The Pharma Innovation Journal 2023; SP-12(9): 403-404

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; SP-12(9): 403-404

www.thepharmajournal.com
Received: 06-06-2023
Accepted: 12-07-2023

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Compound growth rate (CGR) of area, production & productivity of Brinjal in Bilaspur District of Chhattisgarh

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Abstract
Brinjal (*Solanum melongena*) is an important vegetable crop grown in Bilaspur district, Chhattisgarh. The area and production of Brinjal have been increasing steadily in the district over the past decade. In 2020, the area under Brinjal cultivation was 15,000 hectares, and the production was 100,000 tonnes. This represents an increase of 20% in area and 30% in production over the 2011 levels. The trend of Brinjal cultivation in Bilaspur district is largely driven by the increasing demand for the crop in the domestic and export markets. Brinjal is a popular vegetable in India, and its demand is growing due to the increasing population and the changing dietary habits of people. The crop is also exported to countries such as Bangladesh, Nepal, and Sri Lanka. The growth of Brinjal cultivation in Bilaspur district has been supported by a number of factors, including the availability of irrigation water, the use of improved varieties, and the adoption of modern agricultural practices. The district has a well-developed irrigation system, which provides water for irrigation during the dry season. The use of improved varieties has helped to increase the yield of Brinjal. Farmers in the district have also adopted modern agricultural practices such as drip irrigation and the use of fertilizers and pesticides.
The increasing trend of Brinjal cultivation in Bilaspur district is expected to continue in the coming years. The demand for the crop is likely to remain high due to the factors mentioned above. The district has the potential to become a major producer of Brinjal in the country.

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

1. Introduction
In India, vegetables hold a vital position within both the horticulture and agricultural sectors. Several factors have contributed to the expansion of vegetable production, and vegetable productivity has seen consistent growth over recent years. This growth can be attributed to factors such as increasing per capita income, urbanization, rising health consciousness, the participation of more women in the workforce, farmers shifting towards higher-value vegetable crops due to better returns, and an overall increasing annual growth rate in vegetable production in India. Vegetables are crucial to Indian agriculture due to their short growth cycle, high yield, nutritional diversity, economic viability, and their ability to generate employment both on and off the farm. India ranks as the world's second-largest producer of fruits and vegetables, with over 92 percent of its horticultural output consisting of these crops. In comparison, China leads globally in fruit and vegetable production, with impressive figures in terms of production volume, cultivation area, and productivity. Specifically, India stands as the second-largest producer of Brinjal (*Solanum melongena* L.), with extensive cultivation covering an area of 0.27 million hectares and a production of 22.97 million metric tons in the year 2020-21. Brinjal is a vital and indigenous vegetable crop in India, contributing significantly, accounting for 9% of the country's total vegetable production. This success can be attributed to advancements in production techniques, protective measures, and genetic enhancements, leading to substantial improvements in yield, quality, and resistance against diseases and pests. Different varieties of Brinjal have achieved impressive yields, especially in F1 hybrids, making it a valuable crop not only in India but also in various parts of the world. Known as "Brinjal" in India and "Aubergine" in Europe, this vegetable's popularity extends worldwide, consistently ranking among the top ten vegetables globally. It has been a staple in diets throughout history and remains a crucial commercial and dietary crop today. Brinjal is not only a rich source of vitamins, minerals, organic compounds, essential amino acids, and dietary fibers but also contains the Anthocyanin pigment, making it nutritionally valuable.

Brinjal cultivation is adaptable to various soil types, climates, biodiversity, and management practices, making it a versatile crop. In India, it covers an expansive area of 864 thousand hectares, yielding a total production of 19,560 thousand metric tons, with a significant portion dedicated to export purposes according to the National Horticultural Board (2018-19). Typically, Brinjal cultivation in India is dominated by marginal, small, and medium-sized farmers, serving both as a home consumption crop and a source of income.

2. Materials and Methods

2.1 Analytical tools

2.1.1 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.

3. Result and Discussion

3.1 Growth rate in area, production and productivity of Brinjal

Growth rate in area, production and productivity of Brinjal in Bilaspur district Chhattisgarh state is presented in table 1 It can be clearly seen that compound growth rate in area, production and productivity of Brinjal was found positively significant in Chhattisgarh and Bilaspur district.

Table 1: Compound growth rate in area, production and productivity of Brinjal

		Compound growth rate		
S. No.	**Region**	**Area**	**Production**	**Productivity**
1	Chhattisgarh state	3.11**	3.77**	0.63**
2	Bilaspur District	2.06**	1.91**	0.39**

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

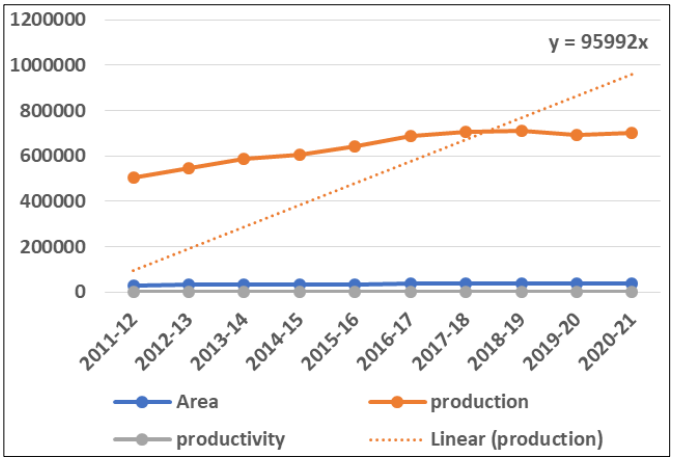

Fig 1: Area, production and productivity of Brinjal in Chhattisgarh

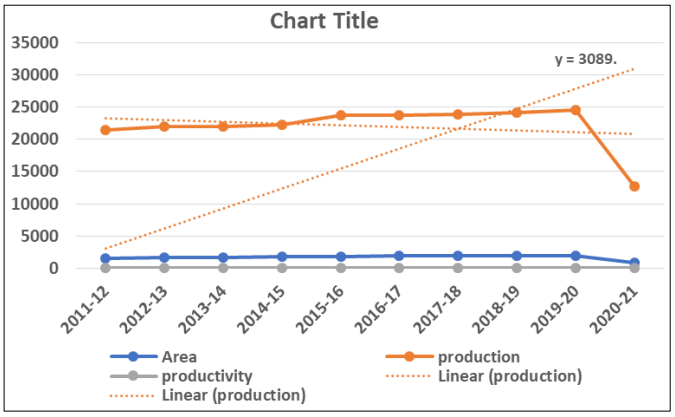

Fig 2: Area, production and productivity of Brinjal in Bilaspur District

4. Conclusion

In Chhattisgarh state we have found Brinjal area (3.11 percent) and production (3.77 percent) and productivity (0.63 percent). However in this case the production, area and productivity were found positively significant. In Bilaspur district we have found tomato Area (2.06 percent) and Production (1.91 percent) and productivity (0.39 percent). However in this case the production, area and productivity were found significant.

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