

Research Paper

The Trends of Area, Production and Productivity of Selected Spices and Traditional Crops in Haryana

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ABSTRACT

India known as “Home of Spices” and produces so many varieties of spices since ancient time. Haryana is one of the developed states of India and produces many traditional crops and horticultural crops. Spices are a major part of horticultural crops and also play an important role in food as well as in medicines. Haryana produces some of the popular spices like ginger, seed fennel, turmeric, coriander, fenugreek, garlic etc. In 2017-18, Haryana produced 75580 tones spices in 11928 hectares. Besides these spice crops, Haryana produced some major traditional crops i.e. wheat, rice, sugarcane, cotton, oilseeds (mustard seed, sunflower, etc.) 13,352, 4,145, 7,169, 993 and 855 thousand tones, respectively. The present study is based on secondary data of Haryana state for the period of 17 years i.e., from 2001-02 to 2017-18. Four spices were selected on the bases of highest area sown and to analysis the data, CGR (compound annual growth rate) has been employed. The results of the study showed that there was significant growth in the area, production and productivity of selected spices and steady growth in area and production of major traditional crops during the study period 2001-02 to 2017-18.

JEL Code: Q18, E23, O13, D24

HIGHLIGHTS

- ① It is a comparative analysis of selected spices and traditional crops in Haryana.
- ① The study is based on secondary data for the years of 2001-02 to 2017-18.
- ① Four spices crops ginger, turmeric, garlic and fenugreek selected on the basis of highest area sown.
- ① The study revealed that the area of spices grew at the rate of 1.7 per cent as compared to 0.7 per cent growth of traditional crops in Haryana.
- ① Production of spices grew at the rate of 2.8 per cent as compared to 2.3 per cent growth of traditional crops in Haryana.

Keywords: Horticultural crops, spices, food grain and compound growth rate

Agriculture is the primary and largest sector of the Indian economy. India has made a lot of progress in agriculture since independence in terms of growth in output, yields, and area under many crops. The contribution of the agriculture sector of India's Gross Domestic Product steadily declining with the country's economic growth. Further, horticulture is an allied and important part of agriculture sector. The horticulture sector encompasses a wide range of crops. The horticulture crops include fruits, vegetables, spices, plantation crops, and flowers. During 2017-18, the production of horticulture

crops was 311.71 million Tonnes from an area of 25.43 million Hectares. The area under horticulture grew by 2.6% per annum and annual production increased by 4.8%. (Horticulture Statistics at a Glance 2018) Spices are one of the major contributors in horticultural sector and India produces so many varieties of spices since ancient times. Indian spices

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have been a heart to Indian culture and it's having always been believed to have healing and magical qualities. In the present, it produces various major spices such as pepper, cardamom, chili, ginger, turmeric, coriander, cumin, celery, fennel, fenugreek, Ajwain, garlic, tamarind, and clove, etc. Major spices growing states are Rajasthan, Andhra Pradesh, Gujarat, Telangana, Karnataka, Maharashtra, West Bengal, Uttar Pradesh, Orisha, Kerala, and Tamil Nadu in India. From these states, Haryana is one of the developed states in India as compare to other states. Haryana produced some popular spices like ginger, seed fennel, turmeric, coriander, fenugreek, garlic, etc. In 1966-67 Haryana had only 0.42 per cent horticulture area from total cropped area. It grew with the time and reached 7.07 per cent of the total area in the year of 2018-19. In 2017-18, Haryana produced 80928 tonnes of spices in 11928 hectares. But the next financial year 2018-19 the production was declining 80928 tonnes to 70300 tonnes. Because the area of spice crops also declined from 11928 to 9178 hectares. (Horticulture Haryana) In Haryana, most spices producer districts are Yamunanagar, Panchkula, Panipat, Sonipat, Ambala, Jind, etc. (Horticulture Haryana 2018-19) It also produced some major crops i.e., wheat, rice, sugarcane, cotton, and oilseeds (mustard seed, sunflower, etc.) 12263, 4880, 963, and 1137 thousand tonnes respectively in 2018-19. (Statistical Abstract 2019-20) some of the study related to growth of horticulture crops showed the importance of horticulture in agriculture sector. According to Yogesh and Mokshapathy 2013, the area, production and consumption of pepper had decreased -2.16, -5.65 and -0.46 per cent per annum. One another study, Naik and Hosamani revealed that the growth rate of turmeric in India were 3.45, 8.09 and 4.48 per cent per annum in pre-WTO period, 1.99, 3.96 and 1.94 per cent annum in post-WTO period and 2.65, 5.60 and 2.88 per cent per annum respectively. The study also revealed that the growth rate of turmeric in Karnataka were 5.26, 15.36 and 9.54 per cent per annum in pre-WTO period, 9.31, 11.93 and 2.27 per cent annum in post-WTO period and 5.92, 6.35 and 0.47 per cent per annum respectively. Patil and Kerur 2016 examined that the growth in area, production and productivity in India and Karnataka were 6.71, 10.12, 2.23 and 3.63, 11.03 and 7.14 per cent per annum respectively. In case of Garlic, study revealed that the growth in area, production and productivity in India and

