



Mapping the Impact of Subsidies in Global Cotton Trade: A Review

Isabella Agarwal¹, Y.G. Prasad²

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ABSTRACT

In the complex journey from seed to shop floor, cotton goes through several stages. More than 70 countries produce and export cotton, while many developed and developing countries depend on imports of cotton lint for their spinning and textile industries. Global cotton consumption has regularly increased alongside cotton production and global population and is now estimated at 26 million tons. Cotton trade and production are highly distorted by policy support extended to cotton producers which has been greatest in the US, followed by China and the EU. It should be noted that while the cotton industry in all cotton producing countries benefit from indirect support provided to the agricultural sector, in general, between half and three quarters of the world cotton production receive direct support during most seasons. Support to the sector in India is expected to result in continuous growth in cotton mill use. The industry, however, faces several challenges, including technological obsolescence, high input costs and poor access to credit. To address these issues, the government has implemented several subsidy schemes and is currently developing a new textile policy for the overall development of the sector.

Key words: Cotton Trade, Government Support, Price, Subsidy.

Subsidy is a fast tool to decrease the cost of productivity which leads to decrease the final price in order to increase the comparative advantage, trying to gain high income with lower profit from exporting high amount of production. The global economy has become reliant upon extensive government intervention in the form of subsidies, both direct and indirect, to support specific economic sectors (e.g. agriculture) or to support a policy objective (e.g. food security, self-sufficiency). Subsidies are a form of financial benefit provided by the government (e.g., cash transfers and tax concessions) conferred on producers and consumers of goods and services, that render the value of the output lower than its full economic cost, i.e., lower than the market price. Subsidies normally aim to promote activities that governments deem beneficial to the economy and society, such as food security and improving rural livelihoods. Subsidies create spillover effects in other economic sectors and industries. Cotton subsidies have remained a contentious issue in international trade and negotiations at the World Trade Organization (WTO). Farmers of developing and least-developed countries (LDCs) complain that the massive support provided by developed countries, especially the United States, has rendered cotton production uncompetitive in the Global South, leading to a disastrous impact on agricultural growth, export earnings and farmers' welfare.

In the complex journey from seed to shop floor, cotton goes through several stages. Cotton must be grown, harvested, processed and spun into a yarn that is ready to be woven or knitted into a fabric, before being transformed into a finished product. About 64 per cent of all cotton fibre produced around the world is used in apparel, with the remainder mostly used in home furnishings. In addition to the soft white fibre of the plant, the cotton seeds are also

¹Department of Agricultural Economics Central Institute for Cotton Research Regional Station, Coimbatore- 641 003, Tamil Nadu, India.

²Central Institute for Cotton Research, Nagpur-441 108, Maharashtra, India.

Corresponding Author: Isabella Agarwal, Department of Agricultural Economics, Central Institute for Cotton Research Regional Station, Coimbatore- 641 003, Tamil Nadu, India. Email: is_agarwal@rediffmail.com

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harvested for animal feed, cooking oil and industrial applications. Zooming in on the agricultural stage of this global supply chain, the majority of cotton is grown in the US, China, India and Pakistan, in addition to other countries such as Uzbekistan, Turkey, Israel, Argentina and Australia. India alone produces 25 per cent of the world's cotton, sustaining the livelihoods of 5.8 million farmers, the majority of whom are small-scale farmers cultivating land less than 2 hectares in size. In India's textile industry, nearly 60 per cent of all raw materials are made up of cotton. The textile industry also makes up about 7 per cent of the industrial output and contributes about 12 per cent to the country's export earnings.

Overview of the world cotton market

The supply side: Production and exports

More than 70 countries produce and export cotton, while many developed and developing countries depend on imports of cotton lint for their spinning and textile industries.

From 2003 to 2022, global cotton production increased by 22 per cent; it is now estimated at 26.13 million tons. After being the top cotton producer for many years, China has now been overtaken by India, whose production was to the tune of 5.9 million tons in 2021-22, representing 23 per cent of global production and China's production has decreased slightly to 22 per cent still making it the second largest global cotton producer at 5.73 million tons (Table 1) followed by The United States with 3.96 million tons (15 per cent of global production). Brazilian cotton production increased from 6 to 10 per cent of the global total during the reference period, making Brazil the fourth largest cotton producer in the world today, as well as a key exporter. Global cotton production is highly concentrated with these four largest producers accounting for 71 per cent

of total production. In addition, with the exception of the United States and Australia, cotton production occurs mainly in developing and emerging countries (more than 80 per cent of global production comes from these two groups). However, West African and Central African countries, which are part of the Franc Zone and at the heart of the Cotton Initiative, account for only 4 per cent of global production. Cotton is a minor component of economic activity in industrialised countries, accounting for only 0.12% of total merchandise trade, but its production plays a major role in some least developed countries in West and Central Africa.

