



Research Article

PRODUCTION AND EXPORT PERFORMANCE OF COTTON FROM INDIA WITH SPECIAL REFERENCE TO TELANGANA

K. NIRMAL RAVI KUMAR^{*1}, M. JAGAN MOHAN REDDY², SHALENDRA³, V. SITARAMBABU⁴ AND CH. SATISH KUMAR⁵

¹Professor & Head, Department of Agricultural Economics, Agricultural College, Bapatla, 522101, Acharya N. G. Ranga Agricultural University, Lam, 522034, Guntur, Andhra Pradesh, India

²Director, Extension Education Institute, Professor Jayashankar Telangana State Agricultural University, Rajendranagar, 500030, Hyderabad, Telangana, India

³Deputy Director (SCM), National Institute of Agricultural Extension Management (MANAGE), (Government of India), Rajendranagar, 500030, Hyderabad, India

⁴Department of Agricultural Economics, Agricultural College, Bapatla, 522101, Acharya N. G. Ranga Agricultural University, Lam, 522034, Guntur, Andhra Pradesh, India

⁵Supervisor, Cost of Cultivation Scheme, Regional Agricultural Research Station (RARS), Tirupati, 517502, Acharya N. G. Ranga Agricultural University, Lam, 522034, Guntur, India

*Corresponding Author: Email - drknrk@gmail.com

Received: December 03, 2022; Revised: December 26, 2022; Accepted: December 28, 2022; Published: December 30, 2022

Abstract: India has been a major cotton supplier in recent years, as the country's ability to increase its exports reflects a long-term increase in output due to increased cultivation of Bt cotton and improved agricultural practices. Farmers were encouraged by two major factors to produce and supply more cotton. Firstly, cultivation of insect resistant transgenic crop, which has a potential to fetch some output even with normal traits. Secondly, the increase in the MSPs also lured farmers to bring more area under cultivation. The global cotton players are looking at India, with its record production and likely increased stock situations, to feed the world cotton market. The growth dynamics of area, production and productivity of cotton in Telangana has revealed a heartening picture, as they registered positive and significant growth rates (at 1% level) during pre-WTO, post-WTO and overall reference periods. During post-WTO regime, India enjoys net exporter status in the international trade. Major trade destinations for Indian cotton exports are China, mainland followed by other traditional buyers like Pakistan, Bangladesh, Vietnam and Indonesia during post-WTO regime. The trends in the NPCs indicated that Telangana enjoyed comparative advantage for exporting cotton across all the major importing countries during both pre and post-WTO regimes (except in Pakistan during pre-WTO regime). So, the farmers and other stakeholders in Telangana should specialize in the production and export of cotton. so as to earn the valuable foreign exchange. However, the higher growth rates of MSPs of cotton has escalated the Cost of Cultivation (COC) and Cost of Production (COP) and consequently, the growth in DMPs is higher compared to its IPs during both pre and post-WTO regimes. This will definitely have an adverse influence on the export performance of cotton in the near future. So, it is high time that the consumer preferences in newer markets, market intelligence and impediments for augmenting exports need to be researched. New buyers are expected from countries such as Iran, Vietnam and Bangladesh. The recent outbreak of coronavirus, which spread from China to over a dozen countries, is unlikely to pose a major threat to India's cotton exports. Telangana enjoyed comparative advantage for exporting cotton across all the major importing countries during both pre and post-WTO regimes (except in Pakistan during pre-WTO regime), as the NPCs are less than unity. The farmers and other stakeholders in Telangana should specialize in the cost-effective and quality production and need based exports of cotton. However, the higher growth rates of MSPs of cotton has escalated the COC and COP and consequently, the growth in DMPs is higher compared to its IPs and this will definitely pose an adverse influence on the export performance of cotton in the near future. So, it is high time that the consumer preferences in newer markets, market intelligence and impediments for augmenting exports need to be researched. It is also essential to make available to exporters the new markets' requirement of SPS restrictions. To boost the domestic production and supply chain mechanism, it is necessary to improve efficiency along the cotton value chain and provide crop and weather insurance products specially designed to address challenges faced by cotton farmers.

Keywords: Markov chain analysis, Export, Structural change, Transitional probability matrix, Export competitiveness

Citation: K. Nirmal Ravi Kumar, *et al.*, (2022) Production and Export Performance of Cotton from India with Special Reference to Telangana. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 14, Issue 12, pp.- 12096-12100.

