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Growth pattern of oilseed and pulse crops of gird agro-climatic region of Madhya Pradesh

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Abstract

The present study confined to Gird Agro Climate Region of Madhya Pradesh. The state is divided in 11 Agro-climatic regions. There are seven districts under Gird Agro Climatic Region e.i., Gwalior, Guna, Ashoknagar, Morena, Shivpuri, Sheopur and Bhind. In Gird Agro Climate Region of Madhya Pradesh, oilseed and pulses is the main crop-grown covering about 67.5 percent of the net sown area. The oilseed & pulse crops were selected based on higher area and production of Madhya Pradesh. Average annual growth of area under oil seeds crops in Madhya Pradesh was found to be 1.11 percent while, compound growth rate was found to be 0.01 percent in Madhya Pradesh. AAGR production of yield was found to be 4.65 percent of oil seeds crops, while CGR was found to be 0.03 percent. AAGR of yield was found to be 3.36 percent of oil seeds crops, while CGR was found to be 0.02 percent of oil seeds yield in Madhya Pradesh. Average annual growth of area under pulses crops in Madhya Pradesh was found to be 2.14 percent while, compound growth rate was found to be 0.03 percent in Madhya Pradesh. AAGR of production of pulse crops was found to be 5.78 percent, while CGR was found to be 0.04 percent. AAGR of yield was found to be 2.62 percent of pulse crops, while CGR was found to be 0.02 percent in Madhya Pradesh.

Keywords: Trend, growth, area, production, productivity and annual average growth rate

Introduction

Indian agriculture has witnessed wide variations in growth performance during a span of six decades after independence. The variability was particularly pronounced due to the subsistence nature of farming in India and the sector's heavy dependence on monsoon and other climatic parameters. In the initial years after the inception of planned development, it was the green revolution technologies that fired up growth in the sector for nearly three decades. The impact of green revolution tapered off gradually towards the later years of the last century. Economic reforms initiated in early nineties had a significant impact on agricultural sector, primarily due to the opening up of economy to external competition, liberalization of trade and deregulation of input and other sub-sectors. In India oilseeds crop of the presently occupies an area of more than 28.79 million hectare with 36.10 million tonne production in India with 1254 kg/ha. Productivity in India during 2020-2021. (At a glance 2021). In Madhya Pradesh contribution 21 percent of the oilseeds area. In Madhya Pradesh oilseed crops are grown in total area of 8.13 million hectares with 6.68 million tones with 822 kg/ha yield total production (Department of Agriculture, Madhya Pradesh, 2020-21). (At a glance 2021) Mustard is most important oilseed crop of the Madhya Pradesh state. Mustard presently occupies an area of 0.77 million hectare with 1.31 million tones production with 1713 kg/ha yield in Madhya Pradesh. (At a glance 2021). In India, pulse crops are grown in different states. Madhya

Pradesh has first rank in area and production, 31 percent and 28 percent respectively, in total pulses. In India pulse crop of the presently occupies an area of more than 28 million hectare with 25.46 million tonne production in India with 885 kg/ha. Productivity in India during 2020-2021. (Annual report 2021-22). In Madhya Pradesh contribution 21 percent of the pulses area. In Madhya Pradesh pulse crops are grown in total area of 60.74 lakh hectares with 59.70 lakh tones with 983 kg/ha yield total production (Department of Agriculture, Madhya Pradesh, 2021-22). Lathyrus, Pigeon pea, Chickpea, Black gram and green gram are the most important pulse crops of Madhya Pradesh. (Annual report 2021-22).

Materials and Methods

Methods of Analysis

The present study confined to Gird Agro Climate Region of Madhya Pradesh. The state is divided in 11 Agro-climatic regions. There are seven districts under Gird Agro Climatic Region e i., Gwalior, Guna, Ashoknagar, Morena, Shivpuri, Sheopur and Bhind. In Gird Agro Climate Region of Madhya Pradesh, oilseed and pulses is the main crop-grown covering about 67.5 percent of the net sown area. The oilseed & pulse crops were selected based on higher area and production of Madhya Pradesh.

