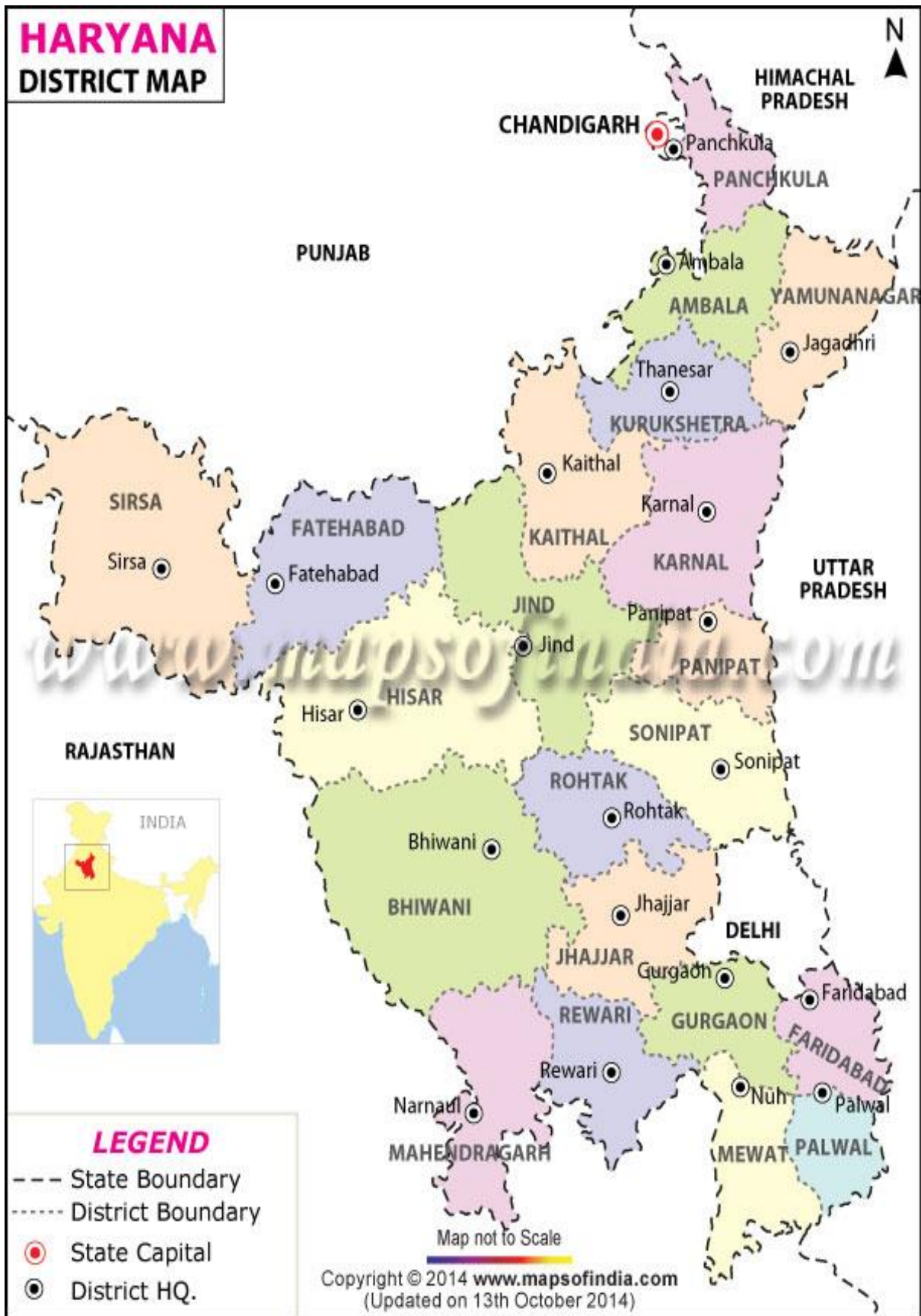
At the time of its formation, the state comprised seven districts named, Gurgaon, Mahendergarh, Rohtak, Hisar, Karnal, Jind and Ambala. At present there are 22 District, 93 Tehsils or 49 sub-Tehsils, 154 towns, 71 sub-divisions, 4 divisions (Such as Ambala, Gurgaon, Hisar and Rohtak), 140 blocks, 43 Universities, and 6841 villages with total areas of

44,212 square kilometres. According to census, it has a total population of 21,144,564. The literacy rate is 75.6 percent (84.1 percent male, 65.9 percent female).

