



# Dynamics of food grains production in Jammu & Kashmir and Haryana

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**Abstract :** The growth in the foodgrains production, area and yield in Haryana was found higher as compared to Jammu and Kashmir. Yield and its interaction with area are the main factors to increase the production. In Jammu and Kashmir in the triennium period 1979 -1982 and current period 2006-09, average area, production and yield of foodgrain crops has shown an increase of 7.25 per cent, 19.93 per cent and 11.85 per cent, respectively whereas in Haryana these variables has shown an increase of 11.50 per cent, 167.79 per cent and 140.20 per cent, respectively. The production of food grains in Jammu and Kashmir and Haryana has increased 59.46 per cent and 83.55 per cent, respectively due to yield effect and 4.16 per cent and 9.60 per cent, respectively due to interaction between yield and area. In Haryana the estimated area, production and yield of food grains will be 4560.82 thousand hectares, 18940.79 thousand tonnes and 4296.53 kg/ha., respectively whereas for Jammu and Kashmir it is estimated as 881.44 thousand hectares, 1584.06 thousand tonnes and 1803 kg/ha., respectively for the year 2019-2020.

**Key Words :** Regression co-efficient, Compound growth rate, Significance, Area, Production, Yield

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## INTRODUCTION

Green revolution was initiated during the mid sixties at a time when the country was whirling through the tyranny of food deficit. Beginning at the advent of introduction of dwarf wheat germplasm and cultivars from CIMMYT, Mexico in 1964-65, and later the new dwarf high yielding variety of rice (IRS released in 1966) from the International Rice Research Institute (IRRI), Manila, the food production increased manifold, which transformed the status from food deficit to a net food surplus country. About four-fold increase in food production was achieved when it climbed the height of 213 million tonnes of food grains in 2001-02. During the period, food production grew at a rate of about 100 percentage point every decade from barely 50 million tonnes in 1950-51. But, unfortunately, the achievement seems to have short-lived, because the food security in the country

has raised doubts on its sustainability and anxiety in the production front in the recent years (Barah, 2005). In a predominantly agricultural economy, the rate of growth in agriculture depends on the way farmers react to various programmes (Prasher *et al.*, 2006). India has achieved self sufficiency in the food grains production, but food grains requirement is continuously growing up with the increase in population of the country. Despite of adverse agro-climatic conditions, the country has produced 233.88 million tonnes of food grains during 2008-09 (Economic Survey, 2010) not only to meet the food requirement but also to develop a good export market of agricultural products. The contribution of Jammu and Kashmir and Haryana state in food grains production was 0.66 per cent and 2.94 per cent, respectively during 1979-80 in national pool which has increased to 0.69 per cent and 3.69 per cent during 2008-09. For rice crop in Haryana Bhatnagar (1995) observed that the growth rates of

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area, production and yield were found highly significant from 1966-67 to 1991-92. Interaction between area and yield has played a significant role in increasing the production of rice. Bhatnagar and Saxena (2000) observed that growth performance of production of wheat in Haryana was better than its growth in area and yield. Though the growth rates of area and production have decreased from 1986-87 to 1995-96 but it has not affected the growth rate of yield of wheat.

An attempt has been made to review the growth performance and to project the area and production of foodgrains in Jammu and Kashmir, Haryana and India up to the year 2019-2020.

## MATERIAL AND METHODS

The secondary data of area, production and yield of foodgrains in Jammu and Kashmir and Haryana 1979-80 to 2008-09 were utilized for this study. The data were collected from different issues of Digest of Statistics of the respective states issued by Directorate of Economics and Statistics, Jammu and Kashmir and Statistical Abstract of Haryana.

Basically any change in production of crop depends on the change in its area and yield. If the production, yield and area are denoted by  $Q_n$ ,  $Y_n$  and  $A_n$  for the current period and  $Q_0$ ,  $Y_0$  and  $A_0$  for base period, the increase in production  $Q = (Q_n - Q_0)$  in  $n$  years over base period is a function of change in area  $A = (A_n - A_0)$  and yield  $Y = (Y_n - Y_0)$ . Sharma (1977) defined the change in production function of a crop as

$$Q = A_0 Y + Y_0 A + AY \quad (1)$$

where,

$A_0 Y$  = Yield effect,

$Y_0 A$  = Area effect and

$AY$  = Interaction between area and yield.

To analyze the time series data, the following two functions were fitted.