The collected data was tabulated in the view of the cited objectives and was interrelated by using suitable statistical measures. Followings statistical measures were used for

present study. Average annual growth rate, likert scale were calculated for the study. The secondary data was collected through different Government offices such as Department of Agriculture, Directorate of Economics and Statistics and Government of Madhya Pradesh. In other hands, the secondary data was collected from the website of Ministry of Agriculture and Farmers' Welfare Government of India (agriculture. gov. in), Department of Farmer Welfare and Agriculture Development, Madhya Pradesh, Agricultural Statistics at a Glance, and Food & Agriculture Organization (FAO). The secondary data on area, production and productivity from 1999-2000 to 2018-19 was used for analysis.

Average Annual Growth Rate (AAGR)

By taking time as the independent variable and the area, production and productivity of the oilseed and pulse crops of Madhya Pradesh, as the dependent variable, the Average Annual Growth Rates was estimated by using the formula (Base year 2005 and current year 2019).

Average Annual Growth Rate (AAGR)

$$AAGR (\%) = \frac{\text{Value of the Current Year} - \text{Value of the Base Year}}{\text{Value of the Base Year} \times \text{Number of years (N)}} \times 100$$

Results and Discussion

Average annual growth rate of Area, Production and Yield: The average annual growth of area, production and productivity was analyzed which was based on data from 1999-2000 to 2018-19 year of selected crops i.e. oil seeds and pulse crops of Madhya Pradesh.

Average Annual Growth Rate of Oil Seed Crop in Madhya Pradesh

The compound and average annual growth rate of area, production and productivity of oil seeds crops was analyzed and presented in table 1. It is observed from data and found that in 1999-2000, 5.79 Mha area of oil seeds crops was found in Madhya Pradesh while in 2018-19 6.99 Mha area was covered by oil seeds crops. Average annual growth of area under oil seeds crops in Madhya Pradesh was found to be 1.11 percent while, compound growth rate was found to be 0.01 percent in Madhya Pradesh. The production of oil seeds crops was found to be 7.75 MT in 1999-2000 which was increased till 8.23 MT in 2018-19. Hence AAGR was found to be 4.65 percent of production of oil seeds crops, while CGR was found to be 0.03 percent. The yield of oil seeds crops was found to be 992 kg/ha in 1999-2000 which was increased till 1177 kg/ha in 2018-19. Hence AAGR was found to be 3.36 percent of yield of oil seeds crops, while CGR was found to be 0.02 percent of oil seeds yield in Madhya Pradesh.