Copyright: Copyright©2022 K. Nirmal Ravi Kumar, *et al.*, This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Academic Editor / Reviewer: Prasad Divedi

Introduction

Economic reforms and trade liberalization policies have been widely adopted by developing countries to improve their position in world trade. With the advent of trade liberalization, it is high time to give more emphasis to cost-effective and quality production of agricultural commodities. With the emergence of World Trade Organization (WTO) in 1995, it was expected that India would be benefited through multilateral trade, as it enjoys comparative advantage with reference to majority of the agricultural commodities and also fulfil the import requirements like pulses, edible oils, technology etc. The earlier studies highlighted positive influence of trade liberalization on the export performance of Indian agriculture. In the post-WTO regime, Indian agricultural commodities exports performance has undergone paradigm shift through the tremendous structural and qualitative changes. India is the fifth largest economy, ranked 13th position in world trade and gained significantly from agricultural exports with US\$330 billion of exports and US\$514 billion of imports in 2018[1].

It is now exporting 7500 products to 190 countries and importing 6000 products from 140 countries, enjoying trade surplus with USA, UK, Bangladesh, Sri Lanka, Nepal, UAE, Hongkong, Singapore, Netherlands, Germany, Belgium, Vietnam, Malaysia, Italy etc., and having trade deficit with China, Saudi Arabia, Iraq, Iran, Switzerland, South Korea, Indonesia, Australia, Qatar, Nigeria etc. India's agricultural exports in 2018 were valued at 38.74 billion US dollars and they accounted for 11.76 per cent of the total exports from India. India is one of the leading exporters of marine products, basmati rice, beef, non-basmati rice, cotton, oilseed meal, spices etc. The agricultural imports in 2018 were valued at 20.35 billion US dollars and they constituted only four per cent of total imports. Main imports were edible oils, pulses, spices, cashews etc. India's share of world exports was 0.53 per cent in 1994 before the WTO came into existence and this share was increased to 1.71 per cent in 2019. India's share of world imports in 2020 reached around 2.5 per cent from about 0.7 per cent in 1994.

India enjoys competitive advantage in several commodities for agricultural exports because of near self-sufficiency of inputs, relatively low labour costs and diverse agro-climatic conditions. These factors have enabled export of several agricultural commodities over the years. In the basket of agricultural exports, cotton is one of the major exporting commodities from India. While India holds an important position in the export market for cotton, in the next decade, India is likely to witness changes in its export pattern due to both internal and external constraints. One of the major internal constraints is mounting cost of production.

Similarly, one of the most important external constraints include excessive subsidization by importing countries makes Indian cotton less competitive in the international market. So, the important research questions in this study include: to analyse the growth dynamics of area, production and productivity of cotton, domestic and export competitiveness of cotton and to study the changes in the direction of exports of cotton from India. Above all, this study is very important, because the trade reforms were at rapid pace in developing countries like India during the past 25 years and it is high time now to ascertain the comparative advantage for rice in the international market [2-8].

Material and Methods

In this study, the researcher examines the computation of Compound Growth Rates (CGRs) for area, production, productivity, exports, imports, MSPs, DMPs and IPs of cotton, Nominal Protection Coefficients (NPCs) to analyse the export competitiveness and Markov Chain analysis to analyse the trade direction of cotton across major importing countries. The secondary information on area, production, productivity, exports, imports, DMPs, IPs, exchange rates, export trade data, trade destinations, transportation and storage costs, port charges, freight charges, exchange rates etc, are collected from different authentic sources such as Directorate of Economics and Statistics (DES), Statistical Year Book (2021), Director General of Foreign Trade (DGFT), Food and Agriculture Organization (FAO), State Agriculture Produce, Processing and Export Corporation Ltd, Container Corporation of India [9-15].

