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An analysis of growth rate in area, production and productivity of major spices in Raigarh district and Chhattisgarh state

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Abstract

The present study conducted with the analysis of growth rate in area, production and productivity of major spices in Raigarh district and Chhattisgarh state. To examine the growth rates in area, production and productivity of chilli, ginger and coriander crops of Raigarh district 2009-10 to 2018-19, exponential form were estimated. The area and production of chilli in Raigarh district was found positive highly significant at 7.15 and 6.20 per cent, and productivity was found negatively significant at 0.89 per cent. The area of ginger in Raigarh district was found positive highly significant at 7.15 per cent and production was found positive not-significant at 0.12 per cent, also the productivity was found negatively highly significant at 1.32 per cent. The area and production of coriander in Raigarh district was found positive highly significant at 3.05 and 5.80 per cent, also the productivity was found highly significant at 2.67 per cent.

Keywords: Gross returns, net returns, B: C ratio, input-output ratio

Introduction

India is rightly called as “spice bowl of the world” for her production of variety and superior quality spices. Growing of spices for various purposes has been famous since the ancient times. There are records about its various properties in Vedas as early as 6000 BC. India is known for trade since the exploration of sea routes. All these attracted the foreigners to India and this was the key reason why India was invaded by European countries and was imperialized. According to the Bureau of Indian Standards (BIS), 63 spices are grown in India. The spices are grown throughout the country from tropical to temperate climate. India has highest number of spice varieties in the world. Chhattisgarh is an agricultural chief land and due to large production of rice, it is known as the “rice bowl”. The total area under spice is 67756 hectare in the Chhattisgarh state with a production of 4,49,353 metric tones. Highest area under growing Coriander (14,988 ha.), Turmeric (12,072 ha.), and Chilli (10,348 ha.), Turmeric gives the highest production 106,430 metric tones, followed by coriander 66,299 metric tones, and Chilli 66,290 metric tones, The total area of spices in Raigarh district is 6,272 ha. and production is 45,831 metric tonnes (Directorate of Horticulture, Raipur, 2021).

Methodology

Sampling technique of Mahasamund district of Chhattisgarh was purposively chosen as the study area because, it has the larger area under groundnut cultivation in the district. A multistage simple random sampling technique (SRS) was adopted to select the villages and the respondents, different farmer involved in groundnut production and marketing in Mahasamund district. The details of the sampling techniques at various stages are given as under:

Compound growth rate

For estimating the growth rates of chilli, ginger and coriander with respect to area and production compound growth rate model will be selected for analysis. In a study secondary data will be used covering the period from 2009-10 to 2018-19.

To compute the growth rate following formulae will be used.

$$Y = aB^t$$

$$\text{Log } Y = \log a + t \log B$$

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Where,

$Y = \text{Area (ha)/production (tonnes)/productivity (Kg/ha)}$

$a = \text{Constant}$

$B = \text{Regression coefficient}$

$t = \text{time in year}$

$\text{Compound growth rate (\%)} = (\text{Antilog } B-1)100$

Results and Discussion

Compound growth rates in area, production and productivity of major spices

To examine the growth rates in area, production and

productivity of chilli, ginger and coriander crops of Raigarh district 2009-10 to 2018-19 exponential form were estimated.

Growth rate in area, production and productivity of chilli

Growth rate in area, production and productivity of chilli for Raigarh district and Chhattisgarh state is presented in table 1. The area and production of chilli in Raigarh district was found positive highly significant at 7.15 and 6.20 per cent, also the productivity was found negatively significant at 0.89 per cent.

Table 1: Compound growth rate of Chilli in Raigarh of Chhattisgarh state

Year	Area (Hectares)	Production (Tonnes)	Productivity (T/h)
2009-10	2240	15680	7.00
2010-11	2990	20980	7.02
2011-12	3030	19361	6.39
2012-13	4558	29130	6.39
2013-14	4558	29130	6.39
2014-15	4560	29145	6.39
2015-16	4560	29145	6.39
2016-17	4560	29145	6.39
2017-18	4560	29145	6.39
2018-19	4560	29145	6.39
CGR	7.15***	6.20***	-0.89**
P-value	0.005291339	0.006216909	0.02600448

Note: ***Denote significant at 1% level of significance.
 **Denote significant at 5% level of significance.
 * Denote significant at 10% level of significance.
 NS = Not Significant.

Growth rate in area, production and productivity of ginger

Growth rate in area, production and productivity of ginger for Raigarh district and Chhattisgarh state is presented in table 2.

The area of ginger in Raigarh district was found positive highly significant at 7.15 per cent and production was found positive not-significant at 0.12 per cent, also the productivity was found negatively highly significant at 1.32 per cent.