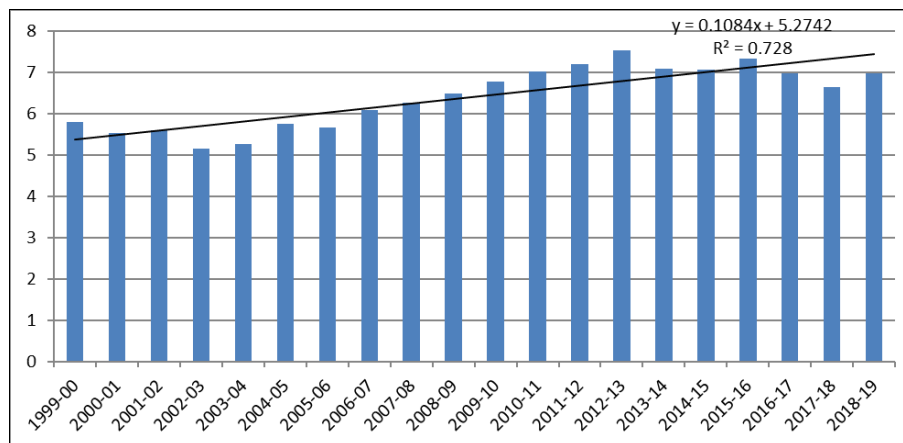


Fig 1: Area of oil seed crop in Madhya Pradesh

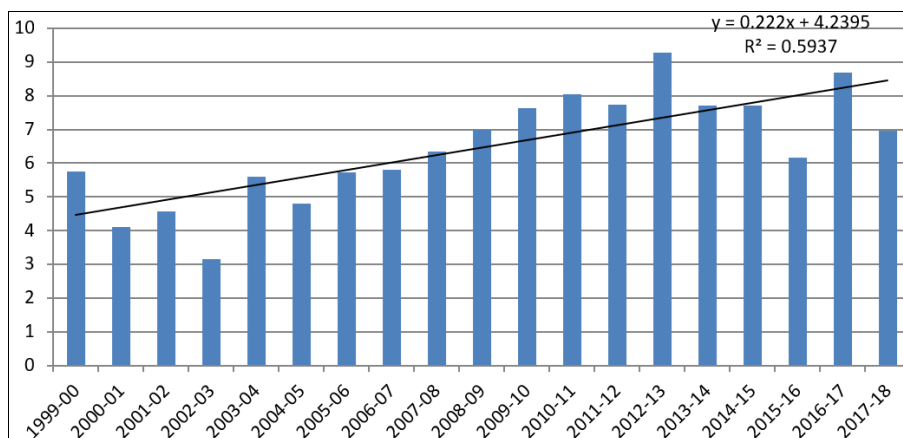


Fig 2: Production of oil seed crop in Madhya Pradesh

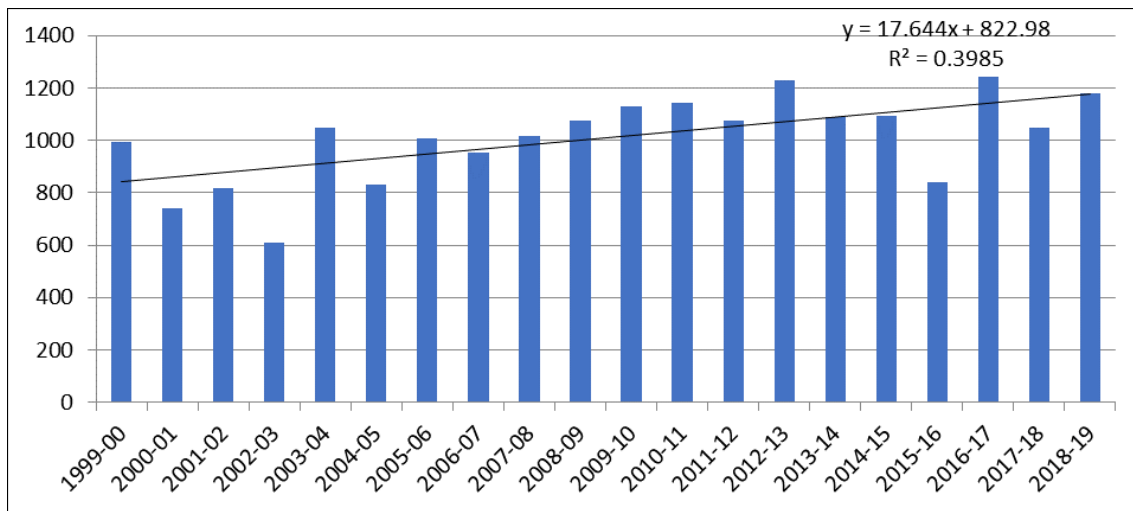


Fig 3: Yield of oilseed crop in Madhya Pradesh

Table 1: Growth rate of area, production and yield of oil seeds crops in Madhya Pradesh

Year	Area (Mha)	Production (MT)	Yield (kg/ha)
1999-00	5.79	5.75	992
2000-01	5.53	4.09	741
2001-02	5.58	4.57	817
2002-03	5.14	3.14	611
2003-04	5.26	5.59	1049
2004-05	5.76	4.8	833
2005-06	5.67	5.72	1009
2006-07	6.09	5.81	955
2007-08	6.26	6.35	1015
2008-09	6.49	6.98	1075
2009-10	6.77	7.64	1129
2010-11	7.03	8.04	1144
2011-12	7.2	7.73	1074
2012-13	7.54	9.28	1231
2013-14	7.09	7.72	1090
2014-15	7.07	7.72	1093
2015-16	7.34	6.17	841
2016-17	6.99	8.68	1243
2017-18	6.64	6.95	1046
2018-19	6.99	8.23	1177
Current year	6.87	7.95	1155.33
Base year	5.64	4.80	850.00
AAGR	1.11	4.65	3.36
CGR	0.01	0.03	0.02
b	0.10	0.22	17.64
R ²	0.72	0.59	0.39

Average Annual Growth Rate of Pulse Crop in Madhya Pradesh

The compound and average annual growth rate of area, production and productivity of pulse crops was analyzed and presented in table 2. It is observed from data and found that in 1999-2000, 4.94 Mha area of pulses crops was found in Madhya Pradesh while in 2018-19 6.66 Mha area was covered by pulses crops. Average annual growth of area under pulses crops in Madhya Pradesh was found to be 2.14 percent while, compound growth rate was found to be 0.03

percent in Madhya Pradesh. The production of pulse crops was found to be 3.78 MT in 1999-2000 which was increased till 6.66 MT in 2018-19. Hence AAGR was found to be 5.78 percent of production of pulse crops, while CGR was found to be 0.04 percent. The yield of pulse crops was found to be 766 kg/ha in 1999-2000 which was increased till 944 kg/ha in 2018-19. Hence, AAGR was found to be 2.62 percent of yield of pulse crops, while CGR was found to be 0.02 percent in Madhya Pradesh.

