

Agricultural development in Maharashtra State by Estimating Growth Rates of Area, Production and Productivity of Major Crops Grown and Fertilizer Consumption Pattern

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Abstract

Agriculture development has been analysed by studying the cropping pattern, land utilization pattern, fertilizer consumption and crop specialization in any agro-ecosystem in regional and temporal framework. Tribal regions are experiencing agricultural intensification changing cropping pattern and crop specialization as a result of ecological economic changes as well as impact of public policy of technology transfer and resource use intensification.

In this paper ,an attempt is made to estimate growth rates of area, production and productivity of major crops grown and fertilizer consumption in Maharashtra state over a period of time. Such an analysis will help in launching different programmes for developing agriculture in the state. Result of study will help policy makers, administrators and research worker for development of agriculture in different fields to plan their strategies for overall development of state. This study revealed that the positive growth rate were noticed in area, production and productivity of majority of major crops. This indicate that the agricultural development is taking place in desired direction. In the overall period the Nitrogenous fertilizer is non significant but phosphatic and potassic fertilizers was significant in Maharashtra state.

Keywords : Area, production , productivity , major crops , and fertilizer consumption

Agricultural development is the process of making rational use of agriculture resources of a country with special reference to improve efficiency of agriculture and living standard of agrarian population. Agriculture development plays a vital role in India, in general with new technology and increased level of production but more attention has been placed on factor of production and market prices to boost output at an aggregate level.

In India agriculture development contributes to national economic growth to a large extent as compared to the developed countries due to heavy dependence of its population for their livelihood. India is predominantly an agricultural economy presently about 64% of India's population is engaged in agriculture

contributing upto 13.5% in total export and 24.30% in GDP. Problems of increasing population and hunger can be solved through agriculture. Land is limiting factor of production therefore it is necessary to increase production by adopting new improved technologies. There are three primary objective of agricultural development, as it provides food and fiber to the millions of people, it supplies capital and foreign exchange for the economic growth and contributes to increase in rural welfare.

Maharashtra state is one of the developed and progressive state in the country. It is the second largest state in India both in term of population and geographical area, 3,07,713 km² (3.08 lakh sq.km.) and population of 11.24 crore (2011 census) which is 9.84% of the total population of the country. As compared to India, Maharashtra drives a major portion of its income and employment from agriculture.

Keeping these in view the present study was proposed. The objective of the study is to estimate growth rates of area, production and productivity of major crops grown in Maharashtra state.

Methodology

Maharashtra state was purposively selected for present study because Maharashtra state has made progress in agricultural development due to increase of irrigation facilities through three major irrigation dams via Jayakwadi, Koyna, Gangapur, Bhatghar, Sidheshwar, Bhandardhara, Vishnupuri and other minor project.

A time series data were necessary to study the objectives. Such data can be available only through secondary sources. The required secondary data was obtained from the different records of state governments and co-operative institutions viz. Epitome of Agriculture, Department of Agriculture, Government of Maharashtra, Pune, Socio-economic Review, Directorate of Economics and Statistics, Government of Maharashtra, Mumbai.

In analytical techniques tabular analysis and functional analysis such as linear and compound growth rate were used to analyse data of present study. Tabular analysis consisted with arithmetic mean, percentages and ratios. To work out triennium averages for base period i.e. 1990-91, period considered was 1988-89, 1989-90, 1990-91 and for end period i.e. 2009-10, period for triennium considered was 2007-08, 2008-09, 2009-10 simple arithmetic averages, percentages of selected parameters of development was used for the comparison of situation in Maharashtra over three period of time.

Results and Discussion

Growth rate of area under different crops

The trend in area of different crops were studied and depicted in Table 1. Linear and compound growth rate of area under rabijowar, wheat, sugarcane total pulses have shown non – significant during study period. Area under *kharijowar*, bajra total cereals, total food grains, groundnut, safflower were negatively significantly LGR and CGR @ 0.76 to 0.474 per cent respectively.

