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Diversification towards vegetable farming in Kangra district of Himachal Pradesh

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Abstract

In Himachal Pradesh, agriculture is a very crucial part of the state's economy as it is the main occupation of people. The area under vegetable crops has witnessed rapid increase in recent years. High-value crops like vegetables can potentially increase farmer's income as demand for high-value food products is increasing more quickly than that of the cereal crops. The present study deals with growth performance of major crops examined in Kangra District and Nagrota Bagwan block of Himachal Pradesh. Growth was analysed in terms of compound annual growth rate in area, production and productivity of major crops, which was carried out for the period 2007-08 to 2016-17. The study revealed that there has been an increase in area and production of vegetables in Kangra District and Nagrota Bagwan block. Per cent change in area of Nagrota Bagwan block and Kangra district were estimated over the period. A negative change in area was noted in crops except vegetable. The per cent increase in vegetable area over 2007-08 during 2016-17 was 176 and 223 per cent, respectively. Highest positive per cent change in production was estimated in vegetables over time. Per cent change in productivity for different crops of Nagrota Bagwan block showed an increasing trend for pulses and vegetable crops. There was no definite trend observed in wheat, maize and paddy.

Keywords: Towards vegetable farming, Kangra, agriculture

Introduction

Horticulture has been one of the fastest growing sectors within the larger agriculture activities and one of the driving forces of overall agricultural development in India. Horticulture sector encompasses a wide range of crops, for example, fruit crops, vegetable crops, potato and tuber crops, ornamental crops, medicinal and aromatic crops, spices and plantation crops. With the growth of urbanization, modernization, and increase in disposable income of the individuals, food consumption pattern gets changed greatly, shifted proportionately more toward the non-cereal crops^[3]. As a result, in the recent past, change in cropping pattern from conventional/traditional to high-value cash crops has also been experienced in the Indian agriculture⁴ and at the same time, farmers are attracted by the higher market prices of the high-value cash crops. Also, growth of the horticulture sectors is not only enthused by the domestic needs but also by a large quantity of export requirements^[4, 5].

The analysis of the performance of major crop groups since early 1970's shows that the value productivity of traditional crops in Himachal Pradesh has either declined or is stagnated. As a result the agricultural sector has recently failed to meet the requirements of the State. Productivity rates of crops, particularly, food crops, are low and possess little growth potential. On the contrary, the State has made tremendous progress in agriculture through fruits, vegetables and off-season vegetables cultivation. Vegetables have always been a better choice of crop diversification because of good productivity and much higher returns compared to cereals. It provides regular as well as good source of income. Vegetables also support many other industries like processing, seed industry, fertilizer, pesticide and farm machinery industry. The important vegetables produced in the state are tomatoes, cauliflower, cabbage, brinjal, okra, potato, radish, turnip, onion, carrot, peas, etc. In Himachal Pradesh, the area under vegetable cultivation has increased from 34 thousand hectares during 2001-02 to about 76 thousand hectares in 2015-16 with an increase of 8.4 per cent per annum. The annual production increased from 6.27 lakh tonnes in the year 2001-02 to 16 lakh tones in the year 2015-16. The vegetable productivity of the state is 19.5 tonnes per hectare, which is higher than the national productivity of 17.5 tonnes per hectare during 2015-16. The major challenge in future to increase vegetable production and productivity is to develop technology. Efforts are also being made by state government to diversify cropping pattern to encourage vegetable cultivation in non-traditional areas. This will also enhance vegetable production.

Methodology

The compound annual growth rates for the area, production and productivity of vegetables in Kangra district as well as Nagrota Bagwan block were computed from a time series data limited to 10 years i.e. from 2007-8 to 2016-17. The growth rates in the mentioned parameters for time series data were computed by employing the following exponential function of the form:

$Y = ab^t$ Where,

$Y = \text{Area/production/productivity of crop}$

$a = \text{Constant}$

$b = \text{Regression coefficient}$

$t = \text{Time}$

$\text{CGR (\%)} = (\text{Antilog } b-1) \times 100$

Student's t test was used to test the significance of growth rates.

$$\text{Per cent growth} = \frac{X_t - X_0}{X_0} * 100$$

Where,

$X_t = \text{Area / production / productivity / quantity of different crops in } t\text{th period}$
 $X_0 = \text{Area / production / productivity / quantity of different crops in base period}$