Karnataka were 5.12, 6.30, -0.35 and 1.37, 5.66 and 4.22 per cent per annum respectively. Patil and Yeledhalli 2016 found that Bengaluru urban and rural had the highest CAGR were 24.26 per cent and 22.26 per cent in productivity respectively. In Davanager, the highest CAGR was found in productivity of tomato (9.12 per cent). Shivamogga district observed highest CAGR in production of Sunflower (29.57 per cent) and area under green Chilies was growing at rate of 34.46 per cent per annum. Sonwani *et al.* (2018) revealed that the growth rate in the area, production and productivity of chilli was observed at 14.38, 31.79 and 15.20 per cent in Bilaspur district and 15.98, 20.84 and 4.19 per cent in Chhattisgarh state respectively. So, these views keep in mind the present study is conducted to find out the trends of the area, production, and productivity of selected spices and traditional crops in Haryana.

METHODOLOGY

The study has been conducted in Haryana state of India to know the trends of area, production and productivity of selected spices and traditional crops in Haryana. The study was based on secondary data for the period of 17 years i.e., from 2001-02 to 2017-18 collected from various relevant sources like Haryana Statistical Abstract, Directorate of Economics & Statistics, Annual Agriculture survey and Department of Horticulture Haryana etc. The spices crops were selected on the basis of highest area sown. Four spices crop ginger, turmeric, garlic and fenugreek has been selected from rabi and kharif season. Panchkula and Yamunanagar districts were selected for rabi crops whereas Karnal and Yamunanagar were selected for kharif crops on the basis of highest under selected spices crops. One major traditional crop (Cereals) has been also selected from already identified districts. For analysis the data Descriptive Statistics (Mean and C.V.), CGR (compound annual growth rate) has been employed.

The formula for the for CGR (compound annual growth rate) is as follows:

$$Y = A [1 + r]^t$$

Where, Y = dependent variable; A = Constant, $B = 1 + r$, r = Compound growth rate; t = time variable in years (2001-02 to 2017-18)

$$\text{Log } Y = \log A + t \log [1 + r]$$

$$\text{OR } Y^* = a + b^t$$

Where $Y^* = \log Y$; $a = \log A$; $b = \log [1 + r]$; $[1 + r] = \text{Antilog } b$; $r = \text{Antilog } b - 1$

In percentage term $r = [\text{Antilog } b - 1] \times 100$

RESULTS AND DISCUSSION

Trends of selected spice (Ginger) and traditional crops (Wheat) in Panchkula district

Table 1: Compound Growth Rate of Spices and Traditional crops (Cereals) in Panchkula District of Haryana (Area in 000 hectares, production in 000 tons and productivity in tons/hectare)

District / Years	Panchkula					
	Ginger			Wheat		
	Area	Production	Productivity	Area	Production	Productivity
2001-02	0.296	2.950	9.966	16.100	43.000	2.671
2002-03	0.100	0.800	8.000	16.500	44.000	2.667
2003-04	0.100	1.200	12.000	17.100	42.000	2.456
2004-05	0.100	1.000	10.000	17.500	39.000	2.229
2005-06	0.120	1.800	15.000	17.000	32.000	1.882
2006-07	0.200	2.000	10.000	16.900	40.000	2.367
2007-08	0.250	2.500	10.000	15.700	41.000	2.611
2008-09	0.200	1.900	9.500	15.500	39.000	2.516
2009-10	0.200	1.800	9.000	15.700	38.000	2.420
2010-11	0.275	2.755	10.018	16.300	42.000	2.577
2011-12	0.600	9.160	15.267	16.000	25.000	1.563
2012-13	0.580	8.890	15.328	16.900	25.000	1.479
2013-14	0.320	4.451	13.909	17.000	38.000	2.235
2014-15	0.080	1.230	15.375	17.600	29.000	1.648
2015-16	0.090	1.380	15.333	17.600	34.000	1.932
2016-17	0.080	1.490	18.625	17.500	31.000	1.771
2017-18	0.425	3.188	7.501	18.100	37.000	2.044
Mean	0.236	2.852	11.575	16.764	36.411	2.868
C. V.	70.330	87.68	23.62	4.59	16.61	20.57
C.G.R.	2.2	4.5	2.2	0.4	-2	3.3

