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COMPARATIVE ANALYSIS OF PRODUCTION AND CONSUMPTION OF SILK AND COTTON IN INDIA

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ABSTRACT

Driven by accelerating population, and increasing urbanization, the demand for silk and cotton is continuously growing in the country. Achieving self-sufficiency in textile fibre like silk and cotton has always been the primary objective of textile policy in India. The study was designed to estimate the Compound annual growth rate (CAGR) and instability index in consumption and production of silk and cotton for a period of ten years (2012-13 to 2021-22). The exponential function was used to analyze the compound annual growth rate and Cuddy-Della Valle index (CDVI) was used to analyze the instability of silk and cotton consumption. The CAGR was found significantly increased in consumption of silk and cotton at the rate of 0.96 per cent and 0.12 per cent per annum, respectively. Instability index was found between low range for both silk and cotton but instability was found more in case of silk (7.72%). The all two variables were found statistically significant during the period of 2012-2021.

Keywords: Cuddy-Della Valle index, instability index, Consumption, CAGR

Introduction

India's textile and apparel sector is resilient due to superior quality of fibre, yarn, fabric, and garments all the way up the value chain. The traditional handloom, handicrafts, wool, and silk products, as well as the organised textile sector, are just a few of the many diverse components of textile sector that make up India's textile and apparel Industry. With a market worth approximately $22 billion, India ranks as the world's fifth-largest manufacturer of technical textiles. By 2047, we expect to have grown to a $300 billion industry. India has been a net exporter and its trade in technological textile items has been expanding rapidly. Cotton is primarily a monsoon-season crop, or Kharif crop, that is seeded in late April and harvested in September. Silk and cotton has lightweight, superior and highly breathable properties. Since early civilization of the society both of the fibre is being used for manufacturing of apparels, upholsteries and carpets. With the change of time, synthetic fibre dominated the natural fibre including cotton and silk. It has replaced the wool in most of the applications due to cheaper price. Achieving self-sufficiency in textile fibre like silk and cotton has always been the primary objective of textile policy in India. Driven by accelerating population, and increasing urbanization, the demand for silk and cotton is continuously growing in the country.

Since most cotton is farmed on small farms and in rain-fed environments, the potential for future productivity development is restricted. Bt cotton was first introduced in 2002 and has since gained widespread acceptance, making up more than 95% of India's cotton production and an estimated 92 percent of the country's total cotton land. The central cotton growing zone in India, which includes the states of Maharashtra, Madhya Pradesh, Gujarat, and Odisha, produces two thirds of the country's cotton. More than 300 hybrids and six biotech cotton events have been certified by the Indian government for intensive cultivation. Since from 2003, India's has been a recognized as net cotton producer as well as large exportable surplus. Domestic mill consumption was growing for the past few years with surplus capacity added in many cotton-growing states.

Silk popularly known as "Queen of Textiles" for its natural colour, strong, purity, fine, and unusual lustrous. India is the second largest producer of silk with 36,582 MT (2022-23) and also the largest consumer of silk in the world. In India, mulberry silk is produced mainly in the states of Karnataka, Andhra Pradesh, Tamil Nadu, Jammu & Kashmir and West Bengal, while the non-mulberry silks viz. Tasar, Eri and Muga are produced mainly in Jharkhand, Chattisgarh, Orissa and north-eastern states. The decline in silk production in China since from 2015-16 has consider as the great an opportunity to increase its production and meet the growing global demand for silk. Silk Samagra-2 is a recent advanced project initiated by the Central Silk Board (CSB), related with development and enhancement of sericulture in India. The main objective of the scheme is to breed improvement through R&D projects, development of mechanized practices, Technology translation through Sericulture Information Linkages and Knowledge System (SILKS) Portal, and seed quality monitoring (Lakshmanan, 2012; Raveesha *et al*., 2016).

Keeping in view of the importance of sericulture and cotton industry and its contribution in the Indian economy for enhancing the employment opportunity following objectives have been taken into consideration.

1. To examine the consumption pattern of cotton and silk in India.
2. To assess the supply and demand gap of cotton and silk in India.

Database and Research Methodology

The entire study is based on secondary data. The data related to silk has been collected from Annual Reports of Central Silk Board (C.S.B) whereas the consumption and production data of cotton has been compiled from Ministry of Textile, GOI and Indiastat. The present study is based on the data pertaining to the consumption and production in metric tonnes for a period of 10 years (2012-2013 to 2021-22)

Analytical Tools and Techniques:

Compound annual growth rate

Compound annual growth rates were estimated to study the percentage increase or decrease in the selected parameter. The following exponential type of function was fitted for the analysis.

$$Y = ab^t e \quad (1)$$

The compound growth rate (CGR) was obtained from the logarithmic form of the equation [1] as below:

$$\ln Y = \ln a + t \ln b \quad (2)$$

The compound annual growth rate was derived using the formula: r = (Anti log of (b)-1) X 100.

