Information on cotton

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Site map

Selected sources of statistics

- FAOSTAT Databases
- UNCTAD Handbook of Statistics
- UNCTAD TRAINS
- UNCTAD Commodity Price Bulletin
- International Cotton Advisory Committee (ICAC)
- Eléments statistiques sur le coton en Afrique de l'Ouest et du Centre (PDF, *French only*): OECD - Sahel and West Africa Club
- Current World Production, Market and Trade Reports: United States Department of Agriculture (USDA)
- Cotton - World Statistics: International Cotton Advisory Committee
- Cotton: Review of the World Situation: International Cotton Advisory Committee
- International Cotton Industry Statistics: International Textile Manufacturers Federation (ITMF)

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Cotton - Marketing Setting, Trade Policies, and Issues (J. Baffes): World Bank Policy Research Working Paper 3218, February 2004.

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Cotton Facts : CCIC and CFC, 2003

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Industry and Trade Summary - Cotton: US International Trade Commission, January 2001

Comparing the Seed Cotton and Wheat Marketing Chains in Sindh (H.R. Lohano, L.E.D. Smith, M. Stockbridge): The Pakistan Development Review, Spring 1998

Cotton Ginners Handbook: United States Department of Agriculture, Agricultural Research Service, December 1994

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Que sais-je ? Le coton et l'industrie cotonnière (P. de Calan), 1996

Clever Links

General information on cotton

Cotton-Forum (Particularly the documentation section)

Gossypium spp. - Cotton: Food and Agriculture Organisation of the United Nations

Cotton - Gossypium hirsutum: Texas A&M University, Department of Plant Pathology and Microbiology

Les modifications du panorama cotonnier de 1949 à 1999: Dagris

Le rôle des facteurs techniques: Dagris - *French only*

Les saisons du coton: Dagris - *French only*

Pest Management: National Cotton Council of America

How to Manage Pests - Cotton: University of California, Agriculture and Natural Resources, IPM Program

Cotton Homepage: University of Georgia, College of Agricultural and Environmental Sciences

Cotton Diseases: University of Georgia, College of Agricultural and Environmental Sciences

Cotton Disease and Nematode Management: University of Georgia, College of Agricultural and Environmental Sciences

Cotton Fact Sheets: Cotton Australia

Cotton Homepage: Queensland Government (Department of Primary Industries and Fisheries)

Story of Cotton: Cottonjourney.com

Quality

United States Standards for the Color Grade of American Upland Cotton: United States Department of Agriculture (5 August 1993)

Cotton Standardization: United States Department of Agriculture

Le classement : un savoir faire et une technologie: Dagris - *French only*

Classification of Upland Cotton: Cotton Incorporated

Classification of American Pima Cotton: Cotton Incorporated

Cotton standardization and grading - Pakistan: United Nations Development Programme

International Bureau for the Standardisation of Man Made Fibres

Uses

L'huile de coton : 5 ème huile alimentaire dans le monde: Dagris - *French only*

Market

Cotton - World Markets and Trade (Feb. 2005): United States Department of Agriculture; Archives since 1996: Cotton: World Markets and Trade

Evolution de la consommation mondiale dans la filature: Dagris - *French only*

Cotton and Wool Yearbook: United States Department of Agriculture, Economic Research Service *(pdf: 3,470 KB)*

World Cotton Supply, Use and Trade: United States Department of Agriculture, Foreign Agricultural Service (FAS)

Importance of Cotton Production and Trade in West Africa: Sahel and West Africa Club/OCDE (March 2004)

- Power Point presentation
- Text of the presentation

- **Chains**

Chad Cotton Sector Reform - A Case Study on Poverty and Social Impact Analysis: World Bank

Cotton Sector Reform in Chad - An Institutional Analysis: World Bank

Reforming the Cotton Sector in Sub-Saharan Africa: World Bank

On Burkina Faso, Benin, Chad, Ivory Coast, Mali, and Niger, please refer to izf.net website - *French only*

Les filières partenaires: Dagris - *French only*

Cotton - profiles of a resourceful industry: National Cotton Council of America

Le coton à Madagascar: CITE - *French only*

L'avenir des filières cotonnières ouest africaines : quelles perspectives après Cancun? - *French only*

Projet de développement d'une culture de coton génétiquement modifié au Mali : Ministry of Agriculture, Livestock and Fisheries - *French only*

Analyse économique de l'impact de la recherche sur le coton au Niger: Purdue University, Department of Agricultural Economics (Dec. 2001) - *French only*

"Cotton Taxation in Uzbekistan", World Bank, August 2005.

Market intelligence and recent information as regards cotton in Western Africa, USDA, December 21, 2005

- **International, professional, trade and research organisations**

International Cotton Advisory Committee (ICAC)

OECD - Sahel and West Africa Club

International Center for Trade and Sustainable Development (ICTSD)

Committee for International Co-operation between Cotton Associations (CICCA)

Australian Cotton Research Institute (Australia)

China National Cotton Exchange (China)

California Cotton Ginners Association and the California Cotton Growers Association (United States)

Cotton Council International (CCI) (United States)

National Cotton Council of America (United States)

National Cottonseed Products Association (United States)

Supima Association of America (United States)

US Cotton Board (United States)

Association Française Cotonnière (AFCOT) (France)

Liverpool Cotton Association (United Kingdom)

Companies

Otto Stadtlander GmbH (Germany)

Auscott Ltd (Australia)

Colly Cotton Marketing Pty Ltd (Australia)

Namoi Cotton Cooperative Ltd. (Australia)

Queensland Cotton Corporation Ltd (Australia)

Weil Brothers Cotton Aust Pty Ltd (Australia)

Weil Cotton Inc (Australia)

Louis Dreyfus Cotton International NV (Belgium)

Chinatex (China)

Daewoo Corporation (Republic of Korea)

Industrial Promotion Services, IPS (Ivory Cost)

Allenberg Cotton Co (United States)

Anderson Clayton Corp (United States)

Calcot Ltd. (United States)

Cargill (United States)

Dunavant Enterprises, Inc (United States)

Ecom Agroindustrial Corp Ltd (United States)

Jess Smith & sons Cotton Ltd (United States)

Paul Reinhart Inc (United States)

Plains Cotton Cooperative Association (United States)

Staple Cotton Cooperative Association (United States)

DAGRIS (France)

Devcot SA (France)

Mambo Commodities (France)

Indutech Spa (Italy)

Toyo Cotton (Japan) Co (Japan)

Toyoshima & Co Ltd (Japan)

Uzprommashimpeks (Uzbekistan)

Central Cotton Company Limited (United Kingdom)

Plexus Cotton Ltd (United Kingdom)

Weil Brothers & Stern Ltd (United Kingdom)

Olam International Ltd (Singapore)

The Sudan Cotton Company Ltd (Sudan)

Cogecot Cotton Company SA (Switzerland)

Ecom Agroindustrial Corp Ltd (Switzerland)

Glencore International Ag (Switzerland)

Cargill Tanzania Ltd (Tanzania)

Etem Ozsoy Tarim Ticaret Ve Sanayi As (Turkey)

Cargill Zimbabwe Pvt Ltd (Zimbabwe)

Cotton Company of Zimbabwe (Zimbabwe)

- **Industry directories**

http://www.cotton-net.com/directory/

http://www.textilefiberspace.com/trade/index.html

http://www.info-textile.com/

http://www.textile.fr:81/fet/annuaire/index.htm

http://www3.kompass.com/kinl/fr/

- **Technology**

Lectures on Mercerization: textileinfo.com

Cotton Fibers: Xiao Gao and Praveen Kumar Jangala

National Institute for Agricultural Research (INRA)

International Service for the Acquisition of Agri-biotech Applications (ISAAA)

- **Prices**

La volatilité des prix sur le marché mondial du coton: International Cotton Advisory Committee (ICAC)

Le coton africain dans le marché mondial: International Cotton Advisory Committee (ICAC)

La compétitivité du coton de la zone franc dans le marché mondial: International Cotton Advisory Committee (ICAC)

""L'Impact sur l'Economie Malienne du Nouveau Mécanisme de Fixation du Prix du Coton Graine", Oxfam/Cirad/IER Ecofil case study in Mali August 2005.

- **Economic policies**

Accomplishing a sustainable agricultural model for Europe through the reformed CAP - the tobacco, olive oil, cotton and sugar sectors: Communication from the European Commission to the Council and European Parliament

The Cotton Sector: Working paper of the European Commission's Directorate-General for Agriculture

The Changing Pattern of International Trade in Textiles and Clothing - Implications of the Introduction of the Agreement of Textiles and Clothing (ATC) on the African Textiles and Clothing Sector: International Trade Centre (ITC)

Textiles and Clothing: What Happens After 2005?: International Trade Centre (ITC)

The Multilateral Trading System and the New Political Economy for Textiles and Clothing: International Trade Centre (ITC)

Briefing Room - Cotton: United States Department of Agriculture (USDA)

Globalisation in textiles: corporate strategy and competitive advantage: The third annual Pasold lecture, London School of Economics

Les producteurs de coton des pays CFA face aux subventions américaines et européennes: International Centre for Trade and Sustainable Development (ICTSD)

WTO, NEPAD, UEMOA and the Subsidies to Agriculture: Translated from the opinion column published in "Marchés tropicaux et Méditerranéens" of 21 June 2002

Cotton after Cancun: Independent contribution to an initiative of the Sahel and West African Club (OECD), March 2004

The Impact of US Subsidies on the World Cotton Market - A Reassessment: B. Shepherd, Groupe d'économie mondiale, Institut d'études politiques de Paris (March 2004)

For an EU-Africa cotton partnership: P. Lamy, EU-Africa Forum on cotton (5 juillet 2004)

EU-Africa Cotton Forum: Pascal Lamy proposes a joint strategy for African countries

Cotton: EU-Africa Forum to outline roadmap supporting African Cotton (2 July 2004)

Préserver un futur au coton africain : la revendication légitime d'équité dans les échanges mondiaux ne sera pas suffisante: French Agricultural Research Centre for International Development (CIRAD)

Ideas Centre International Trade Development Economic Governance Advisory Services

Partners

Enhanced cooperation is being established between the International Cotton Advisory Committee (ICAC) and UNCTAD to promote information exchanges and transparency on the cotton market. In this regard, information on international cotton market is regularly updated as the ICAC makes available to Infocomm an abstract of its monthly outlook as regards the World Cotton Situation. For more information, please consult ICAC website.

