

## Production, Growth and Export Competitiveness of Raw Cotton in India – an Economic Analysis

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### Abstract

Cotton is one of the major commercial crops where 70% of the crop is under rain fed conditions. Eighty-five % of the cotton is grown in ten major countries of the world among which India stands second in production. The present study analyses the state wise production scenario of cotton over the years as well as the export composition and competitiveness. The study revealed that the % change of cotton area in the period II over the period I was highest for the state Andhra Pradesh (71.96%). Moreover, the country as a whole had an increase of 17.73% with a production increase of about 84.78 % and productivity increase of about 55.64%. The growth rate of the cotton area was negative while the growth of cotton production in the country was 4.47% and 3.91% increase in productivity during the period II. The study also showed that India has been exporting all types of cotton from 1980 onwards and the long and extra long staple cotton has registered highest share of exports with more than 40%. The export competitiveness revealed that India's comparative advantage in cotton exports has been increasing over the years.

**Keywords:** Cotton; Export; Production; Competitiveness

**Abbreviations:** CMIE: Centre for Monitoring Indian Economy Pvt. Ltd.; ACGR: Annual Compound Growth Rate; RCA: Revealed Comparative Advantage; EPR: Export Performance Ratio; TE: Triennium Ending; RSCA: Revealed Symmetric Comparative Advantage

### Introduction

Cotton is one of the most important textile fibres in the world, accounting for 35% of the world fibre use. Cotton was first cultivated in the Old World about 7,000 years ago, by the inhabitants of the Indus Valley Civilization. This civilization covered a huge swath of the north-western part of the Indian subcontinent, comprising today parts of eastern Pakistan and north-western India [1,2]. About 60 countries from around

the globe produce cotton. The ten major cotton producers are USA, India, China, former USSR, Brazil, Pakistan, Turkey, Mexico, Egypt and Sudan accounting for 85 % of the total production. The United States, India and China together provide two-thirds of the world's cotton. It is an important cash crop to many developing countries supporting the livelihoods of millions of poor households. Among the countries in which cotton is an important contributor to rural livelihoods are China, India and Pakistan where millions of rural households are engaged in cotton production and more than two-thirds of the world's cotton is produced in the developing countries [3] (<http://cotcorp.gov.in>). The area under cotton across the world has been stagnant for the last five decades; however, production has been increasing due to rise in yield. Presently the major cotton exporting countries include the United States, India, Uzbekistan, Brazil and Australia. The United States is the largest exporter followed by India and Uzbekistan, while the major importers of cotton are China, Turkey, Bangladesh and Pakistan.

In India, 60% of the total cropped area is classified as dry land or rain fed area representing 40% of the total agricultural production. Cotton is one of the major commercial crops where 70% of the crop is under rainfed conditions. The area under cotton crop constitutes almost 9% of the total area under agriculture. This commercial crop is an important raw material for India's textile industry that is one of the largest and oldest industries accounting for about 14% of the national industrial production and contribution about 5% to GDP. Cotton is cultivated in three distinct agro-ecological zones (North, Central and South) of the country. Approximately 65% of India's cotton is produced on dry land and 35% on irrigated lands. The northern zone is almost irrigated, while the percentage of irrigated area is much lower in southern zones (40%) and the lowest being in central zone (23%), which is nearly 60% of cotton area of our country.

India produces a wide range of cotton varieties, which are grouped into five categories on the basis of their staple length. There are; (a) short staple (b) superior medium staple (d) long

staple (e) superior long staple. The northwestern belt of India comprising of Punjab, Haryana and Rajasthan specializes mainly in short and medium staple varieties, while southern and western parts of India produce long and superior long staple varieties. Eighty-five % of the cotton is grown in ten major countries of the world among which India stands second in production (<http://cotcorp.gov.in>).

### Data and Methodology

Data on the area, production and productivity of cotton from the year 1981-82 to 2008-09 for the nine major cotton growing states was obtained from Centre for Monitoring Indian Economy Pvt. Ltd. (CMIE). The growth in the area, production and productivity of cotton across the states and country and cotton exports were studied for the time series data (1985-2008). Though cotton is traded in various forms like raw cotton, yarn, sewing thread etc. In this study the raw cotton exports are considered. The raw cotton is exported as cotton: not carded or combed and cotton waste was used in the analysis. For the purpose of the analysis, the cotton exported was grouped into five types based on their staple length as (a) Bangladeshi cotton of 16 mm staple length (b) Short staple cotton of below 20 mm (c) Medium staple cotton of 20 - 28.5 mm (d) Long and extra long staple length of 28.5 mm - 34.5 mm and above (e) Cotton waste as 'Others'. The data were analysed in two periods based on the availability of data and the study period was divided into period I (1981 to 1994) and period II (1995 to 2007).

