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Economic Analysis on Cotton Crop in India- Growth Patterns and Management

Monu Kumar
Research Scholar, Department of Mathematics, M.M.H. College, Ghaziabad (UP), India
monukummar170190@gmail.com

Charu Singh
L&D Specialist, Belong Education, New Delhi, India, charusingh1301@gmail.com

ABSTRACT

Agriculture contributes mainly to national economies specifically in developing countries, and cotton is an important fiber and cash crop of India and plays a crucial role in the industrial and agricultural economy of the country. India is one of the largest producers of cotton in the world accounting for about 22% of the world cotton production. In the present paper, an attempt has been made to study the production trend and growth rate for cotton by using statistical techniques. It is observed that over the years, India has achieved significant quantitative increase in cotton production. However, the yield per kgs hectare is lower against the world average yield. The projected cultivated area, production and yield for cotton has been worked for 2025-26 and 2030-31. Authors have also suggested the strategies for enhancing the returns of the cotton crop and its products through appropriate marketing strategy and trade liberalization.

Keywords: Cash Crop, Growth Rate, Moving Average, Productivity, Production, Bales

INTRODUCTION

Indian economy is agro-based and agriculture is its mainstay as it constitutes the backbone of

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the rural livelihood security system. Cotton (Gossypium spp.) is an immensely important crop for the sustainable economy of India and livelihood of the Indian cotton farming community. It plays a major role in sustaining the livelihood of an estimated six million cotton farmers and 40-50 million people engaged in related activity such as cotton trade and its processing. India occupies first place in the world in terms of acreage under cotton and cotton production. India has the distinction of having the largest area under cotton cultivation which is about 37% of the world area under cotton cultivation. Over the years, country has achieved significant quantitative increase in cotton production. India is one of the largest producers of cotton in the world accounting for about 23% of the world cotton production. The yield per kgs hectare which is presently 510 kg per hect is still lower against the world average yield of about 808 kg per hect.

METHODOLOGY

The following formulae were used:

Three Year Moving Average

$$Y_{t+1} = \frac{Y_t + Y_{t+1} + Y_{t+2}}{3}$$

Where Y_t is variable (area sown, production or productivity)
And t is period, say, t = 0,1,2…..

Growth Rate

The moving averages have been used to estimate growth rates.

$$R_t = \frac{Y_t - Y_0}{Y_0} * 100$$

Where R_t is the simple growth rate during two periods
Y_t -> Value of the variable of the time t.
Y_0 -> Value of the variable of the initial period

Projection based on Simple Growth Rate

$$y_t = y_0(1 + ng),$$

Where y_0 is an initial year

y_t is the projection year

n is number of years from base year
and g is simple proportionate growth rate

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RESULTS and DISCUSSION

India has brought about a qualitative and quantitative transformation in the production of cotton since independence. Production and productivity of cotton in India have improved significantly during the past six decades. Cotton is one of the most important cash crops in India and it plays a crucial role in the industrial and agricultural economy**.** Cotton is generating employment for millions of farmers and others engaged in activities relating to cotton, cotton processing, transportation etc. India occupies first place in the world in terms of acreage under cotton and cotton production. **Table-1** presents the three yearly moving averages of area sown, production and yield for Cotton crop. It is observed that there is an increasing trend in area sown. This has been increased from the level of 7.77 M hect in 1961-62 to 12.37 M hect in 2021-22. The growth rate has been highest at the level of 3.98 % per annum during 2001-02 to 2011-12 and lowest 0.09% during 1961-62 to 1971-72. The production of Cotton has been constantly increased from the level of 6.22 M Bales in 1961-62 to 34.14 M Bales during 2011-12 and slightly decreased to 32.55 M Bales in 2021-22. The growth rate has been highest at the level of 26.40 % per annum during 2001-2 to 2011-12 and lowest 0.64% during 1961-62 to 1971-72. The yield rate has been 117 Kg per hect during 1961-62, which has gone up to 492 Kg per hect during 2011-12 and declined to 447 Kg per hect during 2021-22. The highest growth rate was observed during 2001-02 to 2011-12 (i.e., 16.03%) and lowest during 2011-12 to 2021-22.

