

Impact of Agricultural Price Policy on Oilseed and Pulse crop in Haryana

**BY
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CERTIFICATE – I

This is to certify that this thesis entitled, “**Impact of Agricultural Price Policy on Oilseed and Pulse crop in Haryana**” Submitted for the degree of “**Master of Science**” in the subject of **Agricultural Economics** to the Chaudhary Charan Singh Haryana Agricultural University, Hisar is a bonafide research work carried out by **Mr. Sandeep Kumar**, under my supervision and that no part of this thesis has been submitted for any other degree.

The assistance and help received during the course of investigation have been duly acknowledged.

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This is to certify that this thesis entitled “**Impact of Agricultural Price Policy on Oilseed and Pulse crop in Haryana**” submitted by **Mr. Sandeep Kumar**, to the Chaudhary Charan Singh Haryana Agricultural University, Hisar, in partial fulfilment of the requirements for the degree of “**Master of Science**” in the subject of **Agricultural Economics** has been approved by the Student's Advisory Committee after an oral examination on the same, in collaboration with an external examiner.

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CHAPTER-I

INTRODUCTION

Agricultural Price Policy in India powerfully arisen in the situation of food scarcity and price fluctuations incited by drought of mid-sixties and a war with Pakistan. The policy was to be bounded keeping in view four different viewpoints namely, (i) Providing food grains for the Public Distribution System, (ii) Guaranteeing reasonable (affordable to consumers) prices of food grains (iii) Prompting adoption of the new technology and (iv) maintaining buffer stocks.

In developing countries, where agriculture is very dominant, the agricultural prices conquer a basic position in the price structure. The most important step simultaneously taken with this was the innovativeness to change agricultural price policy to achieve the planned growth through price incentives. After independence, India continued with close-fitting war time controls on prices and movements of most of the essential commodities. In the case of agricultural commodities the controls included on movement of crops from open market purchases to rationing in almost all the states. It was in the situation of severe food scarcity during the sixties and the let-down of several schemes for food management that the Government of India appointed the LK Jha committee in 1964 to look under the whole inquiry of food management in India. Jha Committee's major contribution was the formation of Food Corporation of India (FCI) and the Agricultural Prices Commission (APC) in 1965.

The Agricultural Prices Commission was set up in January 1965. It guides to Government on price policy for agricultural commodities, with a vision to developing a balanced and integrated price structure in the economy. The policy framework was upgraded in 1980, when the importance was shifted to the balance between demand and supply of food grains. It was redirected in the revised relations of reference of APC (which was later renamed as Commission for Agricultural Costs and Prices) with a shift from maximizing the production to developing a production pattern consistent with the overall needs of the economy. (Acharya, 1997)

The Commission for Agricultural Costs and Prices (CACP) recommends Minimum Support Price (MSP) for 26 different agricultural crops, the most important of which are paddy, wheat, cotton, oilseeds and pulses. The main objectives of the policy provided remunerative prices for agricultural produce to the growers with a view to inspire high investment and production. The price policy has been a matter of argument since its beginning, with a general feeling that MSP favours only the food surplus regions like Punjab and Haryana states from where large stocks of grains are procured for public distribution

system (PDS) (Chand, 2003) Also, the price policy is measured to have preferred food crops more than the other crops (Singh et al., 2002). Broad objectives of the Agriculture Price Commission (APC) are to safeguard remunerative prices to farmers and affordable prices to consumers and encourage sustainable use of all resources towards socially desirable crop mix (Parikh & Singh 2007). During green revolution period, price incentives in the form of minimum support prices helps in India to increase food production. Minimum support prices (MSP) also for procuring food grains from food surplus states for distribution through public distribution system and maintaining buffer stock and thus fulfil the demand supply gap (Jha & Srinivasan 2006; Chand 2008). NAFED acting as the central nodal-agency of the Government of India for responsibility purchases of oilseeds and pulses under price support scheme. Agriculture plays an essential role in the economic development of a country. India will become self-sufficient in oilseeds and pulses in coming year with government taking steps to boost yield through use of better quality seed and technologies. It has been noted by Acharya (Former Chairman of the CACP) that “In fact, the instruments of minimum support prices, food subsidy and input subsidies have played an important role in achieving the objectives of food security and accelerated growth of the economy and benefits all the sections of the society” (1997).

Rapeseed and mustard is the key source of income mainly even to the marginal and small farmers in rain-fed areas. Thus this crop is cultivated mainly in the rain-fed and resource vulnerable regions of the country, their effect to livelihood safety of the small and marginal farmers in these regions are also very important. Indian mustard is mainly cultivated in the states of Rajasthan, Uttar Pradesh, Haryana, Madhya Pradesh, and Gujarat which contribute 81.50 per cent area and 87.50 per cent production.

Chickpea is an important pulse crop grown and consumed all over the world, mainly in the Afro Asian Countries. It is also one of the major pulse crops cultivated and consumed in India and also known as Bengal gram. In India, chickpea accounts for about 45 per cent of total pulses production. Similar the case of other pulses, India is the major chickpea producing country and contributing for over 75 per cent of total world chickpea production.

Total rapeseed and mustard area was 6074 thousand hectares and production was 7917 thousand tonnes in India during the year 2016-17. Total chickpea area in India was 9626 thousand hectares and production was 9378 thousand tonnes. During the year 2016-17, total area of oilseed was recorded 523 thousand hectares and production 984.70 thousand tonnes. Out of total oilseed area, rapeseed and mustard area was recorded 506 thousand hectares and production 946 thousand hectares in Haryana in the year 2016-17.

Total area of pulses was recorded 67.50 thousand hectares and production 46.4 thousand tonnes in Haryana in 2016-17. Out of total pulses area, area under the chickpea was

recorded 37.1 thousand and production was 46.4 thousand hectares in Haryana in the year 2016-17.

Movement of price is a common feature. But fluctuations in the prices of agricultural commodities have severe concerns on the economy of the country. As the sudden steep fall in the price of a particular crop, result in huge loss to the farmers producing that crop as their net return declines. This will force the farmers not to cultivate the crop next year, leading to a serious shortage in the supply of that food item and which leads to force the government to import that food crops from foreign countries. The large scale fluctuation in the price of agricultural produce will create a ruinous effect on the economy of the country.

Price policy of the government for agricultural produce pursues to confirm remunerative prices to growers for their produce in order to boost higher investment and production and also for protection the interests of consumers by making available food supplies at reasonable prices. In order to achieve this end, the government declares minimum support prices (MSPs) for major agricultural commodities in each season and also organises purchase operations through the Food Corporations of India (FCI) and cooperative and other agencies selected by state governments for the purpose. In order to maintain the interest of both producers and consumers a complete agricultural price policy must be properly framed out. This should be supported by keeping buffer stocks of agricultural commodities lengthwise with the wide network of public distribution system.

Keeping in view the above facts the present study was undertaken with following specific objectives

1. To study the trends in area, production and productivity of rapeseed & mustard and chickpea.
2. To estimate the seasonal variation in price and arrival of selected crops.
3. To study the gap between MSP and Farmer harvest price of oilseed and pulses.
4. To identify the constraints in production and marketing of rapeseed and mustard and chickpea.

CHAPTER-II

REVIEW OF LITERATURE

The review of literature functions as elementary material in selection of sample, evaluated the data, interpretation of findings and briefs the results under study. An attempt has been made in this chapter to review the literature concerning with the objectives of study which has provided plans to attain the work. The review of literature concerning to relate studies carried out in the past have been presented under the following sub-heads:

- 2.1 Trends in area, production and productivity
- 2.2 Seasonal variation in price and arrival
- 2.3 Gap between MSP and farmer harvest price of oil seed and pulses
- 2.4 Constraints in production and marketing of rapeseed & mustard and chickpea

2.1 Trends in area, production and productivity

Agarwal (1988) evaluated the trends of growth in Area, Production and Productivity of Oilseeds in Rajasthan. Result found that oilseeds production increased in the state with compound growth rate of 2.92 per cent per annum during the period 1956-57 to 1984-85, While the area was increased through this period was only 0.69 per-cent per annum. Area and production growth rates were significant for rapeseed- mustard, groundnut, sesame and linseed.

Choudhary *et al.* (2011). Conducted study on the trends in area, production and productivity of mustard in India. The growth rates in area and production of mustard have been highly significant indicating the popularity of the crop in India and ever growing demand from the industry prices multiple uses in the economy and diversified utility of mustard in the agricultural economy of India. The increased in the area of mustard may be due to increased demand for mustard in North India.. Increased in productivity might be credited to technology break-through in mustard with the release of high yielding varieties, utilization of proper arrangement of inputs and well field management practices. Production was increased both due to significant increase in area and productivity.

Meena and Hosamani (2012) conducted study on growth rates of area, production and productivity of mustard for the period, 1986-87 to 2007-08 in Alwar and SriGanganagar districts in Rajasthan. Analysis the growth rate for area has exposed significant increase of 2.49, 3.39. Rise in area in mustard crop may be due to shift in domain in favour of mustard due to its higher profitability. Production increased significantly as marked from the compound growth rate of 3.07, 6.08 per cent per in Alwar and Sri Ganganagar district. The

compound growth rate of production was analysed to be positive and significant. Production was increased both due to significant increase in area and productivity.

Sharma (2013) resulted that on the trends in area, production and productivity of food grain in India. Food grain crops in India are positive and statistically significant. The coefficients of variation for almost all crops are less than 0.322 per cent which shows that less risk is complicated in cultivation of food grain crops during the period under review.

Naidu *et al.* (2014) evaluated that the growth rate of area under groundnut and sesame have been negative at -3.23; -7.60 per cent respectively and was statistically insignificant indicating that the area of groundnut and sesame crops has been decreasing year by year. The area, production and productivity of groundnut and sesame have been decreasing during the study period from 1996-97 to 2011-12 in Andhra Pradesh. It is also find out that there is a negative growth is recorded under area oilseeds crops.

Devi *et al.* (2017) analysed the trend in production of total pulses crop in India for the period 1950-51 to 2014-15. In 2014-15, total production was 17mt and area was 23 mha with productivity of 753 Kg/ha. The trend in area of pulses was increasing from 1950-51 (19 mha) to 1990-91 (24 mha). But during 2000-01, trend was declined to 20 m ha, while in the next 10 years trend increasing with 26 m ha during 2010-11. The next four years (2011-12 to 2014-15), the area under pulses deceasing marginally from 24 mha to 23 mha. Further, the production and productivity of pulses was increasing over the year. In the year 1950-51, pulses production was 8.4 m tonnes and productivity of 441 kg/ha, however, production was increased to 17 m tonnes and productivity(753 kg/ha) during 2014-15.

Agashe *et al.* (2018) told the trend in area, production and productivity of linseed in Durg district. In the study period, trend in area was decreasing .In the year 1978-79, highest area (59.9 thousand ha) and in the year 1989- 90, lowest area (24.1 thousand ha). The highest production was recorded in the year 2002-03 (16.3 thousand tonnes), however, lowest production recorded in the year 1979-80 (2.1 thousand tonnes). The trend of productivity of linseed revealed that the highest productivity of 384 kg ha in the year 2002-03 and the lowest productivity of 58 kg ha⁻¹ in the years 1997-98.

Avinash and Patil (2018) conducted study on the growth status of pulses crop from 1980 to 2016 in Karnataka. In Black gram, in period-I (1980 to 1990), the positive growth rate of area 6.26 per cent and production 6.02 per cent, while productivity 0.03 per cent have negative growth rate. However, in period-II (1991 to 2016), the growth status of area, production and productivity was found negative. In relate to total pulses situation in Karnataka discovered that the growth rate in area, production and productivity were positive in all the period excluding productivity (-0.82 per cent) in period-I. The result shown that negative growth rates of productivity found but positive growth rates of production was found

in period -1. But in country growth status in area, production and productivity in all the period was positive.

Kumrawat *et al.* (2018) study conducted in Bharatpur region of Rajasthan. Result find out the area of mustard in the year 2001-03 i.e. 5.31 lakh ha and in the year 2005-07 i.e. 8.66 lakh ha. But in the year 2007-09, area was decreased 7.61 lakh ha but in the year 2011 to 13, area was increasing. In case of production (5.25 lakh tonnes) in 2001-03 but in the year production were doubled 11.85 lakh tones in the year 2009-11. However, production was decline during 2013-15. The productivity of the mustard increased in the year 2001-03 (1057.50 kg/ha) to 1587.5 kg/ha in 2009-11.

Maurya and Kumar (2018) conducted study on growth of chickpea production in India. The production of chickpea in the country has increase up from 3.65 to 9.53 million tonnes between 1950-51 and 2013-14, result out increase growth rate. During the period while the area also increase from 7.57 to 9.93 million ha, the yield also increased from 482 kg/ha to 960 kg/ha. This increasing trend in production and productivity of chickpea in India mainly cause was introduction to resistant varieties against different diseased and insects and pests, better management.

Nimbrayan *et al.* (2019) reported that the growth and trends of area, production and productivity of pulses in Haryana vis-à-vis India. Result shows the growth trends of area in Haryana were negative. In 1971-72, maximum area recorded while in 2015-16 lowest area under pulses. In 2012-13 Maximum production while in 2015-16 lowest production was resulted. During this period, compound growth rate of area and production were -5.56 and -4.51 per cent, thus result out decreasing in trend in pulses. Growth trends of productivity were positive in Haryana.

2.2 The seasonal variation in price and arrival.

Agrawal and Hariom (1990) reported that pattern of market arrivals and prices of rapeseed & mustard in Bharatpur district Rajasthan and find out seasonality in the arrivals of rapeseed and mustard in different season of the year. More than half of the total arrival reaches in the peak season when price are low. Farmers get well price delaying the sale of rapeseed and mustard from peak season to the mid and lean season. Result out that the level of arrivals in the mid and lean season, price level was increase. There was negative correlation between price and arrival.

Nahatkar *et al.* (1998) analysed price variation of cotton in kukshi regulated market of Dhar district of Madhya Pradesh from 1986-87 to 1996-97. The study discovered that in the second quarter (January to March) seasonal index of cotton prices was lowest and in the third quarter (April to June) was maximum. During first quarter (October to December), the coefficient of price variation resulted that price was higher, as buyers tend to attract more

cotton growers to sell their produce at lower prices. The variation in arrivals of cotton was observed to be higher than that of variations in prices.

Handiganur and Kunal (1999) reported trend in arrivals and prices of chickpea in major markets of Karnataka. Time for study was the period 1977-78 to 1996-97. The arrivals of chickpea had found continuous rising measure in all the markets, except Bhalki. The arrival indices were highest in month of (February to May) showing peak arrival period. There was temporal integration in Dharwad, Bidar and Bhalki markets with respect to price formation. Deviation was more in arrivals than prices, representing no integration of market with respect to prices.

Kaur *et al.* (2006) conducted study the price trend and seasonal indices for green pea for the period 1994 to 2003 in Punjab. The results shown that during peak period of arrivals, the prices were low and prices were high during lean period of arrivals. The price indices were recorded higher in the month (July to November) and lower in month (December to June) where lowest in the month (March).

Choudhary and Pawar (2010) evaluated the relationship between market prices and arrival of chickpea in Marathwada region of Maharashtra state. The study period was 1985-86 to 2004-05 and T markets selected for the study were Parbhani, Manvat, Hingoli and Akhadabalapur. The results saw the highest arrivals of chickpea in Hingoli and Akhadabalapur markets in the month of March. There were negative relationship between price and arrival of chickpea was detected in Hingoli market.

Naidu and Kumari (2013) reported the behaviour of arrivals and prices of castor in Kurnool and Adoni markets of Andhra Pradesh. Time period of study was 2004-12 (Kurnool) and 2007-12 (Adoni). The highest arrivals were detected in the months of October to December in Kurnool market, however highest arrivals were observed in Adoni market from September and October. The maximum seasonal variations in prices and arrivals were observed in the months of November and October in Kurnool market and maximum seasonal variations in prices and arrivals were detected as September and October in Adoni markets.

Vani and Srikala (2015) observed the trend in the arrivals of groundnut in different in Madhya Pradesh. The highest arrivals of groundnut in November and December in Adoni market, while highest arrivals in August in Badepalli and Gadwal markets. Lowest arrivals were exposed in July and August in Adoni market and January, May and April in Badepalli market. Highest seasonal index was observed in November and lowest seasonal index was in January in Adoni market. In Badepalli market highest seasonal index was in January, while the minimum seasonal index was in February.

Sharma and Burark (2015) examined the price behaviour of maize in Nimbahera market of Rajasthan. Study done for the period 2002 to 2013. The highest prices of maize

were found during off season i.e. April to August. The higher arrivals of maize were during month of October to January.