Where,

Y = Dependent variable (consumption & production) for which growth was estimated

a = Intercept

b = Regression coefficient

t = Periods in years (1, 2, 3…n)

e = Error terms

Instability Analyses

Instability in consumption & production of cotton and silk was assessed by using two different measures of instability such as Coefficient of Variation and Cuddy-Della Valle Index. Cuddy-Della Valle Index (CDVI) was developed by Cuddy and Valle (1978) for measuring the instability in time series data. The value of Cuddy-Della Valle index is indicate as low instability if the value is between 0-15 %, medium instability if the value is between 15-30 % and high instability if the value is more than 30 % (Kumar *et al*., 2019).

$$Cuddy - Della\ Valle\ Instability\ Index\ (\%) = C.V \times \sqrt{(1 - R^2)}$$

Results and Discussion

The growth and instability in consumption of silk and cotton for a period of 10 years (2012-13 to 2021-22) has been presented in table 1 using compound annual growth rate (CAGR) and Instability Index. Table 1 indicated that growth in consumption of silk (0.96%). during 2012-13 to 2021-22 was found higher than cotton (0.12%). It was showed that consumption was continuously increased for silk through the time period except 2015-16.

Table 1: Growth and Instability in Consumption of Silk and cotton in India: 2012-2013 to 2021-2022.

(In MTs)

Year	Consumption of Silk	Consumption of Cotton
2012-2013	28,638	50,90,000
2013-2014	29,739	52,60,000
2014-2015	32,050	53,60,000
2015-2016	31,799	52,80,000
2016-2017	34,051	54,30,000
2017-2018	32,462	52,90,000
2018-2019	38,253	45,80,000
2019-2020	39,135	57,00,000
2020-2021	35,574	54,80,000
2021-2022	31,620	52,90,000
CAGR (%)	0.96	0.12
Cuddy-Della Valle Index	7.72	5.48

The production has increased more than 1.10 times in 2021-22 as compared to 2012-2013. Table 1 further unveils that consumption of cotton during the period of 2012-2013 to 2021-22 was more stable than consumption of cotton. The table at last shows the instability in consumption of silk and cotton for entire study period were 7.72 and 5.48 percent, respectively.

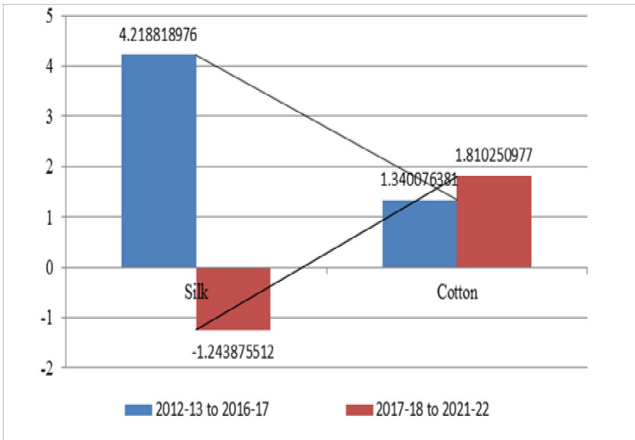

Fig. 1 : CAGR in consumption of silk and cotton

Further, the study examined the CAGR in both cotton and silk consumption quantity during 2012-17 and 2017-2021. The CAGR in consumption of cotton was found more in Period-I (2012-17) as compared to Period-II (2017-22) whereas the CAGR in consumption of silk was found more in Period-II (2017-22) as compared to Period-I (2012-17).

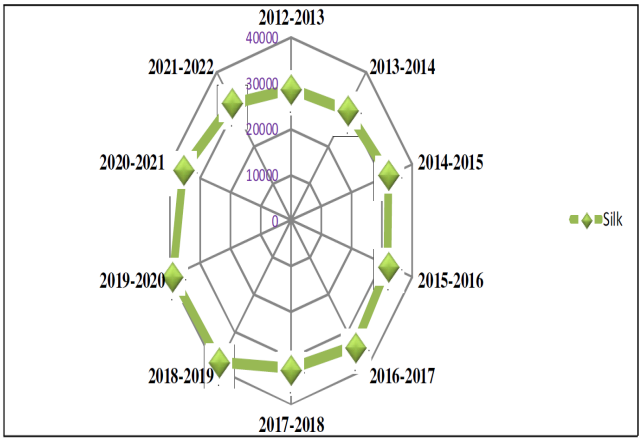

Fig. 2: Consumption of silk in India during 2012-13 to 2021-22

During the late 2012-13 to 2021-22, compared to early 1990s, consumption in southern states have increased more than 25 percent for cotton and 15 percent for silk (Anonymous, 2021).

