

# Growth in area, production and productivity of major vegetable crops in Sonipat a district of Haryana

Priyanka Choyal<sup>1</sup> Manjeet Poswal<sup>2</sup>

<sup>1</sup> INDEPENDENT RESEARCH SCHOLAR

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## Abstract:

Our country has achieved self-sufficiency and a good degree of stability in food production. This has created an urgent need for providing health security to our population by supplying nutrition through balanced diet. Vegetables form the most important component of a balanced diet. We can grow a variety of vegetables around the year.

Consumer's preferences have also shifted away from cereals and moved towards high-value agricultural produce like vegetables. With increase in economic standards, urbanization of growing Indian villages, international market integration and trade liberalization, the demand for horticultural products is expected to increase even further. On the production side, if cereal pricing is left to market forces, land will be released from traditional cultivation to meet the growing demand for non-cereal crops such as oilseeds, fruits and vegetables in accordance with the diversification in consumption pattern (Mittal, 2006). Thus, in a holistic way, horticulture can be promoted as a means of agro-diversification for the second green revolution, providing the much needed impetus to the growth of agricultural sector, through increase in trade, income and employment. Presently, Indian agriculture is diversifying into the production of high value commodities, also providing an increasing role to small holding farmers. Indian rural economy had been facing the challenge of inability to manage the problems involved with transition of agriculture from a supply-driven value chain to a demand-led market-oriented supply chain (Viswanadham, 2006).

## Introduction:

India is the world's second largest producer of vegetables next only to China. India can claim to grow the largest number of vegetable crops compared to any other country of the world and as many as 61 annual and 4 perennial vegetable crops belonging to different groups, namely, solanaceous, cucurbitaceous, leguminous, cruciferous (Cole crops), root crops and leafy vegetables are grown in India in tropical, sub-tropical and temperate regions. Important vegetable crops grown in the country are potato, onion, tomato, brinjal, cabbage, cauliflower, okra and peas.

Vegetable cultivation occupies an important place in the agricultural economy of the country. The agricultural economy of our country has the characteristics of preponderance of small and marginal land holdings and family labor for which vegetable cultivation is more suitable. Though,

vegetable crops hold a great promise for fostering the economic growth and improving the diet of the people, yet they received limited attention in marketing research programmes in India.

In Haryana, area under vegetable crops in 2013-14 was 373.2 thousand hectares and production was 5565.9 thousand metric tonnes with productivity of 14.9 MT/ha. The cauliflower, onion, potato, tomato and radish are the major vegetable crops of Haryana state. In India cauliflower, onion, potato, tomato and radish are grown in 433.87 thousand hectares with production of 8573.28 thousand metric tonnes, 1203.57 thousand hectares area with production of 19401.68 thousand metric tonnes, 1973.19 thousand hectares area with production of 41555.38 thousand metric tonnes, 882.03 thousand hectares area with production of 18735.91 thousand metric tonnes and 173.33 thousand hectares area with production of 2484.85 thousand metric tonnes, respectively (Handbook of Horticultural Statistics, 2014). In Haryana, cauliflower is mainly grown in the districts of Sonipat, Panipat, Karnal, Yamunanagar and Gurgaon, onion is mainly grown in the districts of Mewat, Yamunanagar, Rohtak, Karnal and Ambala, potato is mainly grown in the districts of Kurkeshtra, Yamunanagar, Karnal, Sonipat and Ambala, tomato is mainly grown in the districts of Karnal, Mewat, Yamunanagar, Gurgaon and Sonipat and radish is mainly grown in the districts of Sonipat, Karnal, Yamunanagar, Rohtak and Gurgaon. In Haryana, cauliflower, onion, potato, tomato and radish is grown in 30297 hectares area with production of 526490 tonnes, 30163 hectares area with production of 672165 tonnes, 29973 hectares area with production of 696514 tonnes, 29415 hectares area with production of 627282 tonnes and 29394 hectares area with production of 447727 tonnes, respectively (Haryana Horticulture Statistics, 2014).

### **Review Literature:**

Satinder and Singh (2014) studied the growth rates in the area, production and productivity of sugarcane crop in Haryana and found interesting results. The growth rate in the area of sugarcane crop was found noticeably negative in both the regions and in most of the districts of Haryana. A similar picture of the growth rate in the production of sugarcane was seen in almost all the districts except Bhiwani and Karnal. On the contrary, the growth rate of productivity of sugarcane crop found positive in most of the district of Haryana. This indicates that rate of change in area of sugarcane crop is higher than the rate of change in production in most of the Haryana districts.