The data on the exports were taken from the various issues of the Monthly Statistics of Foreign Trade, DGCIS, Kolkata and the official website of FAO ([www.faostat.fao.org](http://www.faostat.fao.org)) was also used. To study the performance and composition of exports % shares were worked out on triennium basis. The annual compound growth rate (ACGR) was computed to examine the trends in exports. The Revealed Comparative Advantage (RCA) / Export Performance Ratio (EPR) were used to identify the comparative advantage or disadvantage India has for cotton. The index used in this study was according to Balassa [4] using the equation (1)

$$RCA = \frac{S_{it}}{S_{wt}} \dots (1)$$

Where,

$S_{it}$  = Share of cotton exports in the India's total export, and

$S_{wt}$  = Share of cotton exports in the total world exports

When RCA is greater than unity the country is said to have comparative advantage in that commodity. However, RCA suffers from the problem of asymmetry. The index is made symmetry by the methodology followed by Dalum et al. [5] (1998) as Revealed Symmetric Comparative Advantage. It is expressed by equation (2):

$$RSCA = \frac{(RCA - 1)}{(RCA + 1)} \dots (2)$$

It varies from -1 to +1 and a commodity is said to have a comparative advantage in its exports if the RSCA value is positive and vice-versa.

### Results and Discussion

#### Area, production and productivity of cotton and their growth

The nine major cotton growing states in India namely, Punjab, Haryana, Rajasthan, Gujarat, Maharashtra, Madhya Pradesh, Andhra Pradesh, Karnataka and Tamil Nadu were considered for the study. These states put together cover 99% of the area and production in the country. The average area, production and productivity of cotton and their growth were analyzed.

#### Area, production and productivity of cotton in India

The state wise area of cotton showed in Table 1. indicated that, during the period I, the cotton cultivated area was the highest in Maharashtra (35.50%) followed by Gujarat (16.32%), Karnataka (9.20%), Andhra Pradesh (8.17%), Punjab (8.51%), Madhya Pradesh (7.21%), Haryana (5.91%), Rajasthan (5.45%) and Tamil Nadu (3.16%). The cotton area in India was 74.89 lakh hectares during period I. During the period II the average area of cotton increased to reach 88.16 lakh hectares. Thus, there was an increase of 17.73% in the cotton cultivated area. In the states of Maharashtra, Gujarat, Andhra Pradesh, Haryana, Rajasthan and Madhya Pradesh, the average of cotton cultivated area has increased only in Gujarat (20.51%), Andhra Pradesh (11.94%) and Haryana (5.68%), respectively. The % change of cotton cultivated area in the period II over the period I was highest in Andhra Pradesh (71.96%) followed by Gujarat (47.95%), Haryana (28.20%), Rajasthan (17.40%), Maharashtra (14.37%) and Madhya Pradesh (3.24%), respectively. The area under cotton in the states Karnataka, Punjab and Tamil Nadu has declined during period II compared to period I.

The state wise production of cotton during the period I and period II is given in Table 1. During the period I, the average production was highest in Punjab (17.03 lakh bales) with a highest share of 18.91% followed by Maharashtra (18.42%), Gujarat (17.56%), Haryana (10.69%), Andhra Pradesh (10.32%), Karnataka (8.03%), Rajasthan (7.5%) and Tamil Nadu (4.44%), respectively. During the period II, Gujarat was the largest producer of cotton with average production of 43.49 lakh bales sharing 26.13% followed by Maharashtra (20.40 %), Andhra Pradesh (12.75%), Punjab (9.74%), Haryana (8.28%), Rajasthan (4.93%), Karnataka (4.23%), Madhya Pradesh (3.75%) and Tamil Nadu (1.70%), respectively. The % change in cotton production during period II over period I was the highest for Gujarat (174.97%) followed by Andhra Pradesh (128.41%), Maharashtra (104.56%), Madhya Pradesh (96.47%), Haryana (43.12%) and Rajasthan (21.19%), whereas Karnataka (-2.68%), Punjab (-4.82%) and Tamil Nadu (-29.47%) witnessed decline in

production from period I to period II. The average production of cotton in the country was 90.05 lakh bales during Period I which increased to 166.40 lakh bales in the period showing a change of 84.78% between the two periods.

The state wise performance of productivity of cotton in India is given in [Table 1](#). During the period I, the productivity was highest in Punjab with 451 kg/ha followed by Haryana with the productivity of 365 kg/ha. The productivity of cotton in Andhra Pradesh, Gujarat, Rajasthan, Tamil Nadu was between 200 kg/ha and 300 kg/ha, whereas the productivity was below 200 kg/ha for Karnataka, Madhya Pradesh and Maharashtra. The lowest productivity was observed in Madhya Pradesh (101 kg/ha). During the period II, the productivity of cotton was better in all the major cotton growing states. Punjab and Haryana retained their position in India with the productivity of 485 kg/ha and 420 kg/ha, respectively. The analysis of % change in the productivity of cotton revealed that the productivity of cotton in all the states increased between the two periods. The highest % change was noticed in Madhya Pradesh (81.94%), Maharashtra (77.61%) and Gujarat (76%) while the least change was observed in Tamil Nadu (6.85%). The productivity of cotton for the country as a whole is increased from 210 kg/ha in period I to 318 kg/ha in the period II with a change of 55.64%. The introduction of Bt cotton has brought about a significant increase in the productivity of cotton in the country.