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Characteristics

Description and technical features

Cotton is a natural fibre of vegetable origin, like linen, jute or hemp. Mostly composed of cellulose (a carbohydrate plant substance) and formed by twisted, ribbon-like shaped fibres, cotton is the fruit of a shrubby plant commonly referred to as the "cotton plant". The cotton plant, a variety of plants of the genus *Gossypium*, belongs to the *Malvacae* family, which comprises approximately 1,500 species, also including the baobab tree, the bombax or the mallow. The plant, growing up to 10 metres high in the wild, has been domesticated to range between 1 to 2 metres under commercial cultivation. Either herbaceous or ligneous, it thrives in dry tropical and subtropical areas. Whereas by nature the plant is a perennial tree (lasting about 10 years), under extensive cultivation it is mostly grown as an annual shrub. The cotton flower has five large petals (showy, white, white-creamy, or even rose in colour), which soon fall off, leaving capsules, or "cotton bolls", having a tick and rigid external layer. The capsule bursts open upon maturity, revealing the seeds and masses of white/creamy and downy fibres. Cotton fibres of the *Gossypium hirsutum* species range from about 2 to 3 centimetres in length, whereas *Gossypium barbadense* cotton produces long-staple fibres up to 5 centimetres length. Their surface is finely indented, and they become kinked together and interlocked. The cotton plant is almost exclusively cultivated for its oleaginous seeds and for the seminal fibres growing from them (i.e. cotton, strictly speaking). In ordinary usage, the term "cotton" also makes reference to fibres that are made into fabric wires suitable for use in the textile industry.

Although the cotton plant is native to tropical countries, cotton production is not limited to the tropics. Indeed, the emergence of new varieties, as well as advances in cultivation techniques led to the exapansion of its culture within an area straddling from approximately 47 degrees North latitude (Ukraine) to 32 degrees South (Australia). Although cotton is widely planted in both hemispheres, it remains a sun-loving plant highly vulnerable to freezing temperatures. Cotton is crucially important to several developing countries. Out of the 85 cotton-producing countries in 2005, 80 were developing countries, 28 of which were indexed by the United Nations among the least developed countries (LDCs).

Cotton-growing countries by geographical area, 2005

	Developed countries	Developing countries		Total
		LDCs	Other	
Africa	1	21	15	37
North and Central America		2	14	16
South America			7	7
Asia	1	5	16	22
Europe	2			2
Oceania	1			1
Total	5	28	52	85

Source: UNCTAD secretariat

Cotton is of utmost importance to developing countries, particularly in West and Central Africa, where around 10 million people depend on the sector for their revenues. Besides being a major natural fibre crop, cotton also provides edible oil and seed by-products for livestock food. Cottonseed oil is a vegetable oil ranking fifth in world use among edible oils (accounting for about 5% of world consumption of vegetable oil). The cottonseed meal is usually used as roughage in the diet of cattle.

The most commonly cultivated species of cotton in the world include *Gossypium hirsutum* and *Gossypium barbadense* (also referred to as "New World" species). *Gossypium hirsutum* originated in Mexico. It is the most important agricultural cotton, accounting for more than 97% of world fibre production. *Gossypium barbadense*, of Peruvian origin, accounts for about 3% of world fibre. It includes cotton fibres of the highest quality, such as the Jumel variety (from the Barbados), among the finest cotton fibres in terms of quality and fibre length. Two additional cultivated species are *Gossypium arboretum* (which originated in the Indo-Pakistan subcontinent) and *Gossypium herbaceum* (from southern Africa), which are also called "Old World" or "Asiatic cottons". These two varieties of cotton with short staple-length fibre have no commercial value per se. However, several varieties that are grown on a commercial scale botanically derive therefrom.

Cottonseed composition

	Whole seed	Oilmeal (deoiled and partially peeled)	Oilcake expeller (partially peeled)	Hull
Dry matter (%)	92	90	93	92
Proteins (%) MS	22 (19-25)	42 (35-53)	40 (28-49)	5 (3-7)
Rough cellulose (%) MS	28 (23-37)	18 (11-23)	15 (11-23)	53 (49-62)
Fatty matter (%) MS	20 (10-28)	3 (0,4-6)	7 (4-11)	3 (0,6-5)
Ashes (%) MS	4	7	7	3
Calcium (%) MS	0,2	0,3	0,2	0,15
Phosphorus (%) MS	0,6	1,3	1,2	0,19

Source: Institut national agronomique (INA)

Origin and history

The cotton plant has always thrived in the wild. By contrast, the historical origin of its commercial exploitation, particularly with regard to textile uses, is fuzzier. Relevant literary references point to two distinct geographical origins of cultivated cotton, namely, Asia and pre-Columbian America. The first cotton fabric would date back to approximately as early as 3,200 BC, as revealed by fragments of cloth found at the Mohenjo-Daro archaeological site on the banks of the River Indus. From India, cotton textiles probably passed to Mesopotamia, where the trade started around 600 years BC. There is evidence to suggest that trade in cotton

started around Rome at the time of Alexander the Great, in the 4th century BC. The trade flourished after the discovery of the maritime route passing by the Cape of Good Hope and the establishment of trading posts in India. Portuguese trading prominence in this part of the world had been challenged by other European countries (notably, France and England) since 1698. The Arab conquests introduced the first cotton manufacturing facilities into Spain (Granada), Venice, and Milan. In England, the first cotton-spinning factory opened its doors in Manchester in 1641. This date marked the beginning of the cotton industry in Europe. The industrial revolution of eighteenth century Europe paved the way for the most far-reaching, influential transformation of cotton textile manufacturing. In this connection, the major technological innovations were the following:

KAY	1733	First flying shuttle.
HARGREAVES	1764	First spinning wheel operating several spindles (*spinning-Jenny*).
ARKWRIGHT	1767	Water-powered machine to draw out and turn the cotton thread (*water-frame*).
WHITNEY	1793	Invention of the cotton gin.
JACQUARD	1805	Automatic weaving loom endowed with a chain of cards with holes punched in. The loom could weave several patterns.

Following these technological developments, those European countries that had managed to imitate the finesse of the Indian fabrics ceased their trade with India almost completely. Only English commerce with India, transacted by the East India Company, continued. However, England kept trading in raw cotton, while trade in processed forms was declining, especially after the demise of the East India Company in 1858. The second largest commercial outlet for Indian cotton was China. Cotton textile manufacturing resumed in India under the influence of Mahatma Gandhi.

In America, cotton was introduced with the arrival of European settlers familiar with cotton culture, who paved the way for the expansion of cotton plantations.

Some authorities trace back the origin of cultivated cotton to the pre-Columbian civilisations of Mesoamerica (particularly in Peru and Guatemala). It is argued that cotton spread to Mexico from these regions and societies. Cotton varieties grown in the United States were domesticated independently from cotton species originating in Central America. It is nonetheless interesting to note that American upland cotton, the most commonly cultivated type in the US, botanically derives from *Gossypium hirsutum*, a pre-Columbian species.

Mahatma Gandhi portrayed while spinning cotton with a wheel is still an outstanding symbol in the collective unconscious. The wheel itself, a device deeply embedded with national history, stands at the centre of the Indian flag.

Crop

Cultivation

Cotton is primarily grown in dry tropical and subtropical climates at temperatures between 11°C and 25°C. It is a warm climate crop threatened by heath or freezing temperatures (below 5°C or above 25°C), although its resistance varies from species to species. Excessive exposure to dryness or moisture at certain stages of the plant development (lasting 5 to 7 months) may be detrimental to cotton quality and yields, and might also kill the plant.

The seeds should be planted in well-prepared moist soil with high nutrient supplying capacity. Indeed, the cotton plant is particularly weak and its moisture and nutrient uptake is remarkable. Cotton production tends to exhaust the soil, which may require some soil management practices typically by means of physical adjustments, fertilisation, and crop rotation (notably with a culture of leguminous plant and one of cereal). Moreover, the root system of the cotton plant is particularly developed and penetrates downward deeply (its depth can sometimes double the height of the surface stem). Accordingly, cotton should be planted in rich seedbeds that are muddy or argillaceous-sandy, where the taproot would grow downward deeply and develop under favourable conditions. Seedling emergence can occur between one week and a month after planting. During this phase (germination, emergence and seedling growth), the plant needs warm temperature and much moisture (7,000 to 9,000 m3 by hectare), which can be supplied by nature or by means of irrigation. Cotton leaves are about 12-15 cm in length and width. They develop along the main stem in a spiral arrangement. Each new leaf commonly develops 5 to 8 cm above the preceding leaf.

Flowering generally starts one month and a half to two months after the crop is planted. Blooming will continue regularly for several weeks, even months, as long as growing conditions are suitable. After flowering, the inner part of the bloom gradually develops into a fruit (called "cotton boll"). Cotton bolls keep growing until full size (approximately 2 to 3 cm width). It will take about two months between the blooming of the flower and the first opening of the bolls.

Cotton bolls burst open upon maturity, revealing soft masses of fibres. Cotton harvesting is then possible (the relevant timeframe is detailed in the table below, to which the reader is referred). The cotton is picked either manually or mechanically. Manual picking is a very labour intensive and time-consuming task, and may be rather expensive. However, it generally produces quality lint with limited amount of trash, since cotton bolls are picked by hand as they burst open upon maturity. Cotton is harvested mechanically by *cotton pickers* (the most commonly used) or *cotton strippers*, which remove all the cotton bolls. Cotton strippers are generally used after application of a defoliant. Mechanical harvesting is faster than the manual picking of cotton. However, unwanted leaves and twins may be collected with the cotton. Cotton picked by a stripper might thus need additional cleaning (sorting of the trash) in order to obtain quality lint. Once the cotton is picked (either mechanically or

manually) it is transported to a cotton gin, where the cotton fibres (lint) are separated from the cottonseeds. The cotton lint is then compacted in bales and stored.

