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Reena Hota
Ph.D. Scholar, College of Agriculture, IGKV, Raipur, Chhattisgarh, India

AK Gauraha
Professor, College of Agriculture, IGKV, Raipur, Chhattisgarh, India

MR Chandrakar
Professor, College of Agriculture, IGKV, Raipur, Chhattisgarh, India

Corresponding Author:
Reena Hota
Ph.D. Scholar, College of Agriculture, IGKV, Raipur, Chhattisgarh, India

Compound growth rate (CGR) of Area, production & productivity of tomato in Bilaspur District of Chhattisgarh

Reena Hota, AK Gauraha and MR Chandrakar

Abstract
The present study was carried out to estimate the compound growth rate of area, production & productivity of Tomato in Chhattisgarh. The current study made use of secondary data on area, production & productivity from 2011-12 to 2019-21 was collected from various government sources including the Directorate of Economics & Statistics and Department of Agriculture etc. To examine the growth rates in area, production and productivity of Tomato in Chhattisgarh for the period of 2011-12 to 2012-21 exponential form were estimated. It can be clearly seen that the area, production & productivity of Tomato in Chhattisgarh registered significant growth rate. In context of area Chhattisgarh shows significant growth. In context of production Chhattisgarh shows significant growth. In context of productivity Chhattisgarh shows significant growth Bilaspur districts showed non- significant growth in area, production and productivity of Tomato.

Keywords: CGR coefficient of variation growth in area, production and productivity

Introduction
India is the second largest producer of vegetables in the world after China and accounts for 14.47% of production with 15.7% of the area of the world. More than 40 kinds of vegetables from different groups are grown in India. In Chhattisgarh State, there is remarkable gap between actual harvested yield and potential yield of vegetable crops. Hence, scope for harnessing/exploiting potential fully still exists. Instead of the large area of vegetables in Bilaspur district the productivity i.e. 9.91 metric tonnes per hectare does not coincide with its coverage. The State has to go long way in vegetable production. Importance of vegetable is now much recognized and understood by agricultural community due to its wide range of utility. It has been observed that economic returns to vegetables are better than other several crops. The yield per unit area is high and suitable for intensive farming lead generation of supplement incomes and expands Plant. Vegetables support export and international trade. Vegetables are always been a better choice of crop diversification because of good productivity and much higher returns from a unit area. The diversification in favour of these crops improves exports, reduce trade deficit, besides creating more direct and indirect employment. Therefore, looking to the importance of vegetables the has been undertaken to see the trend and variability. The major vegetables grown in Bilaspur district of Chhattisgarh are tomato, brinjal, cabbage, cauliflower, okra. The total area of vegetable crops in the district was recorded 19.976 ha (in '000 Ha) in the year 2020-21with the production of 329.038 MT. (in '000 MT).

Analytical tools
Computation of growth rate
Annual compound growth rates in area, production and productivity of Soybean in Chhattisgarh state were done by fitting an exponential function of the following form.

$Y= \alpha\beta t$

$\text{Log } Y= \log \alpha + t \log \beta$

Were,

Y= Area, production & productivity of Soybean in Chhattisgarh

α= Constant

β= Regression coefficient

t= time in year

Compound growth rate (%) = (Antilog β-1)100.

Result and Discussion

To examine the growth rates in area, production and productivity of Tomato in Bilaspur district Chhattisgarh for the period of 2010-11 to 2019-20 exponential form were estimated.

Table 1: Compound Growth Rate of Area, Production and Productivity of Tomato in selected districts of Chhattisgarh plain

		Compound growth rate		
S. No.	**Region**	**Area**	**Production**	**Productivity**
1		4.21***	6.04**	1.76***
2		-2.41***	-2.33***	0.08***

Note: *** Significant at 1% level of significance
* *Significant at 5% level of significance

The compound growth rates of area, production and productivity of Tomato in Chhattisgarh state during the period of study 2011-12 to 2020-21 is presented in Table 1. The table reveals that area of Tomato in the Chhattisgarh state significantly. The compound growth rate of area 4.21% in the state may be the consequence of significance. Growth rate of production -6.04% is also significant and productivity 1.76% per annum was registered as significant.