The linear function is

$$Y_t = a + bt \quad (2)$$

where

$Y_t$  = area/production/ average yield of food grains in  $t^{\text{th}}$

year,

$a$  = Constant,

$b$  = Regression co-efficient and

$t$  = Time variable in years ( $t = 1, 2, \dots, 30$ ).

The exponential function

$$Y_t = AB^t \quad (3)$$

where,

$A$  = Constant and

$B = (1+r)$  with  $r$  as compound growth rate.

It is in log form as

$$\log Y_t = \log A + t \log B$$

which is similar to linear equation (2).

Compound growth rate (C.G.R) has been calculated as

$$\text{C.G.R. (\%)} = (\text{Anti. Log } B - 1) \times 100 \quad (4)$$

The projections of area and production of food grains have been worked out by using the exponential function.

## RESULTS AND DISCUSSION

The average area, production and yield of food grains in Jammu and Kashmir and Haryana in base and current periods are shown in Table 1. The table revealed that area under the foodgrain crops in Jammu and Kashmir was 744.00 thousand hectares during 1979-80 which has increased to 870.05 thousand hectares during 2008-09 showing an increase of 16.94 per cent whereas the production of foodgrain crops increased about 1.3 times from reporting an increase of 33.79 per cent. Similarly, yield of foodgrains shot up from 1652 to 1957 kg/ hectare *i.e.* an increase of 18.46 per cent during this period. Further, taking the triennium 1979 -1982 as base period and 2006-09 as current period, average area of foodgrain crops has increased from 806.21 to 864.62 thousand hectares *i.e.* 7.25 per cent more area comes under the foodgrain crops (Table 1). Average production of foodgrains has gone from 1340 to 1607 thousand tonnes showing moderate rise of 19.93 per cent. Yield of foodgrain crops has increased 11.85 per cent from 1662 to 1859 kg / hectare.

The table further revealed that, area under the food grain crops in Haryana was 3694 thousand hectares during 1979-80 which has increased to 4550 thousand hectares during 2008-09 showing an increase of 27.13 per cent whereas the production of foodgrain crops increased about 3.1 times from 5040 to 15761 thousand tonnes reporting an increase of 212.72 per cent . Similarly, yield of foodgrains shot up from 1365 to 3464 kg/ hectare *i.e.* an increase of 153.77 per cent during this period. Further, taking the triennium 1979 -1982 as base period and 2006-09 as current period, average area of foodgrain crops has increased from 3999 to 4459

**Table 1: Average area, production and yield of food grains in Jammu and Kashmir and Haryana in base and current periods**

	Jammu & Kashmir			Haryana		
	Area	Production	Yield	Area	Production	Yield
Base period (1979 - 1982)	806.21	1340	1662	3999	5705	1426
Current period (2006 – 2009)	864.62	1607	1859	4459	15277	3426
Change (%)	7.25	19.93	11.85	11.50	167.79	140.20

thousand hectares *i.e.* 11.50 per cent more area came under the foodgrain crops (Table 1). Average production of foodgrains has gone from 5705 to 15277 thousand tonnes showing an appreciable rise of 167.79 per cent. Yield of foodgrain crops has increased 140.20 per cent from 1426 to 3426 kg / hectare.

The contribution of yield, area and their interaction to increase the production has been studied and given in Table 2. Increase in production of foodgrain crops has been decomposed into three components, *viz.*, yield, area and effect of their interaction. The production of foodgrains in Jammu and Kashmir and Haryana has increased 59.46 per cent and 83.55 per cent, respectively due to yield effect and 4.16 per cent and 9.60 per cent, respectively due to interaction between yield and area. The contribution of area in Jammu and Kashmir and Haryana was found to be 36.38 per cent and 6.85 per cent, respectively. Therefore, yield and its interaction with area have played the key role in increasing the production of foodgrains in Jammu and Kashmir and Haryana.

**Table 2 : Contribution of area, yield and their interaction to change the production of food grains production**

Variable effects	Contribution (%)	
	Jammu and Kashmir	Haryana
Yield	59.46	83.55
Area	36.38	6.85
Interaction between area and yield	4.16	9.60

The growth rates of area, production and yield of foodgrains in Jammu and Kashmir and Haryana have been presented in Table 3. Area of foodgrains in Jammu and Kashmir has increased with highly significant growth rate, *i.e.* 1.002 per cent giving an increase of 1.98 thousand hectares area every year. The production of foodgrains has

shown a highly significant growth rate of 1.006 per cent giving an increase of 82.56 thousand tonnes per year. Yield of foodgrains has also increased with slight significant rate of 1.003 per cent *i.e.* an annual increase of 0.06 kg per hectare. It depicts that production has increased more rapidly than area due to adoption of modern production technology at farmer's field.