Meera and Sharma (2016) conducted study on prices of wheat in Sriganganagar district of Rajasthan from 2005 to 2014. In the result out all the selected markets displayed positive trend in prices. Highest Price of wheat was found during off season and lowest during harvest season. The arrivals were high in month of March to May. The price seasonal indices were higher during month of December to February during when arrival was being found low in market.

Bodade *et al.* (2017) had studied the market prices and arrival of wheat in the selected markets of Madhya Pradesh. Study conducted on data for the period 2004-2015. For the seasonal variation, moving average method was used. The results of the study exposed that the prices of wheat were higher in the months from March to August in all the selected markets of the state. The cyclical variation observed in the prices of wheat in the selected markets.

Sahoo and Singh (2017) reported the trend and seasonality in arrival and prices of Bengal gram for the period of 2003-2016. The observed significant and positive growth rate in the prices of Bareilly and Shujalpur markets, which was 0.78 and 0.49 respectively. But there detected insignificant and positive growth rate in arrivals which was 0.07 and 0.02 at 5per cent level of significance. The maximum seasonal indices during the month of May and June in both markets. Result find out, inverse relationship between prices and arrival of Bengal gram.

Suresh (2017) had accepted study on price behaviour major cotton markets of India i.e. Abohar, Adoni, Adilabad, Alkot, Mansa, Rajkot, Rama, Sendhwa and Sirsa. The monthly time series data on arrivals and prices were collected for the period 2005 to 2014. The results had shown a strong positive trend in prices of cotton in all selected markets. For arrivals of cotton, the peak period for arrivals of cotton was October to February and lean period was March to May. The prices of cotton during lean period remained relatively higher than peak period with few exceptions.

2.3 The gap between MSP and Farmer harvest price

Deshpande (2004) showed the relationship between farm harvest price (FHP) and minimum support price (MSP), wholesale prices (WSP). Result founded that in case of, MSP was higher than FHP. Likewise, there were equal chances that MSP was greater than WSP of the specific commodity. This specifies the failure of the price intervention tool worked through MSP, but also failed to safeguard the growers with the policy instrument. The correlation among minimum support prices and farm harvest prices was maximum in paddy crop, while minimum in other cereals and pulses.

Dev and Rao (2011) calculated that the increase in prices of wheat and rice were high in period 2000-01 to 2009-10 as compared to the previous periods 1981-82 to 1990-91 and

1990-91 to 2000-01. During 1981-82 to 2009-10, wheat prices for common variety increased from ₹ 580 to ₹ 1080, while rice prices increased from 510 to ₹ 1000. In 1990s the rate of increase in MSP of rice was lower than that of wheat. The annual changes shown that MSP increased significantly in the first few years after the reforms were introduced and again it increased largely during years 2006-07 to 2009-10. Wheat and rice prices have risen respectively by 54 per cent and 62 per cent during this period.

Ali *et al.* (2012) conducted study on the effectiveness of minimum support price (MSP) for paddy in different regions of India and in Punjab. Based on the secondary data covering from 1980-81 to 2006-07, the deviations of farm harvest prices (FHP) from the MSP find out as a measure of ineffectiveness. While in surplus producing states like Punjab and Andhra Pradesh, the MSP policy has been very effective, it has ineffective for the deficit states. In Punjab, the operative application of the price policy has assisted in improving the production and yield of rice.

Latika *et al.* (2012) analysed the pattern and inter-relationship of minimum support prices (MSPs), farm harvest prices (FHPs) and cost of production of selected cereals in Rajasthan during the period of year 1992- 2009. Farm harvest prices were extremely affected by minimum support prices declared by Government of India. This relationship between price and cost was high proportional for wheat and gram, while less proportional for bajra and maize crops. The minimum support prices categorically results the variations in cost of production of wheat and bajra crop, But minimum support prices reveals less proportional variation than variations in their cost of production of maize and gram. Farm harvest prices reveal the deviation in cost of production improved than the minimum support prices. Wheat measured as gainful crop, while maize as unprofitable crop grounded on the price-cost association.

Narayanamoorthy and Suresh (2012) observed that the trends in minimum support price for paddy and other crops. They examined that for minimum support price for paddy crop was increased from 39.82(₹/qtl) in the year 1965-66 to 1250(₹/qtl) in the year 2012-13, which was increase of 7.44 per cent per annum. With time periods, the increase in MSP for paddy crop was not uniform. During 1965-66 to 1985-86, it was 6.20 per cent per annum and during 1985-86 to 1995-96, it was 8.82 per cent per annum. During 1995-96 to 2012-13, it resulted to 7.16 per cent per annum.

Shayequa *et al.* (2012) evaluated data from 1980-81 to 2006-07 and the deviations of farm harvest prices (FHPs) from the minimum support prices (MSPs) was used as measure of ineffectiveness of price policy. The influence of prices policy on rice yield taken been observed by using the simultaneous equation model. The real operation of the price policy had helped in refining the production and yield of rice in Haryana state.

Verma *et al.* (2013) observed the wholesale prices (WHs) fluctuation of different raw and processed pulses. The study was founded out that maximum price variability in gram

14.49 per cent followed by field pea 12.49 per cent and moong bean 8.56 per cent. The average price differences between numerous dals were the maximum in pigeon pea 7.28 per cent, followed by urd bean, mung bean and lentil 4.65 per cent, 4.44 per cent and 0.17 per cent, respectively. The study discovered extreme price variability in gram, followed by mung bean and field pea for both raw and processed pulses.

2.4 Constraints in production and marketing

Singh *at el.* (2015) evaluated constraints in chickpea cultivation in Baldevgarh Block of Tikamgarh District during 2013-14. The result find out that major constraints related problem of insect, pest and disease 80.66 per cent, followed by inputs-improved seeds and fertilizers are costly 70.34 per cent, unfavourable weather conditions 70.22 per cent, technical-lack of knowledge on location specific improved varieties of chickpea 57.00 per cent and constraints related to market-low market price of chickpea 45.40 per cent. These were serious constraints in chickpea cultivation and other constraints scenario in adoption of chickpea cultivation which was main reason of poor gram productivity.

Churpal *at el.* (2015) observed the production constraints in cultivation of rice. Major problem was infestation of insect 78 per cent. The next problems, Infestation of disease 63.50 per cent. Third problem was weed in the cultivation of rice 56 per cent. Then problem Soil toxicity 53per cent, rainfall 41.25 per cent and submergence 27 per cent were also reported by farmers of study area. In case of availability of inputs, labour availability 48 per cent was the main constraints, followed by fertilizer 47 per cent, non-availability of seed 46 per cent.

Sonvane and Pathak (2016) examine the economic analysis of production and marketing of rapeseed-mustard in Bastar Plateau of Chhattisgarh Result find out major marketing constraints was lack of implementation of support price. Then big problem was lack of awareness about the market information 93 per cent and transportation of small quantity of produce was not an economical option 81per cent in marketing constraints of rapeseed and mustard.

Subhita *at el.* (2017) conducted study on economic analysis and constraint in moth bean in Rajasthan. Major problem was the problem of weeds 90 per cent in crop field and lack of knowledge on seed treatment 92 per cent. The problem of non-availability of inputs 75 per cent and non- availability of HYV seeds 50 per cent of pulse crops. The problem was shortage of labour 67 per cent and inadequate storage facilities 83 per cent for pulses. The problem of high cost of labour 88 per cent, low rainfall during crop cultivation 64 per cent and on-availability of adequate credit 33 per cent.

Sahu *at el.* (2018) reported the constraint in marketing of mustard Morar in Gwalior. The observed that the main problem was price fluctuations 90 per cent by farmers followed by lack of price information 85 per cent, malpractices by traders 80 per cent. The problem of higher market charges 75per cent in the study area followed by high charges of transportation

(60per cent) problem. Lack of transportation (45per cent) was major constraint faced by farmers. Lack of credit facilities (35per cent) was constraint faced by farmers.

Goud *at el.* (2018) conducted study on constraints perceived by the cotton growers in Kurnool district of Andhra Pradesh. Major problem was under technological, insufficient training programs 63.00per cent, followed by inadequate irrigation facilities 65.70 per cent was big problem in bio-physical constraints and higher cost of chemical inputs 63.62 per cent in the socio-economic constraint. Lack of remunerative prices 62.70 per cent in the marketing constraints and Lack of proper storage facilities 67.75 per cent was the chief problem in the institutional constraints.

Kumar *at el.* (2018) evaluated the major constraint in production and marketing of pulses. The major problem was inadequate knowledge of recommended packages and practices (overall Garrett score 66.36), followed by faced by unfavourable weather condition (overall Garrett score 64.49). The other most important constraints were non-availability of quality water for irrigation (overall Garrett score 60.71). The problem was lack of knowledge about latest production technology (overall Garrett score 55.53) and lack of adoption of plant protection measures (overall Garrett score 52.16).

Kumar *at el.* (2018) evaluated constraint of mustard production in Lahar block of Bhind district Madhya Pradesh. Major constraints were High-input cost 95 per cent, followed by low and fluctuating prices 88.89 per cent, incidence of diseases 68.89 per cent and lack of credit 62.22 per cent. Main constraints were less profitable compared with other crops 57.78 per cent, poor quality of soil 55.55 per cent and lack of irrigation facilities 44.44 per cent. Minor constraints faced by farmer were shortage of human labour 42.22 per cent, Mustard more risky compared with other crops 28.89 per cent and weed infestation 22.22 per cent.

Gireesh *at el.* (2019) study was conducted at farmers' field in Maharashtra during 2016 to 2017. Result find out the production constraints faced by the farmers in cultivation of major pulses (pigeon pea and chickpea). Major constraint were low market price or low profit 74.39 per cent and crop damage by wild animals 74.39 per cent was observed, then followed by non-availability of labour 53.43 per cent, high cost of inputs 53.37 per cent, lack of subsidy for inputs 45.55 per cent, non-availability of credit facilities 44.16 per cent, lack of appropriate information sources 36.80 per cent and lastly the theft of crop at the time of maturity 20.00 per cent.

The methodology adopted for the study is given in this chapter. This chapter presents the brief description about the sampling design and analytical techniques used. The present study was undertaken in Bhiwani and Mahendragarh districts of Haryana state based on highest area under rapeseed & mustard and chickpea of selected oilseed and pulses crop. Both primary and secondary data have been used to accomplish the objectives under study. For the primary data, a multi-stage random sampling technique was used for selection of ultimate unit of sample. The primary data for the year 2017-18 was collected by using survey method through personal interview of selected respondent with the help of pre-tested schedule designed for the study.

3.1 Selection of Study Area

3.1.1 Selection of Districts

The present study was conducted in Bhiwani and Mahendragarh districts of Haryana having highest area under rapeseed & mustard and chickpea crop among all rapeseed & mustard and chickpea growing districts in the state.

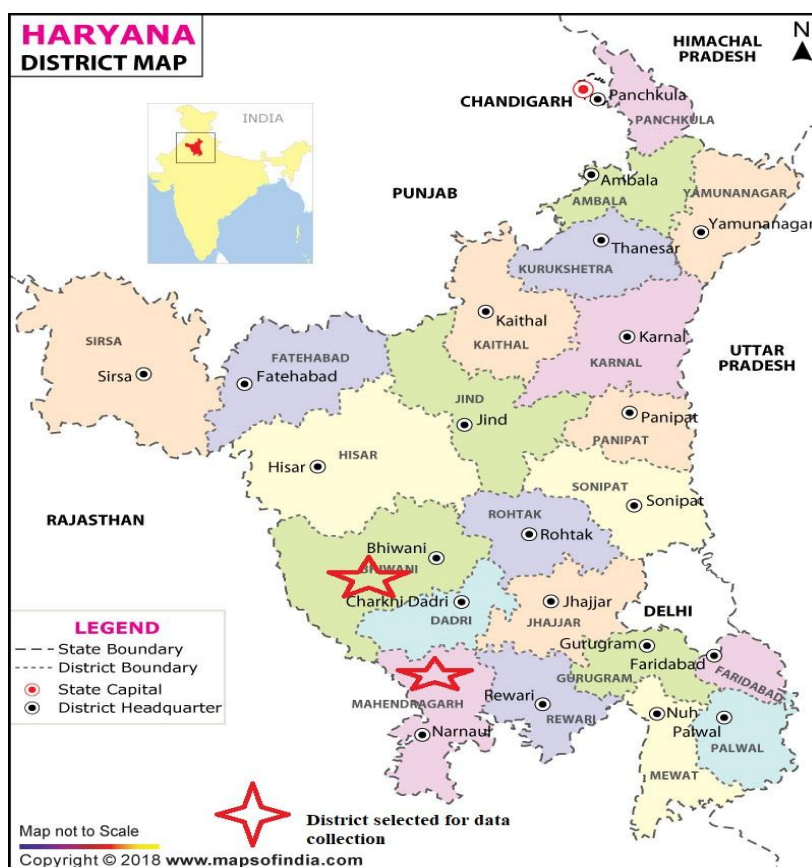


Fig. 1 Bhiwani and Mahendragarh districts of Haryana state

Table 3.1: Selection of districts**(Area in '000 ha)**

Area under Rapeseed & Mustard			Area under Chickpea		
Sr. No.	Name of District	Area	Sr. No.	Name of District	Area
1	Bhiwani	113.10	1	Bhiwani	14.30
2	Mahendragarh	82.90	2	Mahendragarh	11.30
3	Hisar	64.70	3	Hisar	4.50
4	Rewari	63.50	4	Sirsa	3.40
5	Charkhi Dadari	47.00	5	Charkhi Dadari	2.00
	Total area in Haryana	506.10		Total area in Haryana	37.10

3.1.2 Selection of blocks

Two blocks were selected from each selected district on the basis of highest area under selected crop. Tosham and Kairu blocks were selected from Bhiwani district and Kanina and Mahendragarh blocks were selected from Mahendragarh district of Haryana state.

3.1.3 Selection of villages

Two villages were selected randomly from selected blocks to obtain the primary data of selected crop. Alampur and Riwasa village were selected randomly from Tosham block and Sungarpur and Kairu village was selected from Kairu block of Bhiwani district. Sehlang and Nautana village were selected from Kanina block and Deroli Jat and Digrota village were selected from Mahendragarh block of Mahendragarh district of Haryana. In the total eight villages were selected for taking the primary data of selected crops.

3.1.4 Selection of farmers

A sample of 10 respondent farmers was selected purposively from each village irrespective of size of category of the farmers to obtain primary data of selected crops. Thus in the total sample of 80 respondents were selected for taking the primary data of selected crops.

3.1.5 Selection of Market

For computing seasonal variation in price and arrival of selected oilseed and pulses, one market from each district identified on the basis of highest arrival of rapeseed & mustard and chickpea. Thus Bhiwani market was selected from Bhiwani district and Narnaul market was selected from Mahendragarh district.

3.2 Collection of data

Study was conducted in Haryana state. The study was based on primary and secondary data. For the primary data, purposively multi-stage random sampling techniques was used to the selection of respondents and collection of data by personal interview with the help of pre-tested schedule designed for present study on rapeseed & mustard and chickpea crops. Secondary data were collected for last two decades from the year 1995 onward.

3.3 Analytical tools and techniques

The collected data were analysed by using the following tools and techniques to achieve the specified objectives:

3.3.1 Estimation of growth rate

Secondary data regarding area, production and productivity of rapeseed & mustard and chickpea were collected from various published and unpublished sources like statistical abstracts of Haryana, Government of Haryana from 1995-96 to 2017-18 for rapeseed & mustard and chickpea crops.