Dinesha and Sriramappa (2015) carried out a study on fruits and vegetables at all-India and Karnataka levels separately. For the study period 1991-92 to 2012-13 the growth rates of area and production of fruits showed positive of 4.3 percent. The productivity of fruit crop registered insignificant positive growth. The area, production and productivity of vegetables registered positive growth during the study period 1991-92 to 2012-13. The growth rates of area, production and productivity of vegetables exhibited positive rates of 1.90, 2.50 and 0.70 percent, respectively.

### **Objective**

After reweaving the literature, the present paper analysis the objective:-

1. To study the growth in area, production and productivity of major vegetable crops in Haryana.

## Sampling framework

The vegetable crops for the study are being selected on the basis of area and production of these crops grown in Haryana state. The scenario of area and production of selected vegetable crops grown in Haryana are given in Table-1. The table revealed that cauliflower, potato, onion, tomato and radish are the major vegetable crops grown in Haryana and therefore, these five major vegetable crops were being selected for the study.

**Table 1: Area and production of major vegetable crops in Haryana  
(Area in hectares and production in tonnes)**

Vegetable crops	2011-12		2012-13		2013-14		Triennium average	
	Area	Production	Area	Production	Area	Production	Area	Production
Cauliflower	29946	584277	30822	545674	30297	526490	30355	552147
Potato	27818	618845	29473	676016	29973	696514	29088	663792
Onion	27448	589830	27820	518489	30163	672165	28477	593495
Tomato	27070	417443	28755	418311	29415	627282	28413	487679
Radish	26790	424680	28689	438418	29394	447727	28291	436942

**Source:** Haryana Horticulture Statistics

Further for the study, one district i.e. is being selected purposively on the basis of their highest area under vegetable crops for this study.

**Collection of data:** The secondary data from 1994-95 to 2013-14 were collected regarding area, production and productivity of selected major vegetable crops from various issues of Statistical Abstract of Haryana and National Horticulture Board, Gurgaon.

**Analysis of data:** The data are analyzed using various statistical techniques to achieve the objectives as specified below:

**Growth rates:** To study the growth rates in area, production and productivity of Cauliflower, Potato, Onion, Radish and Tomato crops, data are collected for the last 20 years (1994-95 to 2013-14) and annual compound growth rates were worked out as under:

$$Y_t = ab^t \cdot U_t \quad \dots \dots \dots (i)$$

Where,

$Y_t$  is area/production/productivity of vegetable crops in time period  $t$

$t$  is time element that takes the values 1, 2, 3, .....n

$a$  and  $b$  are parameters to be estimated

Where,

$$b = (1 + r); \text{ where 'r' is compound growth rate}$$

$U_t$  is the error term

Thus, equation (i) can be rewritten as

$$Y_t = a (1 + r)^t \cdot U_t \dots \dots \dots (ii)$$

On logarithmic transformation of equation (ii) we get:

$$\text{Log } Y_t = \text{log } a + t \text{ log } (1 + r) \text{ log } U_t \dots \dots \dots (iii)$$

The compound growth rate was obtained as

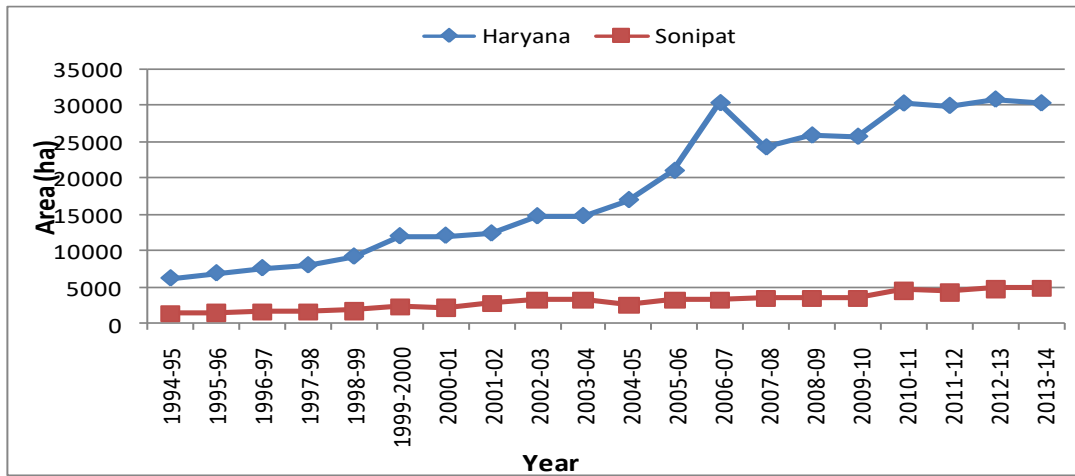
$$r = [(\text{Antilog of } b) - 1] \times 100$$