Especially in the United States, cotton is increasingly grown as "irrigated" cotton. Although irrigated cotton farming tends to be more expensive than "dry land" cotton (which relies on rainfall), it generally produces higher quality lint with greater uniformity and yield potential. Moreover, the maturation period tends to be shorter than for dry land cotton.

Planting and harvesting times for cotton, by producing country

The cotton season conventionally starts on the 1st of August each year.

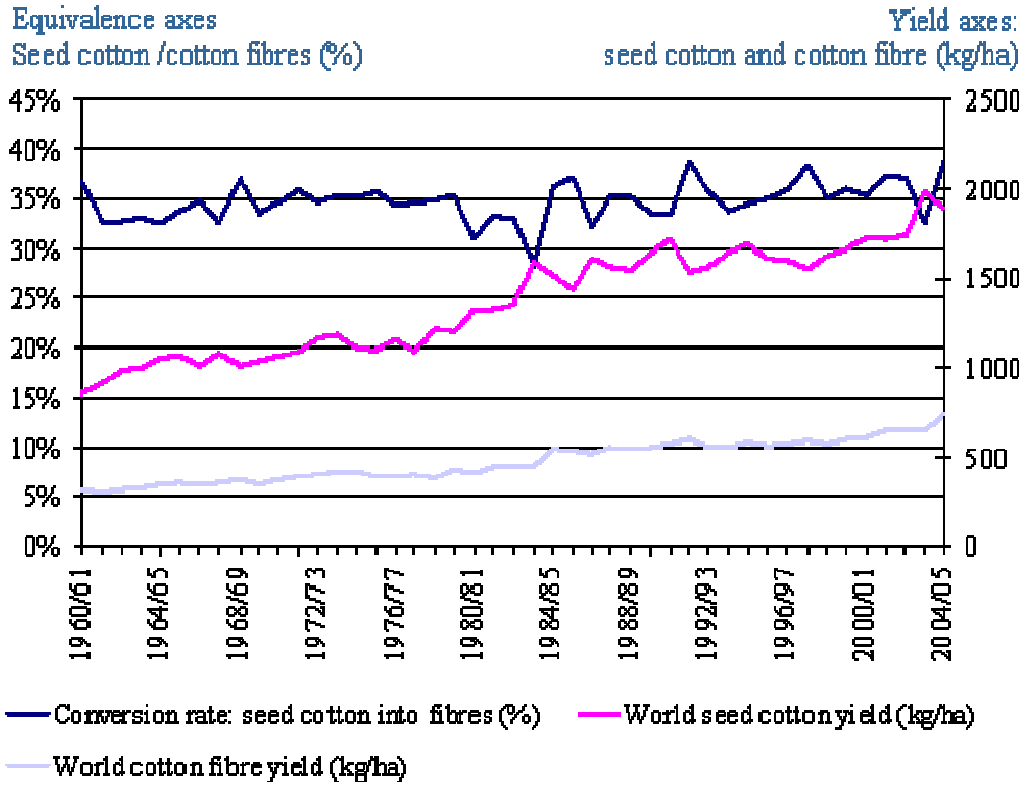
Source: UNCTAD secretariat, based on Dagris and ICAC information

For further information, please refer to:

- Cotton with Special Reference to Africa (A. N. Prentice): chapter 10 - the physical environment: climate and soil, 1972.

Yields

World cotton yields (seed cotton and cotton fibre), 1960/61 to 2004/05



Source: UNCTAD secretariat (Data: Food and Agriculture Organisation (FAO) for seed cotton; the International Cotton Advisory Committee (ICAC) for cotton fibre)

World annual yield production of seed cotton has increased in a constant manner since the early 1960s, except during the decade 1990's where it remained relatively unchanged. Yields in seed cotton rose from 858 kg/ha in 1961 to 1,893 kg/ha in 2005.

While during the 1960-1980 yields in developed countries were on average more than twice and a half those of developing countries, since the beginning of the 1980s the gap has increasingly narrowed, up to a ratio of 1.4 in 2005. Much of the rise in developing countries' share can be attributed to improved yields in China, mainly as a result of investment in research and innovation. Cotton fibre production and yields have also grown considerably. Over the period 1961-2005, fibre output per hectare (world average) grew from 314 kg to 733kg, with an average increase of about 2% per year. Developing and developed countries have followed the same pattern of convergence as for seed cotton.

The five largest producers in the period 1961-2005 were, by order of importance, China, the United States, the Commonwealth of Independent States (Uzbekistan in particular), India and Pakistan. Since the beginning of the 2000s, China recorded higher yields per hectare compared to the other countries with an average of 3,000 kg/ha for seed cotton and 1,090 kg/ha for cotton fibre (about 35% more than the United States over the same period).

Cotton yields (kg/ha), China

Productivity increased sharply in China during the period 1961-1966, when seed cotton yields per hectare rose from 620 kg to 1,425 kg (with an increase of about 130% in five years) and fibre output per hectare moved from 259 kg to 345 kg. But since then productivity had been flat, at least up to the early1980s, when seed cotton yields increased by more than 5 (reaching 3,197kg per hectare in 2005) and output levels rose by more than 4 for cotton fibre (1,119 kg/ha in 2005).

	1960	1970	1980	1990	2000	2005
Seed cotton yields (kg/ha)	1097	1366	2218	2610	3251	3197
Cotton fibre yields (kg/ha)	310	450	715	844	1090	1119
Ginning output (%)	29	33	32	33	34	35

Source: UNCTAD secretariat (Data: ICAC)

Cotton yields (kg/ha), former Soviet Union

Over the period 1961-1991, the former Soviet Union was able to produce higher cotton yields per hectare than the other major cotton producing countries, with an average of 2,562 kg/ha. Since the collapse of the Soviet state, productivity has been flattening. The annual average output over the period 1992-2005 was approximately 2,056 kg/ha, that is, it declined by approximately 500 kg/ha per annum.

	1960	1970	1980	1990	2000	2005
Seed cotton yield (kg/ha)	2206	2764	2672	2197	2070	2296
Cotton fibre yield (kg/ha)	742	861	775	695	625	670
Ginning output (%)	34	31	29	32	30	29

Source: UNCTAD secretariat (Data: ICAC)

Cotton yields (kg/ha), India

Indian yield had increased in a constant manner over the period 1961-2005, with an average yield of 558 kg/ha for seed cotton and 215 kg/ha for fibres. As regard the conversion rate of the seed cotton into cotton fibre, it grew in a regular and significant manner and is among the most important ones in 2005 with 53% (+70% since 1960).

	1960	1970	1980	1990	2000	2005
Seed cotton yield (kg/ha)	394	481	565	700	745	824
Cotton fibre yield (kg/ha)	124	150	222	300	341	439
Ginning output (%)	31	31	39	43	46	53

Source: UNCTAD secretariat (Data: ICAC)

Cotton yields (kg/ha), United States and Pakistan

United States and Pakistan were respectively the second and fourth major world producers, with a respective output of 8 and 3 million tonnes of cottonseed. However, their productivity rate (1,679 kg/ha for the United States and 1,315 kg/ha for Pakistan) did not depart significantly from the world average (1,568 kg/ha over the period 1961-2005).

		1960	1970	1980	1990	2000	2005
Seed cotton yield (kg/ha)	United States	1456	1393	1773	1875	2113	2272
	Pakistan	845	842	1412	1731	1831	2280
Fibre yield (kg/ha)	United States	538	533	646	724	804	958
	Pakistan	272	312	443	576	533	769
Ginning output (%)	United States	37	38	36	39	38	42
	Pakistan	32	37	31	33	29	34

Source: UNCTAD secretariat (Data: ICAC)

Although cotton production in Africa is not significant on a global scale, a large number of African countries remain heavily dependent on cotton. For example, cotton accounts for 60% of foreign exchange earnings in Mali. Between 1961 and 2005, West African countries reported cotton yield per hectare at approximately 900 kg. Yields have been rising over the reference period, reaching approximately 1,200 kg per hectare in 2005, up from 437 kg/ha in 1961, with an annual productivity growth of around 3%. Cotton production and productivity levels vary considerably among African countries. Besides West African countries, the case of Egypt deserves special consideration. Indeed, production and productivity levels were remarkably higher in Egypt than in any other African cotton producing country. Egypt accounted for about 30% of total output in Africa between 1961 and 2005, producing nearly 1.06 million tonnes of cotton over the reference period. In terms of productivity, between 1961 and 2005 its yield per hectare was at 2,250 kg, that is to say, Egypt produced per hectare more than double the cotton of the best performing African country. This performance originates in the fact that cotton is grown under irrigation in Egypt, a way of cultivation that is generally not used in West Africa. By contrast, Chad and the Centrafrican Republic performed weakly, with an annual yield ranging between 400 and 500 kg/ha on average over the period 1961-2005. Even though the annual growth rate has been significant (around 6%), yield per hectare was set below 800 kg in 2005.

Cotton yields (kg/ha), Francophone Africa

	1960	1970	1980	1990	2000	2005
Agricultural output (kg/ha)	560	801	1037	1061	1219	1239
Cotton fibre yield (kg/ha)	233	219	408	427	426	443

Output at cotton gin (%)	42	27	39	40	35	36

Source: UNCTAD secretariat (Data: ICAC)

Note: The analysis draws on figures for nine francophone African countries: Benin, Burkina Faso, Cameroon, Centrafrican republic, Chad, Côte d'Ivoire, Mali, Senegal, Togo, Madagascar, Niger.

Cotton pests and diseases

Cotton pests

Cotton insects are the principal cause of yield losses. Estimates indicate that the yield losses due to insect infections would amount to almost 15% of world annual production.