Table 2: Compound growth rate of ginger in Raigarh of Chhattisgarh state

Year	Area (Hectares)	Production (Tonnes)	Productivity (T/h)
2009-10	1520	18850	12.40
2010-11	1590	19728	12.41
2011-12	1590	18480	11.62
2012-13	1706	18766	11.00
2013-14	1706	18766	11.00
2014-15	1706	18766	11.00
2015-16	1706	18766	11.00
2016-17	1706	18766	11.00
2017-18	1706	18766	11.00
2018-19	1806	19866	11.00
CGR	1.46***	0.12NS	-1.32***
P-value	0.000802607	0.671032185	0.006046383

Note: ***Denote significant at 1% level of significance.
 **Denote significant at 5% level of significance.
 *Denote significant at 10% level of significance.
 NS = Not Significant.

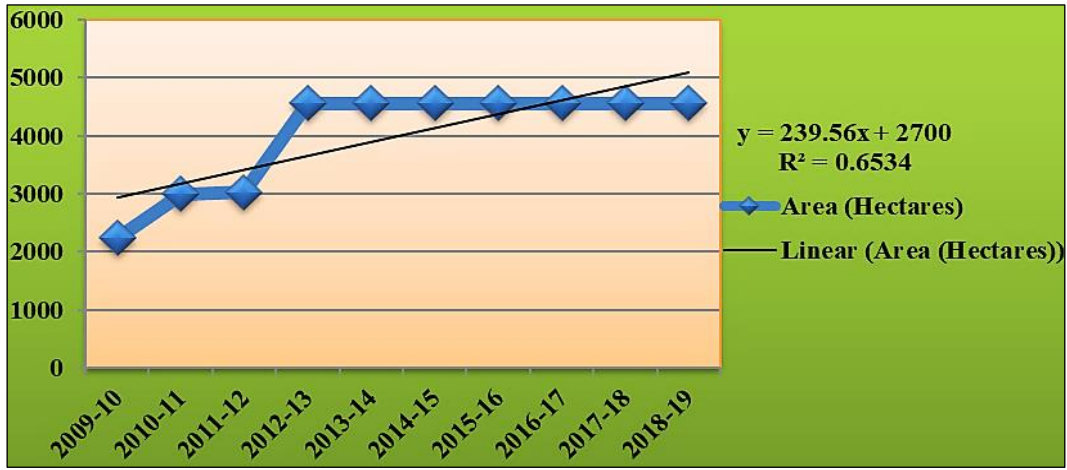


Fig 1: Trend of area under chilli in Raigarh district

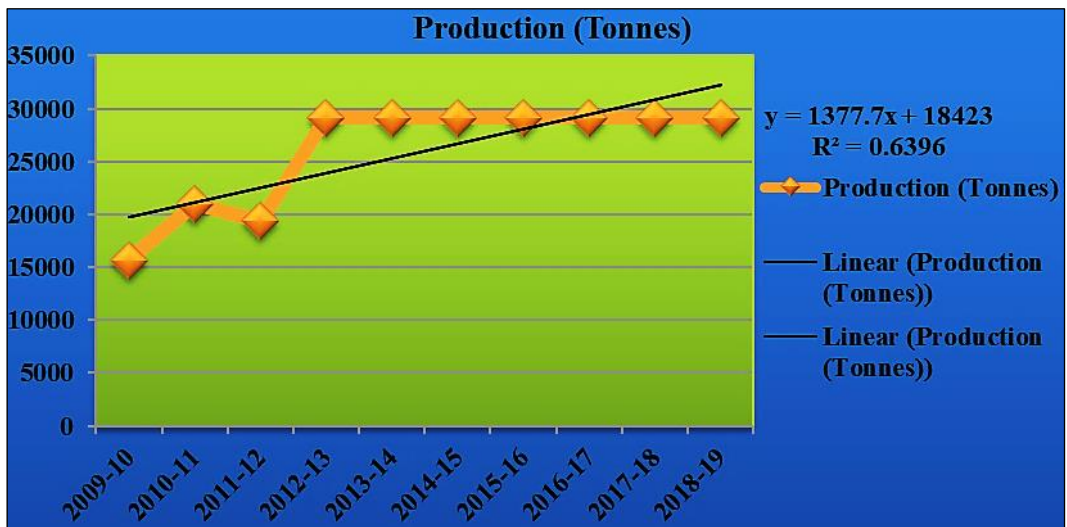


