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Performance of chickpea production in Amravati district of Maharashtra

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Abstract
Chickpea (*Cicer arietinum* L.) commonly known as gram or Bengal gram is the most important pulse crop of India which alone has nearly 75 percent of the world acreage and production of Gram. The present study is an attempt to evaluate the growth and instability of such important crop i.e. chickpea. For the present study, Amravati district from Maharashtra state was chosen purposively as area under chickpea is reported highest in this district. The study was based on secondary data pertained to the year i.e. 1994-95 to 2014-15. The result revealed that Chickpea is the most important pulse crop in Amravati district, the growth rate for area of production of chickpea were found significant. Instability studied in chickpea indicate, that productivity under chickpea exhibited more yield. It means that production of chickpea over the period has been almost high.

Keywords: Chickpea, growth rate, variation, instability

Introduction
Chickpea (*Cicer arietinum* L.) commonly known as gram or Bengal gram is the most important pulse crop of India which alone has nearly 75 percent of the world acreage and production of Gram. Gram occupies about 37 percent of area under pulses and contributes about 50 percent of total pulse production of India. It is used for human consumption as well as feeding to animals. An agricultural sector being unstable in nature may substantially impede the economic growth of the country. The spectacular performance of agricultural sector primarily determined by the generation and sustenance of growth in production. The production instability trends to be transmitted to the market and may cause wide fluctuations in price of agricultural commodities. With the view, it is essential to study the growth and instability of chickpea production in Amravati district of Maharashtra. In view of above the present study has been under taken with the objectives:-

- To study the growth rate of area, production and productivity of chickpea in Amravati district of Maharashtra.
- To study the degree of instability in area, production and productivity of chickpea in Amravati district of Maharashtra.

Mean arrival and mean price
Compound growth rate
$y=ab^t$
Where,
y =Area /Production /Productivity,
a=Intercept,
b= Regression coefficient,
t = Time variable,
From the estimated function, the compound growth rate (CGR) was calculated for the study.
r = Compound Growth Rate

CGR = [Antilog (log b)-1] x 100
Degree of instability in area, production and productivity
The degree of instability in area, production and productivity of gram in different period was measured using coefficient of variation and coefficient of instability.

Coefficient of variation
Coefficient of variation is the ratio between the standard deviation and mean. It was usually represented by percentage. Coefficient of variation was computed by using following formula.

$$\text{Coefficient of variation (\%)} = \frac{\text{Standard deviation}}{\text{Mean}} \text{X } 100$$

Coefficient of instability was worked out using Cop pock's instability index

$$V \log = \Sigma \frac{[\log \frac{X_t + 1}{X_t} - m]^2}{N - 1}$$

$$CII = [\text{Anti}^{\log \sqrt{V \log}} - 1] \times 100$$

$$CII = [\text{Antilog}\sqrt{V \log - 1}\,]X100$$ Where,

X_t =Area/Production/Yield
N =number of years.
M = Mean of the difference between Logs of X_{t+1}, X_t.
Log V = logarithmic variance of the series.

Results and Discussion

The growth performance in agriculture is measured in three ways-area, production and yield. It could seen from the Table 1 that the overall growth rate of area under chickpea was 4.94 percent which was found significant. The growth rate of chickpea production as a whole was significant being 8.39 percent over period.

Productivity is the most significant criteria in measuring the growth of any crop output. The success or failure of any improvement in the art of agriculture is measured by the resultant increase or decrease in the productivity as seen in Table 1.

Table 1: Compound growth rates of gram in Amravati district

Particulars		Amravati
Period I	Area	-3.64*
	Production	-1.16
	Yield	2.57
Period II	Area	8.21**
	Production	13.7**
	Yield	5.06*
Overall Period	Area	4.94***
	Production	8.39***
	Yield	3.28***

(Note: ***significance at 1%, **significance 5%, *significance at 10%)

The growth rate of productivity under gram was 2.57 in period I, 5.06 in period II and 3.28 in overall period respectively which is statistically significant at 1 percent level. Indicating that productivity was increased at 3.28 growth rate at 1 percent level of significance per annum.

As seen from the Table 2 that the coefficient of variation for gram area for entire period was 18.29 percent, 29.92 percent and overall was 41.19 percent respectively. From this it is seen that the district exhibited high and increasing rate of variation in area under gram for all period.

Instability index of area under gram for entire period I was 14.40 percent in period II instability was increasing. The instability index for area has shown increasing trend in overall period was 28.61 percent. It was revealed that there was increasing instability in area under gram cultivation.

Table 2: Coefficient of variation and Instability Index of gram in Amravati district

Particular	Period I		Period II		Overall	
	CV	CII	CV	CII	CV	CII
Area	18.29	14.40	29.92	21.39	41.19	28.61
Production	26.10	25.86	41.35	28.30	62.13	38.72
Yield	20.10	18.90	22.14	17.36	26.36	19.09

A high instability of production as indicated by increasing coefficient of variation value period I, 26.1 percent period II, 41.35 percent and overall period it was 62.13 percent. Instability index of production period I 25.86 percent and period II 28.3 percent and overall period 38.72 percent. The instability index for production has shown increasing trend.

Coefficient of variation were increasing for period I, II and overall period 20.10 percent 22.14 percent and 26.36 percent respectively. Instability index during entire period I and II increasing but overall period it was 19.02 percent. This indicates increasing trend of productivity in period II compared to period I i.e. the farmers were getting higher yield.

Conclusion

1. The growth rate for area, production and productivity of chickpea were found significant.
2. Instability studied in chickpea indicates that indicates increasing trend of productivity in period II compared to period I i.e. the farmers were getting higher yield.
3. Variability in area, production and productivity of chickpea during period I, period II and also overall period it means that increasing rate of variation in area, production and productivity of gram for all period.

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