**Table 2: Area, production and productivity of cauliflower in Haryana state and Sonipat district**

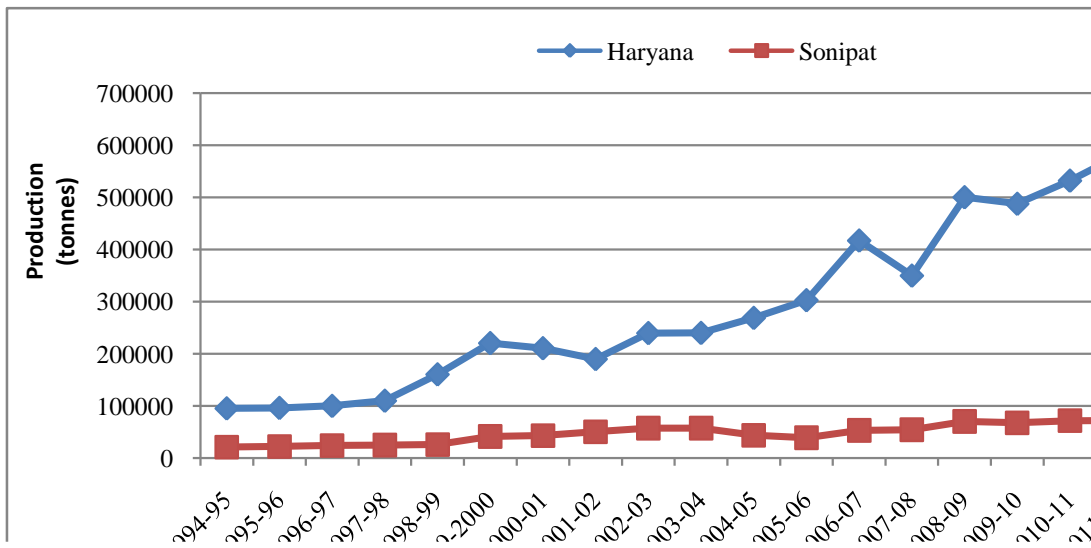
(Area in ha, Production in tonnes and Productivity in tonnes/ha)

Year	Area			Production			Productivity	
	Haryana	Sonipat	per cent Share	Haryana	Sonipat	per cent Share	Haryana	Sonipat
1994-95	6200	1400	22.58	95220	21110	22.17	15.36	15.08
1995-96	6900	1500	21.74	96100	22190	23.09	13.93	14.79
1996-97	7600	1600	21.05	100000	24100	24.10	13.16	15.06
1997-98	8000	1650	20.63	109900	24900	22.66	13.74	15.09
1998-99	9200	1750	19.02	160500	26000	16.20	17.45	14.86
1999-2000	12000	2250	18.75	220500	41400	18.78	18.38	18.40
2000-01	12071	2180	18.06	210688	43210	20.51	17.45	19.82
2001-02	12382	2800	22.61	189885	50380	26.53	15.34	17.99
2002-03	14750	3222	21.84	239700	57275	23.89	16.25	17.78
2003-04	14775	3230	21.86	240000	57310	23.88	16.24	17.74
2004-05	16977	2590	15.26	268812	43820	16.30	15.83	16.92
2005-06	20995	3245	15.46	302759	39060	12.90	14.42	12.04
2006-07	30324	3320	10.95	417197	53120	12.73	13.76	16.00
2007-08	24231	3462	14.29	349891	54390	15.54	14.44	15.71
2008-09	25873	3517	13.59	500336	70200	14.03	19.34	19.96
2009-10	25699	3525	13.72	487689	67600	13.86	18.98	19.18
2010-11	30276	4552	15.04	532120	71660	13.47	17.58	15.74
2011-12	29946	4330	14.46	584277	72123	12.34	19.51	16.66
2012-13	30822	4755	15.43	545674	79120	14.50	17.70	16.64
2013-14	30297	4860	16.04	526490	84450	16.04	17.38	17.38