Statistical Techniques employed

The following techniques are employed to arrive at the realistic conclusions from the study:

Compound Growth Rates (CGRs)

CGR analysis is employed through fitting the exponential function to the variables of interest viz., area, production, productivity, exports, imports, MSPs, DMPs, and IPs of cotton at All-India level during both pre and Post-WTO regimes. The CGRs are calculated by fitting the exponential function:

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

Nominal Protection Coefficient (NPC)

The NPCs were estimated for cotton under exportable hypothesis during both pre and post-WTO regimes in order to measure the extent to which DMPs diverge from border equivalent prices (IP). That is, under exportable hypothesis, the domestic goods compete with a foreign product at the foreign port or in foreign market. It was estimated as follows:

$$NPC = P_d/P_b$$

where, P_d = DMP; and

P_b = the border equivalent producer price.

An NPC greater than one would show that the DMP of the commodity exceeded the border price, which discouraged the export of cotton.

Markov Chain Analysis

The changes in the exports of cotton to different countries was analyzed by employing a first order finite Markov chain model which captured the net effect in changes in its exports over a period of time [16]. In this report, the structural change in the exports of cotton from India in terms of market retention and market switching was examined by using the Markov chain approach. The estimation of the Transitional Probability Matrix (TPM, (P)) was central to this analysis. The element P_{ij} of the matrix indicated the probability that the exports would switch

from the i^{th} country to j^{th} country over a period of time. The diagonal elements P_{ii} indicated the probability that the export share of a country would be retained in the successive time periods, which in other words, measured the loyalty of an importing country to a particular exporting country. In the context of the current application, eleven major importing countries (including all other countries grouped under 'others') are considered for cotton. The direction of trade of cotton exports across major importing countries was denoted algebraically by the following equation:

$$E_{jt} = \sum_{i=1}^r E_{it-1} P_{ij} + e_{jt}$$

Where, E_{jt} = Exports from India to the j^{th} country during the year 't'

E_{it-1} = Exports to the i^{th} country during the year 't - 1'

P_{ij} = Probability that exports will shift from the i^{th} country to j^{th} country

e_{jt} = Error-term which is statistically independent of e_{jt-1} , and

r = Number of importing countries

The transitional probabilities P_{ij} , which can be arranged in a $(c \times r)$ matrix, had the following properties:

$$0 \leq P_{ij} \leq 1$$

$$\sum_{j=1}^r P_{ij} = 1 \text{ for all } i$$

The expected export-share of India during a particular period, 't' was obtained by multiplying the quantity of exports to the selected countries (eleven in the present study) during the previous period (t-1) with the estimated TPM (P). There are several approaches to estimate the transitional probabilities of the Markov chain model such as unweighted restricted least squares, weighted restricted least squares, Bayesian maximum likelihood, unrestricted least squares, etc. In the present study, Minimum Absolute Deviations (MAD) estimation procedure was employed to estimate the transitional probability, which minimizes the sum of absolute deviations. The conventional Linear Programming (LP) technique was used, as this satisfies the properties of transitional probabilities of non-negativity restrictions and row sum constraints in estimation [17,18]. The LP formulation on analysis was stated as per expression given below:

$$\text{Min } O^* P^* + Ie$$

subject to,

$$XP^* + V = Y$$

$$GP^* = 1$$

$$P^* \geq \varphi$$

where, P^* is a vector of the probabilities P_{ij} ; O is a null vector; I is an appropriately dimensional vector of areas; e is the vector of absolute errors ($|U|$); Y is the vector of exports to each country; X is a block diagonal matrix of lagged values of Y ; V is the vector of errors; and G is a grouping matrix to add the row elements of P arranged in P^* to unity.

P^* vectors were arranged to obtain the transitional probability matrix which indicated the overall structure of the transitions that had taken place in the system. Essentially, the transitional probability matrix captures the dynamics of the changes in raw cotton exports from India. The individual probabilities P_{ij} indicate the probability of the shift from the country i to country j .

Results and Discussion

Growth in area, production and productivity of cotton during both pre and post-WTO regimes

To understand the growth dynamics of the cotton during both pre-WTO and post-WTO regimes in Telangana, CGRs are computed by fitting exponential model [Table-1]. The growth dynamics of cotton in Telangana has revealed a heartening picture. Area, production and productivity of cotton has registered positive and significant growth rates (at 1% level) during pre-WTO, post-WTO and overall reference periods. This signifies the potentiality of cotton in Telangana state in view of suitability of soil and climate, advent of Bt cotton varieties, prevailing ginning facilities, marketing opportunities, rising both domestic and export demands etc.

