



DYNAMICS OF PIGEONPEA PRODUCTION IN MAHARASHTRA

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Abstract: *The present study revealed that, the area under pigeonpea has been doubled in Marathwada and Vidarbha region during the period 44 year and showed increasing trend, while Western Maharashtra decreasing trends. Vidarbha region had maximum area under pigeonpea in entire period. As regards the production of pigeonpea in Maharashtra, it had increased by 258.46 per cent during the period of 44 years since 1969. The pigeonpea production was 263433 tonnes during TE 1969-72 which increased continuously and reached to 944292 tonnes during TE 2010-13. The productivity of pigeonpea has shown increasing trend in Maharashtra. The maximum productivity of pigeonpea was found in Vidarbha region (831.52 kg/ha) during TE 2010-13. In the Maharashtra, area, production and productivity of pigeonpea had significant and increased at the rate of 1.97, 3.11 and 1.11 per cent per annum, respectively for the entire period of 44 years. The maximum annual compound growth rate in productivity was observed in Marathwada region (1.82) followed by Vidarbha (0.57) and Western Maharashtra (0.16) region. The significant increase in growth rate of the acreage and production of pigeonpea was noticed in Marathwada and Vidarbha regions while decline in growth rate of area and non-significant but positive growth of production was observed in Western Maharashtra. During pre-TMOP period, the area, production and productivity of pigeonpea had significant and increased at the rate of 2.21, 3.74 and 1.49 per cent per annum, respectively in the State. The maximum annual compound growth rate in productivity was observed in Marathwada region (2.12) followed by Western Maharashtra (1.42) and Vidarbha (0.57) region. The significant increase in growth rate of the acreage and production of pigeonpea was noticed in Marathwada and Vidarbha regions while positive but non-significant in Western Maharashtra.*

Keywords: *Production performance, ACGR, Pigeonpea.*

1. Introduction

Historically, in India the mid-sixties year of the period, technological break-through in the agriculture has resulted in greater strides in augmenting agricultural production with the increase area under irrigation, the intensity of cropping and the area of average of high yielding varieties of the selected crops have steadily increased. Many of the pulse and oilseed crops remained outside of the phenomenon of technological change for a long time. As a result, there existed productivity differentials amongst the various crops categories across different regions and states in the country. Moreover the production performances were not similar for all the crops. The production of pulses has remained stagnant over time. Pulses occupy a unique position not only in Indian agriculture, but

also in Indian diet. Ask a man on the street what he need the most and the reply is surely going to be **Dal-Roti**. Pulses is simple food of millions of our people is the major source of dietary protein. It is due to pulses that the adults among our predominantly vegetarian population rarely suffer from protein deficiency.

In the world, pulses are grown by 171 countries. At triennium ending 2012-13, the total area under pulses was 72.3 million hectare. This area provided about 64.40 million tonnes of pulses with a productivity 890 kg/ha, and major exporting countries is Canada, China, Australia, USA, and importing countries are India, China, USA, Egypt, Pakistan. (FAO, STAT- 2014)

India is largest producer, consumer, of pulses in the world, for the triennium ending 2012-13, the

total area under pulses was 23.90 million hectare. This area provided about 16.58 million tonnes of pulses with productivity 694 kg/ha, the production of pulses has fluctuated between 11.82 million tonnes in 1970-71 and 14.26 million tonnes in 1990-91. It was 18.34 million tons in 2012-13 with average productivity is 789 kg/ha, in area with 23.26 million hectare. The domestic consumption of pulses in India was 21.74 million tonnes. Against this, India produces an average of 18.34 million tonnes during this period, there was a gap of 3.40 million tonnes of pulses in demand and supply, but over the years, the productivity has remained quite at low web as compared to other countries. (Directorate of Economics and Statistics, Govt. of India)

Maharashtra ranks second position in area and third for production of pulses in India with 14.06 per cent of area and 12.60 per cent production contribution. The area under pulses in the year 2012-13 was 3.27 million hectare and production was 2.31 million tonnes with average productivity 706 kg/ha. The area and production under pigeonpea to total pulses was 36.08 and 44.99 percent respectively and productivity 822 kg/ha. for the year 2012-13 in Maharashtra. (Directorate of Economics and Statistics, Govt. of Maharashtra)

2. Objectives

1. To estimate the changes in area, production and productivity of pigeonpea
2. To estimate the growth rates in area, production and productivity of pigeonpea

3. Methodology

3.1 Selection of period

To facilitate proper understanding of percentage increase in area, production and productivity of pigeonpea in the state, the entire period of 44 years from 1969-70 to 2012-13 will be divided as below because, pulses were bought under the ambit of Technology Mission on Pulses (TMP) of the Ministry of Agriculture & Co-operation, Govt. of India in August 1990.

