

Introduction

Analysis of temporal dynamics of agricultural land use help in planning long term sustainable land management goals. Cotton is an important cash crop in Nagpur district of Maharashtra.

Since year 2000 due to introduction of Bt cotton which influenced agricultural land use decisions by farmers. This study analysed the historical change agricultural land use change in Nagpur



Nagpur district of Maharashtra, which is located in the eastern part of Maharashtra has a significant place with respect to cotton cultivation

Material and Methods

Agricultural land use change in Nagpur district for two periods (period1 from 1998-99 to 2005-06 and period 2 from 2009-10 to 2016-17) were studied and compared.

Compound annual growth rate (CAGR) model used is as follows:

$$Y_t = Y_0 (1+g)^t$$

Where,

Y_t = Value of area, production or yield of cotton for the year 't'

t = Time variable Y_0 = Constant term

g = Compound growth rate.

$$\ln Y_t = \ln Y_0 + t \ln(1 + g)$$
$$\alpha = \ln Y_0; \beta = \ln(1 + g)$$
$$\ln Y_t = \alpha + \beta t + u_t$$
$$CAGR = [\text{antilog}(\beta) - 1] \times 100$$

Conclusion

Cotton got an utmost importance in Nagpur district over the study period as revealed by the compound growth rate (CAGR) analysis *i.e.* 3.84 per cent, 9.27 per cent and 3.56 per cent growth in area, production and yield, respectively.

Growth of pulse crops like black gram, soybean, green gram, other *kharif* pulses and millets like sorghum were reduced significantly

The share of cotton area of both the net cropped area and gross cropped area doubled within eight years from it's initial share during 2009 - 10

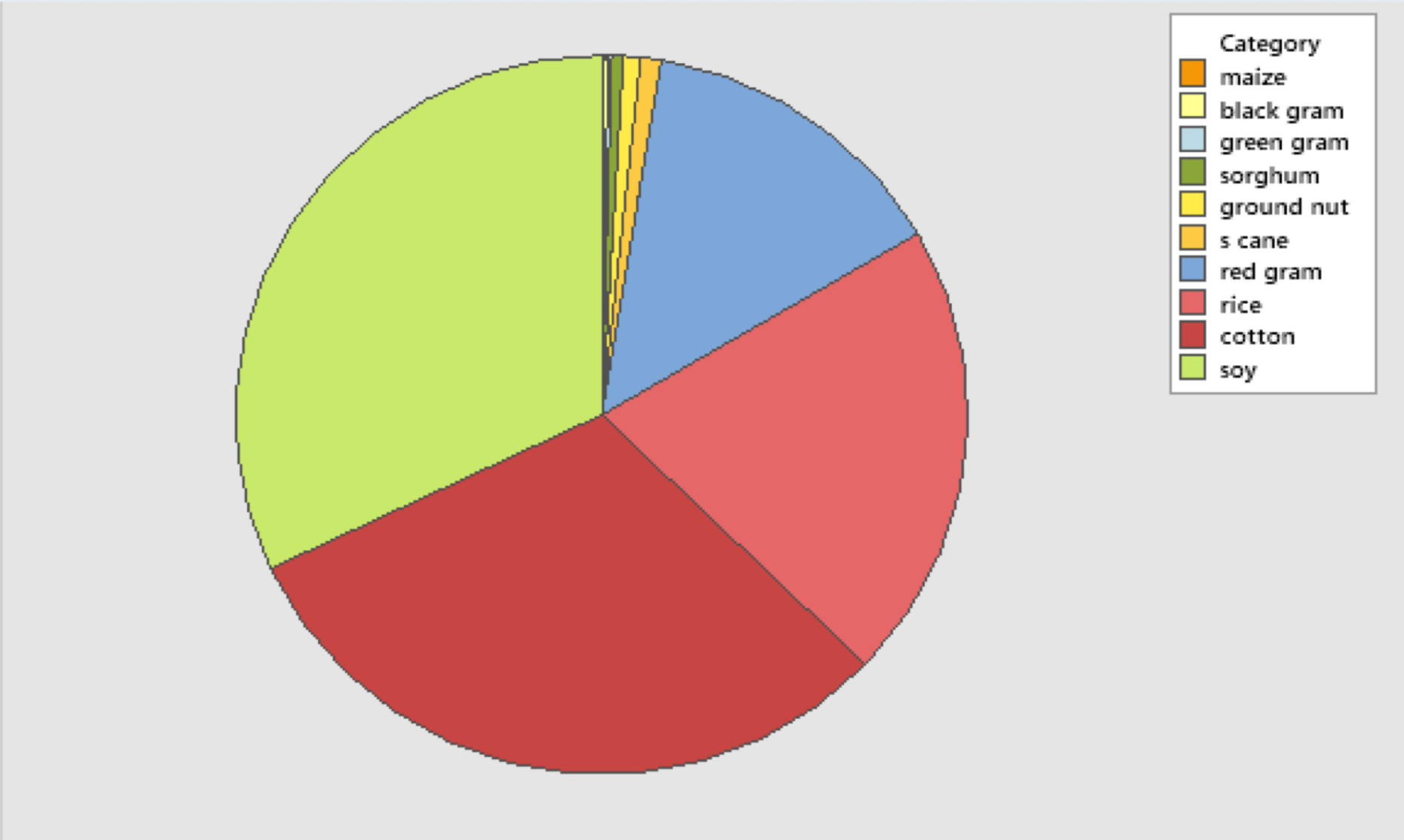
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Results & Inference