Result and Discussion

Growth in area, production and productivity

It was observed from table 1 that paddy, wheat and maize showed negative growth over the study period in Kangra district, but in Nagrota Bagwan block negative trend was noticed in pulses, maize and wheat. The growth in area under vegetables over the period was significant in the Nagrota Bagwan block. The analysis indicates that area of cereal crops is shifting towards vegetables. This may be due to high profitability of vegetables. The growth rate for production of different crops in Nagrota Bagwan block and Kangra district revealed that rice, pulses and vegetables production were recorded positive with significant growth rate, wherein highest production growth rate was observed in vegetables. The growth in production in maize and wheat showed declining trend during the same period and the decrease was observed significant. It was noted from the table that vegetable production showed a positive growth per annum in the study area and Kangra District over the period. But, higher and significant growth in production was observed in Nagrota Bagwan block. This may be due to increase in area under vegetable crops and decrease in area under cereal crops. As far as the trends in productivity of different crops are concerned, a positive growth rate for pulses, vegetables and paddy were recorded in Nagrota Bagwan block and Kangra District. Among different crops, pulses showed the highest growth rate per annum followed by vegetables and paddy. Negative growth rate was observed in maize and wheat crop. This may be due to higher decrease in production in these crops.

Table 1: Growth rate of area, production and productivity of crops in Nagrota Bagwan block and Kangra District 2007-08 to 2016-17

Sr. No.	Crops	Area		Production		Productivity	
		Nagrota Bagwan	Kangra District	Nagrota Bagwan	Kangra District	Nagrota Bagwan	Kangra District
1	Paddy	0.67**	-0.03	1.46**	1.35	0.84	1.39**
		(0.14)	(0.003)	(0.07)	(0.04)	(0.13)	(0.04)
2	Maize	-0.83*	-1.41	-2.06**	-1.34*	-1.25**	0.06
		(0.05)	(0.25)	(0.10)	(0.12)	(0.13)	(0.14)
3	Pulses	-1.58	0.90**	3.22*	20*	4.87*	3.47
		(0.17)	(0.17)	(0.16)	(0.20)	(0.15)	(0.14)
4	Wheat	-2.36	-0.04	-2.66**	-0.73*	-0.31	-0.69
		(0.07)	(0.003)	(0.1)	(0.05)	(0.05)	(0.05)
5	Vegetables	12.41*	15.44	12.84*	16.30	1.90*	0.99*
		(0.21)	(0.21)	(0.20)	(0.20)	(0.13)	(0.20)

Note: Figure in parentheses shows Standard error *1 % level of significance. ** 5 % level of significance.

Per cent change in area of crops

Per cent change in area of different crops of Nagrota Bagwan block and Kangra District over 2007-08 has been given in Table 2. It can be seen from the table that there is no definite trend in per cent increase of area in different crops over 2007-08 for different years was observed. A negative change in area was noticed in different crops except pulses and vegetables over 2007-08. The area under paddy and maize showed a decrease in some of the years and increase in other years. The increase in area in these crops was less than the area during 2007-8. Wheat crops showed a continuous

decrease in area over 2007-08. A negative change in area was noted in different crops except pulses and vegetables over 2007-08. The area under paddy and maize showed a decrease in same years, but increase in other years. The increase in area in these crops was less than the area during 2007-08. Wheat crops showed a continuous decrease in area over 2007-08. Over the years, area under vegetable crops showed higher increasing trend in Nagrota Bagwan block and Kangra District. This may be due to higher income from vegetables crops compared to cereal crops.

Table 2: Per cent change in area of crops in Nagrota Bagwan block and Kangra District over 2007-08

Year	Paddy		Maize		Pulses		Wheat		Vegetables	
	Nagrota Bagwan	Kangra District								
2007-08										
2008-09	0	0	0	0	0	0	-2.67	-0.42	0.00	11.11
2009-10	0	0	0	0	0.08	0.15	-2.67	-0.53	40.00	20.00
2010-11	0	-0.54	0	-0.86	0.08	0.15	-2.67	-0.63	40.00	37.78
2011-12	0	-0.54	-6.98	-0.86	0.14	0.24	-16.00	-0.74	40.00	100.00
2012-13	0	-0.27	-6.98	-0.43	0.05	0.19	-16.00	-0.53	40.00	135.56
2013-14	26.67	-0.27	-6.98	-0.43	0.02	0.16	-16.00	-0.53	92.00	157.78
2014-15	8.33	-0.27	0.00	-36.38	0.14	0.32	-16.67	-0.84	132.00	188.89
2015-16	0	-0.27	-6.98	-0.86	-0.17	0.03	-16.67	-0.53	160.00	188.89
2016-17	0	-0.27	-6.98	-0.34	-0.14	0.07	-16.67	-0.53	176.00	223.38

Per cent change in production of crops

Table 3 revealed the per cent change in the production scenario of different crops in Nagrota Bagwan block and Kangra district. In this case also no definite trend in the per cent change over 2007-08 for production of different crops was noticed. It was observed from the table that decreasing trend was in maize and wheat crop in Nagrota Bagwan block and Kangra district. This may be due to decrease in area and poor production management practices. The negative change was higher in wheat than maize. It was observed from the

table that highest positive change in production was estimated in vegetables followed by paddy and pulses. This may be due to increase in area and a greater attention paid by vegetable growers for their production practices. The per cent change over 2007-08 in Nagrota Bagwan block and Kangra district for vegetable crops varied from 17 to 147 per cent and 17 to 192 per cent over the different years, respectively. The table showed a continuous increase in vegetable production over the years in both areas.