1. Period-I 1969-70 to 1990-91 (Pre –TMP period)
2. Period-II 1991-92 to 2012-13 (Post –TMP period)
3. Overall 1969-70 to 2012-13 (Entire period)

3.2 Sources of data

The present study is based on secondary data. The required data will be collected for different regions (Barring of Konkan region because very little area of pigeonpea in that region and time series data was not available than Konkan region was excluded from analysis) and Maharashtra as a whole from different Govt. Publications.

3.3 Analytical tools

In order to analyze the growth rates in area, production and productivity of pigeonpea in different regions and the state as a whole, compound growth rates will be computed by using the following form of the relationship.

$$Y = ab^t$$

Where,

$$Y = \text{Area (ha.)} / \text{Production (qt.)} / \text{Productivity (Kg.)}$$

a = Constant

b = Trend value

t = Time period in years

$$\text{CGR (\%)} = (\text{Antilog } b-1) \times 100$$

The significance of the estimated compound growth rates will be tested with the help of Student “t” Test.

4. Result and Discussion

4.1 Changes in area, production and productivity of Pigeonpea in Maharashtra (Triennium average)

The information on triennial average of area, production and productivity of pigeonpea in Maharashtra is presented in Table 1. The reason of taking triennial average was to even out the effect of abnormal years.

Table 1: Area, production and productivity of pigeonpea in Maharashtra (Triennium average)

Sr. No.	Region	Period		
		1969-72 (Base Year)	1991-94	2010-13
A) Area ('00' ha.)				
1	Western Maharashtra	1227.00	1532.00 (24.86)	1069.72 (-12.82)
2	Marathwada	2273.33	3983.00 (75.21)	5117.15 (125.09)
3	Vidarbha	2319.00	4568.00 (96.98)	6176.71 (166.35)
	Maharashtra	5864.33	10146.00 (73.01)	12414.65 (111.70)
B) Production('00' tonnes)				
1	Western Maharashtra	483.33	826.67 (71.03)	600.80 (24.30)
2	Marathwada	679.00	1361.67 (100.54)	3734.06 (449.94)
3	Vidarbha	1456.67	3388.33 (132.61)	5130.82 (252.23)
	Maharashtra	2634.33	5625.33 (113.54)	9442.92 (258.46)
C) Productivity(Kg/ha.)				
1	Western Maharashtra	388.43	536.86 (38.21)	511.05 (31.57)
2	Marathwada	293.83	344.95 (17.40)	728.85 (148.05)
3	Vidarbha	628.45	733.70 (16.75)	831.52 (32.31)
	Maharashtra	449.27	553.33 (23.16)	760.82 (69.35)

(Figures in the parentheses indicate per cent change over the base year)

Source: Comissionerate of Agriculture, Govt. of Maharashtra (2014)

The area under pigeonpea in Maharashtra was 586433 hectares during TE 1969-72 which has increased up to 1241465 hectares (111.70 per cent) during TE 2010-13. The results further indicated that the area under pigeonpea has been doubled in Marathwada and Vidarbha region during the period 44 year and showed increasing trend, while Western Maharashtra decreasing trends. Vidarbha region had maximum area under pigeonpea in entire period. The performance of pigeonpea was quite satisfactory as far as the area expansion in the region of State is concerned.

As regards the production of pigeonpea in Maharashtra, it had increased by 258.46 per cent during the period of 44 years since 1969. The pigeonpea production was 263433 tonnes during

TE 1969-72 which increased continuously and reached to 944292 tonnes during TE 2010-13.

The productivity of pigeonpea has shown increasing trend in Maharashtra. The maximum productivity of pigeonpea was found in Vidarbha region (831.52 kg/ha) during TE 2010-13.

4.2 Growth rates in area, production and productivity of pigeonpea in Maharashtra

The estimated compound growth rates in area, production and productivity of pigeonpea are presented in Table 2.