Fig 2: Trend of production under chilli in Raigarh district

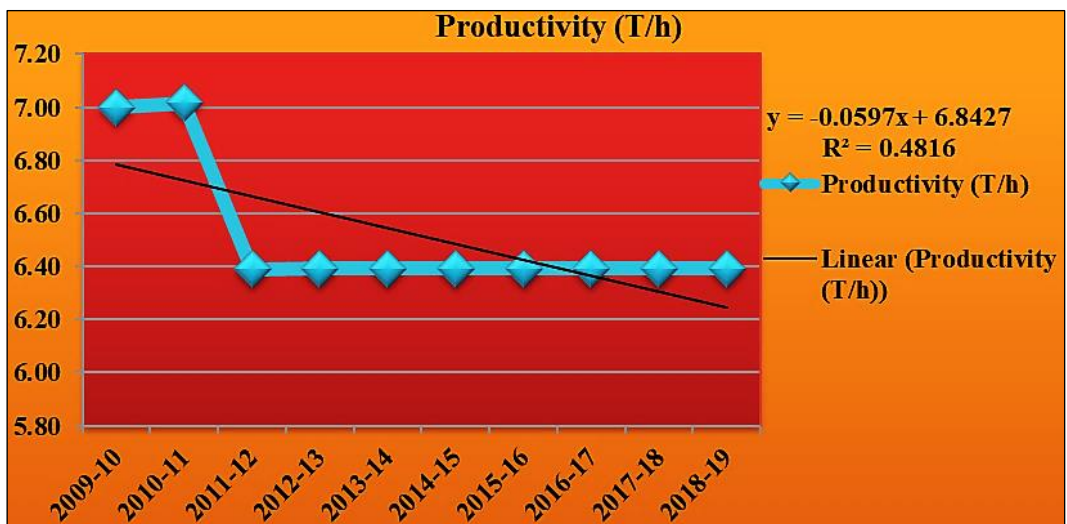


Fig 3: Trend of productivity under chilli in Raigarh district

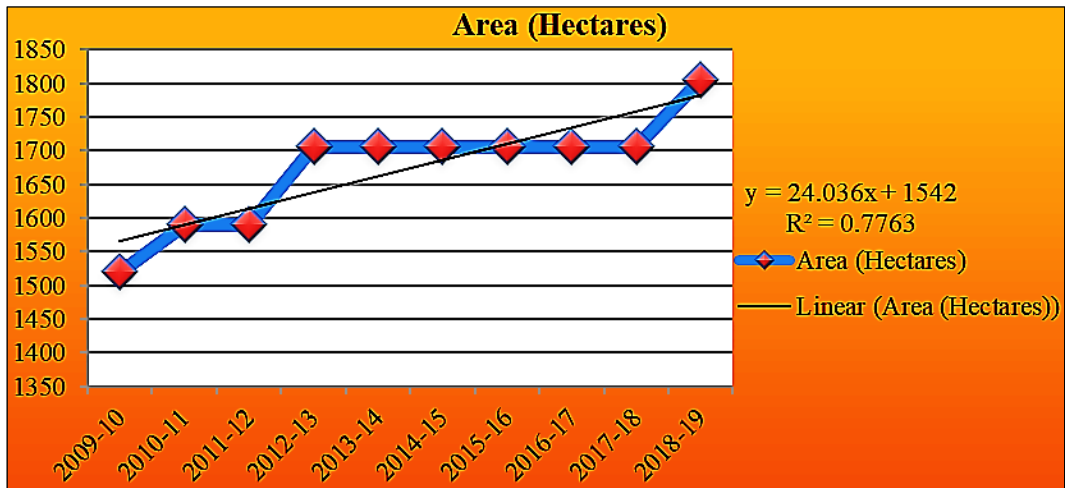


Fig 4: Trend of area under ginger in Raigarh district

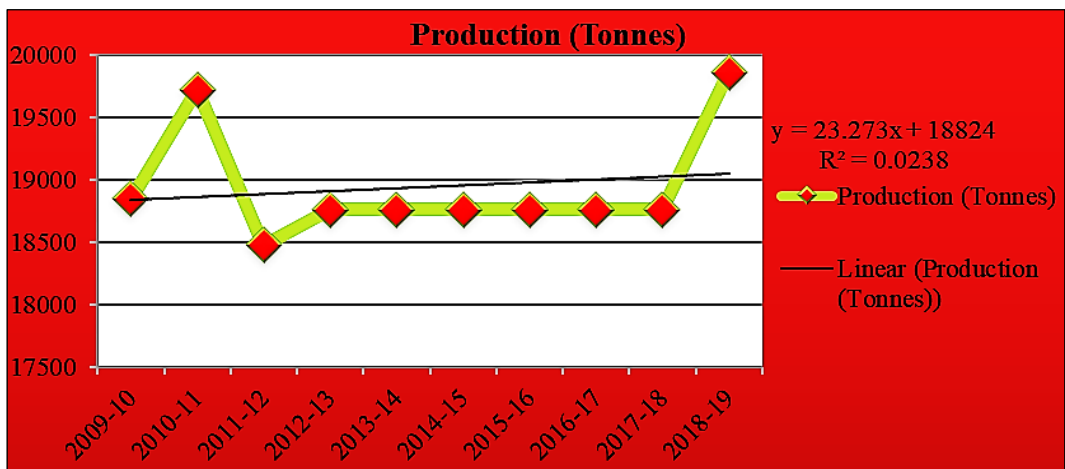


Fig 5: Trend of production under ginger in Raigarh district

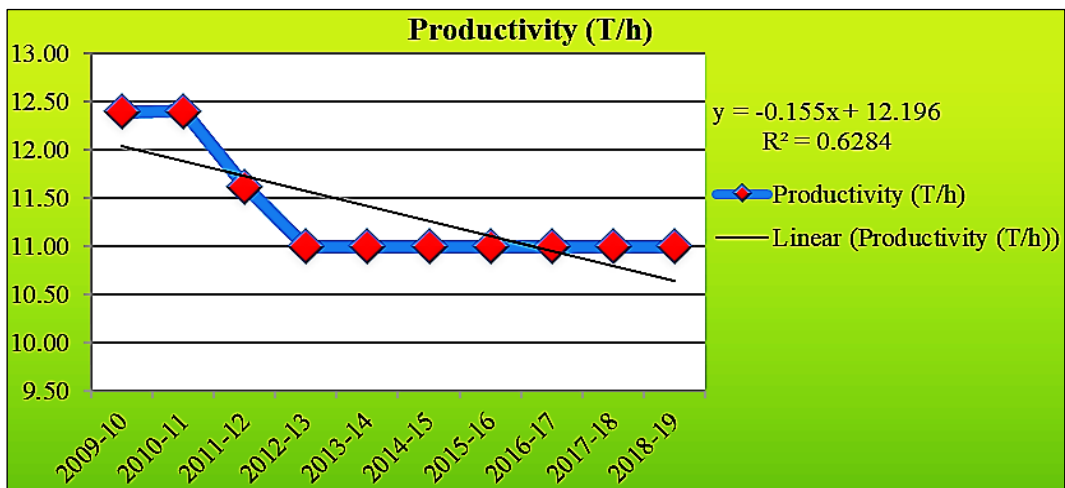


Fig 6: Trend of productivity under ginger in Raigarh district

Growth rate in area, production and productivity of coriander

Growth rate in area, production and productivity of coriander for Raigarh district and Chhattisgarh state is presented in table 3. The area and production of coriander in Raigarh district

was found positive highly significant at 3.05 and 5.80 per cent, also the productivity was found highly significant at 2.67 per cent. The area, production and productivity of coriander in Chhattisgarh state was found negatively non-significant at 0.11, 0.39 and 0.28 per cent, respectively.

Table 1: Compound growth rate of coriander in Raigarh of Chhattisgarh state

Year	Area (Hectares)	Production (Tonnes)	Productivity (T/h)
2009-10	1870	5610	3.00
2010-11	1960	5890	3.01
2011-12	1985	7820	3.94
2012-13	2285	9003	3.94
2013-14	2285	9003	3.94
2014-15	2350	9261	3.94
2015-16	2350	9261	3.94
2016-17	2350	9261	3.94
2017-18	2450	9655	3.94
2018-19	2450	9655	3.94
CGR	3.05***	5.80***	2.67**
P-value	0.000186504	0.00221545	0.025029865

Note: ***Denote significant at 1% level of significance.
 **Denote significant at 5% level of significance.
 *Denote significant at 10% level of significance.
 NS = Not Significant.