Table 2: Area, production and productivity of Tomato in Chhattisgarh state

Year	Area(ha)	Production (mt)	Productivity
2011-12	44572	718535	16.121
2012-13	47971	762216	15.889
2013-14	50375	814216	16.163
2014-15	53051	886104	16.703
2015-16	54907	908980	16.555
2016-17	62803	1089976	17.355
2017-18	62161	1088674	17.514
2018-19	64383	1114802	17.315
2019-20	64717	1182648	18.274
2020-21	61333	1151488	18.774

***Source*:** Directorate of Economics & Statistics Ministry of Agriculture, Govt. of India

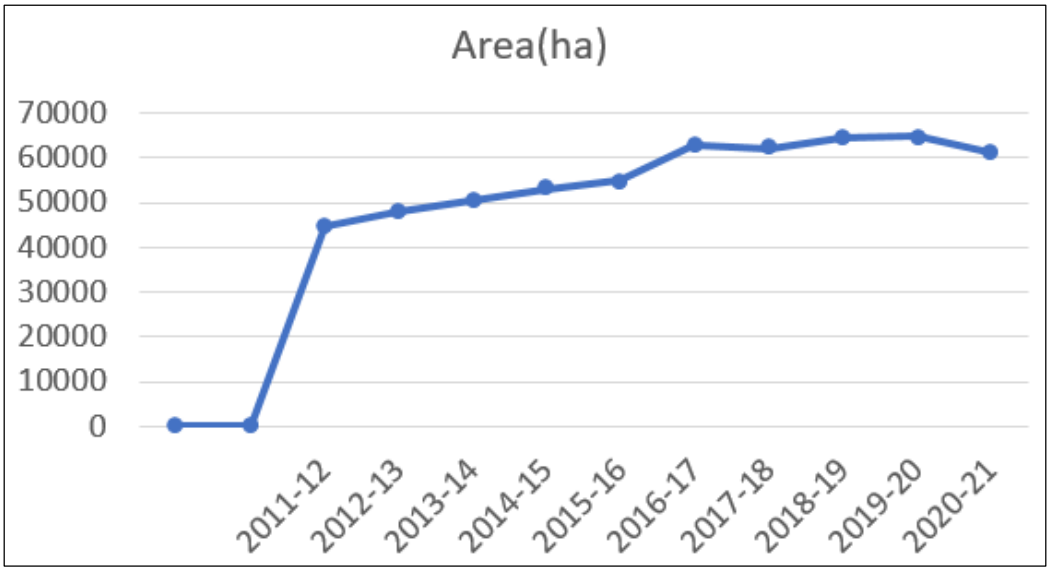

Fig 1: Trends in area of tomato in Chhattisgarh

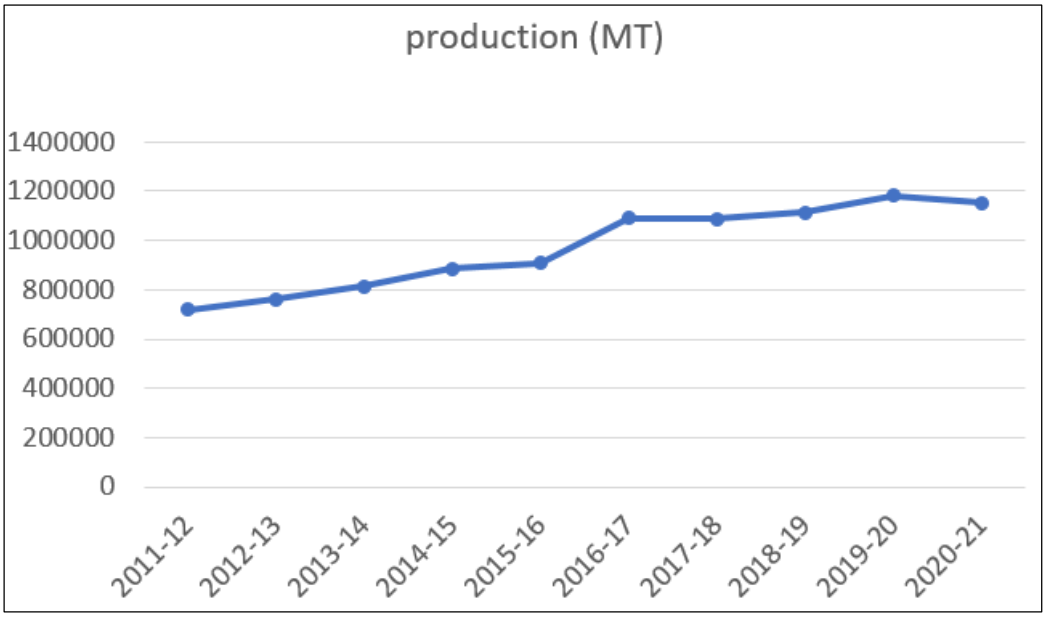