More than 1300 different species of insect pests attack the crop. Among the most common and endogenous species found in cotton fields are:

• The pink bollworm (*Pectinophora gossypiella*) was first described in 1843 by W.W. Saunders as *Depressaria gossypiella*, from specimens found to be damaging cotton in India in 1842. The pink worm withdraws nutrients from the inside of the cottonseed and may cause serious yield losses. Although the most sever infestations have occurred in Africa and India, the pink bollworm has been recorded in nearly all cotton-producing countries and is a key pest in many of these areas. Infestations may be reduced by the heating of cottonseeds at about 55°C, as well as by other management tactics, including plantation treatment and destruction of the infested crop.

• The boll weevil (*Anthonomus grandis*), also known as bollworm, is most common in American cotton plantations.

• The Egyptian (spiny) bollworm (*Earias insulana*) and the red bollworm (*Diparopsis castanea*) feed on the developing cotton bolls.

• Cotton stainers (*Dysdercus superstitious*) attack maturing cotton bolls and seeds. They may cause the staining of the lint. In addition, feeding wounds may allow the entry to the boll of saprophytic fungi (organisms which draw nutrients from the host, but do not harm it, contrary to parasites).

• Other insect pests of cotton, such as the white flies (*Bemisia gossypiella*), may adversely affect lint quality and yield potential. They suck sap from leaves and pose the most serious threat in India and Africa.

• The cotton aphid (*Aphid gossypii*), also known as the melon aphid, infests the cotton seedlings. Cotton aphids are among the most injuring insects found in cotton. They suck sap from leaves and secrete honeydew* on the undersides of leaves. Honeydew secretions may burn the leaves and interfere with photosynthesis. In addition, aphid is a vector of viruses and a carrier of other insects. In Africa, aphid infestations are among the most injuring insect pests in terms of economic yield lost.

• Nematodes: There are approximately 128 species of nematodes associated with cotton. Five parasitic forms pose the most serious threat to the crop, including the *Meloidogyne incognita* (or root knot nematode) and the *Rotylenchulus reniformis* (or reniform nematode). These two species can become serious pests (in the United States, particularly in the State of Virginia, they accounted for 99% of the damage caused by cotton parasitic nematodes). These parasites live in the soil (the root knot nematode favours rough and arenaceous* soil) and withdraw nutrients from the plant roots. Symptom patterns associated with nematodes include stunting, potassic deficiency or early maturity. Nematodes can reduce yields (in Alabama, United States, yield losses are estimated to average 10% or 20%, but can peak to 50% in arenaceous dry soil). Also, depending upon the stage of development of the infested crop, they can hamper the quality of cotton. Root knot nematodes do produce plant damage symptoms that are rather easy to recognise, such as the yellowing or whitening of normally green plant tissue because of a decreased amount of chlorophyll. Damage symptoms caused by other kinds of nematodes (for example, the reniform nematode) are more difficult to detect, since they are generally small and sparse. Besides the direct damage, nemitodes are also an important factor in the incidence of Fusarium and other wilts of cotton. Nematodes may be controlled by cultural practices, such as crop rotations, soil tilling, and use of resistant varieties, or by chemical treatment through nematicides. The two types of nematodes seldom coexist in the same fields.

Certain species are endemic to specific areas of the world. For more information on these types of cotton pests, please refer to the following website:

- Parasitic problems, two new Thysanoptera, insect pests of the cotton plant in Ivory Coast: French Agricultural Research Centre for International Development

More information on cotton pests at:

- Insects associated with Gossypium hirsutum: United States Department of Agriculture, Agricultural Research Service, Southern Plains Agricultural Research Center (SPARC), Crop Germplasm Research Unit

- Fungi associated with Gossypium hirsutum: United States Department of Agriculture, Agricultural Research Service, Southern Plains Agricultural Research Center (SPARC), Crop Germplasm Research Unit

- Cotton and melon aphids: French National Institute for Agricultural Research

- Cotton (P.M. Phipps, Extension Plant Pathologist, Tidewater AREC): Virginia Cooperative Extension

- Pest Management: National Cotton Council of America (in particular, the section on nematodes)

- Nematode: French National Institute for Agricultural Research

- Nematodes in Cotton in Alabama: William Gazaway, Extension Plant Pathologist, Professor, Plant Pathology, Auburn University

- Cotton with special reference to Africa (A. N. Prentice) : chapter 12 - Cotton pests and diseases, 1972.

- Cotton facts: International Cotton Advisory Committee and Common Fund for Commodities (2003)

Most common diseases in the cotton plant

• Bacterial blight of cotton, also called angular leaf spot (*Xanthomonas malvacearum*) is favoured by wet weather (temperature above 25°C and relative humidity exceeding 85%). Disease incidence is higher in plants with injured tissues (due to insect pests or cold temperatures). The disease causes stunting and yellowing of the leaves (mainly lower leaves). As diseases progresses, it may result in defoliation. Affected bolls are smaller than normal and exhibit small black spots on their surface. Bolls may fail to open or produce bad quality lint.

• Boll rot (*Diplodia gossyina*, *Colletotrichum spp.*, *Fusarium spp.*) attacks lower bolls near maturity. Warm, humid conditions favour the disease. Affected bolls are dark brown, with a white to salmon-pink overgrowth. The fungus is capable of giving a brownish tint to the lint. This disease is a stress-related one, in the sense that it infects plants that have been previously damaged by insect pests. Management practices include seed treatment, as well as the use of resistant varieties.

• The *Verticillium dahliae*, a common soil inhabitant, penetrates though roots and grow up along the stem tissue. The fungus is favoured by cooler temperatures, excessive soil moisture and excessive soil nitrogen levels. Symptoms first appear on the lower leaves, which turn yellow. Larger plants are stunted (as diseases progresses, defoliation may occur), whereas younger seedlings may die.

Management strategies include proper management of irrigation and the selection of resistant varieties. Under conditions favourable to the development of the disease, yield reductions of up to 30% are possible.

• Seedling diseases (fungi *Rhizoctonia solani*, *Pythium spp.*) cause seed and root rotting. In the case of *Rhizoctonia solani*, girdling of the stem at ground level is observed. *Pythium spp.* is characterised by the similar symptom patterns, with a water soaked lesion at the soil line.

• Fusarium wilt (*Fusarium oxysporum, F. vasinfectum*) was first discovered in the United States in 1892, in Egypt ten years later. Wet weather conditions (temperature above 23°C and relative humidity exceeding 85%) are particularly conducive to disease development. Disease incidence can be higher in plants with injured tissues (for example, plants damaged by nematodes). Plants can be affected by the disease at any stage during the season. The vascular tissue of infected plants exhibits a brown/chocolate discolouration through the main stem. Infected water-conducting stem tissues become inactive, causing wilted foliage. Plant death, wilting, yellowing and defoliation are typical of disease symptoms. Leaves turn yellow between veins and eventually shed to leave bare stems. Once the fungus has colonised the plant (diagnosis is confirmed by splitting the stem to reveal dark brown), it most likely causes the death of the host. There is no commercially viable way to eradicate the disease once established (apart from soil fumigation, which is excessively expensive). The impact of the disease may nonetheless be reduced by the use of varieties with high levels of resistance to

Fusarium wilt, or by avoiding crop stresses such as over-irrigation and over-application of nitrogen. Fusarium wilt is now an important constraint to sustainable cotton production, especially in Australia.

• Of all diseases known to occur in cotton, cotton root rot (*Phymatotrichum omnivorum*) is one of the most destructive and difficult to control. The fungus lives in alkaline soils low in organic matter. It occurs only at elevations below 1500m. The fungus has unique biological characteristics that contribute to management difficulties. First of all, Phymatotrichum omnivorum has a remarkably wide host range (infecting over 2300 species alongside cotton), although it attacks only mature plants and does not easily spread from field to field. Second, the fungus survives for long periods of time in the soil (much of the fungus is found as deep as 60cm to 2m in soils). This explains why fungicides are not effective treatment. The fungus is only active when air and soil temperatures are high (respectively above 40°C and 27°C). When environmental conditions are conducive to its development, the fungus invades the pants through their root system. Infected plants can die in two weeks. The first disease symptom is slight yellowing of the leaves, which then quickly turn to a bronze colour and begin to wilt.

For further information on diseases in cotton, please refer to:

- Pest management in cotton: The State of Queensland (Department of Primary Industries and Fisheries)

- Cotton Diseases: The Bugwood Network, University of Georgia, College of Agricultural and Environmental Sciences and Warnell School of Forest Resources

- Cotton Home Page: University of Georgia, College of Agricultural and Environmental Sciences, in particular:

• Disease and Nematode Management in Georgia Cotton: University of Georgia, College of Agricultural and Environmental Sciences,

• Cotton diseases and nematodes management: University of Georgia, College of Agricultural and Environmental Sciences.

- Cotton - Gossypium hirsutum: Texas A&M University, Department of Plant Pathology and Microbiology

- How to Manage Pests (Cotton): University of California, Agriculture and Natural Resources (UC IPM - Statewide integrated pest management guidelines)

- Cotton facts (M. R. Chaudhry, A. Guitchounts) : Comité consultatif international sur le coton et Fonds commun sur les produits de base, 2003

- Cotton with special reference to Africa (A. N. Prentice) : chapter 12 - Cotton pests and diseases, 1972.

Glossary

Honeydrew: "Liquid excretions of Homoptera, consisting largely of sugars and amino acids. Honeydew causes a scorching of leaves, the photosynthetic activity of which is reduced by the presence of sooty moulds" (French National Institute for Agricultural Research).

Arenaceous: Sandy.

Quality

Cotton is a natural fibre, like silk, wool, or linen. Alongside natural fibres, there are artificial and synthetic man-made fibres. Artificial fibres (such as viscose rayon and acetates) are made from organic polymers derived from natural raw materials, mainly cellulose. Synthetic fibres (including acrylics, polyamides, and polyesters) are generally derived from petrochemicals.