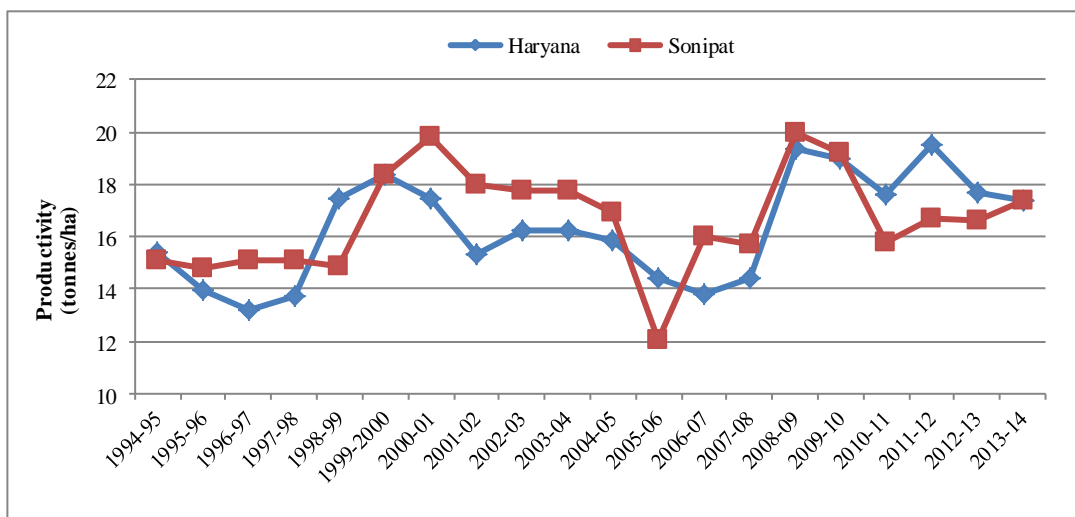
Source: Haryana Horticulture Statistics



**Fig. 1: Area under cauliflower in Haryana state and Sonipat district**



**Fig. 2: Production under cauliflower in Haryana state and Sonipat district**



**Fig. 3: Productivity under cauliflower in Haryana state and Sonipat district**

To study growth in area, production and productivity of cauliflower in Haryana, and its district Sonipat, the compound growth rates for the period (1994-95 to 2013-14) are worked out which are given in Table 3. A perusal of this table shows that the annual compound growth rates (CGR) of area and production in Haryana were 9.64 and 10.85 per cent, respectively. These growth rates are found significant at 1 percent level of significance. One of the notable features is the significant and positive

CGR (1.11 percent) of productivity in Haryana at 5 per cent level of significance. The CGR of area in Sonipat is 6.72 which are also statistically significant at 1 per cent level of significance. The production of cauliflower registered positive growth of 7.36 per cent in Sonipat. However, the productivity of cauliflower registered growth of 0.5 per cent in Sonipat, which is not statistically significant.

**Table 3: Compound growth rates of area, production and productivity of cauliflower**

Particulars	Haryana	Sonipat
Area	9.64**	6.72**
Production	10.85**	7.36**
Productivity	1.11*	0.5 <sup>NS</sup>

\*and \*\* Significant at 5 per cent and 1 per cent level of significance, respectively

### Conclusion:

The compound growth rates of area and production of cauliflower in Haryana and Sonipat are 9.64, 10.85 and 6.72, 7.36 per cent, respectively at 1 per cent level of significance. The CGR of productivity in Haryana is 1.11 per cent at 5 per cent level of significance and in Sonipat it is 0.5 per cent (non-significant).

### Suggestions:

On the basis of the results obtained in the present study, the cultivators of cauliflower, potato, onion, tomato and radish have lack of scientific knowledge about cultivation practices and efficient use of productive resources. Therefore, it is important to impart technological know-how at doorstep through extension workers and Agricultural Research Stations organizing field days on farmer's fields.

### References:

- Dinesha M. V. and K. E. Sriramappa (2015). Growth in area, production and productivity of vegetables and fruits in india with special reference to Karnataka, *International Journal of Applied Research*, Volume 1, pp 288-293.
- Satinder Kumar and Surender Singh (2014). Trends in growth rates in area, production and productivity of sugarcane in Haryana. *International Journal of Advanced Research in Management and Social Sciences*, Volume 3, pp 117-124.