Table 3: Percent change in production of crops in Nagrota Bagwan block and Kangra District over 2007-08

Year	Paddy		Maize		Pulses		Wheat		Vegetables	
	Nagrota Bagwan	Kangra District								
2007-08										
2008-09	0	0	0	-0.33	0.00	0.00	-4.09	-0.72	17.78	17.78
2009-10	2.14	1.00	0	0.00	0.15	0.28	-1.97	0.00	54.89	19.33
2010-11	7.69	7.12	1.16	-0.39	0.18	0.33	-1.97	0.22	55.56	46.00
2011-12	7.69	7.12	-2.77	2.90	0.25	0.40	-14.88	0.38	55.56	66.67
2012-13	11.00	9.53	-11.63	-6.06	0.38	0.53	-22.36	-8.23	66.67	82.02
2013-14	12.18	11.91	-10.55	-4.89	0.38	0.48	-20.94	-6.65	85.45	120.00
2014-15	20.09	10.05	-22.63	-21.94	0.38	0.56	-17.84	-2.28	110.67	145.20
2015-16	11.11	10.59	-10.55	-6.19	0.38	0.57	-17.63	-5.36	125.20	162.02
2016-17	7.91	10.42	-9.66	-3.69	0.18	0.32	-17.84	-4.95	147.67	192.20

Per cent changes in productivity

Per cent changes in productivity in Nagrota Bagwan block and Kangra district have been shown in Table 4. It can be seen from the table that there is no definite trend in per cent change of productivity over 2007-08 was observed. The productivity of maize and wheat showed a decline and a negative change was observed after 2012-13. Paddy showed a negative change in productivity to the tune of -11.41 during 2013-14 in Nagrota Bagwan block. The productivity of pulses

has increased tremendously over the years. As far as the change in productivity of vegetables over 2007-08 is concerned, it showed an increasing trend in Nagrota Bagwan block. The per cent increase in productivity of vegetables in Nagrota Bagwan was observed to be highest (40.10%) for the year 2016-17. Kangra district showed a negative per cent change in the productivity of vegetables from the year 2011-12 to 2013-14.

Table 4: Per cent changes in productivity of crops in Nagrota Bagwan block and Kangra District over 2007-08

Year	Paddy		Maize		Pulses		Wheat		Vegetables	
	Nagrota Bagwan	Kangra District								
2007-08										
2008-09	0	0	0	-0.31	-0.21	-0.43	-1.48	-0.32	17.78	6.00
2009-10	0	0.19	0.00	0.00	6.61	11.73	0.69	0.53	10.63	-0.56
2010-11	7.69	7.76	1.15	0.50	9.59	16.20	0.69	0.84	11.11	5.97
2011-12	7.69	7.76	34	3.82	9.59	12.15	1.32	1.11	11.11	-16.67
2012-13	11.09	9.88	-5.00	-5.66	31.77	29.64	-7.56	-7.76	19.05	-5.66
2013-14	-11.41	12.25	-3.85	-27	35.61	27.29	-5.92	-6.17	4.17	-146
2014-15	10.83	10.39	-22.62	22.70	21.11	18.55	-1.43	-1.48	14.94	7.69
2015-16	11.09	10.90	-3.85	-5.35	65.88	53.30	-1.16	-4.85	17.95	15.38
2016-17	7.88	10.78	-2.88	-3.36	36.89	23.45	-1.43	-29	40.10	13.66

Conclusion

The present study examined the growth performance of area under cultivation, production and productivity of major crops in Nagrota Bagwan block and Kangra district in Himachal Pradesh. The growth rates of area under cereal crops is negative indicating a shift towards vegetables. A significant and positive growth rate of area was observed in Nagrota Bagwan block. Per cent change in productivity for different crops of Nagrota Bagwan block showed an increasing trend for pulses and vegetable crops. There was no definite trend observed in wheat, maize and paddy. The analysis indicates that area of cereal crops is shifting towards vegetables. This may be due to high profitability of vegetables.

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