In industrial uses of cotton, grades defined by the US Department of Agriculture are generally accepted as the world standards for cotton fibre quality.

United States cotton standards

Developments in cotton classification standards

Prior to the development of official standards, cotton was marketed primarily on the basis of its variety and where it was grown, although some physical standards for cotton classification (sets of physical samples) were used privately. The United States Cotton Futures Act of 1914 authorised the Department of Agriculture to establish physical standards as a means of determining colour grade, staple length and strength, and other qualities and properties. These standards were thereafter agreed upon and accepted by the leading European cotton associations and exchanges. They were accordingly termed and referred to as the "Universal Standards for American Cotton." Indeed, when in 1923 the US Department of Agriculture (USDA) signed the Universal Cotton Standards Agreement with nine leading cotton associations in seven major European countries, the US classing system entered into increasingly global use. Under the auspices of the Agreement, the currently twenty-four signatory cotton associations representing twenty-one countries agreed to use only Universal Standards to arbitrate US grown American upland cotton. In addition to use by signatory countries, Universal Standards are routinely used in over twenty-five non-signatory countries as the standard for US and non-US grown cottons. Whereas other countries started developing their own classification system, the USDA kept committed to continual development and improvement efforts in the area of cotton classification standards. Since 1991, USDA cotton classification has relied on instrumental measurements (in addition to or as a substitute for human vision) for fibre length, strength and length, micronaire (a measure of the cotton's fineness), colour grade, colour Rd (reflectance), colour +b (yellowness), and trash percent area. All instrument measurements currently utilised in USDA are performed by High Volume Instrument (HVI) patented by Uster Technologies, a leading company in textile quality controlling. Given the international acceptance of HVI testing, in 1996 the Universal Cotton Standards Agreement was amended to recognize USDA-produced HVI calibration cotton standards for strength, length and uniformity index. The new standards were named Universal HVI Calibration Cotton Standards and continue to serve today as the most recognized standards for HVI calibration. USDA is continuing its effort toward global HVI standardisation.

The quality of the cotton fibre is determined by three factors, namely, the colour of ginned cotton, purity (the absence of foreign matter) and quality of the ginning process, and the

length of fibres. Practically all cotton grown in the United States is classed by USDA at the request of producers. While classification is not mandatory, growers generally find it essential to marketing their crop and for participation in the USDA price support program. For additional information on USDA cotton classification standards, the reader is referred to the official USDA website sections on classification, the HVI system, and standardisation.

Colour

The colour of cotton fibres is primarily determined by conditions of temperature and/or humidity, cotton lint exposure to sunlight, and cotton varieties. Action by parasites or micro-organism, as well as technical defects in harvesting and subsequent storage and transport, may all affect the colour of cotton.

The colour of cotton ranges from white to yellowish and is classed into the groups "White", "Light Spotted", "Spotted Tinged" and "Yellow Stained", in descending order of quality. There are 25 official colour grades of American upland cotton, ranging from "Good Middling" colour through "Middling Yellow Stained" colour. In addition, there is a descriptive "Below Colour Grade" standard for 5 categories of American upland cotton. Fifteen of these grades are each within the range represented by a set of physical samples in the custody of the United States Department of Agriculture (physical standards), whereas the remaining 10 grades (the six "Light Spotted" grades, "Good Middling Spotted Colour", "Strict Middling Tinged Colour", and the two "Yellow Stained" grades), as well as the 5 "below grade" categories, are descriptions based on the physical colour grade standards (descriptive standards).

Colour	Colour Grade	Symbol
White	Good Middling	GM
	Strict Middling	SM
	Middling	Mid
	Strict Low Middling	SLM
	Low Middling	LM
	Strict Good Ordinary	SGO
	Good Ordinary	GO
Light Spotted	Good Middling Light Spotted	GM Lt Sp
	Strict Middling Light Spotted	SM Lt Sp
	Middling Light Spotted	Mid Lt Sp
	Strict Low Middling Light Spotted	SLM Lt Sp
	Low Middling Light Spotted	LM Lt Sp
	Strict Good Ordinary Light Spotted	SGO Lt Sp
Spotted	Good Middling Spotted	GM Sp
	Strict Middling Spotted	SM Sp
	Middling Spotted	Mid Sp
	Strict Low Middling Spotted	SGM Sp
	Low Middling Spotted	LM Sp
	Strict Good Ordinary Spotted	SGO Sp
Tinged	Strict Middling Tinged	SM Tg

	Middling Tinged	Mid Tg
	Strict Low Middling Tinged	SLM Tg
	Low Middling Tinged	LM Tg
Yellow stained	Strict Middling Yellow Stained	SM YS
	Middling Yellow Stained	Mid YS
Below Grade	Below Grade-(Below Good BG 81 Ordinary)	BG
	Below Grade-(Below Strict Good BG 82 Ordinary Light Spotted)	BG
	Below Grade-(Below Strict Good BG 83 Ordinary Spotted).	BG
	Below Grade-(Below Low BG 84 Middling Tinged)	BG
	Below Grade-(Below Middling Yellow BG 85 Stained)	BG

Source: UNCTAD secretariat, based on USDA, United States Standards for the Color Grade ofAmerican Upland Cotton, August 1993

HVI classing has been available on an optional basis to all growers since 1981. The colour of cotton is measured by the degree of reflectance (Rd) and yellowness (+b). Reflectance indicates how bright or dull a sample is, and yellowness indicates the degree of colour pigment. A three-digit colour code is used to indicate the colour grade. This colour grade is determined by locating the quadrant of the colour chart in which the Rd and +b values intersect. For example, a sample with an Rd value of 72 and a +b value of 9.0 would have a colour code of 41-3. In cotton classification, the colour grade of American upland cotton is determined using the HVI Colour Chart (instrument measurement), and referenced to colour grade standards that are in the custody of the USDA (the abovementioned Universal Cotton Standards used by human classers to determine official colour grade).

For further information, please refer to United States Standards for the Color Grade of American Upland Cotton, USDA, August 1993 (PDF, 22.4 KB).

Leaf grade and extraneous matter

Leaf grade describes the leaf or trash content in the cotton. Purity as regards the presence of foreign matter (waste such as leaves or earth) is of the utmost importance. There are seven official leaf grades for American upland cotton designated as "Leaf Grade 1" through "Leaf Grade 7". They are all represented by official physical standards in the custody of the USDA. In addition, there is a descriptive "Below Leaf Grade Cotton" designation for American upland cotton that is lower in leaf grade than Leaf Grade 7.

Official US standards for the leaf grade of American Upland cotton

Leaf Grade	Symbol	Code No.
Leaf Grade 1	LG1	1
Leaf Grade 2	LG2	2
Leaf Grade 3	LG3	3
Leaf Grade 4	LG4	4

Leaf Grade 5	LG5	5
Leaf Grade 6	LG6	6
Leaf Grade 7	LG7	7
Below Leaf Grade	BLG	8

Source: United States Standards for the Leaf Grade of American Upland Cotton, USDA, August 1993

Other foreign matter (such as seed coat fragments), as well as the degree of smoothness or roughness with which cotton is ginned, may all affect the purity of the cotton lint. Additional explanatory terms considered necessary to describe adequately the condition of the cotton may thus be entered on classification memorandums or certificates.

An HVI trash measurement is also available, although the traditional method of classer determination for leaf grade and extraneous matter continues to be included as part of USDA's official cotton classification. Trash in raw cotton is measured by a video scanner, commonly referred to as a trash meter. It is a measure of both leaf and other elements such as grass and bark. The surface of the cotton sample is scanned by the camera and the percentage of the surface area occupied by trash particles is calculated.

For more information: United States Standards for the Leaf Grade of American Upland Cotton, USDA, August 1993 (PDF, 15.8 KB).

Fibre length

• ***Length***

Fibre length is defined as the average length of the longer one-half of the fibres (upper half mean length). Fibre length is basically an inherited/genetically character of the seed variety. However, weather, nutrient deficiencies, as well as excessive cleaning and/or drying at the gin may also affect the fibre length. By affecting yarn strength and evenness, and the efficiency of the spinning process, the length of the fibre has a great influence on quality and price. According to USDA's classing methodology, length measurement of American upland cotton is performed by HVI in accordance with standard test methods. The length of staple, measured in inches and fractions of an inch, is classed according to the following codes:

Length (inches)	Code	Length (inches)	Code
< 13/16	24	1-3/16	38
13/16	26	1-7/32	39
7/8	28	1-1/4	40
29/32	29	1-9/32	41
15/16	30	1-5/16	42
31/32	31	1-11/32	43
1	32	1-3/8	44
1-1/32	33	1-13/32	45

1-1/16	34	1-7/16	46
1-3/32	35	1-15/32	47
1-1/8	36	1-1/2	48
1-5/32	37		

More information on US standards for length of staple of cotton (PDF, 17.5 KB)

• ***Uniformity***

Length uniformity is the ratio between the mean length and the upper half mean length of the cotton fibres within a sample. It is measured on the same beards of cotton that are used for measuring fibre length and is reported as a percentage. The higher the percentage, the greater the uniformity. If all the fibres in the sample were of the same length, the mean length and the upper half mean length would be the same, and the uniformity index would be 100. The following tabulation can be used as a guide in interpreting length uniformity results. Measurements are performed by HVI. Cotton with a low uniformity index is likely to have a high percentage of short fibres and may be difficult to process

Length uniformity index

Descriptive Designation	Length Uniformity
Very Low	Below 77
Low	77 - 79
Average	80 - 82
High	83 - 85
Very High	Above 85

Source: Cotton Classification - Understanding the Data, USDA, July 2004

• ***Strength***

The fibre strength measurement is made by clamping and breaking a bundle of fibres from the same beards of cotton that are used for measuring fibre length. Results are reported in terms of grams per tex (a tex unit is equal to the weight in grams of 1,000 meters of fibre). It expresses the force required to break a bundle of fibres one tex unit in size. Fibre strength is largely determined by variety. Strength measurements are performed by HVI in accordance with standard test methods. The descriptive terms listed below may be helpful in explaining the measurement results.