The CAGR was calculated to show the trends in area, production and productivity. The growth rates were estimated using exponential growth functional form as under

$$Y = ab^t \text{ ----- (1)}$$

Where, Y = Index number of area, production, productivity as the

Dependent variable

t = Time variable (year) as independent variable

a = Intercept

b =Regression coefficient

Equation (1) can be expressed in logarithmic form as follows:

$$\log y = \log a + t \log b \text{----- (2)}$$

$$\log y = A + B t \text{----- (3)}$$

Where, A= log a B = log b

The compound growth rate "r" was computed as:

$$r = (\text{Antilog of } b - 1) \times 100 \text{----- (4)}$$

3.3.2 Time series analysis of arrival and price:

Method of simple average was used to find out the seasonal indices which was the simplest method of obtaining a seasonal index worked out using the following method

- (i) The data was arranged by year and months.
- (ii) Found out the totals of January, February, March.....etc.
- (iii) Divide each total by the number of year for which data were given.
- (iv) Obtain an average of monthly averages by dividing the total of monthly average by twelve.
- (v) Taking the average of monthly averages as hundred the percentage were computed as follows:

$$\text{Seasonal indices} = \frac{\text{Monthly average}}{\text{Average of monthly averages}} \times 100$$

3.3. Gap between minimum support price and farmer harvest price of oilseed and pulses in Haryana

From oilseed crops, rapeseed & mustard and from pulse crops, chickpea was selected for find out the gap between minimum support price and farmer harvest price. The study was based on the secondary data on farm harvest prices and minimum support prices of rapeseed & mustard and chickpea in Haryana state. The time period selected was 1995-96 to 2017-18. To find out the effectiveness of the price policy during the harvest periods, the deviations of farm harvest prices (FHP) from the minimum support prices (MSP) were calculated and divided into positive and negative deviations to observe whether market prices run higher or lower over the minimum support prices. The negative deviations revealed ineffectiveness of MSP policy for producers. The methods used for the mean and adjusted negative / positive deviations were as follows. :

$$\text{MAPD or MAND} = 1/n \sum | \text{FHP}_i - \text{MSP}_i |$$

If, $\text{FHP} > \text{MSP} = \text{Positive deviation (PD)}$
 $\text{FHP} < \text{MSP} = \text{Negative deviation (ND)}$

Where,

- MAPD = Mean absolute positive deviation,
- MAND = Mean absolute negative deviation,
- FHP = Farm harvest price,
- MSP = Minimum support price, and
- n = Frequency of positive or negative deviations.

These deviations were adjusted with MSP in order to examine the degree of their deviation from the MSP. The formulae used for the adjusted mean negative or positive deviation was as follows:

$$\text{AMPD or AMND} = 1/n \sum (| \text{FHP}_i - \text{MSP}_i | / \text{MSP}_i) * 100$$

Where,

- AMPD = Adjusted mean positive deviation, and
- AMND = Adjusted mean negative deviation

3.4 Problems faced by the rapeseed & mustard and chickpea grower

The information related to constraints faced by farmer in production and marketing of rapeseed & mustard and chickpea grower as calculated by pretested schedule. Regarding constraints analysis, the response (various constraints as perceived by the farmers) were recorded on three point continuum i.e. very serious, serious and somewhat serious and subsequently assigned a weight-age of 3, 2 and 1 respectively. The constraints score of each respondent as well as of all the respondents for each item pertaining to production and marketing constraints were worked out. The mean score and rank order were also computed and arrange in descending order of severity of problem.

Following formula was employed to calculate Mean Per cent Score:

$$\text{Mean Score} = \frac{\text{Sum of score (constraint) for all responses}}{\text{Total number of respondents}}$$

$$\text{Mean Percent Score} = \frac{\text{Mean of item (constraint) for all responses}}{\text{Maximum score of the item (constraint)}} \times 100$$

Results obtained from the analysis of the data used in the present study and interpretations thereof have been discussed in this chapter. For better understanding and to cover all the objectives of the study, results are presented under the following four heads:

1. Trends in area, production and productivity of rapeseed & mustard and chickpea.
2. Seasonal variation in price and arrival of selected crops.
3. Gap between MSP and Farmer harvest price of oilseed and pulse.
4. Constraints in production and marketing of rapeseed & mustard and chickpea.

For more clarity and better presentation of the results of the study, head wise details are given below:

4.1 Trends in area, production and productivity of rapeseed & mustard and chickpea.

Rapeseed and mustard was the key source of income mainly even to the marginal and small farmers in rain fed areas. Thus this crop was cultivated mainly in the rain-fed and resource vulnerable regions of the country, their effect to livelihood safety of the small and marginal farmers in these regions are also very important. Chickpea was also an important pulse crop grown and consumed all over the world, mainly in the Afro-Asian countries. It was also one of the major pulse crops cultivated and consumed in India and also known as Bengal gram.

4.1.1 Trends in area, production and productivity of rapeseed and mustard in India

It was evident from the Table 4.1 that in the period (1995-2016), Compound annual growth rate in area, production and productivity of total rapeseed and mustard in India recorded was 0.05, 1.89 and 1.67 per cent respectively. Area of rapeseed and mustard was maximum in the year 2004-05 i.e. 7316 thousand ha while minimum in 2000-01(4477 thousand ha). In case of production maximum was found in the year 2010-11 i.e. 8179 thousand tonnes and minimum (3880 thousand tonnes) in 2002-03. Productivity of rapeseed & mustard in India was maximum (1262 Kg/ ha) in the year 2012-13 while minimum (668 Kg/ha) in the year 1997-98.

Table 4.1: Trends in area, production and productivity of rapeseed and mustard in India

Year	Area ('000 ha)	Production (000'Tonnes)	Productivity (Kg/ha)
1995-96	6547	6000	916
1996-97	6545	6658	1017
1997-98	7041	4703	668
1998-99	6513	5664	870
1999-00	6027	5790	961
2000-01	4477	4190	936
2001-02	5073	5083	1002
2002-03	4544	3880	854
2003-04	5428	6291	1159
2004-05	7316	7593	1038
2005-06	7276	8131	1117
2006-07	6790	7438	1095
2007-08	5826	5834	1001
2008-09	6298	7201	1143
2009-10	5588	6608	1183
2010-11	6901	8179	1185
2011-12	5894	6604	1121
2012-13	6363	8029	1262
2013-14	6646	7877	1185
2014-15	5799	6282	1083
2015-16	5746	6797	1183
2016-17	6074	7917	1134
CAGR	0.05	1.89	1.67

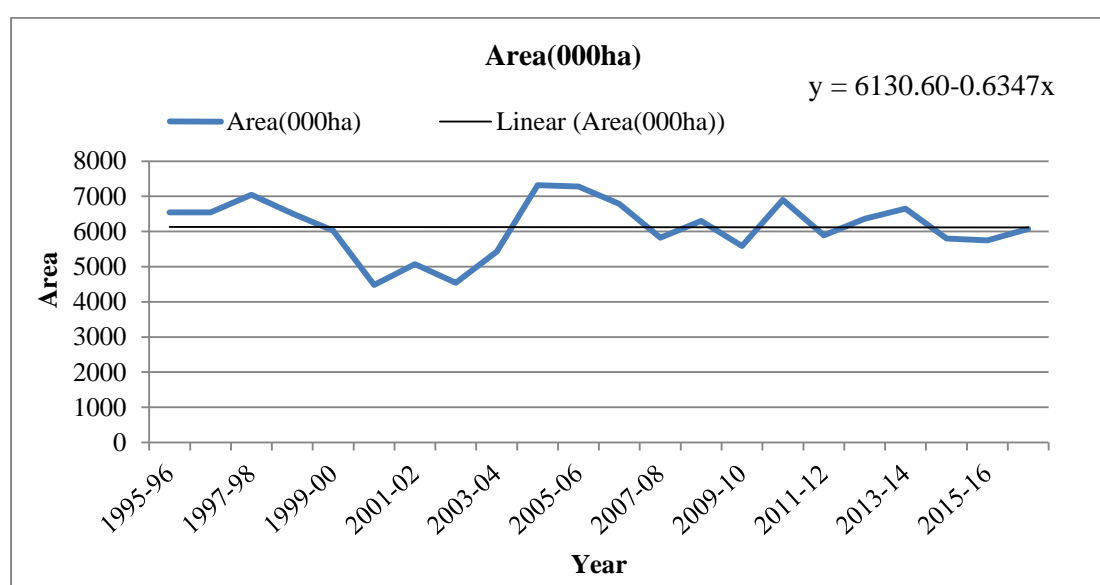


Fig. 2: Trend in area of rapeseed and mustard in India

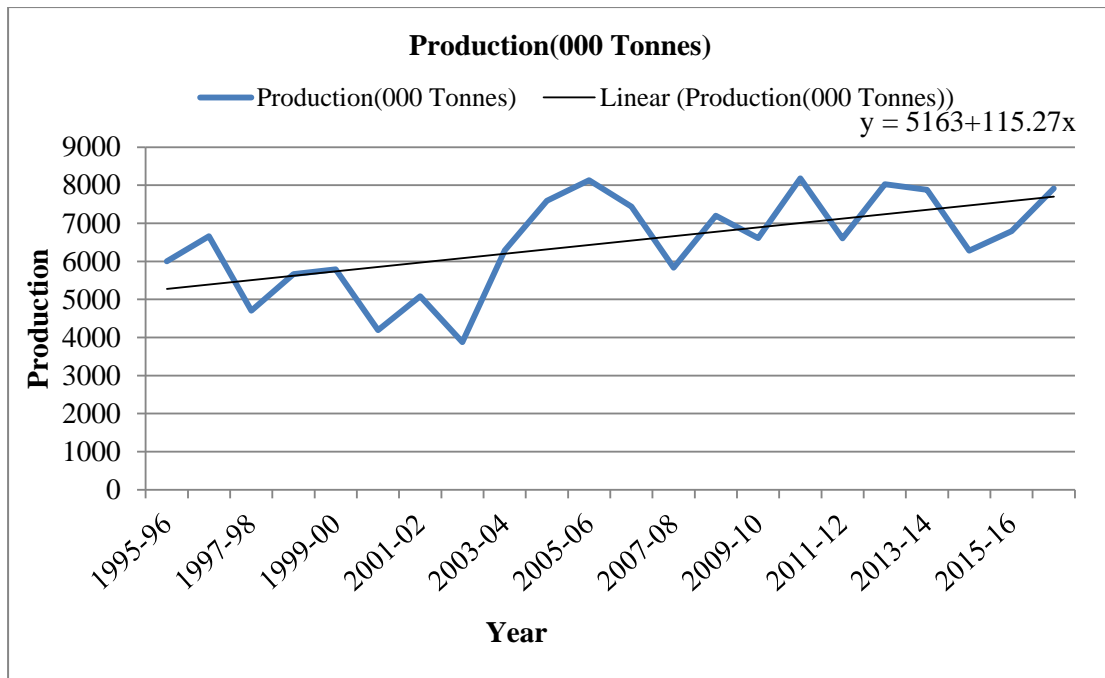


Fig. 3: Trend in production of rapeseed and mustard in India

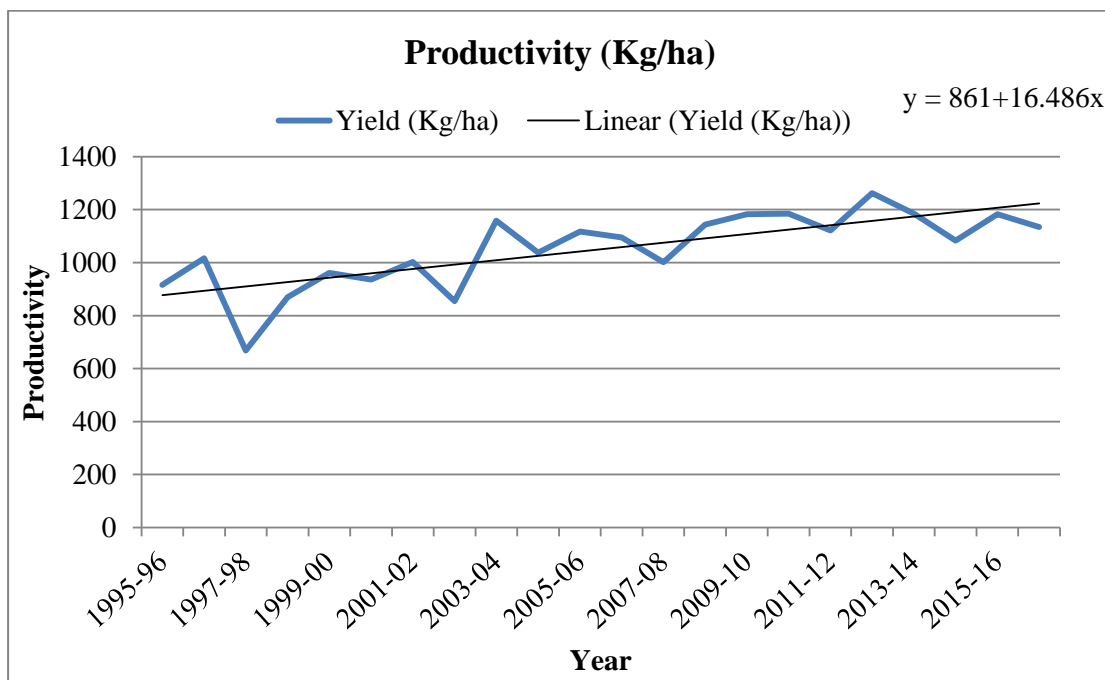


Fig. 4: Trend in productivity of rapeseed and mustard in India

4.1.2 Trends in area, production and productivity of chickpea in India

It was observed from the Table 4.2 that compound annual growth rate in area, production and productivity of chickpea in India was recorded 1.71, 2.84 and 1.11 per cent respectively in the period (1995-2016). In case of area of chickpea was maximum in the year 2013-14 i.e. 9927 thousand ha while minimum in 2000-01(5185 thousand ha). Production of chickpea was maximum (9526 thousand tonnes) in the year 2013-14 while minimum (3855

thousand tonnes) in the year 2000-01. Productivity of chickpea in India was maximum (1036 Kg/ ha) in the year 2012-13 while minimum (700 Kg/ha) in the year 1995-96.

Table 4.2: Trends in area, production and productivity of chickpea in India

Year	Area(000 ha)	Production (000 Tonnes)	Productivity (kg/ha)
1995-96	7116	4979	700
1996-97	6847	5570	814
1997-98	7563	6132	811
1998-99	8469	6801	803
1999-00	6146	5118	833
2000-01	5185	3855	744
2001-02	6416	5473	853
2002-03	5906	4237	717
2003-04	7048	5718	811
2004-05	6715	5469	815
2005-06	6926	5600	808
2006-07	7494	6334	845
2007-08	7544	5749	762
2008-09	7893	7060	895
2009-10	8169	7476	915
2010-11	9186	8221	895
2011-12	8299	7702	928
2012-13	8522	8833	1036
2013-14	9927	9526	960
2014-15	8251	7332	889
2015-16	8399	7058	840
2016-17	9626	9378	974
CAGR	1.71	2.84	1.11