Source: Horticulture department and statistical abstract of Haryana, government of Haryana.

The table 1 show the mean, C.V. and compound growth rate of selected spices and traditional crops in Panchkula district for the year of 2001-

02 to 2017-18. In the district Panchkula, positive growth rate (significant growth rate) was found in the area, productivity and production during the study period. The area under ginger has been grown at 2.2 per cent per annum. Ginger production grew at 4.5 per cent per annum. The productivity of ginger registered a growth rate of 2.2 per cent per annum. As similar to ginger, wheat registered positive growth in area and productivity but a negative growth rate in production. The area and productivity under wheat in Panchkula registered 0.4 and 3.3 per cent growth respectively. The production registered -2.0 per cent growth per annum.

Trends of selected spice (Turmeric) and traditional crops (Wheat) in Yamunanagar district

Table 2: Compound Growth Rate of Spices and Traditional crops (Cereals) in Yamunanagar District of Haryana (Area in 000 hectares, production in 000 tons and productivity in tons/hectare)

District / Years	Yamunanagar					
	Turmeric			Wheat		
	Area	Production	Productivity	Area	Production	Productivity
2001-02	0.262	2.070	7.901	64.90	241.00	3.713
2002-03	0.427	5.183	12.138	64.00	235.00	3.672
2003-04	0.590	14.290	24.220	71.30	242.00	3.394
2004-05	0.330	9.380	28.424	72.30	245.00	3.389
2005-06	0.280	4.530	16.179	72.30	265.00	3.665
2006-07	0.029	1.762	60.759	71.30	295.00	4.137
2007-08	0.170	2.153	12.665	74.50	279.00	3.745
2008-09	0.320	3.191	9.972	84.80	345.00	4.068
2009-10	0.380	2.960	7.789	85.80	355.00	4.138
2010-11	1.264	11.138	8.812	83.40	378.00	4.532
2011-12	1.800	12.600	7.000	84.80	456.00	5.377
2012-13	0.600	7.320	12.200	85.10	369.00	4.336
2013-14	2.120	27.000	12.736	85.10	385.00	4.524
2014-15	2.450	24.100	9.837	88.60	385.00	4.345
2015-16	1.454	15.800	10.867	91.00	408.00	4.484
2016-17	1.600	20.000	12.500	89.00	399.00	4.483
2017-18	0.470	6.000	12.766	89.00	426.00	4.787
Mean	0.855	9.969	15.692	79.835	335.76	4.16
C. V.	88.65	79.81	82.21	11.21	21.84	12.5
C.G.R.	13.8	10.2	-3.2	2.2	4.2	2

Source: Horticulture department and statistical abstract of Haryana, government of Haryana.

The table 2 show furnished result about growth of area, production and productivity in the Yamunanagar district. The result showed significant positive growth in ginger and wheat of area, productivity and production besides negative growth of productivity in turmeric in Yamunanagar. The area and production under turmeric in the state have increased by 13.8 and 10.2 per cent per annum. The productivity of turmeric showed a negative growth rate of -3.2 per cent per annum. In the case of wheat, a significant growth rate in the area, productivity and production was observed during the study period. The area under wheat grew at 2.2 per cent per annum. The productivity registered a significant growth rate of 4.2 per cent per annum and the production registered a growth of 2.0 per cent per annum.