Table 1: Growth rate of area under different crops in Maharashtra State (1990-91 to 2009-10)

Sr.No.	Particular	LGR			CGR		
		I	II	III	I	II	III
1.	Kharifjowar	-4.80**	-2.16**	-3.49**	-4.65**	-2.08**	-3.33**
2.	Rabi jowar	0.07	0.05	-0.27	0.10	0.07	-0.24
3.	Wheat	3.48	2.55	0.54	3.33	2.29	0.52
4.	Bajra	-1.24	-5.16**	-2.82**	-1.23	-5.34**	-3.02**
5.	Total cereals	-0.99*	-0.94	-1.09**	-0.97*	-0.94	-1.08**
6.	Tur	0.20	0.10	0.47**	0.20	0.09	0.47**
7.	Gram	6.12**	5.23**	2.59**	6.68**	5.08**	2.71**
8.	Total pulses	0.87	0.01	0.39	0.88	-0.06	0.38
9.	Total food grains	-0.53	-0.66	-0.71**	-0.52	-0.68	-0.71**
10.	Groundnut	-5.44**	-0.24	-2.80**	-5.14**	-0.34	-2.64**
11.	Safflower	-4.97*	-4.16**	-5.58**	0.56	6.69**	2.38**
12.	Total oil seed	0.49	6.23**	2.51**	0.56	6.69**	2.38**
13.	Sugarcane	3.27*	-3.11	-0.69	3.33	-3.99	-1.29
14.	Cotton	2.67**	1.23	0.80	2.70**	1.21	0.82**

* Significant at 5 per cent

** Significant at 1 per cent

The growth of average area under cotton was significantly and rate of change was 0.802 and 0.822 per cent respectively of LGR and CGR of III period.

Growth rates of production of different crops

The growth rates of production of major crops were calculated and presented in Table 2.

Table 2: Growth rate of production of different crops in Maharashtra State (1990-91 to 2009-10)

Sr.No.	Particular	LGR			CGR		
		I	II	III	I	II	III
1.	Kharifjowar	-3.89	-1.48	-3.96*	-3.52	-1.39	-3.65**
2.	Rabi jowar	1.29	-1.22	-1.69	1.69	-0.84	-1.60
3.	Wheat	5.45	9.22*	4.20**	5.26	9.61**	3.99**
4.	Bajra	1.28	-2.42	-2.12*	1.49	-2.68	-2.09*
5.	Total cereals	0.24	2.71	-0.19	0.43	2.69*	-0.12
6.	Tur	6.10	2.47	2.95**	6.08	2.20	3.25**
7.	Gram	7.78**	12.73**	5.91**	8.94**	13.93**	5.82**
8.	Total pulses	4.25	3.06	1.88*	4.62	2.75	2.20*
9.	Total food grains	0.82	2.82	0.18	1.02	2.78*	0.24
10.	Groundnut	-6.46*	1.25	-3.29**	-5.79*	1.20	-2.85**
11.	Safflower	-2.47	0.62	-4.83**	-1.79	0.48	-4.51**
12.	Total oil seed	5.33*	6.14	4.03**	5.75*	6.76	4.03**
13.	Sugarcane	4.27*	7.26	3.11*	4.31*	7.13	2.62*
14.	Cotton	5.72	11.41**	5.76**	6.55	12.62**	5.71**

* Significant at 5 per cent ** Significant at 1 per cent

Linear and compound growth rate of average production of *Kharifjowar*, *rabijowar*, wheat, *bajra*, Total cereals, tur, total pulses, total food grains, safflower, cotton were non – significantly during I period the growth of groundnut was negatively significant during first period

The growth of gram increased significantly by linear and compound growth rate of 7.789 and 8.943 per cent respectively during I period. Total oilseed, sugarcane increased significantly by linear growth rate of 5.335, 5.728 respectively and by compound growth rate of 5.757, 4.317 per cent respectively.

In II period *kharifjowar*, *rabijowar*, *bajra*, tur, total pulses, safflower were non significantly production. The growth of wheat, total cereals, gram, total food grains and cotton increased significantly by linear growth rate of 9.226, 2.712, 12.136, 2.820, and 11.419 respectively by compound growth rate of 9.611, 2.697, 13.939, 2.781 and 12.629 per cent respectively.