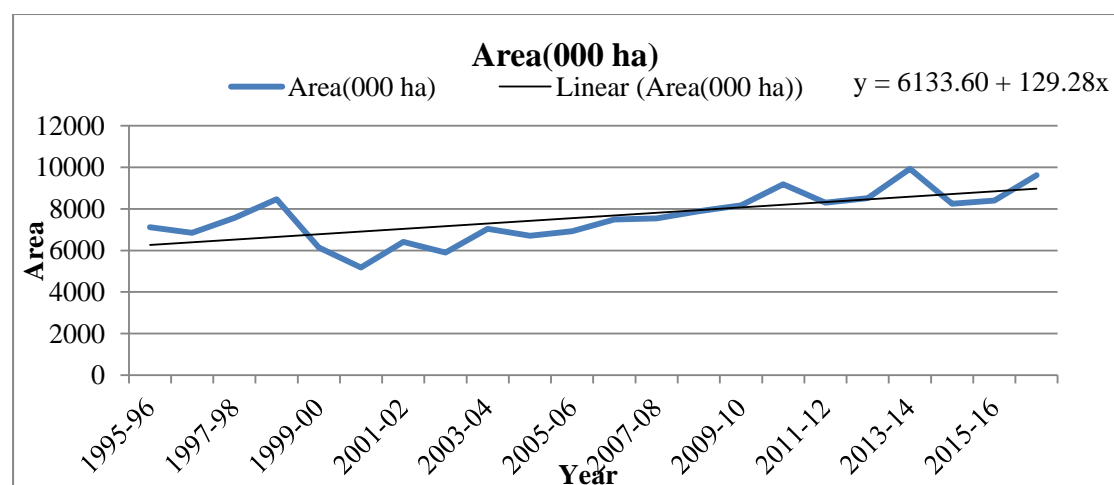


Fig. 5: Trend in area of chickpea in India

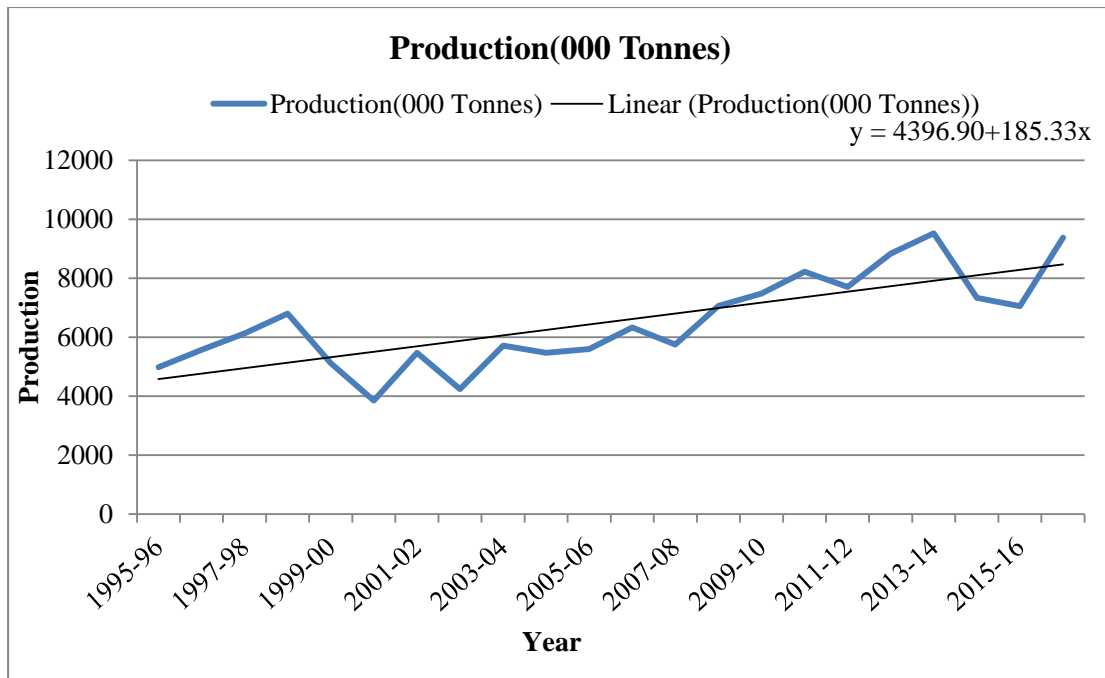


Fig. 6: trend in production of chickpea in India

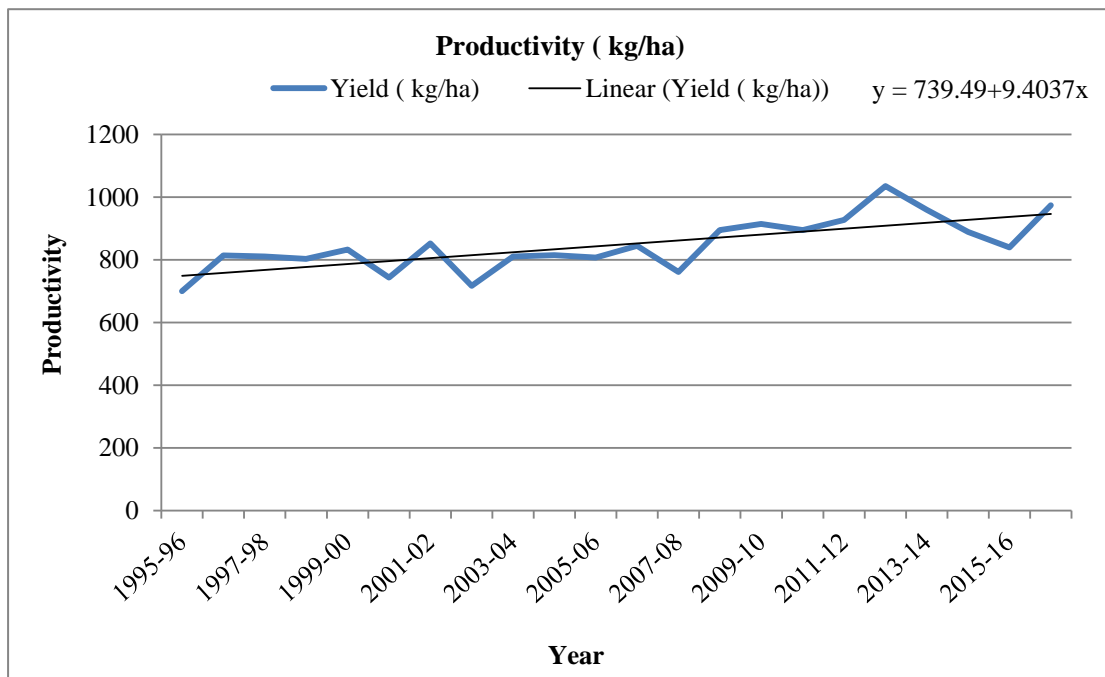


Fig.7: Trend in productivity of chickpea in India

4.1.3 Trends in area, production and productivity of Rapeseed and Mustard in Haryana

It is found from the Table 4.3 that in the period (1995-2016), Compound annual growth rate in area, production and productivity of total rapeseed and mustard in Haryana documented was -0.31, 2.00 and 3.87 per cent, respectively. Area of rapeseed and mustard was maximum in the year 2004-05 i.e. 707.80 thousand ha while minimum in 2000-01 (408.80 thousand ha). In case of production maximum was found in the year 2012-13 i.e. 959.30 thousand Tonnes and minimum (368.00 thousand tonnes) in 1997-98. Productivity of

rapeseed and mustard in Haryana was maximum (1852 Kg/ ha) in the year 2010-11 while minimum (605 Kg/ha) in the year 1995-96.

Table 4.3: Trends in area, production and productivity of rapeseed and mustard in Haryana

Year	Area (000 ha)	Production (000 Tonnes)	Productivity (kg/ha)
1995-96	574.60	729.00	605
1996-97	612.70	894.00	650
1997-98	556.00	368.00	662
1998-99	498.00	615.00	1235
1999-00	449.00	595.00	1322
2000-01	408.80	560.00	1369
2001-02	536.40	800.00	1490
2002-03	607.00	697.00	1148
2003-04	619.20	965.00	1559
2004-05	699.80	824.00	1177
2005-06	707.80	792.80	1117
2006-07	598.10	804.00	1344
2007-08	496.50	597.00	1202
2008-09	514.00	894.90	1722
2009-10	511.10	847.00	1657
2010-11	509.70	953.00	1852
2011-12	535.90	747.00	1394
2012-13	558.30	959.30	1722
2013-14	536.90	878.00	1611
2014-15	481.90	706.00	1432
2015-16	510.40	823.00	1669
2016-17	506.10	946.10	1830
CAGR	-0.31	2.00	3.87

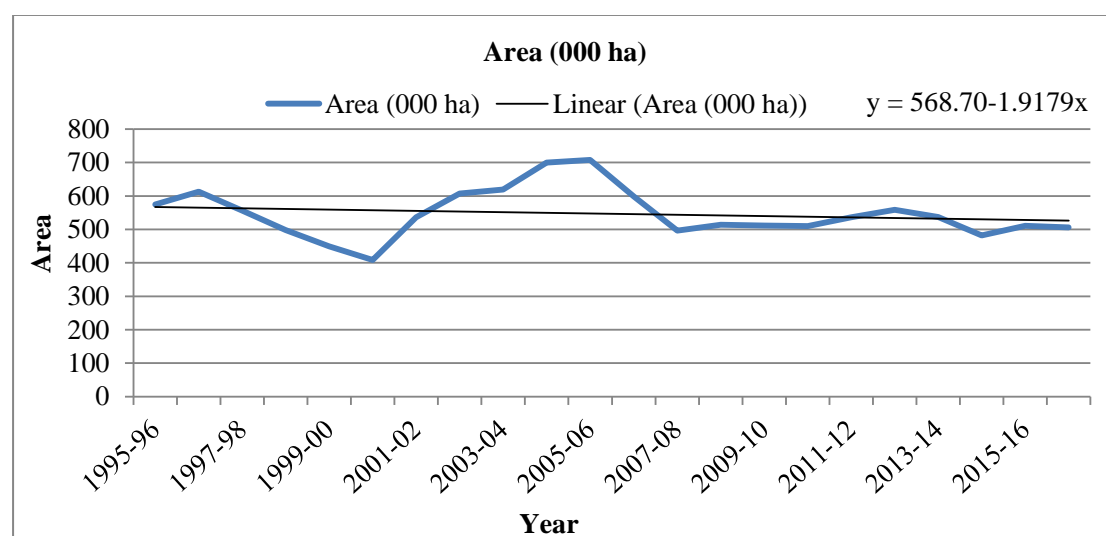


Fig. 8: Trend in area of rapeseed and mustard in Haryana

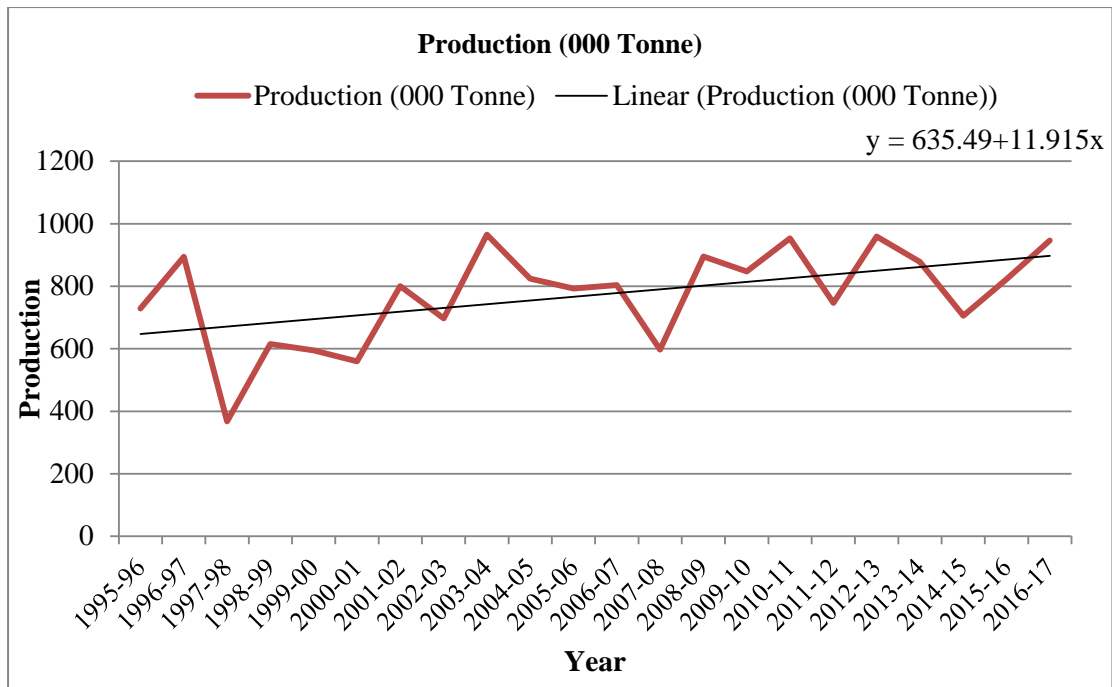


Fig.9: Trend in production of rapeseed and mustard in Haryana

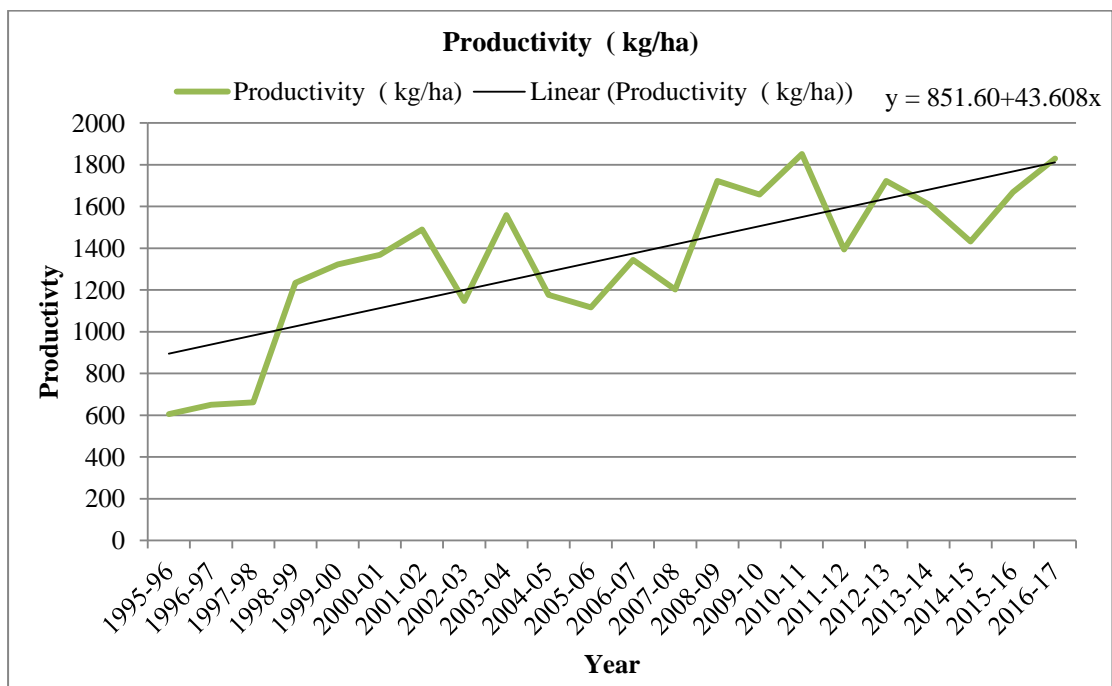


Fig. 10: Trend in productivity of rapeseed and mustard in Haryana

4.1.4 Trend in area, production and productivity of chickpea in Haryana

It was evident from the Table 4.4 Compound annual growth rate for the period (1995-2016). Compound annual growth rate in area, production and productivity of chickpea in Haryana was noted -8.29, -7.79 and 0.46 per cent, respectively. In case of area of chickpea was maximum in the year 1995-96 i.e. 376.70 thousand ha while minimum in 2016-17 (37.10 thousand ha). Production of chickpea was maximum (381 thousand tonnes) in the year 1995-

96 while minimum (27.00 thousand tonnes) in the year 2015-16. Productivity of chickpea in Haryana was maximum (1179 Kg/ ha) in the year 2016-17 while minimum (505 Kg/ha) in the year 2007-08.

Table 4.4: Trends in area, production and productivity of chickpea in Haryana

Year	Area(000 ha)	Production (000Tonnes)	Productivity (kg/ha)
1995-96	376.70	381.00	1,010
1996-97	345.10	276.00	799
1997-98	353.90	309.00	872
1998-99	357.00	294.00	824
1999-00	100.40	58.00	577
2000-01	124.50	80.00	640
2001-02	142.50	122.00	853
2002-03	54.70	41.00	745
2003-04	122.80	100.00	813
2004-05	107.90	91.00	843
2005-06	129.80	72.00	554
2006-07	107.70	90.00	843
2007-08	107.30	54.00	505
2008-09	123.60	129.00	1040
2009-10	84.10	62.00	735
2010-11	111.50	110.00	982
2011-12	78.90	73.00	924
2012-13	47.00	53.00	1128
2013-14	82.60	72.00	867
2014-15	65.10	42.00	646
2015-16	43.00	27.00	619
2016-17	37.10	46.40	1179
CAGR	-8.29	-7.79	0.46