Trends of selected spice (Garlic) and traditional crops (Rice) in Karnal district

Table 3: Compound Growth Rate of Spices and Traditional crops (Cereals) in Karnal District of Haryana (Area in 000 hectares, production in 000 tons and productivity in tons /hectare)

District / Years	Karnal					
	Garlic			Rice		
	Area	Production	Productivity	Area	Production	Productivity
2001-02	0.740	6.000	8.108	166.00	494.00	2.976
2002-03	0.955	9.925	10.393	159.10	426.00	2.678
2003-04	0.870	9.200	10.575	163.20	496.00	3.039
2004-05	1.005	7.010	6.975	167.40	567.00	3.387
2005-06	0.890	4.653	5.228	169.10	521.00	3.081
2006-07	0.365	7.200	19.726	166.20	553.00	3.327
2007-08	0.660	4.659	7.059	167.20	610.00	3.648
2008-09	1.050	6.839	6.513	169.10	465.00	2.750
2009-10	0.764	6.820	8.927	171.50	521.00	3.038
2010-11	0.970	7.784	8.025	172.50	461.00	2.672
2011-12	0.890	8.030	9.022	165.00	501.00	3.036
2012-13	0.935	9.790	10.471	170.20	572.00	3.361
2013-14	0.860	8.250	9.593	161.90	570.00	3.521
2014-15	0.850	7.985	9.394	172.50	559.00	3.241
2015-16	0.950	11.000	11.579	172.20	528.00	3.066
2016-17	0.985	11.500	11.675	174.80	555.00	3.175
2017-18	1.082	12.750	11.784	174.00	661.00	3.799
Mean	0.871	8.199	9.707	168.35	532.94	3.162
C. V.	19.54	27.66	33.08	2.63	10.83	10.07
C.G.R.	1.5	3.3	1.7	0.3	1.1	0.8

Source: Horticulture department and statistical abstract of Haryana, government of Haryana.

The table 3 showed the growth rate of area, production and productivity in garlic and rice in Karnal district. In the case of garlic and rice, there was significant growth in both garlic and rice crops in the Karnal district. The area under garlic grew with significant growth of 1.5 per cent per annum. The production registered a positive growth of 3.3 per cent per annum. The productivity of garlic showed significant positive growth of 1.7 per cent per annum. On the other hand, the area under rice increased at a rate of 0.3 per cent per annum. The productivity also increased at the rate of 0.8 per cent per annum. The production of rice showed positive growth of 1.1 per cent per annum.

Trends of selected spice (Fenugreek) and traditional crops (Rice) in Yamunanagar district

Table 4: Compound Growth Rate of Spices and Traditional crops (Cereals) in Yamunanagar District of Haryana (Area in 000 hectares, production in 000 tons and productivity in tons /hectare)

District / Years	Yamunanagar					
	Fenugreek			Rice		
	Area	Production	Productivity	Area	Production	Productivity
2001-02	0.100	0.275	2.750	53.80	161.00	2.993
2002-03	0.318	0.046	0.145	50.20	151.00	3.008
2003-04	0.228	0.055	0.241	56.80	172.00	3.028
2004-05	0.230	0.310	1.348	58.70	191.00	3.254
2005-06	0.314	0.477	1.519	59.30	200.00	3.373
2006-07	0.001	0.001	1.000	59.40	213.00	3.586
2007-08	0.520	0.980	1.885	59.30	227.00	3.828
2008-09	0.640	2.433	3.802	71.70	221.00	3.082
2009-10	0.610	1.156	1.895	73.50	267.00	3.633
2010-11	0.725	1.204	1.661	74.60	244.00	3.271
2011-12	0.725	2.000	2.759	72.70	268.00	3.686
2012-13	0.345	0.584	1.693	70.00	277.00	3.957
2013-14	0.700	0.235	0.336	68.90	254.00	3.687
2014-15	0.650	2.000	3.077	70.20	266.00	3.789
2015-16	0.600	1.500	2.500	74.00	280.00	3.784
2016-17	0.610	0.800	1.311	75.40	295.00	3.912
2017-18	0.670	1.833	2.736	75.20	313.00	4.162
Mean	0.469	0.934	1.744	66.1	235.29	3.531
C. V.	48.93	83.87	63.92	12.85	20.54	10.48
C.G.R.	11.8	20	13	2.4	4.2	1.8

Sources: Horticulture department and statistical abstract of Haryana, government of Haryana.