Fibre strength table

Descriptive Designation	Strength (grams per tex)
Weak	23 & below
Intermediate	24 - 25
Average	26 - 28
Strong	29 - 30
Very Strong	31 & above

Source: Cotton Classification - Understanding the Data, USDA, July 2004

More on HVI measurement of fibre uniformity and fibre strength: USDA, Cotton Classification - Understanding the Data, July 2004 (.doc, 2.56 MB).

Other properties that are of great importance in the industrial uses of cotton, including fibre fineness and maturity, are measured in accordance with standard test methods. Classing methodology is constantly updated to include state-of-the-art methods and equipment. Fibre properties are also measured for American pima cotton.

While the basic testing procedures for American Pima cotton are the same as for American upland cotton, different grade standards are used. For more information, refer to the Classification of Cotton (Cotton incorporated).

Examples of other national standards

Official cotton standards have been enacted by other countries. In Tanzania, for example, the Tanzania Cotton Board (TCB) has established quality standards for measuring those physical attributes of raw cotton that affect the quality of the finished product and/or manufacturing efficiency.

The grade of cotton is determined in terms of colour, leaf, and preparation. In reference to these factors, cotton is classed into the groups "TANG" (the superior quality), "GANY" (the fair average quality), and "YIKA" (the inferior quality). These grades (referred to as "Physical grade standards") are all represented by physical samples in the custody of TCB. In addition, there are four "descriptive grade standards" for GANY and one descriptive "under grade" ("UG"). Finally, three descriptive colour standards (named "Slight dull mixed stain" (SDM), "Dull mixed stain" (DM), and "Stain") are introduced for lint contaminated by insects or in the field for a long time after balls opening. Cotton grade is assessed on the basis of the above standards by classers.

For more information on Tanzania cotton classing, refer to: Tanzania Cotton Grade Standards.

National standards and testing procedures allegedly reflect domestic conditions and are suitable to local actors. The coexistence of national specifications and universal (US) standard as a point of reference in international trade does not necessarily engender confusion, to the

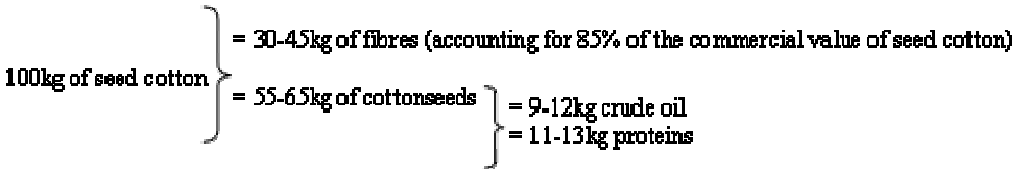
extent that some comparability is assured. Benin for example has developed its own cotton labels for different quality grades. Cotton is classed into three groups, "Kaba" (the superior quality), "Zana, "Kene" and "Bati" (inferior qualities).

Quality of cotton fibre

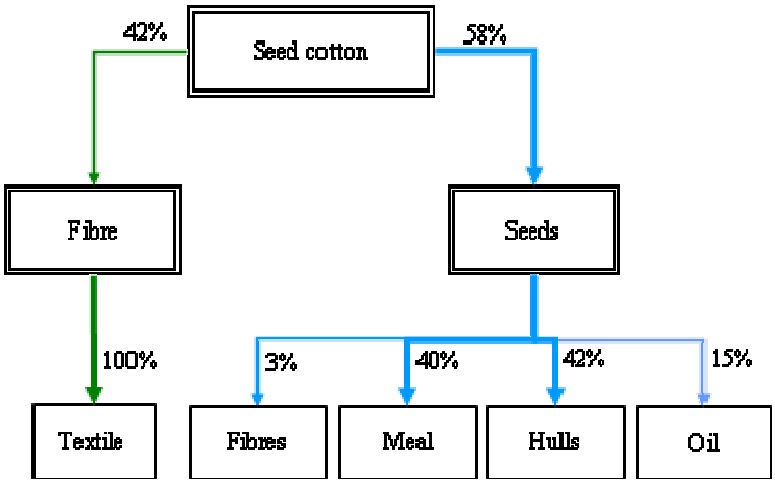
Three fibre classing systems exist at the international level: the English system "Na"; the metrical system "Nm"; and the "TEX" system.

Uses

- Major uses of cotton fibres
- Major uses of cottonseeds

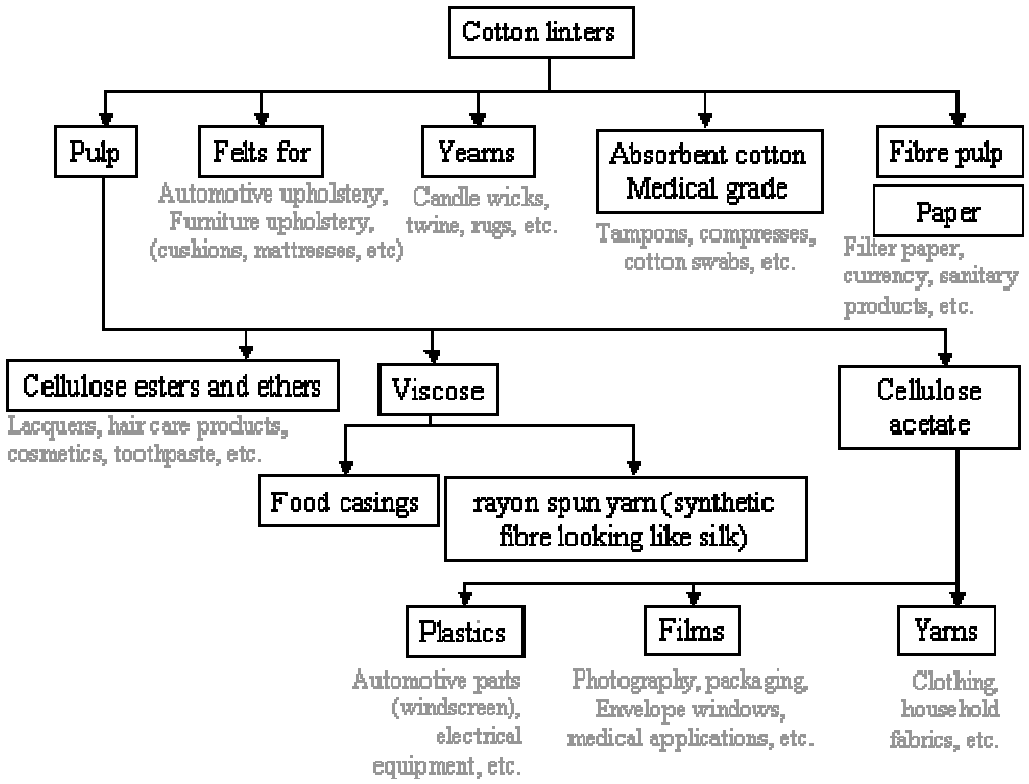


Products derived from cotton fibre



Source : UNCTAD secretariat, drawing upon "*Etude relative au mécanisme de formation des prix de cession du coton-graine et des intrants agricoles au Bénin*" (Anna Croles-Rees and Bio Goura Soulé Lares, 2001)

Major uses of cotton fibres



Source : Adapted from: "Cotton Facts", International Cotton Advisory Committee (ICAC), 2003

The major end uses for cotton fibre include wearing apparel, home furnishings, and other industrial uses (such as medical supplies). The cotton fibre is made primarily into yearns and threads for use in the textile and apparel sectors (wearing apparel would account for approximately 60% of cotton consumption). Cotton is also used to make home furnishings, such as draperies (eventually the third major end use) or professional garments (about 5% of cotton fibre demand).

Besides traditional uses and as a result of different finishing processes that have been applied to the cotton fibre, cotton is made into specialty materials suitable for a great variety of uses. Cotton fabrics with specialty applications include, for example, fire-proof (flame resistant) apparel, which is suitable for professional uses and provides effective protection against potential risks associated with high temperature and particularly flashover. Flame resistant cotton fabrics are treated with chemicals. Without chemical treatment, cotton would burn up releasing very strong heat, just like the major part of synthetic fibres, which melt when they are exposed to high temperatures.

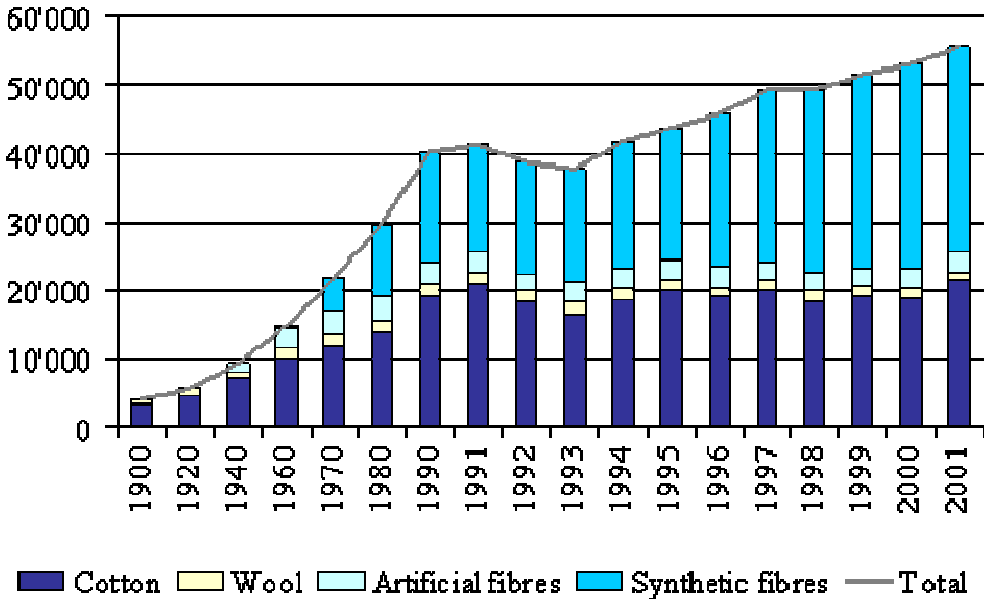
Cotton also finds specialty applications in medical and hygienic uses. Most notably, the fibre is used to manufacture hydrophile cotton (cotton wool), compress, gauze bandages, tampons or sanitary towels, and cotton swabs. In this field, the most suitable cotton variety is the species *Gossypium herbaceum* with short-staple thick fibres.