Almost 30 to 40 per cent of the cotton produced in the world is exported, totalling 8 to 10 million tons. With the exception of China, the main cotton producers are also the main cotton exporters. The global cotton market is thus

Table 1: World cotton production 2003 to 2022.

Country	2003-04		Country	2021-22	
	Production '000 tons	Share %		Production '000 tons	Share %
China	5276	24.97	India	5900	22.93
USA	3975	18.81	China	5730	22.27
India	3043	14.40	USA	3963	15.40
Pakistan	1708	8.08	Brazil	2678	10.41
Brazil	1309	6.20	Pakistan	981	3.81
Turkey	910	4.31	Uzbekistan	940	3.65
Uzbekistan	893	4.23	Turkey	833	3.24
Australia	348	1.65	Australia	608	2.36
Greece	333	1.58	Argentina	349	1.36
Syrian Arab Rep	263	1.24	Greece	305	1.19
C4	585	2.77	C4	1238	4.81
Others	2607	11.76	Others	2208	8.58
World	21129	100.00	World	25733	100.00

Source: Own calculation.

Table 2: World cotton export 2003 to 2022.

Country	2003-04		Country	2021-22	
	Export ('000 tons)	Share %		Export ('000 tons)	Share %
USA	2995	41.32	USA	3375	33.24
Uzbekistan	680	9.38	Brazil	2064	20.33
Australia	470	6.48	India	816	8.04
Greece	247	3.41	Australia	749	7.38
Brazil	210	2.90	Greece	299	2.94
Tajikistan	151	2.08	Mexico	231	2.28
Kazakhstan	129	1.78	Cameroon	156	1.54
Cameroon	126	1.74	Myanmar	153	1.51
India	119	1.64	Tanzania	141	1.39
Turkmenistan	116	1.60	Kazakhstan	80	0.79
C4	835	11.52	C4	1202	11.84
Others	1171	16.15	Others	887	8.74
World	249	100.00	World	10153	100.00

Source: Own calculation.

concentrated around a few actors: the top five exporters make up 71 per cent of total exports (Table 2). While accounting for 15 per cent of global production, the United States is by far the largest exporter, with 33 per cent of global exports in 2022. Though the market share reduced from 41 per cent in 2003-04 it has been relatively stable (around one-third). The high market share is often highlighted by opponents of US cotton policies, which have been accused of depressing world prices especially the United States-Brazil case regarding government support to the cotton farmers.

Brazil and India are also large cotton exporters, hovering around 20 per cent and 8 per cent of the global market, respectively. Although making up only a marginal share of global production, when it comes to exports, West and Central African countries account for 11 per cent of the total; this makes the region the world's third largest exporter, falling just behind Brazil and before India which goes mainly to Asia, where they face competition from the United States.

The demand side: Consumption and imports

Global cotton consumption has regularly increased alongside cotton production and global population and is now estimated at 26 million tons.

In general, the largest consumers of cotton are also the main producers because production in these countries goes primarily to the domestic market. From Table 3, it is evident that there is a huge concentration of cotton consumption in Asian countries: the three largest consumers (China, India and Pakistan) account for 63 per cent of global consumption, with China alone accounting for one third. This high concentration is naturally explained by the relocation of textile industries to Asia as a result of rising labor costs in developed countries. Bangladesh turned out to be major importer occupying 6.48 per cent of world exports during 2022 from meagre 1.79 per cent during 2003-04.

A number of East Asian countries have emerged as important cotton buyers accounting for more than 75 per cent of global cotton imports, with one-fifth going to China (Table 4). Interesting turning point is the entry of Vietnam as one of the largest importer of cotton ranking in the third position since 2012 accounting for 16 per cent of the world imports during 2022. Another noteworthy point is that Pakistan has emerged as one of the largest importer to the tune of 12 per cent during 2022 from 5 per cent of world total imports during 2004. Chinese imports have increased since 2000 largely boosted by the liberalization of the country's textile market. This growth has made China a key player in the international market and a major determinant of global cotton prices.

Global cotton prices

Global cotton prices are usually approximated by the A Index of Cotlook Ltd, based in Liverpool, UK. This index is an average of the five cheapest quotations from a selection of 18 varieties of upland cottons most frequently traded internationally.

Developed countries' active support prices also play a key role in determining the evolution of world cotton prices. (Fousseini, 2015) Zooming in on the agricultural stage of this global supply chain, the majority of cotton is grown in the US, China, India and Pakistan, in addition to other countries such as Uzbekistan, Turkey, Israel, Argentina and Australia. India alone produces 25 per cent of the world's cotton, sustaining the livelihoods of 5.8 million farmers, the majority of whom are small-scale farmers cultivating land less than 2 hectares in size. The declining trend observed between 2003 and 2005 is largely due to the support measures by the government. Cotton prices started rising in 2009 (Fig 1). In addition to the continuing economic recovery, China's net imports and the low level of both global and Chinese stocks were the main determinants

Table 3: World cotton use 2003 to 2022.