The obtained data presented in [Table 2](#) showed that, the growth of cotton cultivated area in India was negative in period I while the production and productivity showed positive growth. On the other hand, the state wise analysis of growth in cotton cultivated area showed that, Haryana and Andhra Pradesh showed significant annual increment of 4.49% and 4.7%, respectively while Karnataka, Tamil Nadu, Gujarat and Madhya Pradesh and for country as a whole witnesses annual decrement in area. In the case of production and productivity Punjab, Haryana, Rajasthan, Madhya Pradesh, Karnataka and country as a whole showed significant positive growth.

During the period II only Gujarat and Madhya Pradesh showed a significant growth in the area while states like Punjab, Haryana, Rajasthan, Karnataka and Tamil Nadu recorded a negative growth. The production and productivity scenario in the period II revealed that the states like Gujarat, Maharashtra and Madhya Pradesh which did not show significant growth in period I showed a significant positive growth. While the southern states of Tamil Nadu and Karnataka showed no significant growth.

### **Composition of cotton exports from India**

India has been exporting all types of cotton in a sizable quantity from 1980 onwards and has shifted from a cotton deficit country to a surplus exporting country with a considerable reduction in the imports [6]. The exports of cotton are categorized into different types and their composition in quantitative and value

terms are presented in the [Table 3](#).

The export of cotton has increased from an average 86.31 thousand tones in the triennium ending (TE) 1988 to 277.09 thousand tones in TE 2006. In value terms, it has increased from Rs 1,222.79 million to Rs 12,949.61 million. The exports of all the five staple lengths of cotton except small and medium staple length have consistently increased. In case of Bengal desi, cotton exports increased from 6.04 thousand tones to 57.71 thousand tones during TE 2006 but declined to 6.85 in TE 2003. In case of long and extra long staple length type, an increase from 39.79 thousand tones to 129.97 thousand tones is noticed. The Bangladeshi-short staple desi cotton is traditionally being exported from India for non-spinnable uses and is in demand for extra factory uses. The international decrease in cotton prices was the main factor behind the loss in competitiveness of Indian short staple cotton in mid 1990s along with the increase in subsidies in the United States [7,8].

The long and extra type of cotton has registered the highest share of above 40% except for TE 2000 and 2003 where the medium and Bengal desi type showed the highest share. The decrease in cotton exports during the TE 2000 and TE 2003 may be due to reasons of drought and crop failure, especially when the production decreased from 167.0 lakh bales to 140 lakh bales in 2002-03 and can be attributed to the increase in the domestic consumption through textile industries. It is evident from the obtained results that the long and extra type of cotton is more preferred for the exports because of its superior quality and its preferable use in spinning and fabric manufacturing. India's species composition of cultivated cotton has changed over the years and it released extra long staple variety in the 1970s like Sankar 4 and 6 (hybrid), MECH 1 etc., which are in demand from abroad and has shown improvement in qualitative aspects of Indian cotton. The total exports of cotton from India shown in [Table 4](#) where a significant increase can be noticed in the exports over years [6]. The % change in the quantity of export was 212.76; while for value and unit value, it was found to be 592.20 and 103.12. It is evident that there has been a noticeable increase in the cotton exports and confirms that India is the major exporter of raw cotton in the world.

### **Export competitiveness of cotton**

The Export Performance Ratio (EPR) / Revealed Comparative Advantage (RCA) and Revealed Symmetric Comparative Advantage (RSCA) for the export of cotton from India are presented in [Table 4 & 5](#). It can be seen that RCAs are below unity till 2002 and in 2004. The ratio has been increasing from 2005 onwards. The comparative advantage in cotton exports showed a significant increase from 0.17 in 2000 to 9.58 in 2007. The RCA suffers from the problem of asymmetry as pure RCA is not comparable on both sides of unity, as index ranges from zero to one, if a country is said not to be specialized in a given sector,

while value of index ranges from one to infinity ,if a country is said to be specialized [9]. The estimated RSCA indices give a clear indication of comparative advantage of India in cotton and the indices reveal that India's comparative advantage in cotton exports is increasing over the years. The value of RSCA was -0.70 in 2000 and fell to -0.77 in 2002 but kept increasing in the following years. The RSCA value shows an increasing trend from -0.70 in 2000 to 0.81 in 2007. The positive RSCA from 2005 can be attributed to the increase in the exports due to the increase in cotton productivity with the introduction of Bt technology. The domestic production has exceeded the domestic consumption and with the good market the farmers got for cotton; India has emerged as a major exporter in the world.

### Conclusion

Cotton is one of the major rain fed crop in the country, making India the second largest producer and a major exporter in the world. There was a significant increase in the production and productivity of cotton in the country, though area increase was meagre. India has been exporting all types of cotton in a sizable quantity from 1980 onwards where in the long and extra long staple type of cotton had registered the highest share of above 40%. The estimated RSCA indices give a clear indication of comparative advantage of India in cotton and the indices reveal that India's comparative advantage in cotton exports is increasing over the years.

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