Infrastructure in Haryana

- Roads: Length in the state is around 27000 km.
- Airports: The Indira Gandhi International Airport at New Delhi nearby Gurgaon and Faridabad. Civil aerodromes at Pinjore, Karnal, Hisar, Bhiwani and Narnaul and airport at Chandigarh.
- Power: According to economic survey of Haryana, 2012-13, the generation capacity is 8728.36 MW and total power available stood at 293744 MW
- Railways: As of March 2011, Haryana had a railway-route length of 1,540 km. Kurukshatra, Rohtak, Jind, Hisar, Ambala, Panipat, and Gurgaon are some of the important railway stations. There is a railway workshop at Jagadhari.

HARYANA DISTRICT MAP



1.7) Agriculture Economy of Haryana

Haryana is the one of the smallest state in India. Haryana state can be divided into four zones, northern, western, central and southern. Southern zone has better irrigation facilities and good overall infrastructure. Western zone is having major area under millet, rapeseed and mustard. This zone is suitable for arid –horticulture. Mewat area is more suitable for agro- forestry, sheep and goat rearing.

Sangwan (1985) reported that changes in the state cropping pattern resulted from increase in irrigation facilities to a large extent. The diversity in soil, agro-climatic conditions in addition of canal irrigation availability and infrastructure services across the sub-regions, it has a potential to cultivate variety of crops in the state.

Regions	Climate & Soil	Average rainfall	Average ground water quality	Districts	Crops
Arid (Western)	Hot and Arid with deserts with saline soil	350	>4000	Sirsa, Fatehabad, Hisar, Bhiwani, Mahendergarh and Rewari	Millet, Bareley, pulses, cotton*, maize, oilseeds, wheat, rice, sugarcane
Semiarid (Central)	Hot semiarid with alluvial soils	350-500	>1500-4000	Kathial, Jind, Rohtak, Jhajjar, Gurgaon	Wheat & rice with maize, cotton**, pulses, oilseeds and sugarcane
Semiarid (Eastern)	Hot semiarid with alluvial soils	500-600	<1500	Panchkula, Ambala, Karnal, Yamunanagar, Karnal, Kurukshetra, Panipat, Sonapat, Faridabad	Wheat & rice with maize, cotton, oilseeds and sugarcane
* not cultivated in Mahendergarh & Rewari districts ** not cultivated in Mahendergarh & Rewari districts					

1.8) Districts covered

This present study is based on the district wise and zone wise data from 19 districts for the 2000-01 to 2014-15. The newly created districts Mewat, Palwal and Charkhi Dadri have not been included due to non-availability of separate dates of these districts. The information of these districts is included within their parental districts.

1.9) Objectives of study

1. To analyse the regional disparities in agriculture growth in Haryana.
2. To analyse the regional disparities in agriculture determinants in Haryana.
3. To study the impact of agriculture inputs on agriculture production in Haryana.

1.10) Scope of study

The pattern of agricultural development in Haryana is characterised by several serious distortions mainly due to unequal distribution of assured irrigation facilities, infrastructure across districts and the spread of new seed-fertilizer technology. This has led the incensement inter-district disparity in the growth of agricultural output in state. Therefore, the district wise analysis may be useful in assessing the progress of agriculture and may thus provide a future perspective in the light of the past experiences.

1.11) Organisation of the study

This study is divided in to seven chapters .The details of the chapters are given below:

Chapter-1: Introduction

This chapter deals with the introduction of the topic, significance of study and objectives of the study.

Chapter -2: Review of Literature

This chapter included theoretical and empirical literatures related to the study.

Chapter-3: Research Methodology

This chapter included sources of data, statistical technique which were used in the study.

Chapter- 4: Regional Disparities in Agricultural Determinants in Haryana

This chapter analysed disparities in agricultural determinants in Haryana zone- wise and district -wise.

Chapter -5: Regional Disparities in Agricultural Growth in Haryana

This chapter regional disparities in agricultural growth with area production and productivity of selected major food grain and cash crops in Haryana district-wise and zone-wise.

Chapter -6: Impact of Agricultural Input on Agricultural Production in Haryana

This chapter analysed the impact of agriculture inputs on agriculture production in Haryana.

Chapter-7: Major Findings and Recommendations

This chapter discuss the major findings, recommendation and further research directions of study.