



Growth of Area Under Principal Crops in India

KEYWORDS

Growth trends, long-run modal rice wheat, cereals, foodgrains, groundnut and sugarcane

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ABSTRACT *The rate of growth (compound) of area under food and non-food crops in general and important crops like rice, wheat, sugarcane and groundnut in particular were higher during pre-green revolution period as compared to different phases of green revolution as well as in the entire green revolution and overall periods.*

To examine this trend, the growth of area under important crops has been studied before and after the setting-in of green revolution. The period under study has been divided into four periods, viz. Pre-Green Revolution Period (1949-50 to 1965-66), Green Revolution Phase-I (1966-67 to 1980-81), Green Revolution Phase-II (1981-82 to 1990-91) and Green Revolution Phase-III (1990-91 to 2008-09). The last period is also known as economic reforms period or liberalization period. To understand the overall trend, overall period from (1949-50 to 2008-09), is also taken for the study. The growth of area during periods under wheat, sugarcane, rice, groundnut, cereals and foodgrains were 1.83, 1.70, 0.65, 0.50, 0.28 and 2.24 per cent respectively.

Introduction

Cereals have occupied a significant place in cropping pattern in the wake of green revolution. The new agricultural technology made certain crops more profitable and this in turn led to shift in area in favour of those crops at the expense of others. The area under superior cereals like wheat and rice has increased considerably at the expense of inferior cereals like jowar and bajra, pulses and oilseeds. It was found that there were significant area shifts in favour of rice and wheat in India. The cropping pattern has been either wheat or rice dominating in several parts of the country in the wake of green revolution and development of irrigation facilities. A study by Bunsil found that the real effect of green revolution would appear to have been reflected mainly in the extension of area under wheat, although rice and jowar also exhibited potentialities for higher change.

A more recent study by Bhalla and Tyagi reveals that growth rates are significant at 1 per cent level in the case of all crops except groundnut during green revolution period. Several measures were undertaken by central and state governments to boost the growth of oilseeds. However, the case of groundnut is still disappointing. Sugarcane is one of the important commercial crops in the country. This is mainly produced in Uttar Pradesh, Maharashtra, Andhra Pradesh, Tamil Nadu and to some extent in Karnataka.

Before 1960, agricultural production increased mainly due to extensive cultivation, which resulted in the growth of area under different crops. Since sixties, particularly after setting-in of green revolution, production rose on account of intensive cultivation.

Because of this since the on-set of green revolution the growth of area under some crops was either insignificant or negative. To examine this trend, the growth of area under important crops has been studied before and after the setting-in of green revolution.

Objective:

1. To study the area growth rates of principal crops in India
2. Suggest suitable measures for improving area growth rates

Data and Methodology:

The principal sources of secondary data were the periodical publications, such as, Statistical Abstracts, and Season and Crop Report, both published by the Bureau of Economics and Statistics, Government of Andhra Pradesh, the publications of Government of India, the Reserve Bank of India and the National Institute of Rural Development etc.,

Besides simple averages and percentages, compound growth rates were computed in order to study the long terms growth rates in the area of important crops viz., the areas of rice, wheat, cereals, foodgrains, groundnut and sugarcane in India using the following function.

$$Y = AB^X \text{ or}$$

$$\text{Log } Y = \text{Log } A + X \text{ Log } B$$

Where Y = Area

X = Time component, (1950-51 to 2008-09)

'A' and 'B' are constants

Compound growth rate = (anti-log of B-1)*100

For testing the significance of compound growth rate, the following test was employed.

$$t = \frac{B}{SE(b)}$$

$$\text{Where } SE(B) = \frac{1}{n-2} \left\{ \frac{S_{yy} - B^2}{S_{xx}} \right\}$$

$$S_{yy} = \sum \log^2 Y - \frac{(\sum \log Y)^2}{n} \text{ and}$$

$$S_{xx} = \sum x^2 - \frac{(\sum x)^2}{n}$$

Table. I Area under Important Crops in India (Area in Million Hectares)

Year	Rice	Wheat	Cereals	Food grains	Sugarcane	Ground Nut
1950-51	30.81	9.75	78.23	97.32	1.71	4.49
1954-55	30.77	11.26	85.95	107.86	1.62	5.54
1959-60	33.82	13.38	90.99	115.82	2.14	6.44
1964-65	36.46	13.42	94.23	118.11	2.60	7.38
1969-70	37.68	16.63	101.55	123.57	2.75	7.13
1974-75	37.89	18.01	99.05	121.08	2.89	7.06
1999-00	45.16	27.49	101.99	123.1	4.22	6.87
2004-05	41.91	26.38	97.32	120.00	3.66	6.64
2008-09	45.54	27.75	100.74	122.83	4.22	6.16

Source: Ministry of Agricultural Government of India.