In case of Haryana, area of food grains has increased with highly significant growth rate of 0.4 per cent *i.e.* 18.42 thousand hectares more area has been adopted food grains crops every year. The production of food grains has shown a highly significant growth rate of 3.5 per cent giving an increase of 337.44 thousand tonnes per year. Yield of food grains has also increased with highly significant rate of 3.0 per cent *i.e.* an annual increase of 70.2 kg per hectare. It depicts that production has increased more rapidly than area and average yield in Haryana. For production and yield variables in Jammu and Kashmir and Haryana, both the functions were found equally good fitted.

Future projections of area and production of foodgrains in Jammu and Kashmir and Haryana have been worked out by using the exponential function (Table 4). It is estimated that the area of foodgrains in Jammu and Kashmir will be 865.56, 871.53, and 881.44 thousand hectares for the years 2011-12, 2014-15 and 2019-20, respectively whereas the production of foodgrains is likely to be 1518.01, 1542.78 and 1584.06 thousand tonnes during these periods. The corresponding average yields will be 1755, 1773 and 1803 kg/ ha in the respective years. In Haryana, it is estimated that the area of foodgrains will be 4413.45, 4468.71, and 4560.82 thousand hectares for the years 2011-12, 2014-15 and 2019-20, respectively whereas the production of foodgrains is likely to be 16241.31, 17253.61 and 18940.79 thousand tonnes during these periods. The corresponding average yields will be 3734.48, 3945.25 and 4296.53 kg/ ha in the respective years.

**Table 3: Growth rates of area, production and yield of food grains in Jammu and Kashmir and Haryana from 1979-1980 to 2008-2009**

Jammu and Kashmir/ Haryana	Variables	Linear Regression coefficient	R <sup>2</sup> (%)	Compound growth rate (%)	R <sup>2</sup> (%)
Jammu and Kashmir	Area	1.98**	53.50	1.002**	52.7
	Production	82.56**	24.50	1.006**	21.3
	Yield	0.06**	10.50	1.003**	8.70
Haryana	Area	0.0**	32.10	0.4**	29.90
	Production	0.3**	95.60	3.5**	93.10
	Yield	70.26**	95.50	3.0**	39.40

**Table 4: Future Projections of food grains in Jammu and Kashmir and Haryana for 2011-2012, 2014-2015 and 2019-2020**

Year (t)	Area ('000' ha.), Production ('000' tonnes), Yield (kg/ha.)					
	Jammu & Kashmir			Haryana		
	Area	Production	Yield	Area	Production	Yield
2011-2012	865.56	1518.01	1755.00	4413.45	16241.31	3734.48
2014-2015	871.53	1542.78	1773.00	4468.71	17253.61	3945.25
2019-2020	881.44	1584.06	1803.00	4560.82	18940.79	4296.53

**Conclusion:**

The present study estimated the growth rate of area, production and yield of food grains in Jammu and Kashmir and Haryana and also the future projections of food grains upto 2019-2020. Estimates indicated that area will increase both in case of Haryana and Jammu and Kashmir. The production and yield will also show an increasing trend in both the states.

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**REFERENCES**

**Barah, B.C. (2005).** Dynamic of ice economy in India: Emerging scenario and policy options. Department of Economic Analysis & Res., NABARD, Mumbai. 47:3.  
**Bhatnagar, S.(1995).** Growth performance of rice crop in Haryana.

*Haryana agric. Univ. J. Res.*, **25** (1/2) : 41-46.

**Bhatnagar, S., Sharma, Manish and Batra, S.D. (2010).** Dynamics of food grains production in Haryana: A Temporal Analysis. *Haryana Agricultural University. J. Res.*, **40** : 15-17.

**Bhatnagar, S. and Saxena, K.K. (2000).** An estimate of area and production of wheat in Haryana by 2002. *Agric. Situ. India*, **56** : 665-667.

Economic Survey (2010). Directorate of Economics and Statistics, Ministry of Agriculture, Govt. of India.

**Gill, K., Jagdeep, Sharma, Manish and Mahmood, A. (2002).** Growth trends in Food grains production. *Productivity*, **43**(3):495 – 501.

**Prasher, R.S., Thomas, M. and Negi, Y.S. (2006).** Estimation of supply functions for Himachal apples. *Indian J. Economics*, **85** (3) 433–453.

**Sharma, K.L. (1977).** Measure of the effects of area, yield and price in increased value of crop output in India. *Agric. Situ. India*, **32** : 349-351.

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