Fig 2: Trends in area of tomato in Chhattisgarh

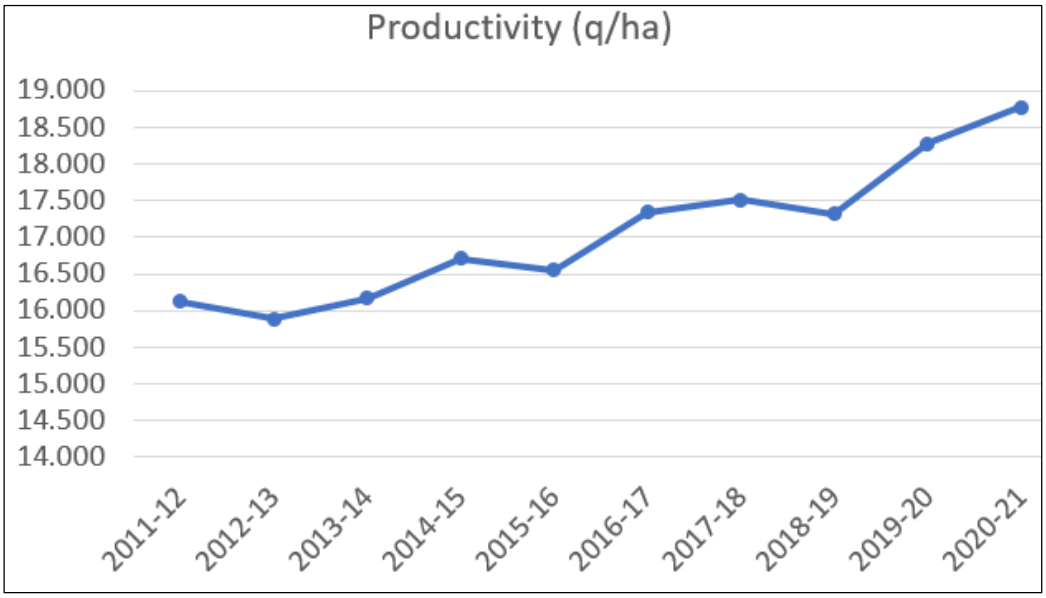

Fig 3: Trends in Productivity of tomato in Chhattisgarh

Table 3: Area, production and productivity of Tomato in Bilaspur district

Years	Area(HA)	Production(mt)	Productivity
2011-12	6584	87664	13.315
2012-13	6914	89856	12.996
2013-14	7260	89900	12.383
2014-15	7405	91695	12.383
2015-16	7841	97093	12.383
2016-17	7881	97588	12.383
2017-18	7893	97737	12.383
2018-19	7905	97885	12.383
2019-20	7950	98442	12.383
2020-21	3523	49451	14.037

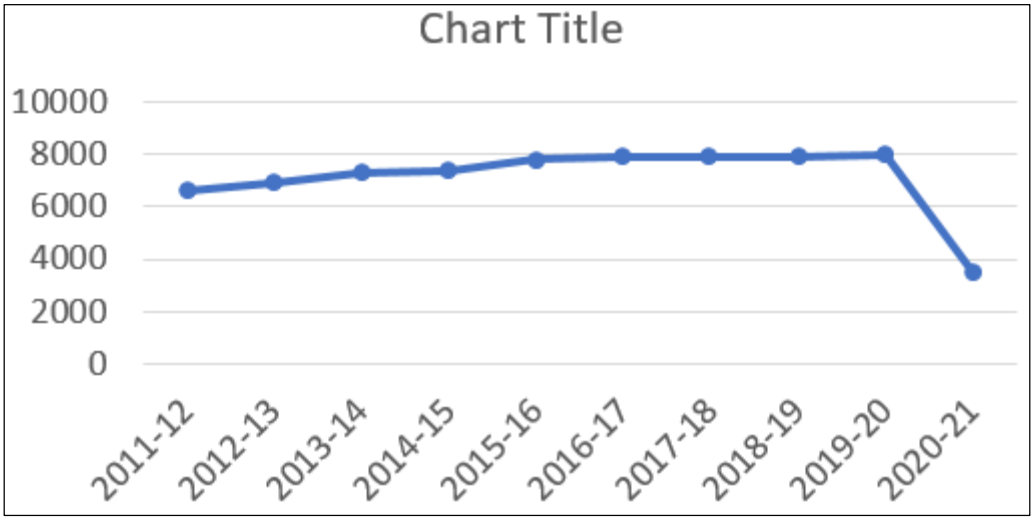

Fig 4: Trend of Area of Tomato in Bilaspur district (kg. /Ha.)