Growth rate of productivity

The growth rate of productivity under different crops by linear and compound growth rate show in Table 3, in III period was in *rabijowar* and sugarcane negatively decreased and under wheat, total cereals, gram total pulses, total oil seeds, cotton increased significantly and *bajara*, total cereals, total food grains, groundnut safflower *kharifjowar* was non significant during study period.

Table 3: Growth rate of productivity of different crops in Maharashtra (1991-2010)

Sr.No.	Particular	LGR			CGR		
		I	II	III	I	II	III
1.	Kharifjowar	0.775	3.387	0.470	1.190	3.250*	0.568
2.	Rabi jowar	1.600	-0.876	-1.563	1.625	-0.784	-1.646
3.	Wheat	1.820	3.350*	1.806**	1.839	3.335*	1.833**
4.	Bajra	2.709	2.718*	0.868	3.209	2.805*	1.083
5.	Total cereals	1.090	3.624**	0.887	1.180	3.680**	0.889
6.	Tur	5.936	1.967	2.469**	5.875	1.829	2.85**
7.	Gram	2.081	.220**	1.789**	2.228	5.248**	1.731**
8.	Total pulses	3.469	3.205**	1.765**	3.723	3.191**	1.930*
9.	Total food grains	1.382	3.454**	0.903	1.536	3.503**	0.942
10.	Groundnut	2.637	1.477	0.715	2.963	1.493	0.839
11.	Safflower	2.820	4.766*	0.888	3.297	5.003	0.927
12.	Total oil seed	4.93*	-1.070	1.777*	5.165*	-1.588	1.823*
13.	Sugarcane	0.879	0.950	-0.399	0.874	1.006*	-0.420
14.	Cotton	3.204	8.356**	4.190*	8.333	9.466*	4.333**

* Means significant at 5 per cement

** Means significant at 1 per cement

Growth rate of fertilizer consumption

The growth rate of fertilizer consumption were worked out and presented in Table 4 During period I the nitrogenous fertilizer consumption increased significantly at linear rate 4.940 and at compound rate 4.985 percent respectively.

Table 4: Growth rate of fertilizers consumption in Maharashtra State (1990-91 to 2009-10)

Sr.No.	Particular	LGR			CGR		
		I	II	III	I	II	III
1.	N	4.94**	3.79	2.20	4.98**	-0.83	0.63
2.	P	5.75*	7.82	5.36**	5.36*	6.56	5.00**
3.	K	1.44	13.55**	7.67**	1.44	14.21**	7.07**

Phosphatic fertilizer consumption increased significantly @5.754 linearly and at compound 5.360 per cent respectively. Potassic fertilizer non significant during the I period in Maharashtra state. During the II period the Nitrogenous fertilizer was non significant and the phosphatic fertilizer also non significant but potassic fertilizer was significant in the Maharashtra state.

In the overall period the Nitrogenous fertilizer is non significant but phosphatic and potassic fertilizers was significant in Maharashtra state.

Conclusion

Growth rate of area under gram, tur, safflower, total oilseed, cotton increased significantly, area under kharifjowar, bajara, total cereals, total food grains, groundnut increased negatively significant and area under wheat, total pulses, sugarcane non significant.

Growth rate of production of wheat, tur, total pulses, total oilseed, sugarcane cotton was increased significantly and kharifjowar, bajara, groundnut, safflower increased negatively significant and growth rate of production under rabijowar, total cereals total food grains, was non significant. Growth rate of productivity of wheat, tur, gram, total pulses, total oilseed, cotton was increased significantly during 1990-91 to 2009-10 productivity of kharifjowar, bajara, total cereals, total food grains, groundnut, safflower was non significant.

Growth rate of fertilizer consumption of phosphorus and potassium increased significantly but nitrogen was non significant during 1990-91 to 2009-10.

In general the positive growth rate were noticed in area, production and productivity of majority of major crops. This indicate that the agricultural development is taking place in desired direction

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