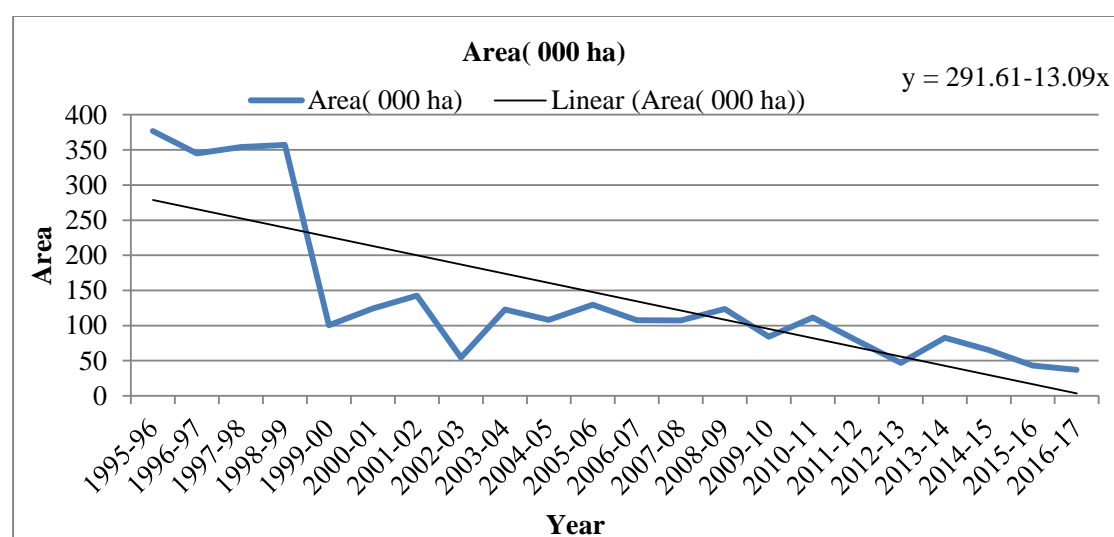


Fig.11 Trend in area of chickpea in Haryana

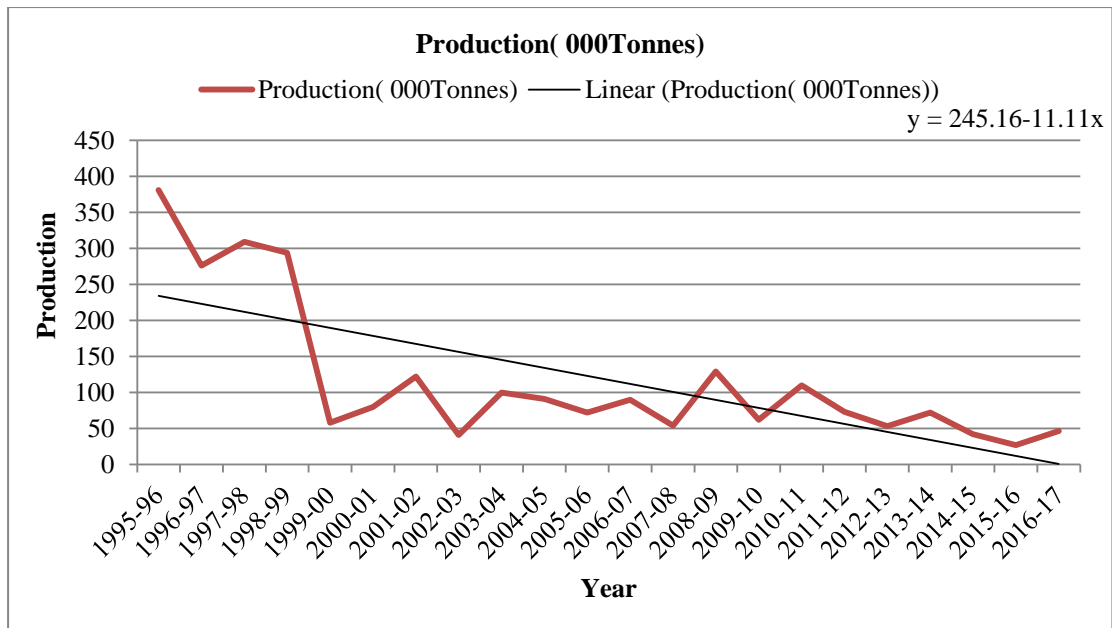


Fig.12 Trend in production of chickpea in Haryana

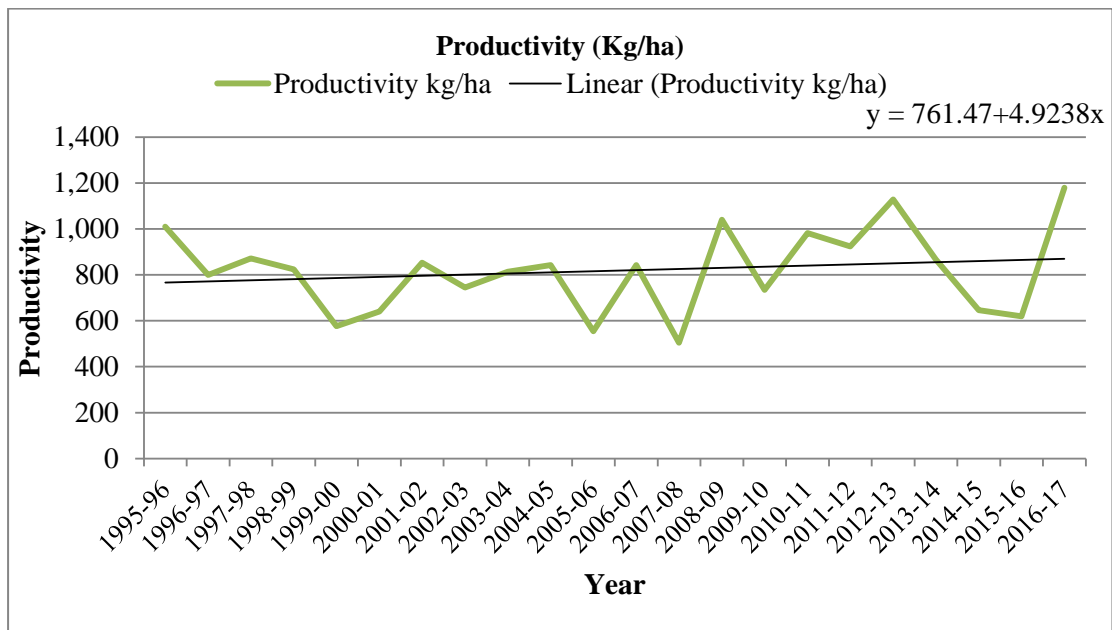


Fig.13 Trend in productivity of chickpea in Haryana

4.2 Seasonal variation in prices and arrivals of rapeseed & mustard and chickpea

Method of simple average was used to find out the seasonal index which was the simplest method of obtaining a seasonal index of rapeseed & mustard and chickpea prices and arrivals in the selected market for the study period (1995-96 to 2016-17).

4.2.1 Seasonal indices of rapeseed and mustard prices and arrivals in Bhiwani Market

The most widely used 'method of simple averages' was used for estimating seasonal indices of rapeseed and mustard prices and arrival in Bhiwani market for the study period (1995-96 to 2016-17). The Table 4.5 found that the peak period of rapeseed and mustard

arrivals in Bhiwani market was March to June. However, maximum arrivals were observed in the months of March, April and May.

The Table 4.5 observed that the price indices of rapeseed and mustard was lesser during the peak arrivals (i.e. less than 100) and higher during lean period (i.e. more than 100). Thus, the inverse relationship existed between prices and arrivals in the market and represented in Figures 14. The arrival indices varied from 9.53 to 422.31 in the market. April arrival was at the highest with seasonal index at 422.31. January arrival was at the lowest with seasonal index at 9.53. The price indices varied from 93.42 to 107.20 in the market. December Price was at the highest with seasonal index at 107.20. February price was at the lowest with seasonal index at 93.42.

Table 4.5: Seasonal indices of rapeseed & mustard price and arrival in Bhiwani market

Sr. No.	Month	Arrival	Price
1.	JANUARY	9.53	94.37
2.	FEBUARY	13.79	93.42
3.	MARCH	281.49	94.54
4.	APRIL	422.31	95.47
5.	MAY	248.76	97.29
6.	JUNE	81.19	98.89
7.	JULY	34.58	100.62
8.	AUGUST	28.13	103.05
9.	SEPTEMBER	26.49	103.48
10.	OCTOBER	20.94	105.55
11.	NOVEMBER	18.69	106.14
12.	DECEMBER	14.10	107.20

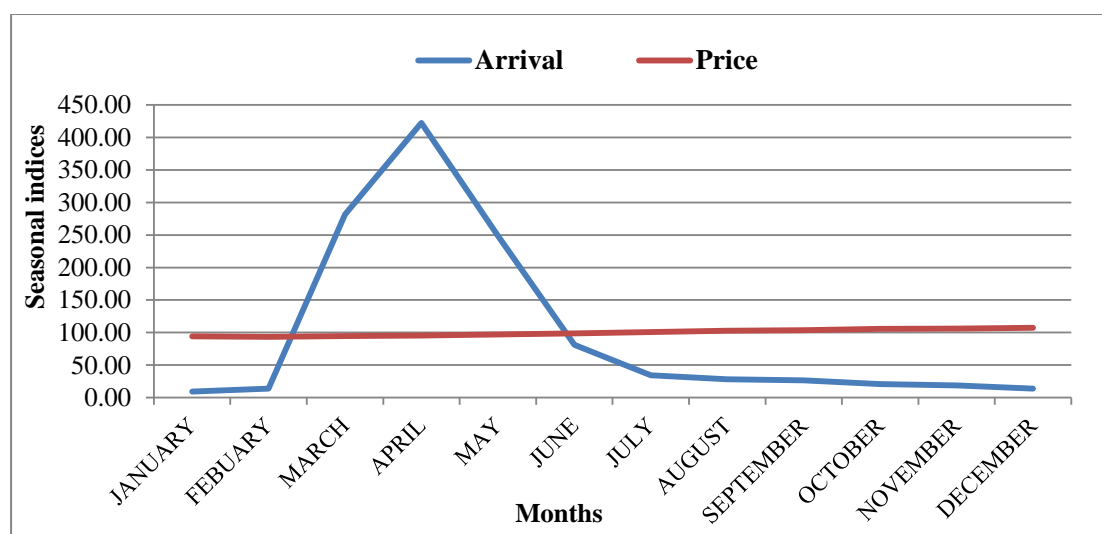


Fig.14: Seasonal indices of rapeseed & mustard arrival and prices in Bhiwani market

4.2.1 Seasonal indices of chickpea prices and arrivals in Bhiwani market

The Table 4.6 discovered that the peak period of chickpea arrival in Bhiwani market was March to June. However, maximum arrivals were detected in the months of March, April and May in Bhiwani market. The Table 4.6 shown that the price indices of chickpea in the market was higher during lean period (i.e. more than 100) and lesser during the peak arrivals (i.e. less than 100) Thus, the inverse relationship occurred between price and arrivals in Bhiwani market and represented in Figure 15. The arrival indices varied from 21.76 to 422.10 in the market. April arrival was at the maximum with seasonal index at 422.10. January arrival was at the minimum with seasonal index at 21.76. The price indices varied from 96.17 to 103.55 in the market. December Price was maximum with seasonal index at 103.55. January price was lowermost with seasonal index at 96.17.

Table 4.6: Seasonal indices of chickpea price and arrival in Bhiwani market

Sr. No.	Month	Arrival	Price
1.	JANUARY	21.76	96.17
2.	FEBUARY	34.92	96.89
3.	MARCH	209.25	97.36
4.	APRIL	422.10	97.88
5.	MAY	199.89	98.17
6.	JUNE	89.69	98.05
7.	JULY	54.26	99.05
8.	AUGUST	44.13	103.20
9.	SEPTEMBER	38.51	103.53
10.	OCTOBER	34.68	102.93
11.	NOVEMBER	25.93	103.23
12.	DECEMBER	24.87	103.55

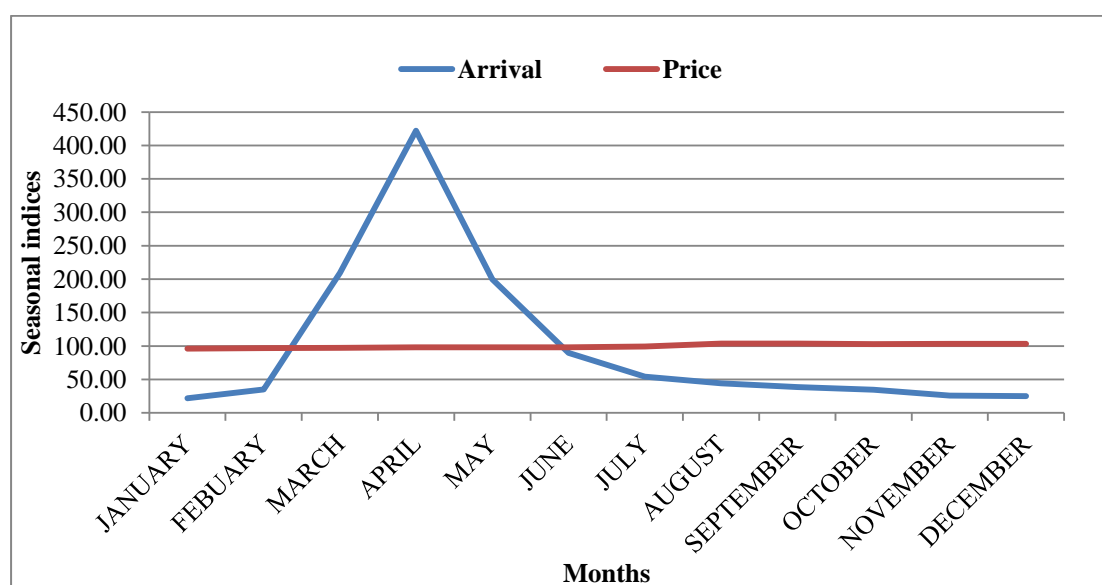


Fig. 15: Seasonal indices of chickpea arrival and prices in Bhiwani market

4.2.3 Seasonal indices of rapeseed and mustard price and arrival in Narnaul market

The Table 4.7 exposed that the peak period of rapeseed and mustard arrival in Narnaul market was March to June. However, maximum arrivals were perceived in the months of March, April and May in market. The Table reported that the price indices of rapeseed and mustard in the market was maximum during lean period (i.e. more than 100) and minimum during the peak arrivals (i.e. less than 100) and Thus, the inverse relationship been between price and arrivals in the market and represented in Figure16. The price indices varied from 94.73 to 104.94 in market. September Price was at the highest with seasonal index at 104.90. February price was at the lowest with seasonal index at 94.73. The arrival indices varied from 20.30 to 373.88 in market. April arrival was at the top with seasonal index at 373.88. December arrival was at the bottom with seasonal index at 20.30.

Table 4.7: Seasonal indices of rapeseed & mustard price and arrival in Narnaul market

Sr. No.	Month	Arrival	Price
1.	JANUARY	20.81	95.15
2.	FEBUARY	33.90	94.73
3.	MARCH	213.40	95.99
4.	APRIL	373.88	95.66
5.	MAY	248.29	98.17
6.	JUNE	91.29	97.60
7.	JULY	51.15	100.51
8.	AUGUST	49.73	104.31
9.	SEPTEMBER	43.82	104.94
10.	OCTOBER	30.78	104.05
11.	NOVEMBER	22.65	104.30
12.	DECEMBER	20.30	104.60

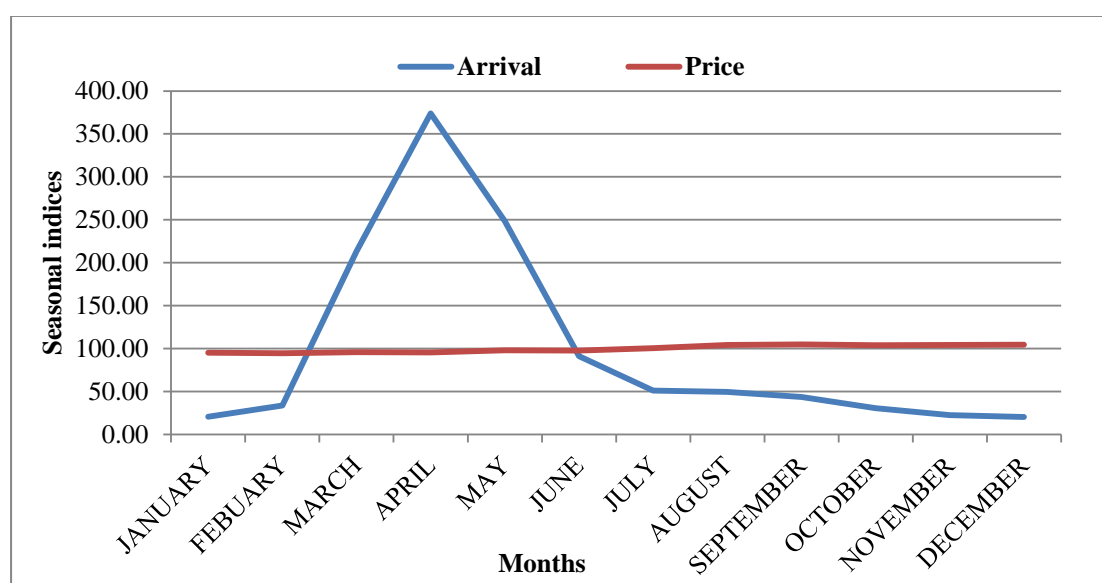


Fig.16: Seasonal indices of rapeseed and mustard price and arrival in Narnaul market

4.2.4 Seasonal indices of chickpea price and arrival in Narnaul market

The Table 4.8 discovered that the peak period of chickpea arrival in Narnaul market was March to June. Though, maximum arrivals were perceived in the months of March, April and May in market. The price indices of chickpea in the market was lesser during the peak arrivals (March to June) and higher during lean period (September to December). Thus, the inverse relationship happened between price and arrivals in Narnaul market and represented in Figures17. The Table shown that arrival indices varied from 20.30 to 373.88 in market. April arrival was at the uppermost with seasonal index at 373.88. December arrival was at the lowermost with seasonal index at 20.30. The Table shown that price indices varied from 98.04 to 103.21 in the market. December Price was highest with seasonal index at 103.21. March price was lowest with seasonal index at 97.25.