Country	2003-04		Country	2021-22	
	Mill use ("000 tons)	Share %		Mill use ("000 tons)	Share %
China	7224	33.60	China	8200	32.00
India	2987	13.89	India	5698	22.23
Pakistan	2024	9.41	Pakistan	2152	8.40
Turkey	1415	6.58	Bangladesh	1660	6.48
USA	1364	6.34	Turkey	1617	6.31
Brazil	869	4.04	Vietnam	1541	6.01
Indonesia	450	2.09	Uzbekistan	836	3.26
Mexico	435	2.02	Brazil	700	2.73
Thailand	403	1.87	USA	544	2.12
Bangladesh	385	1.79	Indonesia	514	2.01
Korea rep	290	1.35	Mexico	303	1.18
Russian fed	290	1.35	Myanmar	165	0.64
Others	3363	15.64	Others	1699	6.63
World	21499	100.00	World	25629	100.00

Source: Own calculation.

of this price increase. This changed in 2012, however, when global stocks rose and China began accumulating large stocks since that time, global prices have declined which was exacerbated by an increase in global production combined with a decrease in demand due to the East Asia crisis and to China's placement of an important part of its stocks on the international market as part of its new national pricing policy.

Impact of global subsidies on the world cotton market

Recurrent changes in public policies do not create a conducive economic environment for boosting investment in the sector. This is notably the case in some key producing countries, with, for instance, frequent changes in stockholding policies, border measures, input subsidies and support to the domestic textile industry. Another challenge

Table 4: World cotton imports 2003 to 2022.

Country	2003-04		Country	2021-22	
	Import ("000 tons)	Share %		Import ("000 tons)	Share %
China	1929	26.65	China	2520	24.82
Turkey	515	7.12	Bangladesh	1688	16.63
Indonesia	415	5.73	Vietnam	1576	15.52
Mexico	405	5.60	Pakistan	1200	11.82
Pakistan	393	5.43	Turkey	1170	11.52
Bangladesh	388	5.36	Indonesia	539	5.31
Thailand	365	5.04	Mexico	178	1.75
Korea rep	277	3.83	India	170	1.67
Russian fed	275	3.80	Malaysia	140	1.38
Taiwan	220	3.04	Korea Rep	138	1.36
Italy	202	2.79	Thailand	131	1.29
Others	1853	25.60	Others	703	6.92
World	7237	100.00	World	10153	100.00

Source: Own calculation.

Table 5: Summary of the main studies on the impact of cotton subsidies.

Author(s)	Model type	Simulated scenario	Impact on world price in %
ICAC (2002)		partial equilibrium	26.30
Goreux (2003)	Partial equilibrium	removal of subsidies in USA, The EU, China	[7.5; 11.4]
Reeves <i>et al.</i> (2001)	General equilibrium	removal of subsidies and all import barriers	10.70
ODi (2004)	Partial equilibrium	removal of subsidies in the USA, The EU, China	[18; 28]
Sumner (2000)	Partial equilibrium	removal of subsidies in the United states	12.60
FAPRI (2004)	Partial equilibrium	multilateral liberalization of all agricultural commodities	11.40
Pan <i>et al.</i> (2006)	Partial equilibrium	removal of subsidies in the United states	2.43
Julian <i>et al.</i> (2007)	Supply demand Simulation model	Reductions in US cotton subsidies on West African Cotton producers	5.9 to 17
John Baffes (2011)	Regression analysis	More than cotton subsidies, number of other important, issues require attention like persistent divergence between cotton prices and the prices of other agricultural commodities, structural inefficiencies of the CFA franc against the US dollar.	
Sharma, (2020)	Floating and fixed reference period model	Developed members like Australia and USA would gain 3.1 and 0.82 per cent respectively if additional flexibility to provide support by 2030. Under the proposal. On the other hand, developing members like India and Indonesia will experience reductions of -5.37 and - 6.11 per cent respectively from their existing entitlements under the AoA.	
Xinyao <i>et al.</i> (2022)	Cotton subsidy income model	Cotton subsidies ultimately affected the income of cotton farmers by affecting the planting area of cotton farmers and this mediation effect accounted for 25.22% of the total effect.	

is the price-cost squeeze that the textiles and manufacturers face because of stagnant retail prices and rising production costs. The result of that, is a race to build economies of scale through consolidation. Cotton farmers have limited alternatives but to adapt to this economic context, characterized by recurrent periods of declining cotton prices and high market volatility.