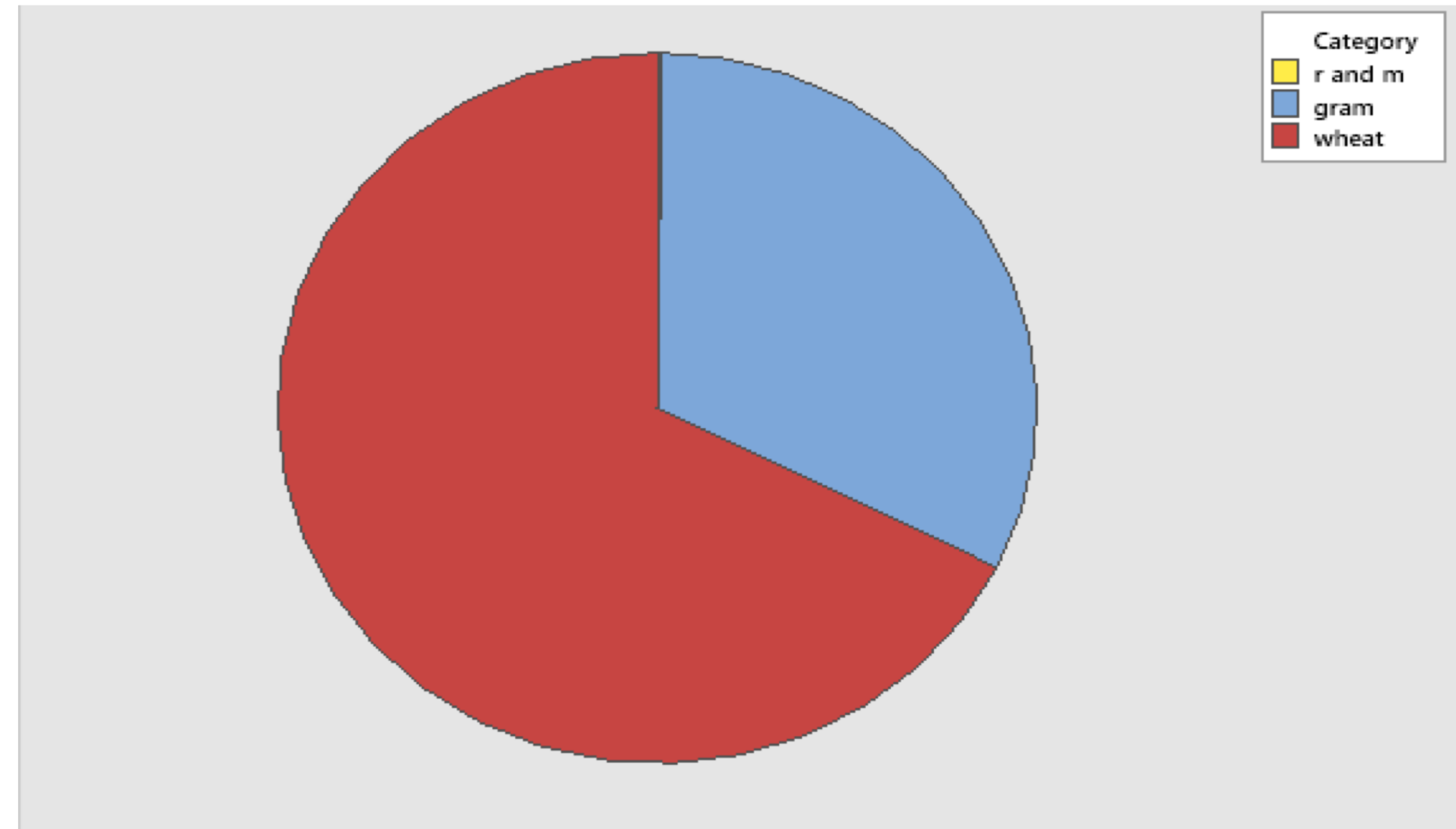
STATUS OF COTTON CULTIVATION IN NAGPUR

- 114 per cent increase in area under cotton
- 347 and 105 per cent growth in cotton production and yield respectively.
- CAGR of cotton area, production and yield was 3.84 , 9.27 and 3.56 per cent respectively

Kharif cropping pattern of Nagpur : 2017-18



Rabi cropping pattern of Nagpur: 2017-18



Major crops of Nagpur district were rice, cotton and soybean in kharif season and wheat and gram during rabi season.

CAGR OF AREA, PRODUCTION AND YIELD OF MAJOR CROPS

Highlights

Area under cotton, rice, wheat, red gram and gram in the district showed positive growth.

Shifting from diversified cultivation to intensive monoculture.

Growth of most of the important pulse and oilseed crops declined.

Increase in the area of cotton was at the cost of other competing crops like millets and other pulses

Year	Cotton area (ha)	Share in Net Cropped Area	Share in Gross Cropped Area
2009-10	63600	11.58	9.83
2010-11	80800	14.71	12.35
2011-12	102100	18.59	15.93
2012-13	89400	16.26	13.94
2013-14	92400	16.76	14.27
2014-15	111300	20.15	17.15
2015-16	126400	22.85	19.45
2016-17	136500	24.37	20.72