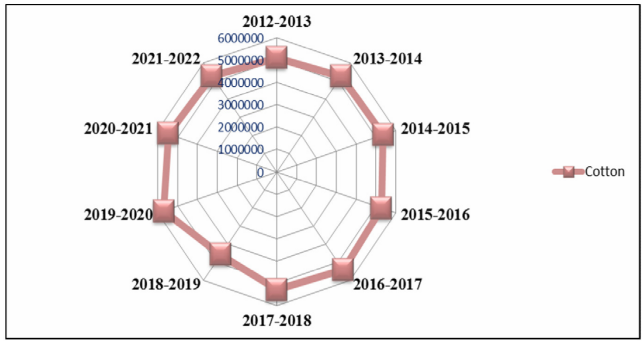

Fig. 3: Consumption of Cotton in India during 2012-13 to 2021-22

For clear understanding of the supply and demand gap scenario, the table 2 further discussed the association between production and consumption gap in cotton and silk during the same period.

Table 2: Demand-Supply projections and gaps for Silk and cotton

Year	Silk Produc-tion	Silk Consu m-ption	Gap	Cotton Produc -tion	Cotton Consum -ption	Gap
2012-2013	23,679	28638	-4,959	6290000	5090000	1200000
2013-2014	26480	29739	-3,259	6766000	5260000	1506000
2014-2015	28708	32050	-3,342	6562000	5360000	1202000
2015-2016	28523	31799	-3,276	5644000	5280000	364000
2016-2017	30348	34051	-3,703	5865000	5430000	435000
2017-2018	31906	32462	-556	6290000	5290000	1000000
2018-2019	35469	38253	-2,784	5661000	4580000	1081000
2019-2020	35820	39135	-3,315	6205000	5700000	505000
2020-2021	33770	35574	-1,804	5992160	5480000	512160
2021-2022	34903	31620	3,283	5289890	5290000	-110

Demand-Supply projections and gaps for Silk and cotton

Therefore, the surplus silk was found during the period of 2021-22 only to substitute cotton leading to lower availability of surplus silk, as indicated in the table 2. During the past decades, the per capita consumption of silk as apparel has declined while that of cotton has increased. There is no doubt that household income and silk apparel prices strongly influence the silk consumption pattern. There are a number of arguments which support the shifts in

consumption structure as distinguished by the income and price effects. The consumption of silk items increases with rise in income. The study has observed that the demand for cotton has been be met with their domestic production during the last ten years, with a marginal deficit during 2021-22. To meet all the requirements of the growing population, the nation will have to increase its current levels of cotton production with higher emphasis on better quality management, addressing climatic and environmental concerns.

Conclusion

The Government of India has enacted a variety of export policies to assure domestic consumption and adequate supplies of silk and cotton are available to the Indian textile industry. India's national fiber policy (NFP) and national silk policy affirms that cotton and silk exports should be limited to an exportable surplus. Cotton and silk yarn exports are allowed under an Open General License (OGL) without any quantitative restrictions. Ministry of Textiles, GOI endeavors to safeguard domestic spinning industry keeping in view accelerated investment in silk through silk samagra which has gone into sericulture sector, while the imports and exports of cotton remain free.

Reference

Bindu, C.S. (2018). Production and marketing of silk cocoons in Kolar district of Karnataka-An Econometric Analysis. M.Sc. (Agri.) Thesis (Unpub.), Jawaharlal Nehru Krishi Vishwa Vidyalaya Jabalpur, Madhya Pradesh, India.

Cuddy, J.D.A. and Valle, P.A.D. (1978). Measuring the instability of time series data. Oxford Bull. *Econ. Statist*, **40**, 53-78.

Kumar, G.A., Reddy, B.S., Goudappa, S.B., Hiremath, G.M. and Patil, S.S. (2019). Growth performance of silkworm cocoon production in Karnataka, India. *International Journal of Current Microbiology and Applied Science*, **8**(**11**), 674-682.

Lakshmanan, S. (2012). Employment of rural women in sericulture-an empirical analysis. *Journal of Rural Development,* **31**(2), 163-72.

Raveesha, S., Kumar, K.A. and Bai, D.S. (2016). A socioeconomic analysis of women's participation in sericulture. *Advance Research Journal of Social Science*, 7(1), 55-61.