Table -1 Three years moving average of Area, Production and Yield of the Cotton

Year	Area Sown M hect	Growth rate per annum	Production Million Bales (170 Kg of each)	Growth rate per annum	Yield Kg per hect	Growth rate per annum	Irrigation %age	Growth rate per Annum
1961-62	7.77		6.22		117		13.27	
1971-72	7.70	-0.09	5.82	-0.64	128	0.94	19.55	4.73
1981-82	7.92	0.29	6.81	1.70	160	2.50	27.99	4.32
1991-92	7.55	-0.47	10.32	5.15	233	4.56	33.63	2.02
2001-02	8.44	1.18	9.38	-0.91	189	-1.89	33.07	-0.17
2011-12	11.80	3.98	34.14	26.40	492	16.03	33.91	0.25
2021-22	12.37	0.48	32.55	-0.47	447	-0.91	35.80	0.56

In India, majority of the cotton production comes from ten major cotton growing states, which are grouped into three diverse agro-ecological zones, Northern zone comprising States of Punjab, Haryana and Rajasthan, Central zone comprising the States of Gujarat, Maharashtra and Madhya Pradesh and Southern zone comprising the States of Telangana, Andhra Pradesh, Karnataka and Tamil Nadu. Besides this, cotton cultivation has also gained momentum in the Eastern part of India in Odisha as well as in small areas of non-traditional States such as West Bengal, Uttar Pradesh, Tripura, etc. The state-wise analysis for Cotton crop is presented in **Table-2**. It is seen that Maharashtra is the highest Cotton producing state (29%) of the total

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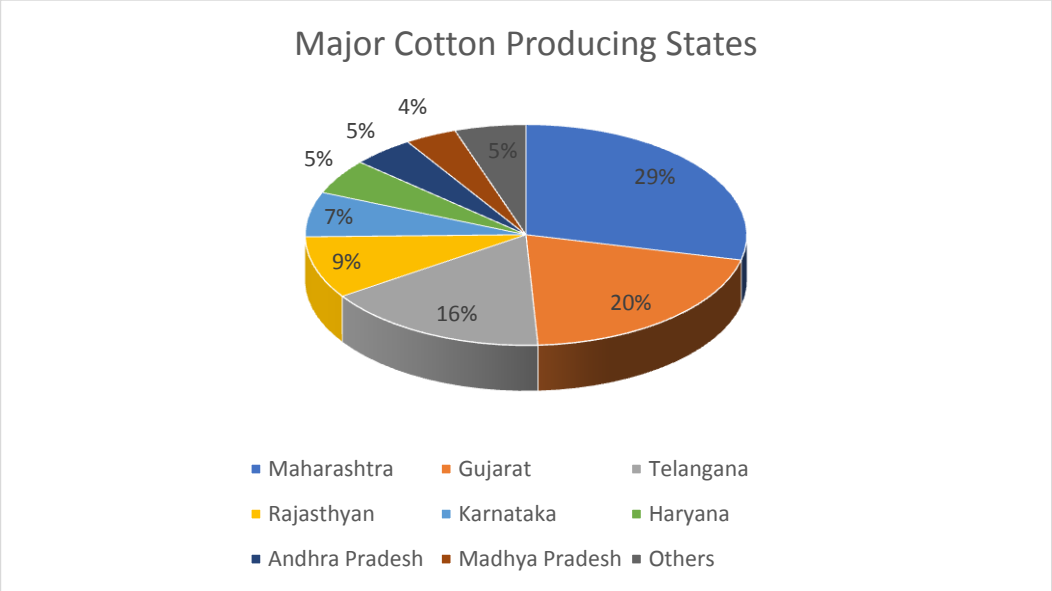
Cotton in the country. Gujarat is the 2nd highest Cotton producing state with 20% share. Maharashtra along with Gujarat, Telangana, Rajasthan and Karnataka produce about 81% cotton production in the country. The highest yield rate has been observed of the order of 675 kg per hect in Rajasthan followed by Gujarat (540 kg per hect) and Karnataka (481 Kg per hect) and lowest 378 Kg per hect in Maharashtra.