Cotton trade and production are highly distorted by policy support extended to cotton producers which has been greatest in the US, followed by China and the EU. When the prices of cotton are high, subsidies tend to decline and when the prices are low, subsidies rise. Cotton subsidies encourage over production which is then sold in

the world market which has depressed world cotton prices, damaging those developing countries which rely on exports of cotton for a substantial component of their foreign exchange earnings.

Many studies have attempted to measure the impact of cotton subsidies on world cotton prices and production (Table 5). It is difficult to draw direct comparisons because the analyses adopt different methodologies, examine the impacts on a different set of countries and use different reference years to estimate the effects of subsidy removal.

The results do serve to provide an initial insight into the magnitude of likely impacts. According to several simulation studies, elimination of cotton subsidies in the USA would

Table 6: Comparative cotton trade analysis.

Particulars	2003-04	2014/15	2018-19	%
Production (m tons)	21.13	26.2	25.98	22.95
Yield (kg/ha)	622	785	747	20.10
Exports (m tons)	7.25	7.7	9.28	28.00
Mill use (m tons)	21.5	24.2	26.01	20.98
Ending stocks (m tons)	9.84	21.9	22.56	129.27
Stock/use ratio (%)	0.34	0.90	0.64	88.24
Fiber market share (%)	37.4	28.1	22.3	-41.18
Direct assistance (US\$ billion)#	3.27	10.4	5.74	75.54
Price (US cts/lb)	68	71.0	78	14.71

Source: Own calculation #ICAC report.

Table 7: An overview of the cotton sector in selected member countries.

Description	Unit	USA	India	China3	C-4
Farmers	Number	8103	9801538	8586200	1017294
Average cotton farm size	Hectare	624.7	1.2	0.4	0.7 to 4.8
Average cost of lint	US\$/kg	1.65	1.44	2.09	1.10 to 1.48
Average cost of seed cotton	US\$/kg	0.56	0.45	0.75	0.38 to 0.54
Notified cotton support*	mill US\$	952.05	261.41	2535.03^	0
Per farmer notified support	US\$	117494	27	295	0
Notified support as a % of VoP	%	11.70	2.37	21.32	0
Flexibility for cotton-Amber box (2020)	% of VoP	228	10	8.5	10

Source: ICAC report.

*Notified support of US, India and China is for years 2017, 2018 and 2016 respectively.

^China has started a Blue box program from 2017 onwards.

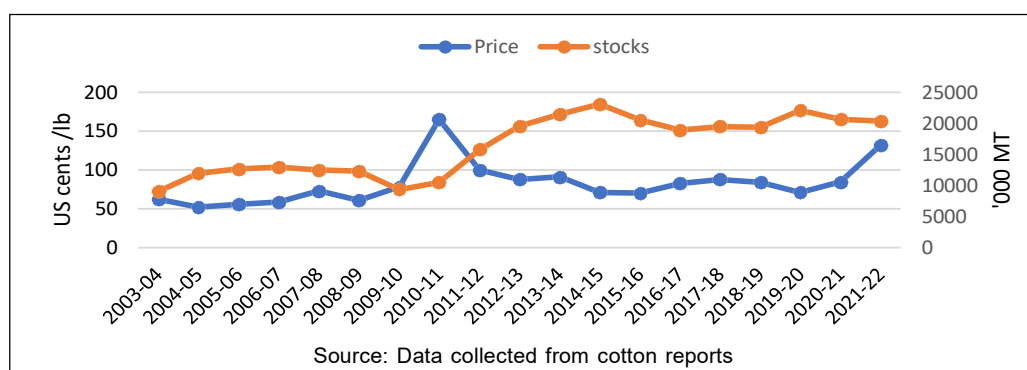


Fig 1: World price vs stock 2003-04 to 2021-22.

increase the world cotton price by 3-11 per cent, increase African cotton export revenue by \$35-\$100 million and reduce USA exports by 43 per cent.

The levels of government support to cotton in addition to all agricultural products, tend to fall during the years when prices rise (Fig 2). In cotton, there has been a strong negative correlation between subsidies and cotton prices: in years when prices are high, subsidies tend to decline and in years when prices are low, subsidies tend to rise. Support provided by governments represented approximately one-quarter of the value of world cotton production in 2014/15, but fell to one-tenth of the value of production in 2016/17 and 2017/18.

It should be noted that while the cotton industry in all cotton producing countries benefit from indirect support provided to the agricultural sector, in general, between half and three quarters of the world cotton production receive direct support during most seasons.

The Cot look A Index declined from an average of 88 cents/lb in 2012/13 to an average close to 70 cents/lb in 2014/15 and 2015/16, before rising to 84 cents/lb in 2017/18. Subsidies provided to cotton growers declined in 2016/17 from record levels. However, during 2017/18 average prices rose to 88 cents/lb and subsidies increased as well, while in 2018/19 moderate decline in prices was accompanied with a moderate decline in subsidies (Fig 3). The share of world cotton production receiving direct government assistance, including direct payments and border protection, increased from an average of 55 per cent between 2003-04 and 2007-08, to 83 per cent in 2008-09.