The information in respect of annual compound growth rates in area, production and productivity for different time periods viz., Period-I 1969-70 to 1990-91 (pre-TMOP period), Period-II 1991-92 to 2012-13 (post -TMOP period) and entire period 1969-70 to 2012-13 (overall period) and for

different region of Maharashtra is presented in Table 2,

In the Maharashtra, area, production and productivity of pigeonpea had significant and increased at the rate of 1.97, 3.11 and 1.11 per cent per annum, respectively for the entire period of 44 years. The maximum annual compound growth rate in productivity was observed in Marathwada region (1.82) followed by Vidarbha (0.57) and Western Maharashtra (0.16) region. The significant increase in growth rate of the acreage and production of pigeonpea was noticed in Marathwada and Vidarbha regions while decline in growth rate of area and non-significant but positive growth of production was observed in Western Maharashtra.

The positive output growth of pigeonpea was registered in all district of Marathwada and Vidarbha region. In Western Maharashtra region, the positive output growth rate was observed only in Nasik, Dhule and Jalgaon district while remaining six districts showed negative trends in production. Only seven districts, namely Aurangabad, Beed, Latur, Nanded, Akola, Nagpur, and Bhandara showed positive and highly significant trends in the productivity of crops. The area under pigeonpea showed significant increase in all district of Vidarbha and in Marathwada region except the Aurangabad and Osmanabad district. The significant growth rate in area were observed in Nasik, Dhule and Jalgaon district of Western Maharashtra, while the area under pigeonpea declined significantly in Pune, Solapur, Satara, Sangli, Kolhapur district.

During pre-TMOP period, the area, production and productivity of pigeonpea had significant and increased at the rate of 2.21, 3.74 and 1.49 per cent per annum, respectively in the State. The maximum annual compound growth rate in productivity was observed in Marathwada region (2.12) followed by Western Maharashtra (1.42) and Vidarbha (0.57) region. The significant increase in growth rate of the acreage and production of pigeonpea was noticed in Marathwada and Vidarbha regions while positive but non-significant in Western Maharashtra.

For the period I, positive output growth of pigeonpea was registered in all district of and Vidarbha and in Marathwada region except Aurangabad and Osmanabad district. In Western Maharashtra region, the positive output growth rate was observed only in Dhule and Jalgaon district. Only three districts, namely Solapur, Beed, and Bhandara showed positive and highly significant trends in the productivity of crops. The area under pigeonpea showed significant increase in all district of Vidarbha and in Marathwada region except the Nagpur and Nanded district. The significant growth rate in area were observed in Dhule, Jalgaon and Satara district of Western Maharashtra, while the area under pigeonpea declined in Pune, Solapur, Sangli, Kolhapur district.

As evident from table, during the second period the area, production and productivity of pigeonpea had significant and increased at the rate of 0.77, 3.01 and 2.21 per cent per annum, respectively in the State. The maximum annual compound growth rate in productivity was observed in Marathwada region (5.21) followed by Western Maharashtra (0.87) and Vidarbha (0.57) region. The significant increase in growth rate of the acreage and production of pigeonpea was noticed in Marathwada and Vidarbha regions while negative but significant in Western Maharashtra.

In period II, positive output growth of pigeonpea was registered in all district of and Vidarbha and in Marathwada region. In Western Maharashtra region, the positive output growth rate was observed only in Nasik and Dhule district while remaining district showed negative trends in production. Only four districts, namely Solapur, Aurangabad, Latur and Osmanabad showed positive and highly significant trends in the productivity of crops. The area under pigeonpea showed significant increase in all district of Vidarbha regions except Yavatmal and in Marathwada region except the Beed and Aurangabad district. The significant growth rate in area was observed only in Nasik district of Western Maharashtra.

5. Conclusions:

The area, production and productivity of pigeonpea were significantly increased at the rate 1.97, 3.11 and 1.11 per cent per annum, respectively in state. The production was increased by area expansion and productively improvement, but area expansion has played major role than productivity improvement. The growth rates in area of pigeonpea

was negative in Western Maharashtra region while the same were positive and highly significant in Marathwada and Vidarbha region. The growth rates in production and productivity of pigeonpea were positive in Western Maharashtra region while positive and highly significant in Marathwada and Vidarbha region during the entire period of consideration.