Table-1 CGRs of Area, Production and Productivity of Cotton in Telangana

Particulars		CGR (%)
Pre- WTO period (1980-1994)	Area	24.17**
	Production	58.88**
	Productivity	27.84**
Post WTO- period (1995-2020)	Area	16.81**
	Production	25.31**
	Productivity	7.29**
Total Period (1980-2020)	Area	18.10**
	Production	33.19**
	Productivity	12.75**

District-wise Growth dynamics of cotton in Telangana

During pre-WTO regime, Ranga Reddy registered in high growth rate category whereas Karimnagar, Mahabubnagar, Warangal, Nalgonda and Khammam are with medium growth rate [Table-2]. Adilabad, Medak, Nizamabad and Hyderabad are the four districts remained in low performing districts with reference to cotton cultivation in Telangana. During post-WTO regime, Ranga Reddy is replaced by Mahabubnagar as a high performing district followed by Nalgonda and Medak with medium growth rate. Adilabad, Nizamabad and Hyderabad continued to perform as low growth rate districts along with Karimnagar, Khammam, Ranga Reddy and Warangal.

Table-2 Categorization of the districts based on their growth rate in area under cotton in Telangana during pre and post-WTO regimes

Period	Pre-WTO regime (1980-1994)	Post-WTO regime (1995-2020)
High growth	Ranga Reddy	Mahabubnagar
Medium growth	Karimnagar, Warangal, Nalgonda, Khammam	Nalgonda, Medak
Low Growth	Adilabad, Mahabubnagar, Medak, Nizamabad, Hyderabad	Adilabad, Karimnagar, Khammam, Nizamabad, Ranga Reddy, Warangal, Hyderabad

Growth rates of exports and imports

CGRs of exports and imports both in terms of quantity and value [Table-3] are worked out for cotton during both pre and post-WTO regimes, so as to ascertain the trends and prospects in international trade. It is heartening to note that the growth in exports of cotton was drastically increased during post-WTO regime compared to pre-WTO regime. The findings are much encouraging in the during post-WTO regime, as the exports had shown positive and significant growth rates (value terms) compared to pre-WTO regime. Further, these growth rates are much higher compared to imports performance during post-WTO regime. Reverse is the during pre-WTO regime, as the growth in imports significantly outweigh the growth in exports. So, with the advent of WTO regime, the exports had shown positive and significant growth trend and outweighed the imports growth performance. However, during overall reference period 1980-2020, though the exports showed positive and significant growth rates both in terms of quantity and value, still the growth of imports is much higher than exports.

Table-3 CGR (%) of Exports and Imports of Cotton from India

Particulars		CGR (%)
Pre-WTO regime (1980-1994)	Export quantity (M.Tonne)	-16.64NS
	Export value (US\$)	-7.45NS
	Import quantity (M.Tonne)	76.73*
	Import value (US\$)	113.20**
Post-WTO regime (1995-2020)	Export quantity (M.Tonne)	66.96NS
	Export value (US\$)	77.02**
	Import quantity (M.Tonne)	11.72NS
	Import value (US\$)	22.37**
Overall period (1980-2020)	Export quantity (M.Tonne)	18.34**
	Export value (US\$)	26.46**
	Import quantity (M.Tonne)	51.46**
	Import value (US\$)	59.99**

Fluctuating crop production due to frequent droughts, higher volatility of DMPs, decline in global prices for cotton due to higher production than mill-use etc., has prompted the Indian industry to look for cotton from global suppliers such as the

US, Brazil and African countries. It is interesting to note that the imports of cotton provide an economical proposition to Indian traders and millers, as it is more economical to import rather than purchasing cotton at higher DMPs in terms of both price difference and quality.