From 2009-10 through 2013-14, this share declined and averaged 48 per cent. In 2014-15 and 2015-16, the average per centage of production receiving direct assistance increased to 75 per cent and later averaged at 49 per cent between 2016-17 and 2018-19.

Global domestic support provided to cotton

Policies and programmes affecting cotton production have been implemented in many countries. These include direct payments to producers to support incomes and government purchases of cotton and buffer stocks to stabilize prices and guarantee domestic supplies. Furthermore, subsidized premiums for insurance products to protect farm income during seasons of adversity, barriers to cotton imports to protect domestic industries and input subsidies to raise yields and lower production costs, are among some of the other policy instruments used by governments (Annexure I)

Developed countries are providing huge subsidies to agriculture sector and thereby, create distortions in the international market. Some of the developed countries are enjoying artificial comparative advantage due to a large amount of subsidies and thus, adversely affecting the welfare of millions of farmers in developing countries.

Over years, there is a phenomenal change in the direct assistance to the tune of 3.27 US\$ billion to 5.74 US\$ billion between 2003-04 and 2018-19 (with a huge increase in between during 2014-15 around 10.4 US \$billion), respectively with 76% change. During the same period, the price increase was just to the tune of 15% as seen from Table 6 above. Historically, the United States and the European Union were the chief culprits but China's

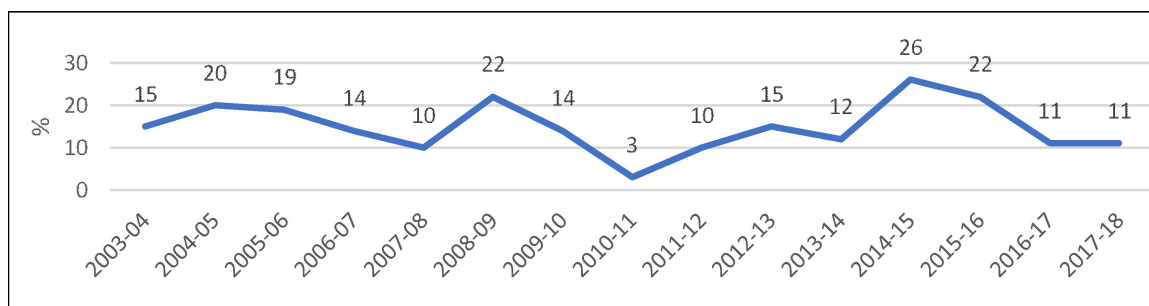


Fig 2: Support to cotton as % of value of world cotton production.

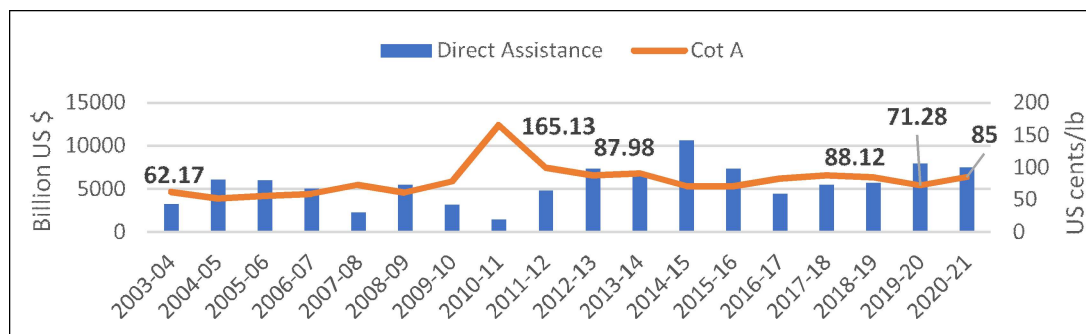


Fig 3: Government assistance and cotton prices.

Table 8: Country wise government assistance in the cotton value chain.