Table –2 Area, Production and Yield of Cotton (2020-21)

	Area M hect	%age of Total Area	Cumulative % Share Area	Production M Bales (170 kg each)	%age of Total Production	Cumulative % Share Production	Yield Kg per hect
Maharashtra	4.54	34.16	34.16	10.11	28.68	28.68	378
Gujarat	2.27	17.08	51.24	7.21	20.45	49.13	540
Telangana	2.36	17.76	69.00	5.8	16.45	65.59	418
Rajasthan	0.81	6.09	75.09	3.21	9.11	74.70	675
Karnataka	0.82	6.17	81.26	2.32	6.58	81.28	481
Haryana	0.74	5.57	86.83	1.82	5.16	86.44	419
Andhra Pradesh	0.61	4.59	91.42	1.6	4.54	90.98	449
Madhya Pradesh	0.59	4.44	95.86	1.34	3.80	94.78	387
Others	0.55	4.14	100	1.84	5.22	100	565
All India	13.29	100		35.25	100		451



India has the distinction of having the largest area under cotton cultivation which is about 37% of the world area under cotton cultivation. India got 1st place in the world in cotton acreage with 120.69 Lakh Hectares area under cotton cultivation i.e., around 36% of world area of

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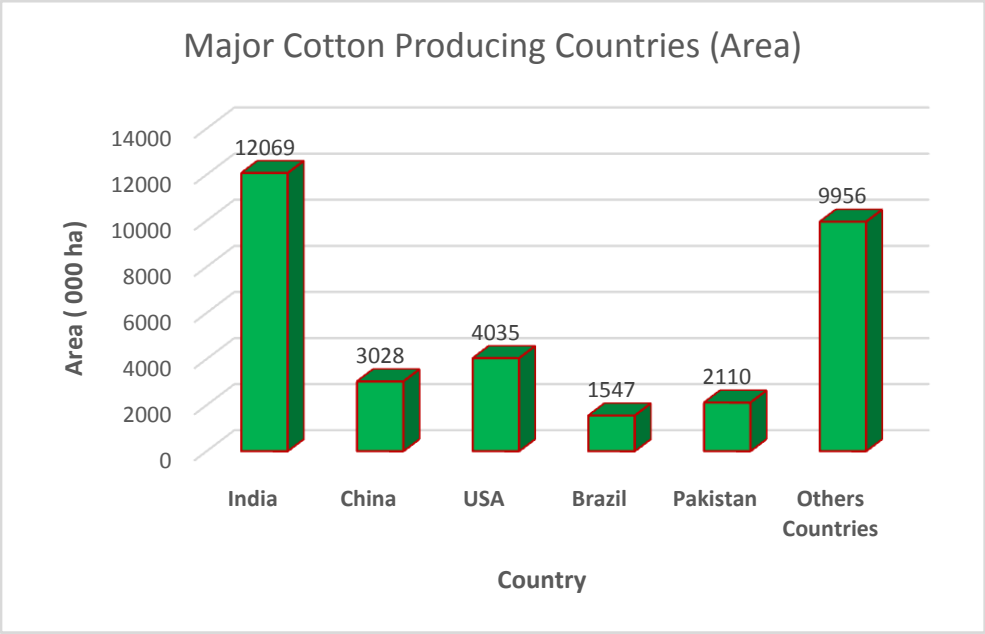
333 Lakh Hectares. Around 67% of India's cotton is grown on rain-fed areas and 33% on irrigated area. In terms of productivity, India is on 38th rank with yield. **Table -3** presents the major cotton producing countries in the world. It is seen, that India is the world's largest Cotton producer with 23% share followed by China and USA. India, China, USA and Brazil together accounting for more than 69% of world's Cotton production.