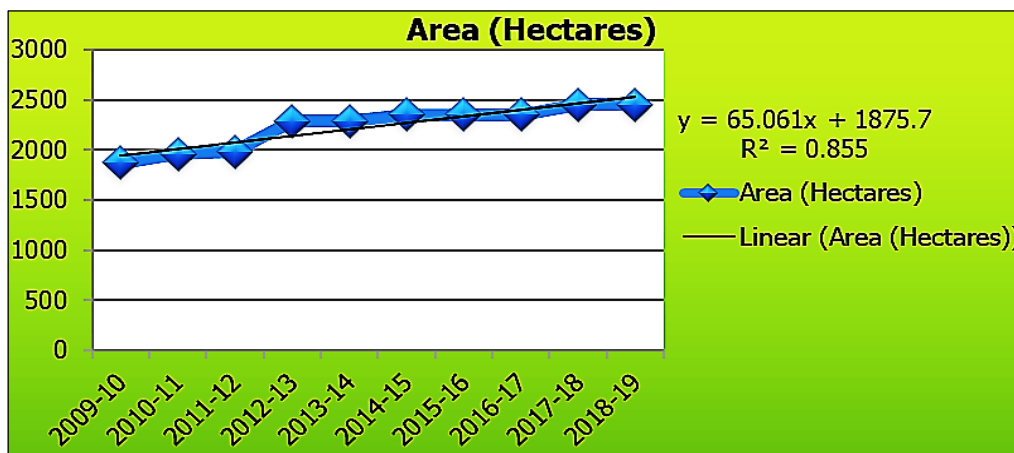


Fig 7: Trend of area under coriander in Raigarh district

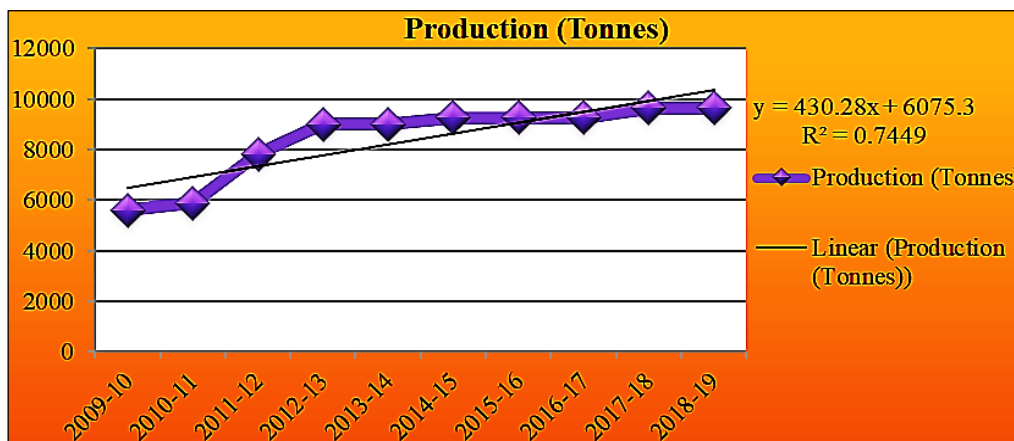


Fig 8: Trend of production under coriander in Raigarh district

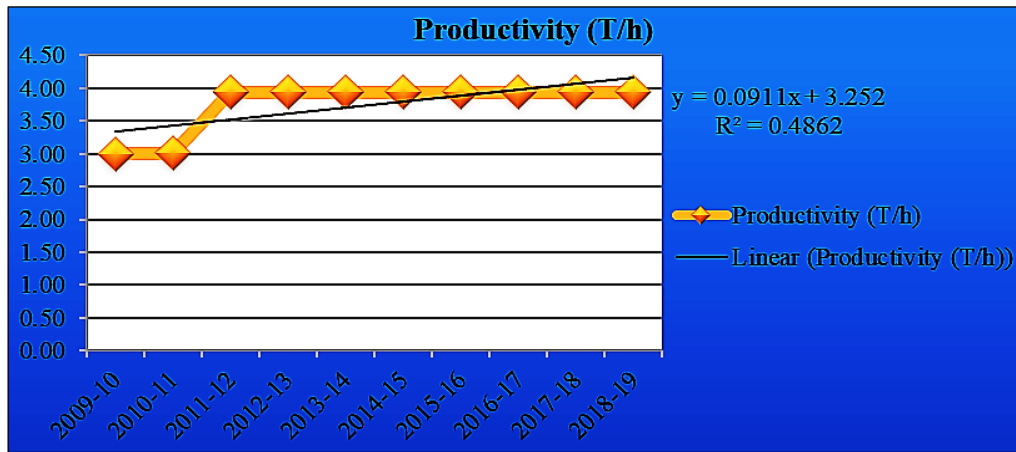


Fig 9: Trend of productivity under coriander in Raigarh district

Suggestions

In view of finding of this study, it may be suggested that there is need to increase the profitability from major spices cultivation by the use of low-cost farm machinery, irrigation, good quality and high yielding varieties, use of balanced fertilizers and agrochemical, improved package and practices, marketing and remunerative prices, effective extension along with conducive policy measures. Horticultural crop producer's cooperative societies should be formed for better performance and achievement. Government should encourage partnership between research institutions, agricultural universities, NGO's and private industries to address constraints and help the spice growers to markets.

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