China	The Government of China is encouraging the development of a complete cotton-textile-apparel supply chain in the Xinjiang Uyghur Autonomous Region, which is in the far northwest of the country. Coupled with Chinese investments in transport infrastructure throughout Central Asia, part of its 'One Belt, One Road' initiative, the rise in textile production in Xinjiang Uyghur Autonomous Region heralds increased exports throughout Central Asia, Turkey and Europe over the next few years.
India	About 60 per cent of imports in India consist of machine-picked cotton from the United States of America, Australia and Brazil. Over one-half of Indian exports go to Bangladesh, China, Viet Nam, Pakistan and Indonesia account for another one-third of total export shipments. The Government is committed to helping the textile industry in all the possible ways to achieve a US\$ 350 bn market size by 2025-26, with US\$ 100 bn exports. MITRA Scheme, National Technical Textile Mission, Removing Anti-Dumping Duties Mission, Removing Anti-Dumping Duties on MMF Raw Materials, ROSCTL for Garments and Made-ups, RODTEP for all Textile Products, PLI Scheme for MMF Fabrics, MMF Garments and Technical Textiles are taken by the govt. to strengthen textile sector. Central Subsidy ATUFS concentrating on Garmenting, Technical Textiles, weaving, Composite unit /Multiple Segments with subsidy of 10 to 15 per cent with upper limit of Rs. 20 to 30 crores; encourage setting up of Fiber to Fashion value chain; Special focus on processing, knitting, hosiery and garmenting sectors to create an internationally competitive textile industry in the cotton growing States. Pakistan has the third largest cotton spinning industry in the world after China and India. Similar to Viet Nam, Pakistan benefits from substantial investments in infrastructure and textile activity from China. However, inconsistent electricity supplies hamper the expansion of the textile industry.
Pakistan	As in Viet Nam, mill use of cotton in Bangladesh has been grown exponentially since the early 1990s. However, Viet Nam and Bangladesh differ on one key aspect: Bangladesh has developed an integrated domestic supply chain from spinning to garment assembly, while Viet Nam is highly integrated with China, Viet Nam, together with investments from Japan, Taiwan and other countries, total growth in spinning capacity in Viet Nam is expanding significantly and has become a major yarn exporter to China. Viet Nam spins cotton into yarn, exports the yarn to China for weaving/knitting, dyeing and finishing and then reimports the finished fabric for apparel assembly.
Vietnam and Bangladesh	Mexico benefitted largely from strong investments made in textiles and apparel, in addition to a greater demand from retailers.
Mexico	As in the cases of Malaysia and Mexico, African countries are benefitting from the efforts being made by international brands and retailers to diversify their textile and apparel supply chains.
C4	The long-run trend in cotton production in Europe is still negative. Reduced government support for the cotton sector, together with a partial decoupling of support from current production and the rising wages and alternative employment opportunities outside agriculture, are leading to reductions in cotton areas and production.
Europe	Kenya in its "Big Four" agenda highlighted the cotton-to-garment chain as a particular focus to grow manufacturing from 9% to 15% of GDP. The government has announced that new high-yielding cotton varieties from Turkey, Israel, India and Pakistan are being tested. Textile manufacturers primarily receive fiscal incentives from the government through operations in Export Processing Zones (EPZs). These zones offer a range of incentives including: a corporate income tax holiday, exemption from import duties on inputs, streamlined license processing and subsidized electricity. A "super sale" launched in 2017 through the "Buy Kenya, Build Kenya" program allows for up to an additional 20% of an EPZ firm's annual clothing production to be sold on the local market without sales taxes or import duties on raw materials and equipment.
Kenya	

Source: Own calculation #ICAC report.

Annexure I: Global domestic support provided to cotton sector.