Table 4.8: Seasonal indices of chickpea price and arrival in Narnaul market

Sr. No.	Month	Arrival	Price
1.	JANUARY	20.81	98.04
2.	FEBUARY	33.90	98.13
3.	MARCH	213.40	97.25
4.	APRIL	373.88	97.77
5.	MAY	248.29	98.85
6.	JUNE	91.29	99.02
7.	JULY	51.15	99.43
8.	AUGUST	49.73	101.13
9.	SEPTEMBER	43.82	102.34
10.	OCTOBER	30.78	102.28
11.	NOVEMBER	22.65	102.57
12.	DECEMBER	20.30	103.21

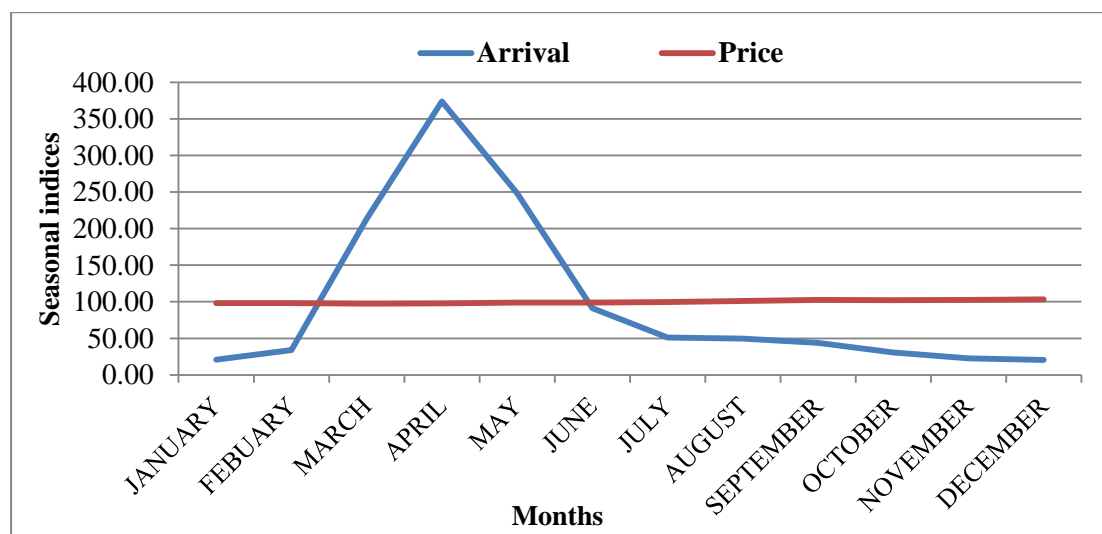


Fig.17: Seasonal indices of chickpea price and arrival in Narnaul market

4.3 Gap between minimum support price and farmer harvest price of oilseed and pulses crops from 1995-96 to 2017-18

From oilseed, rapeseed & mustard and from pulse crops, chickpea were too selected for find out the gap between minimum support price and farmer harvest price. In this, find out the difference between the farm harvest price and minimum support price of rapeseed & mustard and chickpea from 1995-96 to 2017-18 fixed by government.

4.3.1 Gap between minimum support price and farmer harvest price of rapeseed and mustard crop during 1995-96 to 2017-18

The Table 4.9 exposed gap between minimum support price and farmer harvest price of rapeseed and mustard in Haryana. The gap was found out for the study period i.e. 1995-96 to 2017-18. The results exposed that gap between FHP and MSP of rapeseed and mustard in Haryana resulted which ranged from (-198.75 to 989.43 ₹/qtl). The maximum gap was noted in the year 2011-12 i.e. 989.43₹/qtl while minimum gap was recorded in the 2016-17 (-198.45₹/qtl).

Table 4.9: Gap between farm harvest price and minimum support price of rapeseed & mustard crop during 1995-96 to 2017-18 (₹/qtl)

Year	Farm Harvest Price(FHP)	Minimum Support Price(MSP)	Gap between FHP and MSP
1995-96	1031.08	860.00	171.08
1996-97	1094.66	890.00	204.66
1997-98	1273.98	940.00	333.98
1998-99	1240.53	1000.00	240.53
1999-00	1088.21	1100.00	-11.79
2000-01	1132.52	1200.00	-67.48
2001-02	1212.86	1300.00	-87.14
2002-03	1742.18	1330.00	412.18
2003-04	1658.3	1600.00	58.30
2004-05	1601.62	1700.00	-98.38
2005-06	1634.53	1715.00	-80.47
2006-07	1771.72	1715.00	56.72
2007-08	2380.58	1800.00	580.58
2008-09	2365.80	1830.00	535.80
2009-10	2341.00	1830.00	511.00
2010-11	2463.71	1850.00	613.71
2011-12	3489.43	2500.00	989.43
2012-13	3416.19	3000.00	416.19
2013-14	3437.50	3050.00	387.50
2014-15	3511.21	3100.00	411.21
2015-16	3523.72	3350.00	173.72
2016-17	3501.25	3700.00	-198.75
2017-18	4041.67	4000.00	41.67

Note- Positive variations mean that the FHP is higher than MSP

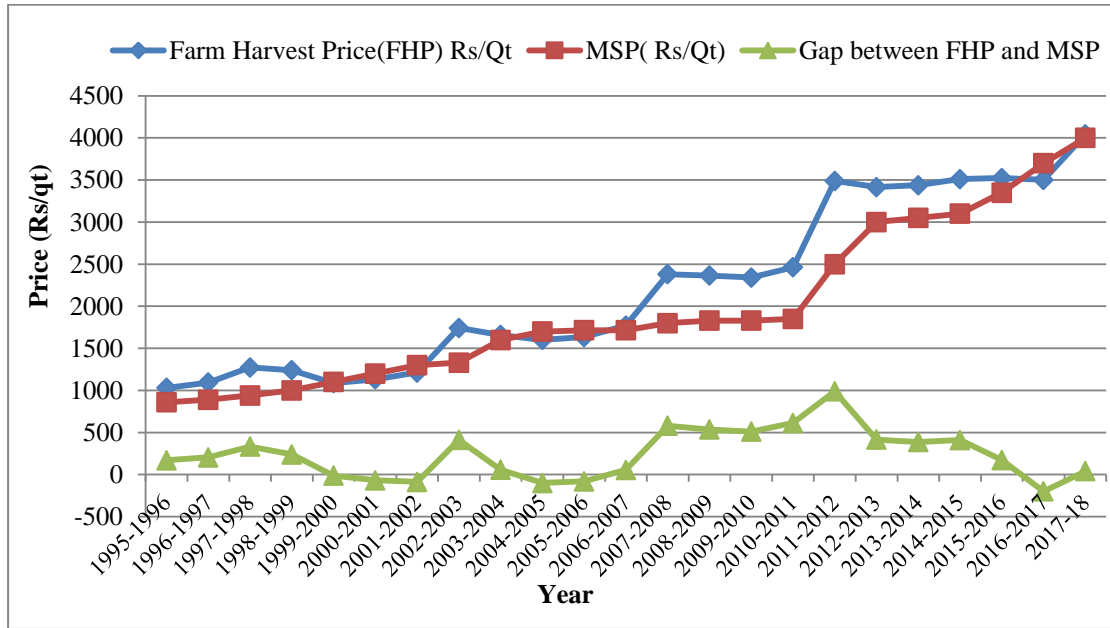


Fig. 18: Gap between farm harvest price and minimum support price of rapeseed and mustard

4.3.2 Gap between minimum support price and farmer harvest price of chickpea crop during 1995-96 to 2017-18

The Table 4.10 revealed gap between farm harvest prices and minimum support prices of chickpea in Haryana. The gap is detected for the study period i.e. 1995-96 to 2017-18. The results exposed that gap between farm harvest prices and minimum support of chickpea in Haryana noted which ranged from (-93.00 to 1115.50 ₹/qtl). The maximum gap was recorded in the year 2011-12 (1115.50 ₹/qtl) while minimum gap was recorded in the 2017-18 i.e.-93.00.

Table 4.10: Gap between minimum support price and farmer harvest price of chickpea crop during 1995-96 to 2017-18 (₹/qtl)

Year	Farm Harvest Price(FHP)	Minimum Support Price (MSP)	Gap between FHP and MSP
1995-96	894.99	700.00	194.99
1996-97	1257.42	740.00	517.42
1997-98	1001.06	815.00	186.06
1998-99	1014.69	895.00	119.69
1999-00	1356.37	1015.00	341.37
2000-01	1864.98	1100.00	764.98
2001-02	1580.94	1200.00	380.94
2002-03	1566.9	1220.00	346.90
2003-04	1467.85	1400.00	67.85
2004-05	1533.38	1425.00	108.38
2005-06	2191.68	1435.00	756.68
2006-07	2186.79	1445.00	741.79
2007-08	2645.65	1600.00	1045.65
2008-09	2310.83	1730.00	580.83
2009-10	2321.63	1760.00	561.63
2010-11	2940.00	2100.00	840.00
2011-12	3915.50	2800.00	1115.50
2012-13	3739.02	3000.00	739.02
2013-14	3506.15	3100.00	706.15
2014-15	4069.44	3175.00	894.44
2015-16	4072.83	3500.00	647.83
2016-17	4807.87	4000.00	807.87
2017-18	4307.00	4400.00	-93.00

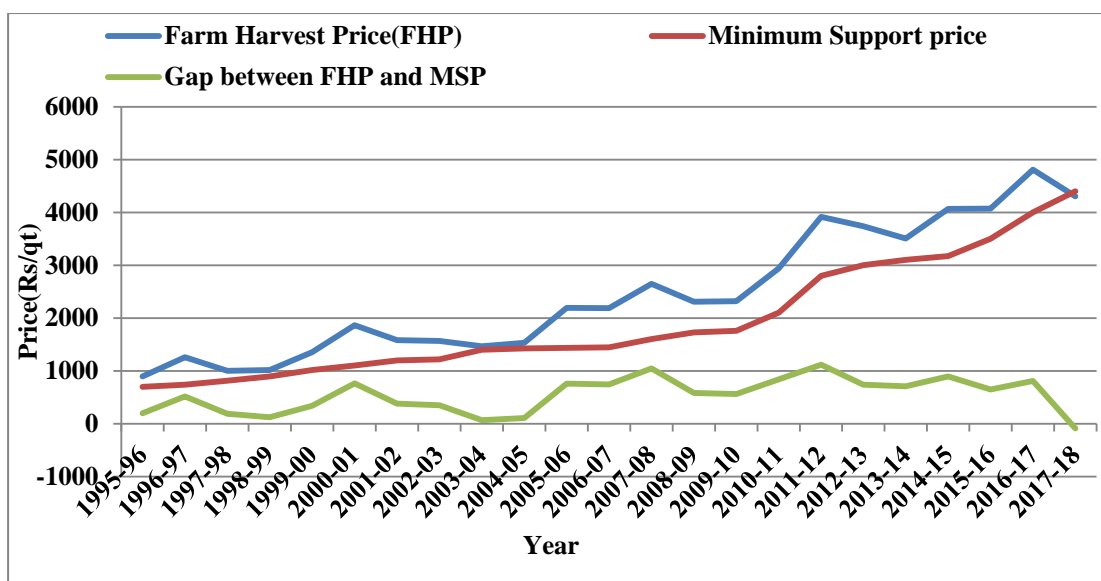


Fig. 19 Gap between minimum support price and farmer harvest price of chickpea crop

4.3.3 Deviations of FHPs from MSPs of major food crops in Haryana from 2007-18

To study the effectiveness of MSP policy for rapeseed & mustard and chickpea crops in Haryana, difference between its minimum support price and farmer harvest prices was calculated in different years and was given in Table 4.11. Chickpea shown positive deviations 22 times and negative deviation 1 time in 23 year during 1995-17. This means that the average farmer harvest price was equal to or ruled higher than minimum support price in 22 times and lower than minimum support price in one time out of 23 year. The adjusted difference (positive) between minimum support price and farmer harvest price was as 95 per-cent of minimum support price and the negative difference was 5 per-cent of minimum support price.

Rapeseed and mustard revealed positive deviations 17 times and negative deviation 6 times in 23 years during 1995-17. It means that the average farmer harvest price was equal to or ruled higher than minimum support price in 17 times and lower than minimum support price in 6 times out of 23 years. The adjusted difference (positive) between minimum support price and farmer harvest price was as 74 per-cent of minimum support price and the negative difference was 26 per-cent of minimum support price.

Table 4.11: Deviations of FHPs vis-à-vis MSPs of rapeseed & mustard and chickpea crops in Haryana: 1995-2017 (₹/qtl)

Crops	Negative deviations					Positive deviations				
	Frequency	MAND	Range	AMND	Per cent	Frequency	MAP	Range	AMPD	Per cent
Chickpea	1	-93.00	-93.00	-2.11	5	22	566.64	67.85-1115.5	33.58	95
Rape seed and mustard	6	--90.67	-198.75 to-11.79	-4.87	26	17	358.62	173.72-989.43	213.58	74

Note: positive deviations indicating success of the MSP policy Average= Average of the difference of FHP from MSP (+ve or -ve) and per cent= Percentage of average positive or negative deviations over MSP.

4.4 Constraints in production and marketing of rapeseed & mustard and chickpea

The information about the problems faced by the rapeseed & mustard and chickpea grower was obtained from the selected respondents on various facets of production and marketing of rapeseed & mustard and chickpea.

4.4.1 Production constraints in rapeseed & mustard and chickpea in Bhiwani

Production constraints related to rapeseed & mustard and chickpea in Bhiwani district of Haryana was depicted in Table 4.12. Major production constraint in rapeseed & mustard and chickpea was inadequate irrigation facilities 74.17 per cent followed by lack of full adoption of plant protection measures 70.00 per cent, less-availability of institutional credit 63.33 per cent while least problem was labour problem during harvesting 55.00 per cent and superious agrochemicals 50.00 per cent.

Table 4.12: Production constraints in rapeseed & mustard and chickpea in Bhiwani

(N= 40)

A. Production Problems				
S.No.	Constraints / Problems	MS	MPS	Rank order
1	Inadequate irrigation facilities	2.23	74.17	1
2	Lack of full adoption of plant protection measures	2.10	70.00	2
3	Less-availability of institutional credit	1.90	63.33	3
4	Inadequate knowledge of recommended packages and practices	1.78	59.17	4
5	Labour problem on weeding time	1.65	55.00	5
6	Labour problem during harvesting	1.65	55.00	5
7	Superious agrochemicals	1.50	50.00	7

4.4.2 Marketing constraints in rapeseed & mustard and chickpea in Bhiwani

Marketing constraints in rapeseed & mustard and chickpea in Bhiwani district of Haryana are presented in Table 4.13. Major marketing constraints observed in rapeseed & mustard and chickpea were wide fluctuation in prices 72.50 per cent followed by remunerative prices are not available 61.67 per cent, large number of intermediaries in marketing process 57.50 per cent, while minor problem was less procurement by government agencies at MSP 41.67 per cent and high transportation cost 41.05 per cent.

Table 4.13: Marketing constraints in rapeseed & mustard and chickpea in Bhiwani

(N= 40)

B. Marketing Problems				
S.No.	Constraints / Problems	MS	MPS	Rank order
1.	Wide fluctuation in prices	2.18	72.50	1
2.	Remunerative prices are not available	1.85	61.67	2
3.	Large number of intermediaries in marketing process	1.73	57.50	3
4.	Inadequate scientific storage facilities at reasonable price	1.63	54.17	4
5.	Non existences cooperative marketing organization.	1.45	48.33	5
6.	Inadequate knowledge about market news and intelligence	1.40	46.67	6
7.	Less procurement by government agencies at MSP	1.25	41.67	7
8.	High transportation cost	1.20	41.05	8

4.4.3 Production constraints in rapeseed & mustard and chickpea in Mahendragarh

Production constraints related to rapeseed & mustard and chickpea in Mahendragarh district of Haryana were depicted in Table 4.14. Major production constraints in rapeseed & mustard and chickpea were inadequate knowledge of recommended packages and practices 61.67 per cent. Then big problem was inadequate irrigation facilities 58.33 per cent followed by lack of full adoption of plant protection measures 55.83 per cent, less-availability of institutional credit 54.17 per cent while least problem was labour problem on weeding time and harvesting 48.33 per cent.