Growth in MSPs, DMPs and IPs

In all the three reference periods, MSPs, DMPs and IPs of cotton recorded positive and significant growth rates (at 1% level), except for DMPs during pre-WTO regime (recorded non-significant [Table- 4]). It is interesting that, the growth rates of MSPs and DMPs are much higher than IPs during the three reference periods. Further, the growth rate of MSPs is higher than growth rate of DMPs during the three reference periods. This highlights three important aspects: Firstly, the rise in MSPs of cotton by the Government of India has escalated the Cost of Production (COP) and hence its DMPs. Secondly, there is slow pace of increase in MSPs of cotton during post-WTO regime compared to pre-WTO regime, but this is sufficient enough to escalate the DMPs at a faster pace over and above its IPs. Thirdly, the higher growth rates of MSPs of cotton above its respective IPs is a warning signal for losing its export competitiveness in the international market. The higher growth rates of MSPs of cotton over and above its DMPs during the three reference periods imply that, the farmers are encouraged to escalate the Cost of Cultivation (COC) and COP of these crops. These higher growth rates of MSPs are sufficient enough to escalate the DMPs of cotton and hence, the growth of the DMPs is higher compared to its IPs during the overall reference period and even during the sub-periods. This price movement from MSP to COP and to DMP for the commodity will have a direct relation with its export competitiveness. That is, rise in MSPs of cotton have an indirect influence on its export performance from the country.

Table-4 CGR (%) in MSPs, DMPs and IPs of Indian cotton

Period	Prices	CGR (%)
Pre-WTO - regime (1990-1994)	DMP#	17.18NS
	MSP#	12.34**
	IP	1.70**
Post-WTO - regime (1995-2020)	DMP	5.39**
	MSP	5.71**
	IP	3.11**
Overall reference period (1990-2020)	DMP	5.52**
	MSP	6.28**
	IP	2.05**

Export Competitiveness of Indian cotton

The export competitiveness of Indian cotton was examined by using NPC. This is a measure of actual divergence or distortion DMP and IP or border price. The NPCs were calculated under exportable hypothesis (implying the domestic good competes at a foreign port) for three years viz., pre-WTO regime (1992-93) and post-WTO regime (2005-06 and 2019-20). These NPCs are estimated for three major exporting counties under each commodity and this highlights the comparative advantage the commodity that enjoys in the international market. If NPC is less than 0.5, the commodity is highly competitive, if it is between 0.5 to 0.1, it can be judged as moderately competitive and if the NPC is more than, then the commodity is not competitive for export into the international market. The NPCs for cotton are estimated to the three major export destinations viz., Indonesia, Nepal and Malaysia for the above said three years [Table-5].

Table-5 NPCs of cotton from Telangana to major importing countries during pre and post-WTO regimes

Countries	Pre-WTO period	Post - WTO period	
	1992-93	2005-06	2019-20
China, mainland	0.732	0.629	0.618
Bangladesh	0.607	0.595	0.584
Pakistan	1.132	0.567	0.512

The selected three major markets namely China, mainland; Bangladesh and Pakistan are moderately competitive for exporting cotton from Telangana, as the NPC values are ranged between 0.500 to 1.000 during post-WTO periods viz., 2005-06 and 2019-20. Though this commodity remained non-export competitive only in Pakistan during pre-WTO regime (1992-93), it gained export competitiveness during post-WTO regime.

Table-6 TPM of Cotton exports from India (2006-07 to 2019-20)

Countries	Bangladesh	China, mainland	China, Taiwan Province	Indonesia	Japan	Malaysia	Pakistan	Thailand	UK	Vietnam	Others
Bangladesh	0.030	0.480	0.030	0.050	0.010	0.000	0.150	0.050	0.000	0.040	0.170
China, mainland	0.010	0.460	0.030	0.050	0.060	0.020	0.200	0.026	0.000	0.060	0.090
China	0.120	0.430	0.020	0.080	0.020	0.020	0.120	0.060	0.000	0.020	0.110
Indonesia	0.080	0.550	0.030	0.040	0.000	0.010	0.110	0.020	0.000	0.040	0.120
Japan	0.110	0.570	0.030	0.040	0.000	0.010	0.090	0.020	0.000	0.040	0.008
Malaysia	0.180	0.540	0.010	0.020	0.000	0.020	0.160	0.010	0.000	0.020	0.040
Pakistan	0.140	0.700	0.010	0.010	0.000	0.010	0.050	0.010	0.000	0.030	0.040
Thailand	0.150	0.600	0.010	0.200	0.000	0.010	0.070	0.010	0.000	0.050	0.070
UK	0.220	0.460	0.010	0.030	0.010	0.000	0.080	0.010	0.000	0.100	0.090
Vietnam	0.310	0.210	0.010	0.030	0.010	0.010	0.240	0.020	0.000	0.090	0.080
Others	0.310	0.210	0.200	0.050	0.010	0.010	0.180	0.010	0.000	0.110	0.100

The trends in the NPCs indicated that Telangana enjoyed comparative advantage for exporting cotton during both pre and post-WTO regimes (except in Pakistan during pre-WTO regime). With these results, it implies, Telangana should specialize in the production and export of cotton. To earn the valuable foreign exchange. The country also needs to capitalize this advantageous position thereby, ensuring its position in the international market as a stable and dependable source of low-price good-quality produce in the world.