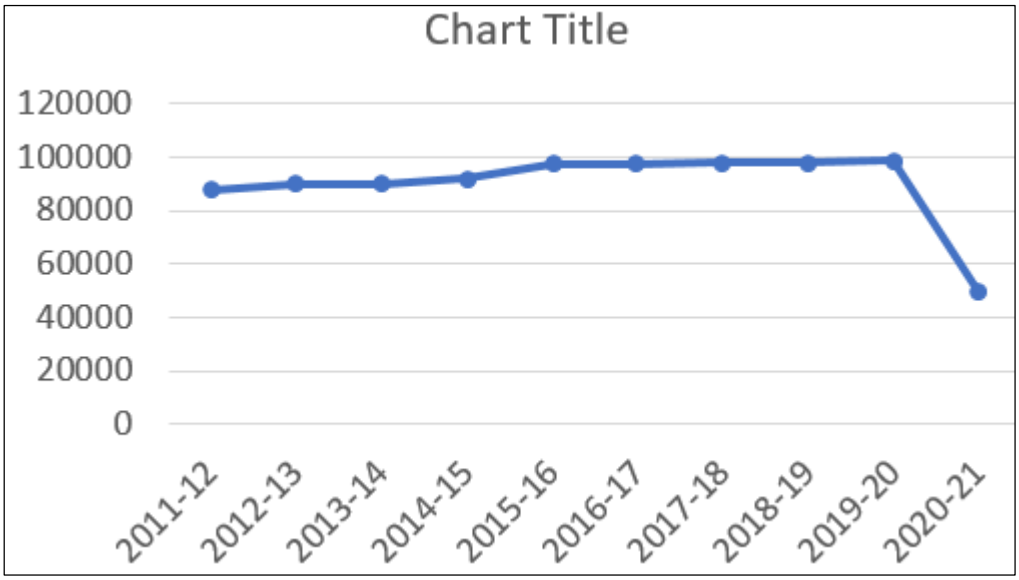

Fig 5: Trend of Production of Tomato in Bilaspur district (kg. /Ha.)

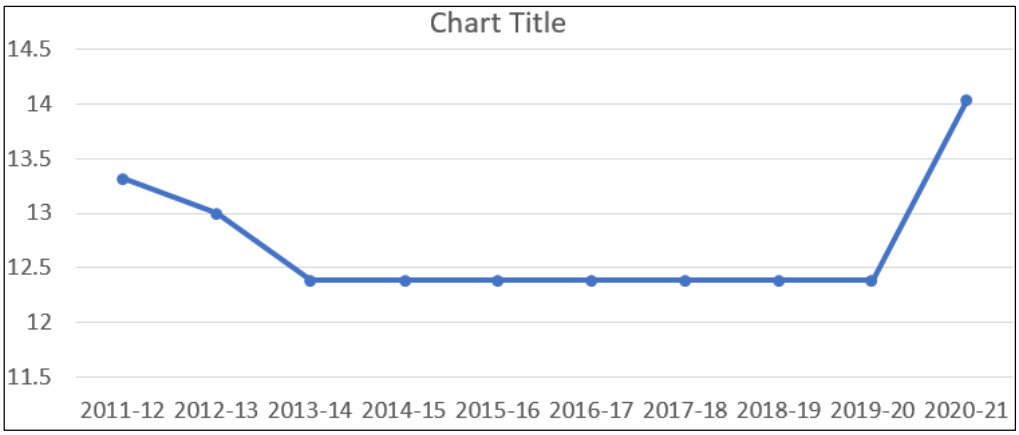

Fig 6: Trend of Productivity of Tomato in Bilaspur district (kg. /Ha.)

4. Conclusion

The compound growth rates of area, production and productivity of Tomato in Chhattisgarh state during the period of study 2010-11 to 2019-21 is presented in reveals that area of Tomato in the Chhattisgarh state significantly. The compound growth rate of area 4.21% in the state may be the consequence of significance. Growth rate of production 6.04% is also significant and productivity 1.76% per annum was registered as significant. The compound growth rates of area, production and productivity of Tomato in Bilaspur state during the period of study 2010-11 to 2019-21 is presented in reveals that area of Tomato in the Bilaspur District non-significantly Bilaspur districts showed. The compound growth rate of area -2.41% in the state may be the consequence non - significance. Growth rate of production -2.33% is also non-significant and productivity 0.08% per annum non- significant of Tomato.

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