Table 4.14: Production constraints in rapeseed & mustard and chickpea in Mahendragarh (N= 40)

A. Production Problems				
S. No.	Constraints / Problems	MS	MPS	Rank order
1	Inadequate knowledge of recommended packages and practices	1.85	61.67	1
2	Inadequate irrigation facilities	1.75	58.33	2
3	Lack of full adoption of plant protection measures	1.68	55.83	3
4	Less availability of institutional Credit	1.63	54.17	4
5	Superious agrochemicals	1.55	51.67	5
6	Labour problem on weeding time	1.45	48.33	6
7	Labour problem during harvesting	1.45	48.33	6

4.4.4 Marketing constraints in rapeseed & mustard and chickpea in Mahendragarh

Marketing constraints in rapeseed & mustard and chickpea in Mahendragarh district of Haryana are presented in Table 4.15. Major marketing constraints in rapeseed & mustard and chickpea were remunerative prices are not available 62.50 per cent followed by wide fluctuation in prices 60.00 per cent, large number of intermediaries in marketing process 56.67 per cent while minor constraints were inadequate knowledge about market news and intelligence 45.83 per cent and non-existences cooperative marketing organization and high transportation cost 44.17 per cent.

Table 4.15: Marketing constraints in rapeseed & mustard and chickpea in Mahendragarh (N= 40)

B. Marketing Problems				
S. No.	Constraints / Problems	MS	MPS	Rank order
1.	Remunerative prices are not available	1.88	62.50	1
2.	Wide fluctuation in prices	1.80	60.00	2
3.	Large number of intermediaries in marketing process	1.70	56.67	3
4.	Inadequate scientific storage facilities at reasonable price	1.60	53.33	4
5.	Less procurement by government agencies at MSP	1.50	50.00	5
6.	Inadequate knowledge about market news and intelligence	1.38	45.83	6
7.	Non-existences cooperative marketing organization.	1.33	44.17	7
8.	High transportation cost	1.33	44.17	7

The results of the study presented in chapter IV are discussed in this chapter under the following sub headings:

Growth rates

5.1 Growth rates

5.2 Seasonal variation between arrival and price

5.3 Gap between minimum support prices and farm harvest prices

5.4 Constraints in production and marketing of rapeseed & mustard and chickpea

5.1 Growth rates

The discussion in this section is divided into four parts as explained below

5.1.1 Growth in area, production and productivity of rapeseed and mustard in India

The growth of area and production of rapeseed and mustard in India for the period 1995-96 to 2016-17, i.e. 0.05 and 1.89 per cent per annum, respectively and productivity grew at 1.67 per cent, respectively (Table 4.1). The introduction of technology in mustard with the release of high yielding varieties was the major reason for increase in production and productivity of rapeseed and mustard during this period in India. Result was in conventionality with the earlier findings of Choudhary *et al.* (2011).

5.1.2 Growth in area, production and productivity of chickpea in India

Compound annual growth rate in area, production and productivity of chickpea in India was recorded 1.71, 2.84 and 1.11 per cent respectively, (Table 4.2) for the period 1995-96 to 2016-17. For the country as a whole the growth rate of area, production and productivity was found positive during study period. This increasing trend in production and productivity of chickpea in India mainly because was introduction of resistant varieties against different diseased and insects and pests, better management. The result is in the same pattern was reported by Maurya and Kumar (2018).

5.1.3 Growth in area, production and productivity of rapeseed and mustard in Haryana

It was found from the Table 4.3 that in the period (1995-96 to 2016-17), Compound annual growth rate in area, production and productivity of total rapeseed and mustard in Haryana was recorded was -0.31, 2.00 and 3.87 per cent respectively. Major cause of decrease of area of rapeseed and mustard is farmer sifting towards another rabi crop like wheat and barley. Domestic demand for mustard seed oil and high yield varieties used by farmer was also the reasons for rise in production and productivity. The similar study conducted by Kumrawat and Yadav (2018).

5.1.4 Growth in area, production and productivity of chickpea in Haryana

Compound annual growth rate in area, production and productivity of chickpea in Haryana was noted -8.29, -7.79 and 0.46 per cent respectively for time period 1995-96 to 2016-17 in Table 4.4. Production of chickpea was maximum (381 thousand tonnes) in the year 1995-96 while minimum (27.00 thousand tonnes) in the year 2015-16. Reason of decreasing area under chickpea was lack of improved varieties, low market price and no certain market. Table 4.4 shows as area decreases as well as production also decrease because it's directly proportional to area. The similar study was conducted by Nimbrayan *et al.* (2019).

5.2 Seasonal variation between arrival and price

The discussion in this section is divided into three parts as explained below

5.2.1 Seasonal indices of rapeseed and mustard prices and arrivals in Bhiwani market.

The Table 4.5 reported the presence of seasonality in prices and arrivals in Bhiwani market. The results show that the peak period of rapeseed and mustard arrivals in the market was March to June and lean period of arrivals was September to January. Also results indicated that prices of rapeseed and mustard were lesser during the peak arrivals and higher during lean period in market. Agrawal and Hariom (1990) also reported more than half of the total arrival reaches in the peak season when price are low. The Figures 4.14 showed the inverse relationship existed between price and arrivals in Bhiwani market.

5.2.2 Seasonal indices of chickpea prices and arrivals in Bhiwani market.

The Table 4.6 discovered that the peak period of chickpea arrivals in Bhiwani market was March to June. However, maximum arrivals were detected in the months of March, April and May in Bhiwani market. Also result show price indices of chickpea in Bhiwani market were higher during lean period and lesser during the peak arrivals. Thus, the inverse relationship happened between price and arrivals in Bhiwani market and represented in Figure 15. The result is in the same pattern on green pea in Punjab as reported by Kaur *et al.* (2006).

5.2.3 Seasonal indices of rapeseed and mustard prices and arrivals in Narnaul market.

The peak period of rapeseed and mustard arrivals in Narnaul market was March to June shown in the Table 4.7 and lean period of arrivals was October to January. Also results shown that prices of rapeseed and mustard were lesser during the peak arrivals and higher during lean period in market. Thus Figure16 shown, the inverse relationship happened between arrival and prices. The similar study was conducted on the behaviour of arrivals and prices of castor by Naidu and Kumari (2013).

5.2.4 Seasonal indices of chickpea prices and arrivals in Narnaul market.

The Table 4.8 revealed that the peak period of chickpea arrivals in Narnaul market were in the month of March to July. Though, maximum arrivals were found in the months of March, April and May in market. Also, results shown that prices of chickpea were lesser during the peak arrivals and higher during lean period in market. There was inverse relationship occurred between arrival and prices by figure17. The similar study by

Choudhary and Pawar (2010) evaluated were negative relationship between price and arrival of chickpea was detected.

5.3 Gap between minimum support prices and farm harvest prices and Deviations of FHPs from MSPs of rapeseed & mustard and chickpea in Haryana from 1995-18

The discussion in this section is divided into two parts as explained below

5.3.1 Gap between minimum support prices and farm harvest prices of rapeseed and mustard

The Table 4.9 reported the gap between FHP and MSP of rapeseed and mustard ranged from -198.75 to 989.43 ₹ per qtl. The highest gap was recorded in the year 2011-12 i.e. 989.43 ₹/qtl lowest gap was recorded in the 2016-17 (-198.45 ₹/qtl). The Table 4.11 result shown that rapeseed and mustard experienced positive deviations i.e. MAPD 358.62 ₹/qtl and AMPD 213.58 ₹/qtl. Rapeseed and mustard shown positive deviations 17 times in 23 year during 1995-96 to 2017-18. It means that the average farm harvest price was equal to or ruled higher than minimum support price in 17 times out of 23 year. The adjusted difference (positive) between minimum support price and farm harvest price was as 74 per-cent of minimum support price and the negative difference was 26 per-cent of minimum support price. The similar study was observed by Latika *et al.* (2012).

5.3.2 Gap between minimum support prices and farm harvest prices of chickpea

The Table 4.10 exposed that gap between farm harvest price (FHP) and minimum support price (MSP) of chickpea which ranged from (-93.00 to 1115.50 ₹/qtl) in Haryana. The highest gap was noted in the year 2011-12 (1115.50 ₹/qtl) while lowest gap was noted in the 2017-18 i.e. -93.00. The Table 4.11 result out that chickpea experienced positive deviations i.e. MAPD 566.64 ₹/qtl and AMPD 33.58 ₹/qtl. The Table 4.11 shown chickpea shown positive deviations 22 times in 23 year during 1995-17. This means that the average farmer harvest price was equal to or ruled higher than minimum support price in 22 times out of 23 year. The adjusted difference (positive) between minimum support price and farmer harvest price was as 95 per-cent of minimum support price. Latika *et al.* (2012) also observed similar findings that FHP of chickpea was significantly affected with the MSP announced by the government.

5.4 Constraints in production and marketing of rapeseed & mustard and Chickpea

The discussion in this section is divided into four parts as explained below

5.4.1 Production constraints in rapeseed & mustard and chickpea in Bhiwani

Table 4.12 evaluated production problem in rapeseed & mustard and chickpea in Bhiwani. Also result out that major production problem faced by most of the farmer was inadequate irrigation facilities 74.17 per cent. Keeping this in view, there was a strong need irrigation facility by government for increasing the chickpea production in the study area. The second most important problem faced by growers were lack of adoption of plant protection measures 70.00 per cent and third problem was less-availability of institutional credit 63.33

per cent. In addition to the above problems, the farmer also faced the minor problems of labour problem during harvesting and weeding time 55 per cent and superior agrochemicals 50.00 per cent. Similar study was reported by Kumar *et al* (2018).

5.4.2 Marketing constraints in rapeseed & mustard and chickpea in Bhiwani

From the contents of Table 4.13, it was indicated that wide price fluctuation was ranked as the most important constraint among the farmer with mean per cent score of 72.50 followed by remunerative prices 61.67 per cent. Large number of intermediaries in marketing process which got rank III with a score of 57.50. Fourth major constraint reported by the farmer was inadequate scientific storage facilities at reasonable price 54.17 per cent. In addition to the above problems, non-existences cooperative marketing organization (v), inadequate knowledge about market news and intelligence (VI) procurement by government agencies at MSP (VII) and high transportation cost (VII). Kumar *et al* (2018) study also observed price fluctuations, problem faced due small quantity of marketable surplus and lack of availability about market news and intelligence were the important constraints faced by the farmer.

5.4.3 Production constraints in rapeseed & mustard and chickpea in Mahendragarh

It was evident from Table 4.14; most important constraint was inadequate knowledge of recommended packages and practices 61.67 per cent, followed by inadequate irrigation facilities 58.33 per cent. Also result shown that rank III with a score 55.83 per cent of lack of adoption of plant protection measures. Fourth major constraint reported by the farmer was less availability of institutional Credit 54.17 per cent while least problem was labour problem on weeding time and harvesting 48.33 per cent. Kumar *et al* (2018) in their study also observed that the constraints in production of pulses inadequate knowledge of recommended packages and practices, unfavourable weather condition, non-availability of quality water for irrigation, lack of knowledge about latest production technology and lack of adoption of plant protection measures.

5.4.4 Marketing constraints in rapeseed & mustard and chickpea in Mahendragarh

Table 4.15, found that major marketing constraints in rapeseed & mustard and chickpea in Mahendragarh. Major marketing constraints were remunerative prices 62.50 per cent followed by wide fluctuation in prices 60.00 per cent and third problem was large number of intermediaries in marketing process 56.67 per cent. In addition to the above fourth problem was inadequate scientific storage facilities at reasonable price 53.33per cent, procurement by government agencies at MSP with rank (V), Inadequate knowledge about market news and intelligence (VI), Non-existences cooperative marketing organization and high transportation cost have seventh rank. Sahu *et al* (2018) study main problem expressed by farmer were price fluctuations, lack of price information, malpractices by trader, problem of higher market charge and lack of market yard, late payment.

CHAPTER-VI

SUMMARY AND CONCLUSIONS

In developing countries, agriculture is main step of economy and the agricultural prices inhabit a main site in the price structure. The study of price behaviour is a vital necessary of any sound price policy. The most important step to this was the innovativeness to change agricultural price policy to attain the planned growth through price incentives. . The policy was to be enclosed keeping in view different objective (i) Providing food grains for the Public Distribution System, (ii) Guaranteeing reasonable prices of food grains and (iii) maintaining buffer stocks. The Agricultural Prices Commission was set up in January 1965 and advises to Government on price policy for agricultural sector with a vision to developing a balanced and integrated price building in the economy. The Commission for Agricultural Costs and Prices (CACP) recommends minimum support price (MSP) for 26 agricultural crops, the most important of which are paddy, wheat, cotton, oilseeds and pulses. Broad objectives of the Agriculture Price Commission (APC) are to ensure remunerative prices to farmer and affordable prices to consumer and promote sustainable use of all resources towards generally necessary crop mix (Parikh & Singh 2013). Minimum support prices (MSP) also objectives at procuring food grains from food surplus states for distribution through Public Distribution System and maintaining buffer stock and thus fulfil the demand supply gap (Jha & Srinivasan 2009; Chand 2016). In the present competitive economy prices of the commodities give sign to the farmer about the nature and quantity of commodity to be produced in a specific place at specific point of time. Prices help to spot a balance between demand and supply of the commodity. Therefore, analysis of prices and market arrivals over time is necessary for formulating a sound agricultural policy. NAFED Acting as the Central Nodal-Agency of the Government of India for undertaking purchases of oilseeds and pulses under Price Support Scheme. Agriculture plays an essential role in the economic development of a country.

The present study has been undertaken with the following specific objectives

1. To study the trends in area, production and productivity of rapeseed & mustard and chickpea
2. To estimate the seasonal variation in price and arrival of selected crops
3. To study the gap between MSP and Farmer harvest price of oilseed and pulse
4. To identify the constraints in production and marketing of rapeseed & mustard and chickpea

6.1 Trends in area, production and productivity of rapeseed and mustard-

6.1.1 Trends in area, production and productivity of rapeseed and mustard in India vis-à-vis Haryana

The trends in area, production and productivity of rapeseed and mustard for the whole period 1995-96 to 2016-17 at country level showed an increasing trend. The compound growth rates for area, production and productivity were found 0.05, 1.89 and 1.67 per cent. The trends in production and productivity of rapeseed and mustard in Haryana showed an increasing trend for the time period of 1995-96 to 2016-17. Whereas, it followed a decreasing trend in area under rapeseed and mustard for the same period. The compound growth rates were found -0.31, 2.00 and 3.87 per cent for area, production and productivity of rapeseed and mustard.

6.1.2 Trends in area, production and productivity of chickpea in India vis-a-vis Haryana

The trends in area, production and productivity of chickpea for the whole period 1995-96 to 2016-17 at country level showed an increasing trend. The compound growth rates for area, production and productivity of chickpea were found to be 1.71, 2.84 and 1.11 per cent. The trends in area and production of chickpea in Haryana indicated a decreasing trend for the time period of 1995-96 to 2016-17. Whereas, it followed an increasing trend in productivity under chickpea for the same period. The compound growth rates were found to be -8.29, -7.79 and 0.46 per cent rates for area, production and productivity of chickpea.

6.2 Seasonal variations in price and arrival of selected crops-

6.2.1 Seasonal indices of rapeseed and mustard price and arrival in Bhiwani and Mahendragarh

For arrival, Bhiwani market was selected from Bhiwani district and Narnaul market was selected from Mahendragarh district. The monthly time series on arrivals and prices of rapeseed and mustard were collected from AGMARKNET and other published and unpublished sources for selected markets covering period from 1995-96 to 2016-2017. The seasonal indices of arrivals revealed that the peak period was March to June. However, maximum arrivals were observed in the months of March, April and May irrespective in markets. Then the prices of rapeseed and mustard were lesser during the peak arrivals and higher during lean period in the selected market. Thus, the inverse relationship existed between price and arrivals in the market.

6.2.2 Seasonal indices of chickpea price and arrival in Bhiwani and Mahendragarh.

Bhiwani market was selected from Bhiwani district and Narnaul market was selected from Mahendragarh district. The seasonal indices of arrivals revealed that the peak period was March to June for chickpea in selected market. Though, highest arrivals were perceived in the months of March, April and May in market. The price indices of chickpea in the market was lesser during the peak arrivals (March to June) and higher during lean period (September to December).