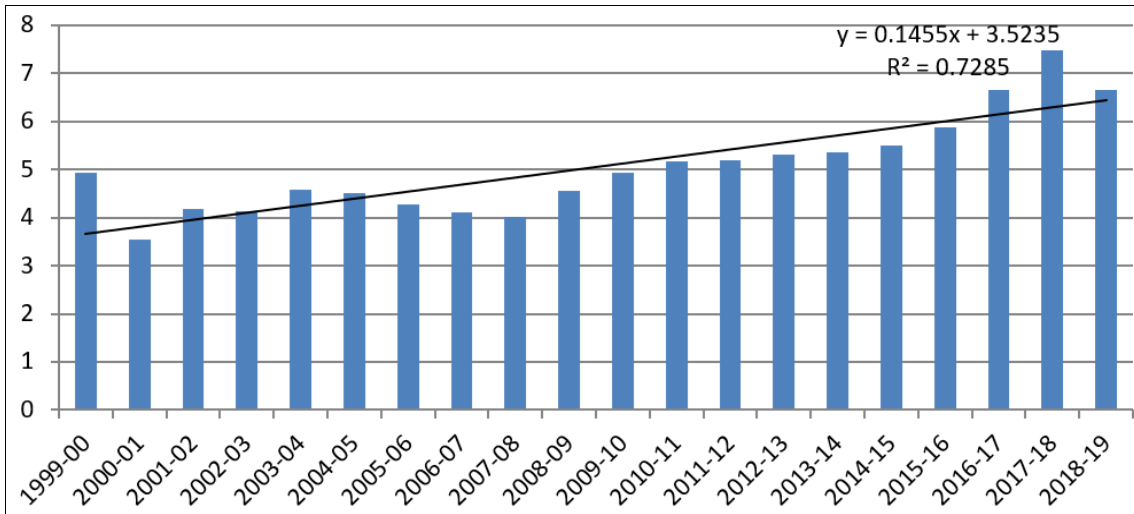


Fig 4: Area of pulse crop in Madhya Pradesh

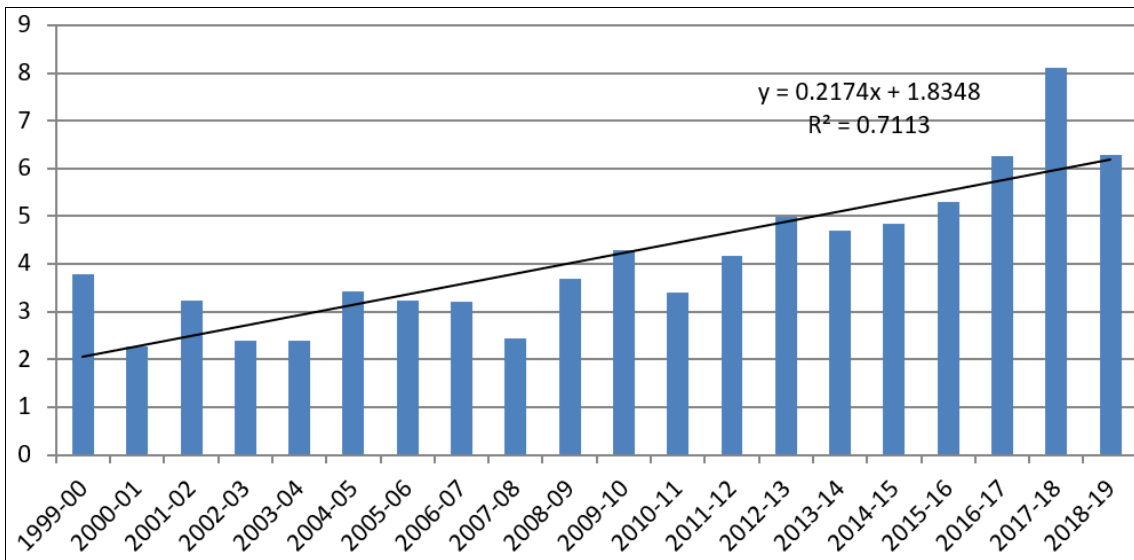


Fig 5: Production of pulse crop in Madhya Pradesh

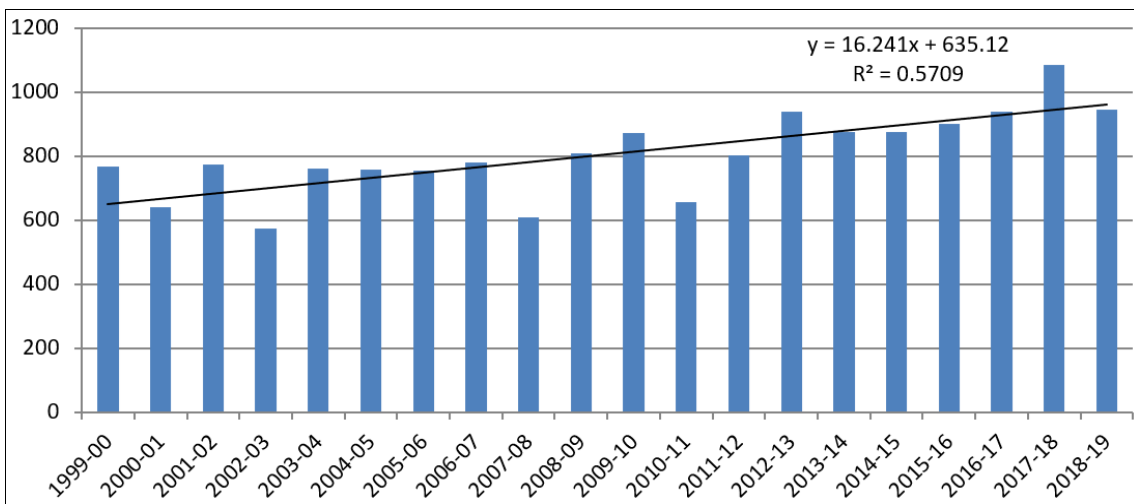


Fig 6: Yield of Pulse crop in Madhya Pradesh

Table 2: Growth rate of area, production and yield of pulse crops in Madhya Pradesh

Year	Area (Mha)	Production (MT)	Yield (kg/ha)
1999-00	4.94	3.78	766
2000-01	3.55	2.28	640
2001-02	4.17	3.22	773
2002-03	4.14	2.38	574
2003-04	4.59	2.38	761
2004-05	4.52	3.43	759
2005-06	4.28	3.23	754
2006-07	4.11	3.2	780
2007-08	4.02	2.45	609
2008-09	4.56	3.68	808
2009-10	4.94	4.3	871
2010-11	5.16	3.39	657
2011-12	5.19	4.16	802
2012-13	5.31	4.98	938
2013-14	5.36	4.7	877
2014-15	5.51	4.83	876
2015-16	5.88	5.3	902
2016-17	6.66	6.25	938
2017-18	7.48	8.11	1084
2018-19	6.66	6.29	944
Current year	6.93	6.88	988.67
Base year	4.22	3.09	726.33
AAGR	2.14	5.78	2.62
CGR	0.03	0.04	0.02
b	0.145	0.2174	16.241
R ²	0.7285	0.7113	0.5709

Summary and Conclusion

Average annual growth of area under oil seeds crops in Madhya Pradesh was found to be 1.11 percent while, compound growth rate was found to be 0.01 percent in Madhya Pradesh. AAGR production of was found to be 4.65 percent of oil seeds crops, while CGR was found to be 0.03 percent. AAGR of yield was found to be 3.36 percent of oil seeds crops, while CGR was found to be 0.02 percent of oil seeds yield in Madhya Pradesh.

Average annual growth of area under pulses crops in Madhya Pradesh was found to be 2.14 percent while, compound growth rate was found to be 0.03 percent in Madhya Pradesh. AAGR of production of pulse crops was found to be 5.78 percent, while CGR was found to be 0.04 percent. AAGR of yield was found to be 2.62 percent of pulse crops, while CGR was found to be 0.02 percent in Madhya Pradesh.

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