Countries	Domestic support
China	The government of China supports cotton production by controlling cotton import volumes and values and by applying border protection measures based on quotas and sliding scale duties, with an effective tariff of 40% on cotton imported without a quota. In addition, China maintains a strategic reserve of cotton, serving as a national buffer stock, which is managed by the China National Cotton Reserve Corporation (CNCRC). China releases cotton to the market from the reserve through a system of auctions when there is a shortage and replenishes the reserve in times of abundance, thus supporting prices. (ICAC '2018).
EU	Changes were introduced in the EU Common Agricultural Policy starting in 2009/10. As before, cotton producers receive 65% of EU support in the form of a single decoupled payment (income aid) and the remaining 35% in the form of an area payment (coupled, or production aid). Greece and Spain are the major cotton producers in the EU. For production aid, the maximum base eligible areas are set at 250,000 hectares for Greece and 48,000 hectares for Spain. (ARD, European Commission 2012)
India	India has a Minimum Support Price (MSP) system that was operational during the 2014/15 and 2015/16 seasons through direct cotton purchases by the government, because market prices were below the MSP during at least part of those sea sons. Cotton farmers in India benefit from debt forgiveness and fertiliser subsidies from their government. India also provides some backing in the form of subsidies for crop insurance, although the value of this support is unknown. In addition, the government of India provides support to cotton production through several programs, such as the development of infrastructure facilities for production and distribution of quality seeds. Under the government's Technology Mission, support was provided for the modernisation of ginning and pressing units and the improvement of cotton marketing in recent years. Noinformation on these programs is publicly available. In addition, the government supports the textile sector with a number of programs that provide direct support and soft loans. Indian farmers are aided by direct payments and large subsidies for in puts, such as irrigation water, power and fertilizers. Producers in India receive support corresponding to about 7.8 per cent of gross farm receipts, aswell as market price support of 2 per cent. India is subsidizing agriculture by over US\$11 billion. However, this is offset in the OECD data by what they term India's negative market price support, which reflects the amount that domestic producers are implicitly taxed due to a series of complex domestic regulations and trade policy that more than off sets any gains they receive from subsidies to the tune of US\$77 billion, a -14.8 per cent hit in terms of farm receipts. (ICAC '2018).
Turkey	The government of Turkey pays a premium per kilogram of seed cotton to producers. In the past, the premium for seed cotton produced from certified seeds was higher than that from non-certified seeds. According to ICAC, payments in Turkey represent about one-third of the farm value of cotton production. (ICAC '2018).
USA	The Agriculture Improvement Act of 2018 (Farm Bill). The bill includes continuation of the designation of seed cotton (unginned upland cotton that includes both lint and cotton seed) as a covered commodity under the Title 1 Price Loss Coverage (PLC) and Agriculture Risk Coverage (ARC) programs These programs were enacted in February 2018 by the 2018 budget legislation and were already effective for 2018/19 season. The 2018 Farm Bill marks a significant change in cotton farm policies -from mostly insurance programs to guaranteed and enhanced safety net and payments based on reference price, similar to the countercyclical payments that were in effect under the 2008 Farm Bill. This change will mean a significant increase in support to some upland cotton producers (those who control seed cotton base and still produce upland cotton). The new program is based on seed, not lint cotton, however, and will result in increased income support to those who control seed cotton base acres in a manner similar to pre-2014 Farm Bill, and it could result in increased US cotton plantings. However, the payments, if any, are decoupled from actual planting decisions since they are tied to historical, and not current, cotton acreage and yields. In addition to seed cotton ARC/PLC provisions, programs in the new Farm Bill includes full access to the market-ing loan program, and crop insurance products. The Economic Adjustment Assistance Programme provides a subsidy of US 3 cents/lb to textile mills in the United States of America for each pound of upland cotton consumed. Under the Short-Term Export Credit Guarantee Program, known as GSM-102, the United States Government guarantees loans made by US banks to non-US banks for the purchase of agricultural products exported by the United States of America (ICAC, 2018).
Uzbekistan	The Government of Uzbekistan is actively encouraging value-added exports of cotton yarn, fabric and clothing. First, the Government allocates certain districts and regions for cotton production and cotton farmers receive preferential access to scarce land and water resources, which are provided free of charge. Second, the Government sets the prices for seed cotton delivered by farmers to procurement centres, and over the past ten years the administered prices for cotton have been increasing in real terms. Finally, the Government sets the prices and provides financing to farmers for production inputs. (USDA '2022).
Vietnam and Bangladesh	Government to boost production since the late 1990s, its cotton policies are currently focused on encouraging the development of textile chains using imported fibre. No specific subsidies or programmes to encourage cotton production in Bangladesh, other than funding for research and extension activities (ICAC'2018).
C4 (Benin, Burkina Faso, Chad, Mali and Cote d'Ivoire)	Support is provided for cotton production in the form of subsidized fertilizer and planting seed (Chabi <i>et al.</i>, 2022) and (C4 Project Evaluation).

agricultural subsidies now vastly exceed those of the traditional subsidisers. China has now surpassed the United States as the world's biggest cotton subsidiser. Over the past decade, China has provided US\$41 billion in cotton subsidies-nearly six times more than the US\$7 billion provided by the United States. China alone accounts for nearly three-quarters of all cotton subsidies worldwide. China's heavy subsidies and import barriers have reduced the incomes of cotton farmers in Africa and around the world, causing significant economic pain for many developing countries. The C4 countries are among the lowest-cost producers of cotton. Despite this comparative advantage, these countries are losing world markets due to artificially depressed prices from the big cotton subsidisers.

Instead of reforming its cotton sector, the US has been challenging domestic support measures in other countries to get market access for its highly subsidised cotton.

India has more than 9 million cotton farmers with an average cotton farm size of 1.2 hectares. On the other hand, the total number of farmers in the US are 8103 with an average cotton farm size of 624 hectares. Over and above, per-farmer cotton-specific Amber box is only US\$ 27 in India as compared to US\$117494 in the US (Table 7). The US has flexibility to provide support up to 238% of the cotton VoP in 2020 due to AMS entitlement, whereas the developing countries are capped at 10%. Further, as a per centage of VoP, the product-specific support to cotton in India has always remained below the *de minimis* limit and despite this the average cost of production of cotton lint and seed cotton in India is less than that in the US. The US cotton farmers receive support through several programs, whereas cotton farmers in developing countries are low-income or resource-poor without any adequate safety nets. These farmers remain extremely vulnerable to price fluctuations caused by the entitlements of the developed members to provide support beyond the *de minimis* limit. This clearly shows that millions of poor cotton farmers in developing countries have been facing an unfair and uneven playing field in the international cotton trade.