See, in particular: Modified Fibers with Medical and Specialty Applications

One development that will most likely affect cotton consumption patterns is the marketing of coloured fibres tailored to the needs of the textile industry. Substantial technological advances have taken place in this area. According to the Ministry of Higher Education and Scientific

Research in Burkina Faso: *"... In China for example, one does not make any more dyeing. China uses transgenic cotton plants which produce yellow, white, green, or red cotton; to sum up, any customised colour grade..."*.

Share of selected fibres in world use, 1900 - 2001



Source : UNCTAD secretariat (Data: "Statistiche 2002 Italia E Mondo," Associazione Tessile Italiana, October 2003)

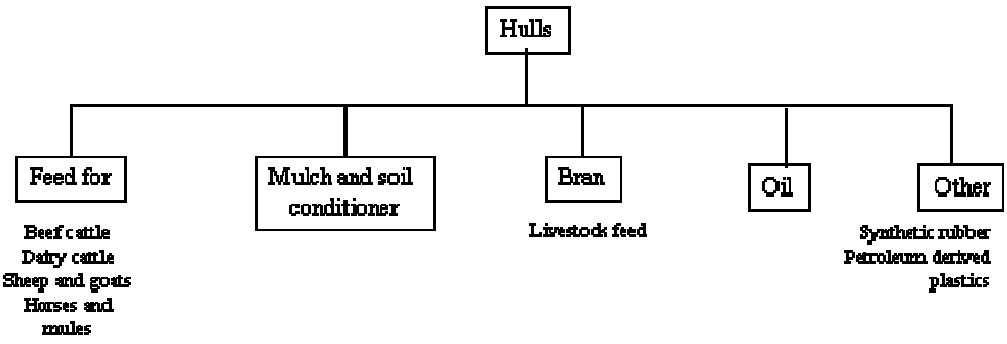
Cotton demand is strongly influenced by comparative prices vis-à-vis man-made fibres (artificial and synthetic fibres). Artificial fibres (like viscose rayon and acetates) are made from organic polymers derived from natural raw materials, mainly cellulose. Synthetic fibres (including acrylics, polyamides, and polyesters) are generally derived from petrochemicals petroleum products.

From the beginning of the 20th century until the end of the second world war (WWII) cotton had accounted for 81% of world total fibre consumption. A shift occurred in the 1940s, when man-made fibres first appeared in the market (accounting for 12% of the world's total fibre consumption over the 1940s). As from the 1960s, with a deepening of the trend since 1970, decline in cotton consumption has become more prominent. The ratio of cotton in the fibre market decreased from 75% in 1940 to 68% in 1960. In 1970 cotton accounted for 57% of textile fibres. Since the early 2000s, cotton has accounted for roughly 38% of world fibre consumption. By contrast, the share of synthetic fibres rose to 57% in 2001, up from 5% in 1960.

For further information concerning weaving, refer to the following website: Weaving, how does it go? : Tenthorey S.With.

Uses of cottonseeds

- **The seed coat (hull)**



Source : Adapted from "Cotton Facts", ICAC (2003)

Cottonseed oil is mechanically extracted from the cottonseed by means of screw or press. Cottonseed oil ranked fifth in production and consumption volume among vegetable oils over the period 1961-2003, accounting for approximately 8% of the world's vegetable oil consumption (close to the ratio of groundnut oil). In many countries of francophone Africa (notably, Mali, Chad, Burkina Faso, Togo, Ivory Coast, and Cameroon), cottonseed oil (used as oil or margarine) provides the main source of fat and oil supply and has several food applications. Cottonseed oil is also further refined for use in soaps and cosmetics.

Some figures about the cottonseed oil market

Cottonseed oil production

The five largest producers of cottonseed oil over the period 1995-2003 (four are developing countries and countries in transition) accounted for a combined 70% of global output. They relative shares were:

- China: 27%,
- United States: 12%
- Former Soviet Union: 10% (of which: Turkmenistan: 10% and Uzbekistan: 72%, Tajikistan: 8%, Kazakhstan: 6%),
- India: 11%,
- Pakistan: 9%.

Cottonseed oil trade

Trade in cottonseed oil is more concentrated than production, with five countries (the United States, Brazil, Argentina, the former Soviet Union, and Syria) accounting for more than 86% of world exports. Although West African countries are major cotton producers, none of them ranks among the ten largest producers of cottonseed oil. Over the period 1990-2002, West African countries accounted as a whole for just 3% of world cottonseed oil production, and approximately 1.3% of world exports.

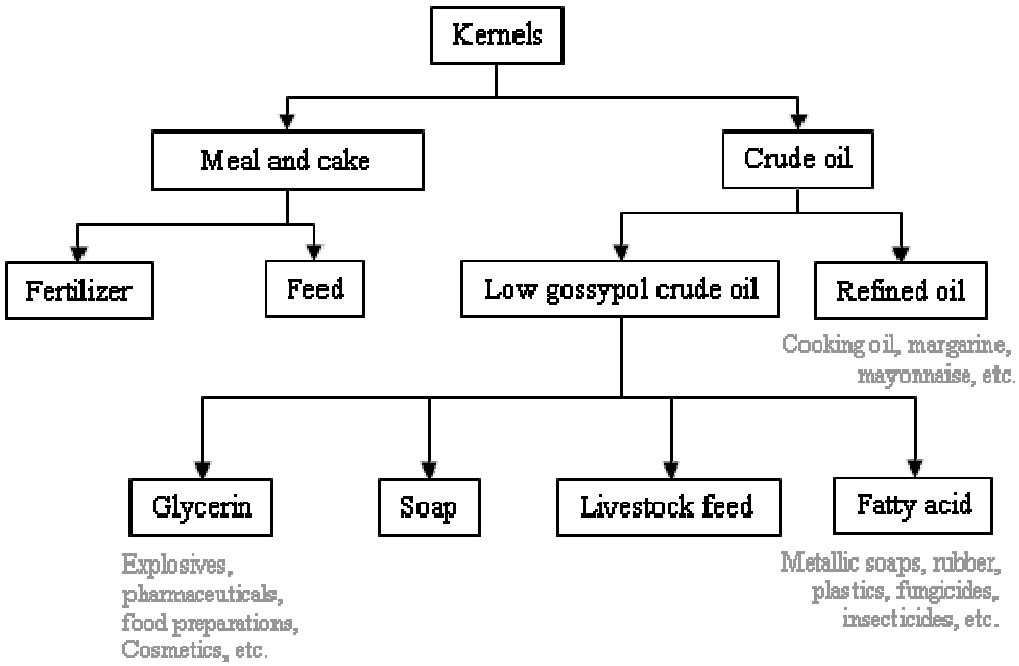
Cottonseeds hulls have also been used to provide roughage in animal feed. The remains of the seed after the oil has been extracted can also be rendered as flours for livestock feed. Whereas these usages refer to animal consumption, research is being conducted to develop new uses for cottonseed derivatives in human diet. Major achievements in this direction include:

- Development of gossypol extraction techniques (gossypol is a toxic compound found in the cotton plant, mainly concentrated in the cottonseed);

- Development of "glandless" cotton varieties (where the plant is genetically bred to produce gossypol-free cottonseed)

Cottonseed meal

After the oil has been extracted from the cottonseed, the residue (i.e. cottonseed meal) is high in proteins (about 40%). It is usually marketed for animal feed, although it can have other usages (see the figure below).



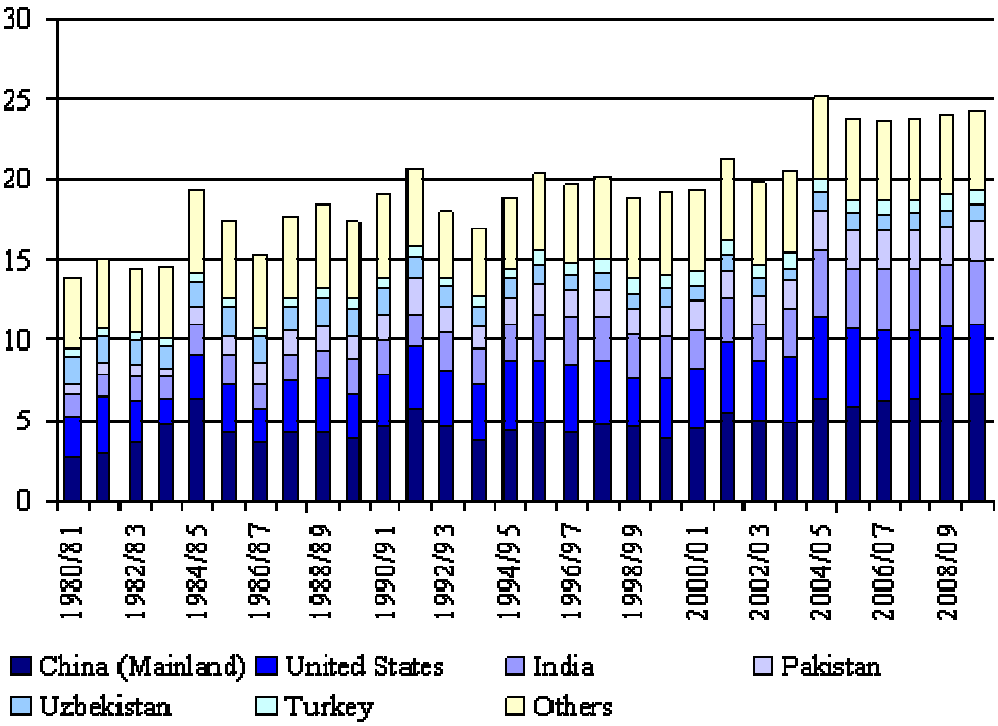
Source: Adapted from: "Cotton Facts", ICAC (2003)

Market

- Cotton production
- Cotton consumption
- International trade in cotton
- Fair Trade Cotton Market

Cotton production

Cotton production (million tonnes), by main countries, 1980/81 - 2009/10



Source: UNCTAD secretariat, based on: "Cotton: World Statistics - International Cotton Advisory Committee (ICAC)"

Despite the declining trend of cotton's share in textiles fibres since the 1970s, cotton remains by far the most important natural fibre of the 20th century (see "uses"). Still in the early 2000s, cotton represents 38% of the fibre market. In a development context, cotton is crucially important for income and employment provided in its production and processing. Much of the growth of cotton production since the end of the Second World War (WWII) was due to improved yield (output per hectare tripled between 1946 and 2003, topping at 643 kilograms per hectare (kg/ha) in 2003 up from 209 kg/ha in 1946, according to the International Cotton Advisory Committee - ICAC), rather than to expanded area (cultivated land increased by only 32% over the 1946-2003 period, expanding from 22.3 million hectares to 30 millions).