Table 2: District, Region and period wise annual compound growth rates in area, production and productivity of pigeonpea in Maharashtra

Sr. No	District/Region	Period- I (1969-70 to 1990-91)			Period- II (1991-92 to 2012-13)			Entire period(1969-70 to 2012-13)		
		A	P	Y	A	P	Y	A	P	Y
1	Nasik	0.51	1.50	0.98	0.65 ***	0.75	0.10	1.85 ***	1.55 ***	-0.29
2	Dhule	4.09 ***	4.81 ***	0.68	0.66	0.31	-0.35	4.17 ***	3.22 ***	-0.91 **
3	Jalgaon	2.81 ***	3.96 ***	1.12	-1.54 **	-1.14	0.40	2.42 ***	2.65 ***	0.22
4	Ahmednagar	0.70	0.32	-0.37	-4.75 ***	-5.10 ***	-0.37	-0.56	-0.65	-0.09
5	Pune	-0.15	-0.88	-0.73	-3.69 ***	-4.59 ***	-0.93	-2.05 ***	-2.44 ***	-0.39
6	Solapur	-1.24	3.97	5.27 ***	-4.91 **	-0.88	4.24 ***	-2.75 ***	-1.61 *	1.16 **
7	Satara	1.95 ***	0.17	-1.75	-5.81 ***	-6.97 ***	-1.23	-0.97 **	-2.66 ***	-1.71***
8	Sangli	-0.43	-2.20	-1.78	-3.75 ***	-5.82 ***	-2.15	-1.61 ***	-3.13 ***	-1.55 **
9	Kolhapur	-0.50	-1.53	-1.03	-3.62 ***	-5.21 ***	-1.65	-1.80 ***	-3.37 ***	-1.60***
10	W.Maharashtra	0.14	1.56	1.42 *	-2.43 ***	-1.57 *	0.87	-0.11	0.16	0.27
11	Aurangabad	-1.63 *	-0.98	0.65	-1.00 *	5.29 ***	6.36 ***	-0.19	1.40**	1.59 ***
12	Jalna	-----	-----	-----	1.25 ***	5.16 ***	3.87 **	1.76 ***	3.47 ***	1.69 *
13	Beed	4.46 ***	11.03***	6.28 ***	0.14	3.44 **	3.30 **	2.06 ***	4.37 ***	2.26 ***
14	Latur	-----	-----	-----	2.20 ***	10.24***	7.87 ***	1.72 ***	5.69 ***	3.90 ***
15	Osmanabad	-1.67 *	-0.45	1.24	0.83 *	7.46 ***	6.57 ***	0.18	1.82 **	1.63 **
16	Nanded	0.03	3.41 **	3.39 **	1.82 ***	3.72 **	1.86	1.20 ***	3.08 ***	1.85 ***
17	Parbhani	2.09 ***	3.49 **	1.37	1.62 ***	6.05 ***	4.35 **	2.25 ***	2.82 ***	0.56
18	Marthwada	2.54 ***	4.72 ***	2.12 *	1.14 ***	6.41 ***	5.21 ***	1.93 ***	3.78 ***	1.82***
19	Buldhana	4.12 ***	5.12 ***	0.96	0.94 **	0.33	-0.61	2.82 ***	2.94 ***	0.12
20	Akola	3.43 ***	5.57 ***	2.07 **	2.47 ***	3.37 ***	0.88	3.29 ***	4.31 ***	0.99 ***
21	Amravati	3.52 ***	4.46 ***	0.92	1.47 ***	1.92 **	0.44	3.05 ***	3.55 ***	0.49 **
22	Yavatmal	3.18 ***	3.70 ***	0.50	0.28	0.30	0.02	2.97 ***	3.35 ***	0.37
23	Wardha	1.82 ***	2.22 ***	0.39	1.41 ***	2.73 *	1.30	2.57 ***	2.16 ***	-0.40
24	Nagpur	0.99	2.17 **	1.17 *	0.33 *	3.23 **	2.89 **	1.23 ***	2.44 ***	1.19 ***
25	Bhandara	1.49 ***	3.71 ***	2.18 ***	2.73 ***	4.79 ***	2.01 *	1.91 ***	3.40 ***	1.47 ***
26	Chandarpur	2.85 ***	2.96 **	0.10	1.63 ***	3.90 **	2.24	3.23 ***	4.21 ***	0.95 **
27	Gadchiroli	-----	-----	-----	6.75 ***	8.34 ***	1.49	7.16 ***	8.47 ***	1.22 **
28	Vidarbha	2.88 ***	3.90***	1.00 **	1.28 ***	2.07 **	0.79	2.76 ***	3.35 ***	0.57***
29	Maharashtra	2.21 ***	3.74 ***	1.49 **	0.77 ***	3.01 ***	2.21 ***	1.97 ***	3.11 ***	1.11 ***

* = Significant at 10 per cent level, ** = Significant at 5 per cent level, *** = Significant at 1 per cent level,

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