CAGR OF AREA, PRODUCTION AND YIELD OF COTTON IN NAGPUR FROM 2000-2001 TO 2017-18

Description	Mean	CV (%)	Relative Change (%)	Compound Growth Rate (%)
Area(ha)	84498	32.05	113.65	3.84** (54.04)
Production (tonnes)	24229	80.58	347.49	9.27** (63.45)
Yield (t / ha)	0.27	43.02	104.83	3.56* (38.79)

CAGR of Area, Production and yield of cotton in Nagpur for two periods

Period	CAGR of Area (%)	CAGR of production (%)	CAGR of yield (%)
2000-01 to 2008-09	-4.54* (53)	1.98 (6)NS	6.85* (62)
2009-10 to 2017-18	9.64** (89.5)	18.07** (68)	7.4 NS (30)
2000-2001 to 2017-18	3.84** (54.04)	9.27** (63.45)	3.56* (38.79)

- ✓ First period showed a negative trend in cotton area
- ✓ Second period growth in area was 9.64 %
- ✓ Total period growth rate of 3.84 %
- ✓ Second period showed a production and yield growth of 18 and 7.4 % as compared to their lower growth rate during the first period

Crops	CAGR of Area (%)	CAGR of production (%)	CAGR of yield (%)
Cotton	3.84	9.27	3.56
Rice	5.95	8.1	2
Wheat	5.7	9.1	3.2
Gram	4.78	8.59	3.63
Red gram	1.55	2.26	0.7
Soybean	-0.96	-3.21	-2.21
Black gram	-5.3	-9.99	-4.32
Green gram	-5.85	-5.72	0.14
Sorghum	-16.94	-18.23	-1.55
Other pulses	-10.3	-1.31	-1.11

TREND IN COTTON AREA , PRODUCTION AND YIELD OF NAGPUR