Trade Direction of cotton from India

The dynamics of changes in the export trade of cotton from India was studied through the estimation of a Markov probability matrix. The major importing countries taken for the analysis of trade in cotton exports during the post-WTO regime (2006-07 to 2016-17) were Bangladesh, China, mainland, Indonesia, Japan, Malaysia, Pakistan, Thailand, UK, Vietnam and along with the remaining importing countries grouped under 'others'. That is, there are ten major countries importing cotton in large quantity and rest of countries is pooled under 'others' category. The diagonal elements in the TPM [Table-6] for cotton exports provide the information on the probability of retention of the trade, while row elements indicate the probability of loss in trade on account of competing countries. The column elements indicate the probability of gain in trade from the competing countries. China, mainland was found to be the most stable and loyal importer of Indian cotton as it retained its share of around 46.00 per cent which was the highest among the importing countries. TPM of cotton exports revealed that China, mainland lost its remaining share of 54.00 per cent to Pakistan, Vietnam, Japan, Indonesia and other countries. Vietnam lost major share of 91.00 per cent to Bangladesh, Pakistan, China, mainland and other countries. Other countries are also found to be stable with 10.00 per cent of retention of their shares, while losing a share of 90.00 per cent to Bangladesh, China, mainland, China, Taiwan province, Pakistan and Vietnam. So, China, mainland is the stable importer of Indian cotton, followed by other traditional buyers like Pakistan, Bangladesh, Vietnam and Indonesia. The higher exports to China, mainland, Bangladesh etc., and retentions by major countries could be due to higher export competitiveness of cotton across these countries.

It is also revealed from [Table-6] that China, mainland and 'other' countries were the stable markets for cotton among the importing countries, as reflected by high retention probabilities of 46.00 and 10.00 percents respectively. This was reflected in fact that India's share in total import of cotton by China, mainland would be on increasing trend in the future years. Next to China, mainland and 'other' countries, Vietnam, Pakistan and Indonesia are also the major importers of cotton, as their retention probabilities are 9.00, 5.00 and 4.00 percents respectively. India could not retain the previous export shares to Japan and UK and this reflects these are unstable markets for cotton, as the probabilities of retention are zero.

Summary and Conclusions

From study, it was concluded that though India being the third largest producer of cotton in the world, it exports only small proportion of the total production after meeting the domestic demand. Indian cotton exports significantly increased from 1.13 lakh tonnes in TE 1992-94 to TE 13.95 lakh tonnes in TE 2014-16. Though India imports significant quantum of cotton (3.15 lakh tonnes during TE 2014-16), it enjoys net exporter status in the international trade. Major trade destinations for Indian cotton exports are China, mainland followed by other traditional buyers like

Pakistan, Bangladesh, Vietnam, and Indonesia during post-WTO regime. The trends in the NPCs indicated that Telangana enjoyed comparative advantage for exporting cotton across all the major importing countries during both pre and post-WTO regimes (except in Pakistan during pre-WTO regime). So, the farmers and other stakeholders in Telangana should specialize in the production and export of cotton. To earn the valuable foreign exchange. However, the higher growth rates of MSPs of cotton has escalated the COC and COP and consequently, the growth in DMPs is higher compared to its IPs during both pre and post-WTO regimes. This will have an adverse influence on the export performance of cotton in the near future. So, it is high time that the consumer preferences in newer markets, market intelligence and impediments for augmenting exports need to be researched. New buyers are expected from countries such as Iran, Vietnam and Bangladesh. The recent outbreak of coronavirus, which spread from China to over a dozen countries, is unlikely to pose a major threat to India's cotton exports. Considering the comparative price advantage, Indian cotton is export competitive in China, Bangladesh, Pakistan, Vietnam, Indonesia and Taiwan and this hints that India's cotton will have no difficulty finding a market elsewhere. It is also essential to make available to exporters the new markets' requirement of SPS restrictions. To boost the domestic production and supply chain mechanism, it is necessary to improve efficiency along the cotton value chain and provide crop and weather insurance products specially designed to address challenges faced by cotton farmers.