6.3 The gap between MSP and Farmer harvest price of oilseed and pulses

The gap is found out for the study period i.e. 1995-96 to 2017-18. Rapeseed & mustard and chickpea were selected for study. The gap analysis showed that in most of the cases FHPs ruled higher than MSPs of rapeseed & mustard and chickpea in Haryana. Maximum gap in FHPs and MSPs of rapeseed and mustard i.e. ₹ 989.43 per quintal found in year 2011-12. Maximum gap in FHPs and MSPs of chickpea i.e. ₹ 1115.50 per quintal found in year 2011-12.

6.4 Constraints in production and marketing of rapeseed & mustard and Chickpea

In Bhiwani, among all the constraints faced in the production of rapeseed & mustard and chickpea of the important one were inadequate irrigation facilities. Lack of adoption of plant protection and less-availability of institutional credit were main constraint faced by the farmer. Major marketing constraints observed in rapeseed & mustard and chickpea were wide fluctuation in prices, remunerative prices and large number of intermediaries in marketing process. In Mahendragarh district, production constraint of rapeseed & mustard and chickpea faced by the farmer were inadequate knowledge of recommended packages and practices, inadequate irrigation facilities, lack of full adoption of plant protection measures and less-availability of institutional credit. Major marketing constraints were found remunerative prices, wide fluctuation in prices, large number of intermediaries in marketing process, while minor constraints were inadequate knowledge about market news and intelligence and high transportation cost.

CONCLUSIONS

1. The trends in area, production and productivity of rapeseed and mustard in India from 1995-96 to 2016-17 showed an increasing trend. The trends in production and productivity of rapeseed and mustard in Haryana also indicated the increasing trend while area depicted the decreasing trend. The trends in area, production and productivity of chickpea in India showed increasing. In Haryana area and production of chickpea indicated a decreasing trend but increasing trend in productivity under chickpea.
2. The seasonal indices of arrivals of rapeseed & mustard and chickpea revealed that the peak period was March to June in Bhiwani and Narnaul market. Then the prices of rapeseed & mustard and chickpea were lesser during the peak arrivals and higher during lean period (September to December) in the selected market. Thus, the inverse relationship existed between price and arrivals in the market.
3. The gap analysis in which deviations of FHPs from MSPs of rapeseed & mustard and chickpea crops results in positive deviations (FHP ruled higher than MSP) in most of cases in Haryana during 1995-96 to 2017-18.
4. The government intervention was very strong and did not allow the FHPs to move away from MSPs in a significant manner despite large marketed surplus. Due to heavy

procurement, the government had strong interest in the Haryana state and did not allow the private trade to play a significant role. In some cases, the farmer did receive prices higher than the MSP but the margin was very small.

5. It was concluded that no adverse impact of MSP on area and production of chickpea in Haryana.
6. Most of the farmers were aware of the policy of minimum support prices. However, they were not very conversant with the administrative mechanism. There was need felt by the farmer for covering other crops which will help them to diversify their areas of farm.
7. In Haryana the price policy was considered to be ineffective as the government has less interest in procurement operations for oilseeds and pulses crop due to small marketable surpluses.
8. An inadequate irrigation facility was the major main cause for diminishing area and production of chickpea.

Suggestions and Policy Implications:

- ✓ The government of India may approve the recommendation given by the National Commission for Farmer (NCF) that minimum support price should be at least 50per cent more than the weighted average of cost of production.
- ✓ Government must be work on national food security mission for pulses to increase the production and productivity through incentives in the form of subsidized seeds, pesticides, micro-nutrients, gypsum, farm implements and sprinkler sets.
- ✓ Introduction of Direct Payment Deficiency System (DPDS) for paying MSP guarantee for the farmer has to be initiated. Under this system, the farmer will directly get the amount, which is the difference between the minimum support price (MSP) and the market price, when the market price falls below the MSP.
- ✓ In Haryana state, chickpea area as well as productivity is continuously declining. In this context, concerned research efforts are needed to find out the main reasons for the devastation of these crops and also suggest appropriate remedial measures for correcting this undesired trend.
- ✓ Haryana government should made availability of procurement machinery for all oilseed and pulses crop.
- ✓ In Haryana, irrigation facilities should be strengthen by the government for increasing area and production of oilseed and pulses crop.
- ✓ Adequate knowledge of recommended package and practices of rapeseed & mustard and chickpea must be supportive to farmers.
- ✓ Full adoption of plant protection measures in cultivation of rapeseed and mustard must be needed for good production.

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APPENDIX I**Farm harvest prices of major food grains in Haryana markets from 1966-67 to 2017-18****(Prices in ₹/qtl)**

Year	Wheat	Chickpea	Rapeseed and mustard
1966-67	96.74	100.77	164.62
1967-68	74.24	69.40	134.05
1968-69	79.17	97.34	146.43
1969-70	77.85	89.67	160.10
1970-71	74.55	79.68	153.58
1971-72	79.57	100.19	168.89
1972-73	79.23	145.43	212.87
1973-74	120.79	197.72	312.91
1974-75	108.90	190.17	239.40
1975-76	104.77	102.33	174.14
1976-77	116.31	143.90	359.10
1977-78	116.41	166.51	309.68
1978-79	117.43	177.80	300.08
1979-80	124.52	264.25	400.49
1980-81	131.20	346.08	424.13
1981-82	145.59	268.88	347.64
1982-83	162.35	286.88	430.99
1983-84	156.49	352.72	458.60
1984-85	159.71	450.14	391.97
1985-86	165.12	368.03	455.28
1986-87	169.05	388.29	652.63
1987-88	190.80	536.74	677.38
1988-89	200.99	602.53	541.71
1989-90	217.99	707.38	714.23
1990-91	244.19	690.89	839.47
1991-92	318.18	679.72	888.59
1992-93	331.87	866.54	863.31
1993-94	353.22	1071.90	1006.93
1994-95	361.46	871.60	1012.01
1995-96	407.10	894.99	1031.08
1996-97	480.36	1257.42	1094.66
1997-98	502.68	1001.06	1273.98
1998-99	582.07	1014.69	1240.53
1999-00	582.26	1356.37	1088.21
2000-01	610.00	1864.98	1132.52
2001-02	630.00	1580.94	1212.86
2002-03	630.00	1566.90	1742.18
2003-04	630.00	1467.85	1658.30
2004-05	640.00	1533.38	1601.62
2005-06	756.91	2191.68	1634.53
2006-07	856.07	2186.79	1771.72
2007-08	1000.00	2645.65	2380.58
2008-09	1081.89	2310.83	2365.80
2009-10	1100.00	2321.63	2341.00
2010-11	1173.76	2940.00	2463.71
2011-12	1289.50	3915.50	3489.43
2012-13	1350.00	3739.02	3416.19
2013-14	1430.00	3506.15	3437.50
2014-15	1486.49	4069.44	3511.21
2015-16	1533.94	4072.83	3523.72
2016-17	1626.39	4807.87	3501.25

APPENDIX II**Minimum support prices of major food grains in Haryana markets from 1900-1901 to 2017-18
(Prices in ₹/qtl)**

Year	Wheat	Chickpea	Rapeseed and mustard
1990-1991	225	450	600.00
1991-1992	280	500	670.00
1992-1993	330	600	760.00
1993-1994	350	640	810.00
1994-1995	360	670	830.00
1995-1996	380	700	860.00
1996-1997	475	740	890.00
1997-1998	510	815	940.00
1998-1999	550	895	1000.00
1999-2000	580	1015	1100.00
2000-2001	610	1100	1200.00
2001-2002	620	1200	1300.00
2002-2003	620	1220	1330.00
2003-2004	630	1400	1600.00
2004-2005	640	1425	1700.00
2005-2006	650	1435	1715.00
2006-2007	750	1445	1715.00
2007-2008	1000	1600	1800.00
2008-2009	1080	1730	1830.00
2009-2010	1100	1760	1830.00
2010-2011	1170	2100	1850.00
2011-2012	1285	2800	2500.00
2012-2013	1350	3000	3000.00
2013-2014	1400	3100	3050.00
2014-2015	1450	3175	3100.00
2015-2016	1525	3500	3350.00
2016-2017	1625	4000	3700.00
2017-2018	1735	4400	4000.00

APPENDIX III

Area, production and productivity of rapeseed & chickpea and gram in Haryana state during 1990-01 to 2016-17 (A-Area ('000ha), P-Production ('000 tonnes) and Y-Productivity (kg/ha))

Year	Rapeseed and Mustard			Chickpea		
	A	P	Y	A	P	Y
1990-1991	7521	5356	712	7521	5356	712
1991-1992	5580	4121	739	5580	4121	739
1992-1993	6454	4417	684	6454	4417	684
1993-1994	6359	4981	783	6359	4981	783
1994-1995	7543	6436	853	7543	6436	853
1995-1996	7116	4979	700	7116	4979	700
1996-1997	6847	5570	814	6847	5570	814
1997-1998	7563	6132	811	7563	6132	811
1998-1999	8469	6801	803	8469	6801	803
1999-2000	6146	5118	833	6146	5118	833
2000-2001	5185	3855	744	5185	3855	744
2001-2002	6416	5473	853	6416	5473	853
2002-2003	5906	4237	717	5906	4237	717
2003-2004	7048	5718	811	7048	5718	811
2004-2005	6715	5469	815	6715	5469	815
2005-2006	6926	5600	808	6926	5600	808
2006-2007	7494	6334	845	7494	6334	845
2007-2008	7544	5749	762	7544	5749	762
2008-2009	7893	7060	895	7893	7060	895
2009-2010	8169	7476	915	8169	7476	915
2010-2011	9186	8221	895	9186	8221	895
2011-2012	8299	7702	928	8299	7702	928
2012-2013	8522	8833	1036	8522	8833	1036
2013-2014	9927	9526	960	9927	9526	960
2014-2015	8251	7332	889	8251	7332	889
2015-2016	8399	7058	840	8399	7058	840
2016-2017	9626	9378	974	9626	9378	974

APPENDIX IV

Area, production and productivity of rapeseed & chickpea and gram in Haryana state during 1990-01 to 2017-18 (A-Area ('000ha), P-Production ('000 tonnes) and Y-Productivity (kg/ha))

Years	Rapeseed and mustard			Chickpea		
	A	P	Y	A	P	Y
1990-91	473.8	634	1,338	649.3	469	722
1991-92	637.9	662	1004	306.7	202	659
1992-93	562.3	518	-	387.9	260	669
1993-94	576	798	-	405.3	403	995
1994-95	579.1	802	-	399.7	440	1099
1995-96	574.6	729	605	376.7	381	1,010
1996-97	612.7	894	650	345.1	276	799
1997-98	556	368	662	353.9	309	872
1998-99	498	615	1235	357	294	824
1999-00	449	595	1322	100.4	58	577
2000-01	408.8	560	1369	124.5	80	640
2001-02	536.4	800	1490	142.5	122	853
2002-03	607	697	1148	54.7	41	745
2003-04	619.2	965	1559	122.8	100	813
2004-05	699.8	824	1177	107.9	91	843
2005-06	707.8	792.8	1117	129.8	72	554
2006-07	598.1	804	1344	107.7	90	843
2007-08	496.5	597	1202	107.3	54	505
2008-09	514	894.9	1722	123.6	129	1040
2009-10	511.1	847	1657	84.1	62	735
2010-11	509.7	953	1852	111.5	110	982
2011-12	535.9	747	1394	78.9	73	924
2012-13	558.3	959.3	1722	47	53	1128
2013-14	536.9	878	1611	82.6	72	867
2014-15	481.9	706	1432	65.1	42	646
2015-16	510.4	823	1669	43	27	619
2016-17	506.1	946.1	1,830	37.1	46.4	1,179

**APPENDIX-V
INTERVIEW SCHEDULE**

CCS HARYANA AGRICULTURAL UNIVERSITY

COLLEGE OF AGRICULTURE, HISAR

DEPARTMENT OF AGRICULTURAL ECONOMICS

Title of Research Problem: Impact of Agricultural Price Policy on Oilseed and Pulse crop in Haryana

1. Household identification

Farmer's name	
Father's name	
Age of Farmer	
Education	
Village name	
Block	
District	
Mobile number	

2. Individual Farm size information

Items	Irrigated	Un-irrigated	Total Area
Owned			
Leased in			
Leased out			
Total operational holding			

3. Family composition of household

	Adult Male	Adult Female	Children	Total Membe`
Number				
Family type	Nuclear/Joint			

4. Cropping Pattern:

Name of crop	Irrigated	Un-irrigated	Total
Kharif Season			
1.			
2.			
3.			
Rabi Season			
1.			
2.			
3.			
Other			
Total			

5. Source wise Irrigation pattern

Sr. No.	Source	Area Irrigated (in Hectares)	Rate/hour/irrigation
1	Canal		
2	Tube well		
3	Other		
	Total		

Constraints faced by rapeseed & mustard and chickpea grower

A) Production problems

		Very serious (1)	Seriously (2)	Some what serious (3)	No response (4)
1.	Inadequate knowledge of recommended packages and practices				
2.	Labour problem during harvesting				
3.	Inadequate irrigation facilities				
4.	Less-availability of institutional Credit				
5.	Labour problem on weeding time				
6.	Lack of full adoption of plant protection measures				
7.	Spurious of agrochemicals				

B) Marketing problems

		Very serious (1)	Seriously (2)	Some what serious (3)	No response (4)
1.	High cost of transportation				
2.	Wide fluctuation in prices				
3.	Inadequate knowledge about market news and intelligence				
4.	Remunerative prices are not available				
5.	Inadequate scientific storage facilities at reasonable price				
6.	Large number of intermediaries in marketing process				
7.	Non existences cooperative marketing organization				
8.	Less procurement by government agencies at MSP				

ABSTRACT

Title of Thesis : **Impact of Agricultural Price Policy on oilseed and pulse crop in Haryana**
Name of Degree Holder : **Sandeep Kumar**
Admission no. : **2017A08M**
Title of degree : **Master of Science**
Name and Address of Major : **Dr. V. P. Luhach, Major Advisor,
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Year of award of degree : **2019**
Major Subject : **Agricultural Economics**
Minor Subject : **Statistics**
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The present study was carried out with the objectives to analyse the trend in area, production and productivity, the seasonal variation in price and arrival, gap between FHP (Farm Harvest Prices) and MSP (Minimum Support Prices) and identify the constraints in production and marketing of rapeseed & mustard and chickpea. The study was based on primary as well as secondary data. Bhiwani and Mahendragarh districts were purposively selected based on the highest area under rapeseed & mustard and chickpea from Haryana, respectively. Two blocks namely Tosham and Kairu from Bhiwani district, Kanina and Mahendragarh from Mahendragarh district selected purposively. Further two villages of each selected block were selected randomly. From each village, 10 farmers were selected randomly and finally, 80 farmers of eight villages were interviewed to excerpt all desired information. The outcomes of study revealed an increasing trend in the area, production and productivity of rapeseed and mustard at the national level with CGRs values of 0.05, 1.89 and 1.67 per cent, respectively. Whereas, in Haryana, the trend in area indicated decreasing trend -0.31 per cent, while production and productivity illustrated increasing trend with CGRs values of 2.00 and 3.87 per cent, respectively. In the study shown an increasing trend in the area, production and productivity of chickpea at the national level with CGRs values of 1.71, 2.84 and 1.11 per cent, respectively. Whereas, in Haryana, the trend in area and production indicated decreasing trend -8.29 per cent and -7.79 per cent while productivity illustrated increasing trend with CGR values of 0.46 per cent, respectively. Seasonal analysis resulted that the rapeseed & mustard and chickpea arrivals in the selected markets were higher in the months of March to June (Peak period) and lower in the months of February to October to February (Lean period). The inverse relationship was found between price and arrivals of rapeseed & mustard and chickpea in the selected markets. Gap between FHP and MSP resulted that in mostly cases FHP is higher than MSP because higher demand than supplies does not allow the market prices to fall below MSP. In recent year, market prices ruled higher than MSP. The major problems faced by the farmer in the production, marketing of rapeseed & mustard and chickpea in Bhiwani district were inadequate irrigation facilities 74.17 per cent followed by lack of adoption of plant protection measures 70.00 per cent and marketing constraints were wide fluctuation in prices 72.50 per cent followed by remunerative prices 61.67 per cent. In Mahendragarh district major production constraint of rapeseed & mustard and chickpea were inadequate knowledge of recommended packages and practices 61.67 per cent followed by big inadequate irrigation facilities 58.33 per cent, lack of adoption of plant protection measures 55.83 per cent and marketing constraints were was remunerative prices 62.50 per cent followed by wide fluctuation in prices 60.00 per cent, large number of intermediaries in marketing process 56.67 per cent.

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