Recent global developments with government assistance in the cotton value chain

Demand for cotton depends on the demand for textiles. Over the last decade, textiles utilisation has been risen steadily mainly driven by population and income growth mostly in developing countries, particularly in Asia. Moreover, demand for natural fibres has expanded quite markedly in recent years, sustained by a growing trend for sustainability, providing further market opportunities for cotton. It is estimated that 15 per cent of world cotton is produced under some sustainability standards. Despite these positive prospects and opportunities, the cotton share in global textile fibre consumption continues to hover around 27 per cent, after accounting for close to 60 per cent between 1960s and 1970s. Robust demand for man-made fibres, most notably polyester fibres, helped by technological

improvements, explains the loss in market share for cotton. The recent global development with government assistance in the cotton value chain has been discussed as given in Table 8.

Future estimates

World cotton production in 2022/23 is projected at 118.1 million bales, 2.5 million bales (2 per cent) higher than 2021/22. Global harvested area is forecast at 32.5 million hectares (80.3 million acres) in 2022/23, slightly higher than last season. The world cotton yield in 2022/23 is projected at 791 kilograms (kg) per hectare (706 pounds per acre), compared with the 3-year average of 770 kg per hectare (687 pounds per acre). China is expected to account for 24 per cent of world production this season. For India, 2022/23 cotton production is projected at 27.5 million bales, 12 per cent (3 million bales) above the year before, with increases in both area and yield. Harvested area is forecast about 7 per cent higher, at 13 million hectares and yield is also projected 5 per cent higher than last year at 461 kg per hectare, as more normal weather patterns allowed cotton plantings and production to rebound in key regions. India is expected to account for 23 per cent of world production this season. Projections now show a year-to-year decrease of 800,000 bales (13 per cent) to 5.2 million bales, the second lowest production level in nearly 40 years.

For India, this season's cotton exports are projected to reach 3.5 million bales, down from 3.7 million bales in 2021/22. On the other hand, cotton exports for Brazil in 2022/23 are expected to increase 670,000 bales (9 per cent) to 8.4 million bales, while Australia's exports are expected to increase 2.5 million bales (65 per cent) year-to-year to a record 6.2 million bales in 2022/23. With global mill use declining this season, China, Bangladesh and Vietnam are projected as the leading raw cotton importers in 2022/23. With global cotton demand declining and stocks increasing, the 2022/23 Cotlook A-Index average is expected to decrease from 2021/22's relatively high level of 131.7 cents per pound.

India will continue to be the world's largest cotton producer with the increase in production resting mostly on relatively higher yields, while area expansion is expected to be limited in line with recent trends. By 2030, India's cotton production is projected to expand to 7.2 mt (approximately 43 million bales of 170 kg each) compared with current output of 6 mt equivalent to roughly 36 million bales. India will contribute to as much as 40 per cent global increase in cotton production during the outlook period. Cotton yields must increase, agronomic limits be overcome, resource use must decrease and fibre characteristics need to transform to reach a level of performance that meets the demands of consumers (FAO, 2021).

CONCLUSION

Cotton is one of the world's greatest industries, touching almost everyone daily by providing incomes for tens of millions, connecting producers in remote areas to world markets. However, the industry must change and adapt in

order to compete with polyester, or it will decline. Greater coordination among the value chain segments to enhance transparency, improve efficiency and raise productivity would contribute to the long-term viability of the world cotton industry.

The global cotton market has been characterized by huge subsidies in developed countries, particularly in the late 1990s; most of these subsidies have consisted of domestic support measures. While subsidies are declining in developed countries, new developing countries have emerged, potentially providing more subsidies than developed countries did previously and offering less market access for least developed countries. Since the United States and the EU have partially reformed their support measures and since US production is expected to fall in the future, the burden has now shifted to these emerging countries, such as China, which is also the main destination for African cotton. Cotton is still considered a key commodity that deserves specific treatment. It is now expected that the reduction of cotton subsidies will be more important than reductions for other commodities and that these reductions will be implemented over a shorter period of time. Developing countries that still provide subsidies could benefit from lower reduction rates and longer implementation periods. Growing demand from the domestic apparel industry continues to spur investments in the sector. Support to the sector in India is expected to result in continuous growth in cotton mill use. The industry, however, faces several challenges, including technological obsolescence, high input costs and poor access to credit. To address these issues, the government has implemented several subsidy schemes and is currently developing a new textile policy for the overall development of the sector.

Conflict of interest

This is to ensure that our review is conducted ethically and in compliance with relevant guidelines and regulations.

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