The table 4 show the growth rate of area, production and productivity in fenugreek and rice in Yamunanagar district. The area under fenugreek in the Yamunanagar district showed a significant increase of 7.3 per cent per annum. There was a significant increase in productivity at the rate of 13.9 per cent per annum. The growth in production of fenugreek was also positive growth of 7.6 per cent per annum. Thus, the growth in production of fenugreek in Yamunanagar was due to growth in both area and productivity of fenugreek in the district. Rice recorded a significant increase in area, production, and productivity in the district. The growth in the area was found to be 2.4 per cent per annum. The production of rice increased at the rate of 4.2 per cent per annum. The productivity of rice also increased at the rate of 1.3 per cent per annum.

Trends of spice and traditional crops (Cereals) in Haryana state

Table 5: Compound Growth Rate of Spices and Traditional crops (Cereals) in Haryana State (2001-02 to 2017-18) (Area in 000 hectares, production in 000 tons and productivity in tons /hectare)

Year	Haryana					
	Spices			Total Cereals Crops		
	Area	Production	Productivity	Area	Production	Productivity
2001-02	15.500	105.000	6.774	4064.3	13150	3.235
2002-03	13.737	83.259	6.061	3845.8	12246	3.184
2003-04	8.603	45.700	5.312	4099.7	13050	3.183
2004-05	8.121	42.450	5.227	4041.3	12922	3.197
2005-06	10.194	44.436	4.359	4116.1	12894	3.133
2006-07	9.996	44.835	4.485	4178.3	14627	3.501
2007-08	10.605	36.432	3.435	4305.2	15193	3.529
2008-09	12.995	48.040	3.697	4436.9	16000	3.606
2009-10	14.855	64.280	4.327	4410	15248	3.458
2010-11	15.960	73.460	4.603	4524.6	16413	3.628
2011-12	18.092	93.585	5.173	4458.5	18263	4.096
2012-13	18.454	94.800	5.137	4226.7	16069	3.802
2013-14	18.600	97.640	5.249	4256.7	16879	3.965
2014-15	12.610	81.190	6.439	4397.9	15533	3.532
2015-16	12.630	81.280	6.435	4389.5	16292	3.712
2016-17	11.651	78.175	6.710	4495.4	17933	3.989
2017-18	11.928	75.580	6.336	4476	17976	4.016
2018-19	9.178	70.300	7.660	4486.5	18063	4.026
Mean	13.208	70.008	5.279	4277.81	15334.58	3.574
C. V.	25	31.88	19.82	4.56	12.58	9.01
C.G.R.	1.7	2.8	1.1	0.7	2.3	1.5

Sources: Horticulture department and statistical abstract of Haryana, government of Haryana.

The table 5 show the results about spices and traditional crops (cereals) in Haryana state. The state recorded a significant increase in area, production and productivity of both spices and traditional crops. The area under spices has increased at 1.7 per cent per annum. The production of spices showed positive growth of 2.8 per cent per annum. The spices productivity in the state grew at the rate of 1.1 per cent per annum. On the other hand, the area of traditional crops in Haryana grew at 0.7 per cent per annum. The production also increased at the rate of 2.3 per cent per annum. The productivity of traditional crops showed a significant growth rate of 1.5 per cent per annum. The table 5 also shows the fluctuations in spices and traditional crops in Haryana. It shows that there were high fluctuations in spices crops as compare to traditional crops. The area, production and productivity of spices crops fluctuate at the rate 25, 31.88 and 19.82 per cent respectively. In the other hand, the area, production and productivity of traditional crops (cereals) fluctuate at the rate 4.56, 12.58 and 9.01 per cent respectively. The result has been evidencing that the spices crop more fluctuates as compare to traditional crops.

CONCLUSION

The compound growth rate of selected spices has increased over the study period due to shifting the area of traditional crops to spices crops. The area of spices grew at the rate of 1.7 per cent as compared to 0.7 per cent growth of traditional crops in Haryana. Production of spices grew at the rate of 2.8 per cent as compared to 2.3 per cent growth of traditional crops in Haryana. Regarding the comparative analysis of the spices crops and traditional crops in selected districts, spices grew more rapidly as compared to traditional crops. The study revealed through the figure that there was positive trend in area, production and productivity in spices and traditional crops in selected districts. Besides, turmeric had negative (-3.2 per cent) growth in Yamunanagar district and wheat had negative (-2.0 per cent) growth in Panchkula district.

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