Application of research: This study suggests to strengthen cotton production in India and Telangana and to sustain in world market, as there is a need to focus on reliable markets and accordingly bring about desirable changes both in research and trading priorities. This research will also have an impact on the future road map on cotton production and policy decision in the Indian cotton sector with the emergence of changing policy regimes. The findings are relevant to the policy settings given.

Research Category: Agriculture economics

Acknowledgement / Funding: Authors are thankful to Department of Agricultural Economics, Agricultural College, Bapatla, 522101, Acharya N. G. Ranga Agricultural University, Lam, 522034, Guntur, Andhra Pradesh, India; Director, Extension Education Institute, Professor Jayashankar Telangana State Agricultural University, Rajendranagar, 500030, Hyderabad, Telangana, India; Deputy Director (SCM), National Institute of Agricultural Extension Management (MANAGE), (Government of India), Rajendranagar, 500030, Hyderabad, India; Regional Agricultural Research Station (RARS), Tirupati, 517502, India

****Principal Investigator or Chairperson of research: Dr K. Nirmal Ravi Kumar**
University: Acharya N. G. Ranga Agricultural University, Lam, 522034, India
Research project name or number: Research station study

Author Contributions: All authors equally contributed

Author statement: All authors read, reviewed, agreed and approved the final manuscript. Note-All authors agreed that- Written informed consent was obtained from all participants prior to publish / enrolment

Study area / Sample Collection: Telangana

Cultivar / Variety / Breed name: Nil

Conflict of Interest: None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.

Ethical Committee Approval Number: Nil

References

- [1] www.fao.org
- [2] Fialor S. (1985) *M.Sc. (Agri.) Thesis, University of Agricultural Sciences, Bangalore, India.*
- [3] Mahadevaiah G.S., Ravi P.C. and Chengappa P.G. (2005) *Agricultural Economics Research Review*, 18(2), 253-259.
- [4] Maji C. (1996) *India and exports of rice. In: visions of India's Rice Trade, Ed. Chand, R. and Haque, T., National Commission on Agricultural Policies, New Delhi, pp. 95-108.*
- [5] Negi Y., Parashar S. and Jewari S. (1994) *Indian J. of Agric. Mktg.*, 8(1), 25-29.
- [6] Shilpashree J., Serma A., Pandian S., Kumaravel N. and Thangarasu (2017) *Res J. Chem. Environ. Sci.*, 5(3).
- [7] Sonu Madan and Rajni Sharma (2018) *Asian Review of Social Sciences*, 7(1), 25-32.
- [8] Srinivasamurthy D. and Subramanyam K. (1999) *Agric. Econ. Res. Rev.*, 12(2), 118-128.
- [9] Suresh A. and Mathur V.C. (2016) *Indian Journal of Agricultural Sciences*, 86(7), 876-883.
- [10] Tamanna C., Chaurasia S. and Singh Z. (1999) *The Bihar J. Agric. Mktg.*, 7(1), 44-50.
- [11] Ushunde U.M., Patil S.S. and Yasmeen (2016) *Proceedings of the Annual Vietnam Academic Research Conference on Global Business, Economics, Finance & Social Sciences (AP16Vietnam Conference) ISBN: 978-1-943579-92-1 Hanoi-Vietnam. 7-9 August, 2016. Paper ID: V666.*
- [12] Veena U.M., Suryaprakash S. and Achoth L. (1994) *Indian Coffee*, 58(10), 11-12.
- [13] Venkiteswaran (1984) *Agricultural Situation in India*, 39(1), 9.
- [14] Singh V.K. and Gautam A. (2019) *IMJ*, 11 (1).
- [15] Viswanath V., (1998) *M.Sc. (Agri.) Thesis, University of Agricultural Sciences, Bangalore, India.*
- [16] Eswaraprasad Y., Achoth L. and Radha Y. (1997) *Agricultural Economics Research Review*, 10(2), 78-87.
- [17] Mandanna P., Urs D. and Achoth L., (1998) *Trop. Agric. Res.*, 10, 134-142.
- [18] Hugar L.B. (2002) *Artha Vikas. J. Econ. Dev.*, 38(1), 1-9.