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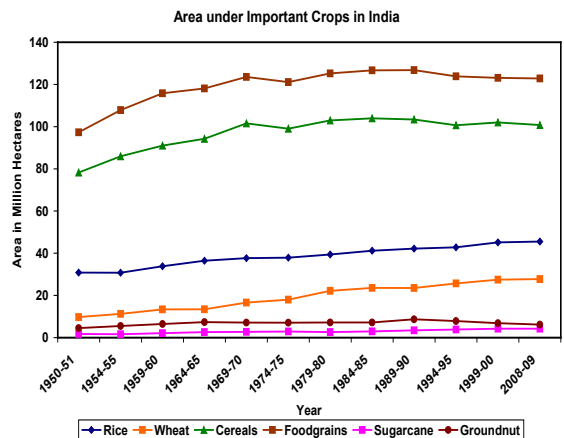


Table.2 Growth of Area under Rice, Wheat, Cereals, Foodgrains, Sugarcane and Groundnut (Per cent)

Crops	P.G.R.P		G.R .P-I		G.R P-II		G.R.P-III		G.R.P		T.P	
	CGR	"t" Value	CGR	"t" Value	CGR	"t" Value	CGR	"t" Value	CGR	"t" Value	CGR	"t" Value
Rice	1.372	(14.923)**	0.824	(7.856)**	0.603	(1.771)@	0.191	(1.520)@	0.479	(13.980)**	0.651	(22.636)**
Wheat	2.316	(5.853)**	3.429	(9.027)**	0.361	(1.080)@	0.712	(4.683)**	1.300	(13.251)**	1.836	(22.593)**
Cereals	1.165	(8.647)**	0.533	(4.235)**	-0.250	(1.003)@	-0.064	(0.693)@	-0.031	(0.890)@	0.287	(6.934)**
Foodgrains	1.227	(7.452)**	0.507	(3.967)**	-0.187	(0.688)@	-0.045	(0.466)@	-0.028	(0.780)@	0.237	(6.132)**
Sugarcane	3.411	(6.354)**	1.716	(3.312)**	1.350	(1.786)@	1.297	(3.399)**	1.666	(17.085)**	1.701	(23.945)**
Groundnut	3.789	(10.996)**	-0.292	(1.804)@	1.697	(2.028)*	-2.116	(8.186)**	-0.278	(2.442)*	0.346	(3.194)**

Note: ** : Significant at 1 Per cent Level

* : Significant at 5 Per cent Level

@ : Not Significant

P.G.R.P : Pre Green Revolution Period (1955-1956 to 1965-1966)

G.R.P : Green Revolution period (1966-67 to 2008-2009)

G.R.P.P-I : Green Revolution Phase-I (1966-1967 to 1980-1981)

G.R.P.P-II : Green Revolution Phase-II (1981-82 to 1989-1990)

G.R.P.P-III : Green Revolution Phase-III (1990-91 to 2008-2009)

T. P : Overall Period (1955-56 to 2008-2009)

C.G.R : Compound Growth Rate

Source : Computed Using Data

The results presented in table show that the area under rice has grown at a compound rate of 1.7 per cent during pre-green revolution period, 0.82 per cent during phase-I, and 0.60 per cent in phase-II and 0.19 per cent in period-III of green revolution period. The growth rates were highly significant (at 1 per cent level) in pre-green revolution and the phase-I and were not significant during phase-II and phase-III. The area under rice has grown at a compound rate of 0.48 per cent during the entire green revolution period and 0.65 per cent during the overall period, covering both pre-green revolution and green revolution periods. Both the rates are statistically significant. It is

noticed that the growth rate was higher during pre-green revolution period as compared to green revolution period, suggesting that the area effect on production was higher before the on-set of the green revolution.

The area under wheat, which registered a compound growth of 2.32 per cent during pre-green revolution period, has grown at 3.43 per cent in phase-I, 0.36 per cent in phase-II and 0.71 per cent in phase-III of green revolution. For the entire green revolution period the growth rate was 1.30 per cent. With the exception of phase-I the growth rate was lower during the other phases of green revolution as also for the entire green revolution period and the whole period when compared to pre-green revolution period. For cereals and foodgrains, a similar trend is found.

The area under sugarcane and groundnut also indicated the same trend. The area under sugarcane has grown at 3.41 per cent during pre-green revolution period 1.72 per cent in phase-I, 1.35 per cent in phase-II and 1.30 per cent in phase-III. For the entire green revolution period and total period the growth rates were 1.67 per cent and 1.70 per cent respectively. Groundnut registered the growth rate of 3.79 per cent during the pre-green revolution period, -0.29 per cent in phase-I, 1.70 per cent phase-II and -2.12 per cent in phase-III of green revolution. During green revolution period we notice a negative growth of -0.28 per cent and for the total period it was 0.35 per cent.

Conclusion

The area under rice had grown at a compound rate of 1.7 per cent. The growth rates were highly significant (at 1 per cent level) in pre-green revolution and the phase-I but these were not significant during phase-II and phase-III. Covering both pre-green revolution and green revolution periods, both the rates are statistically significant. It was noticed that the growth rates for all crops were higher during pre-green revolution period as compared to green revolution period, suggesting that the area effect on production was higher before the introduction of the green revolution. The area under wheat, registered a compound growth of 3.43 per cent in phase-I, the growth rates were highly significant (at 1 per cent level). For the entire green

revolution period the growth rate of wheat was 1.30 per cent. With the exception of phase-I the growth rate of wheat was lower during the other phases of green revolution as also for the entire green revolution period and the whole period when compared to pre-green revolution period. For cereals and foodgrains, a similar trend was found. The area under sugarcane indicated the same trend. The area under sugarcane had grown at 3.41 per cent during pre-green revolution period and groundnut registered the growth rate of 3.79 per cent during the pre-green revolution period.

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