Table 3: Major Cotton Producing Countries in the World (2021-22)

Country	Area thousand hect	%age share Area	Cumulative % Share Area	Production million metric Tones	%age share Production	Cumulative % Share Production	Yield Kg per hect
India	12069	36.86	36.86	6.16	23.30	23.30	510
China	3028	9.25	46.10	5.73	21.67	44.97	1892
USA	4035	12.32	58.43	3.84	14.52	59.49	951
Brazil	1547	4.72	63.15	2.71	10.25	69.74	1752
Pakistan	2110	6.44	69.60	0.98	3.71	73.45	467
Others Countries	9956	30.40	100	7.02	26.55	100	
Global	32745	100		26.44	100		808



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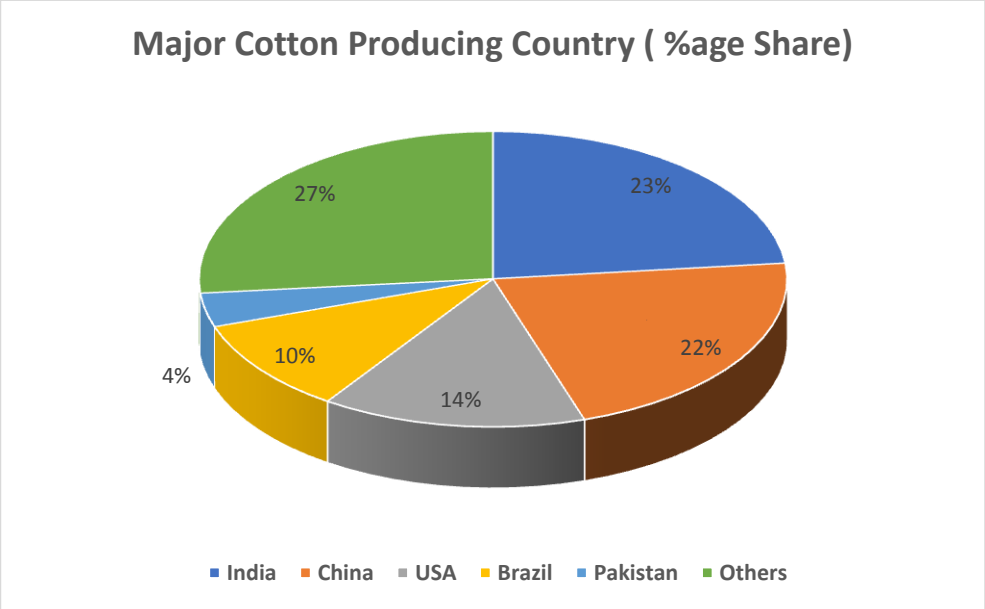

Table –4 Projected Area, Production and Yield

	2025-26	2030-31
Area M hect	14.02	15.02
Production M Bales (170 Kg each)	41.98	47.35
Yield Kg per hect.	546	599

Table -4 presents the projected area, production and yield for Cotton for 2025-26 and 2030-31. It is seen that the production has been estimated of the order of 41.98 M Bales and 47.35 M Bales in 2025-26 and 2030-31 respectively. The area will be 14.02 M hect in 2025-26 and 15.02 M hect in 2030-31. The yield rate will be 546 Kg per hect in 2025-26 and 599 Kg per hect 2030-31.

CONCLUSION

India is one of the largest producers of cotton in the world. Over the years, country has achieved significant quantitative increase in cotton production. However, production will continue to face challenges. The decline in cotton production in India presents a multifaceted challenge, encompassing economic, environmental, and agricultural dimensions. Indian cotton sector has come a long way in achieving record productivity, production, consumption and exports. However, the momentum in growth is expected to be accelerated in the coming years. The yield per kg hectare is lower against the world average yield. There is a vast potential for increase in yield. To overcome these challenges, India must prioritize research, technology adoption, irrigation infrastructure, diversification, financial support, infrastructure development, and farmer education. By embracing a comprehensive approach, India can revitalize its cotton sector, strengthen rural livelihoods, and ensure the resilience of this crucial crop in the face of evolving pressures and opportunities.

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WAY FORWARD

The roadmap for India's cotton future should be necessarily based on sustainable practices that ensure high productivity at low cost. The crop production practices must incorporate inputs in consonance with the ecosystems to make it ecologically and economically as sustainable as possible.

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