Despite the fact that production is spread out all over the world (in 2004, cotton was grown in about 100 countries), four countries alone (China, the USA, India, and Pakistan) account for approximately two thirds of world output. If we added Uzbekistan and Egypt, six countries would account for three fourths of world cotton production. This concentration in cotton production has to be put into perspective by considering the impact of domestic policy

reforms in the largest cotton producing countries, as well as climatic and sanitary contingencies. For example, global output increased by 30% between the seasons 1983/84 and 1984/85, rising to 19.2 million tonnes up from 14.5 million tonnes. Most of the growth came from China, where increases in production (Chinese production edged upward from 4.6 million tonnes in 1983/84 to 6.3 million tonnes in the 1984/85 season) were prompted by incentive measures taken by the Government. To stimulate production growth, the Government used price incentives (price adjustment increased from 15% to 50% according to the main commodities) and above-quota premiums in cotton procurement (in China farmers were assigned quotas for delivering cotton at administered prices). Additional policy measures were taken to stimulate cotton production in the 1993/4 season, including loans at preferential rates and advance payments to cotton producers before planting. The combined effect of these policy reforms was quite remarkable. Cotton production increased by 3.7 million tonnes in the 1992/93 season to 4.34 million tonnes in 1993/94 (a 16.1% increase). The increase in production remained around the trend in the 1995/96 season, as the Government announced that it would increase cotton procurement price by 25%.

Cotton quotations also affect global output. Indeed, the perception that cotton is not profitable has led a number of producing countries to turn away from the sector. This was notably the case of several Latin American countries, where central planning (as in China and the former Soviet Union) or cotton support programmes (as those implemented in the USA) were not in place.

Cotton consumption

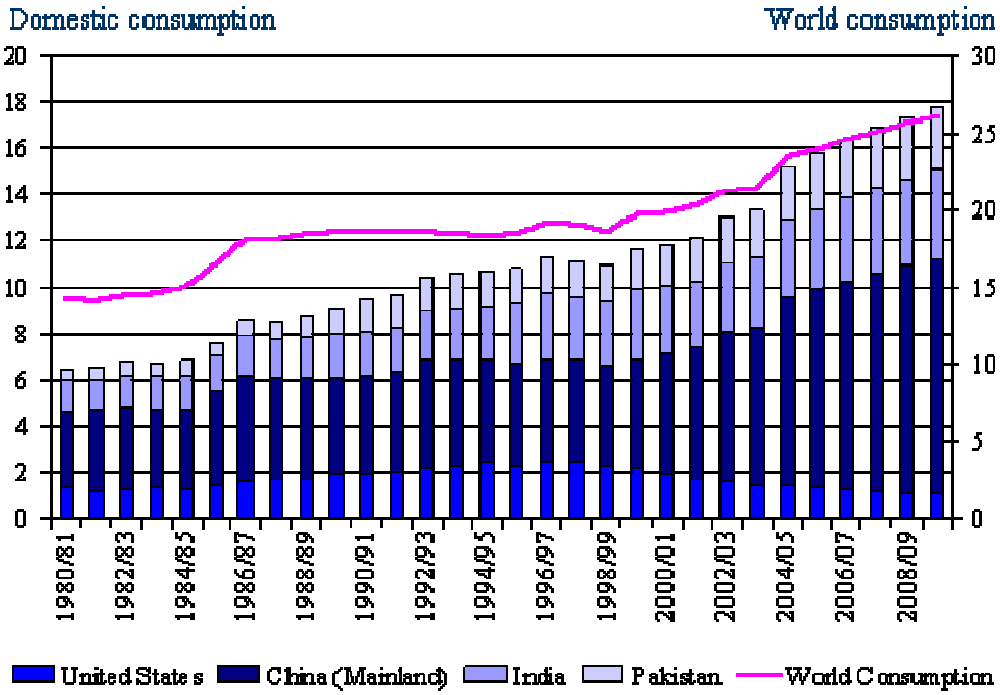
Since 1940, world cotton consumption has increased at an average annual growth rate of about 2% (roughly the same as production). Growth in the demand for cotton was comparatively higher in the 1950s and 1980s, with an average growth rate of 4.6% a year during the 1950s and 3% in the 1980s. Developing countries have absorbed much of global cotton output since the end of WWII. Their share in global consumption has become even more significant since the end of the 1990s. Developing countries accounted for approximately 77% of global cotton consumption between 1981and 1998; since 1999 their ratio has been above 80%; according to projections based on ICAC figures, in 2007 they would absorb almost 87% of global cotton output.

Cotton consumption has shifted to developing countries mainly as a reflection of rising wage levels in developed countries. In the textile sector, labour accounts for about 1/6 of production costs. This means that raising labour costs eroded the competitive edge of developed countries, and contributed to the shifting of cotton processing to low-cost economies (most notably Asia and the Maghreb, but also Africa). Following specialisation, certain countries were able to forge new patterns of comparative advantages out of competitive differences in quality. These countries built on the competitiveness and dynamism of the textile sector, which became the foundation stone of their development. Other exogenous factors (such as the development of new technologies and improved infrastructures) favoured delocalisation of production by enterprises based in developed countries.

The main cotton producing economies also account for a large part of consumption. According to ICAC data, China, the United States, India, and Pakistan as a whole would account for approximately 56% of global cotton consumption over the period 1980 to 2007. Their overall consumption has risen considerably in volume (see figure below). For example,

consumption multiplied by 1.3 in the USA and almost doubled in China and India. Pakistan has had the largest increase in volume (which multiplied by 4.5 between 1980 and 2007).

Cotton consumption (million tonnes), by main countries, 1980/81-2009/10

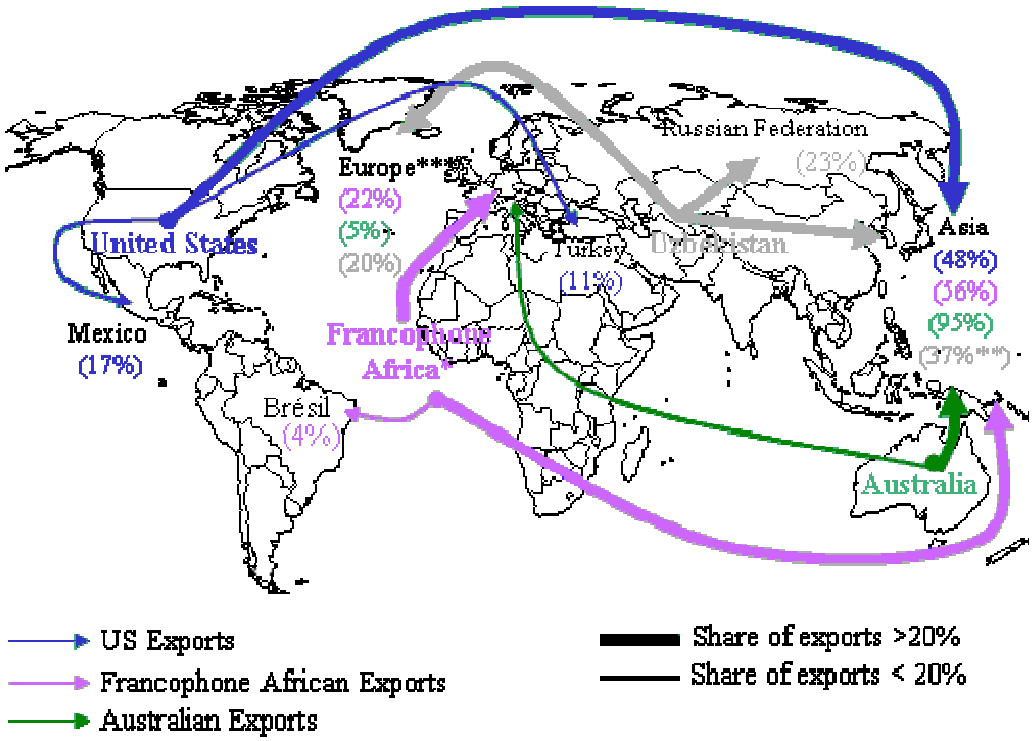


Source: UNCTAD secretariat, based on: "Cotton: World Statistics - International Cotton Advisory Committee (ICAC)"

International trade in cotton

Despite increasing local processing (especially in developing countries), cotton is still one of the most traded agricultural raw materials. Almost one third of cotton production (approximately 4.6 million tonnes of fibre) has been traded per annum since the 1960s.

Flow chart for trade in cotton (avg 2000-2004)



Notes :

* Francophone Africa (Benin, Burkina Faso, Cameroon, Centrafrican Rep., Chad, Côte d'Ivoire, Madagascar, Mali, Niger, Senegal, Togo).

** 10% of exports from Uzbekistan to Rep. of Korea and 14% to China (Mainland)

*** Europe is EU(15) + Switzerland

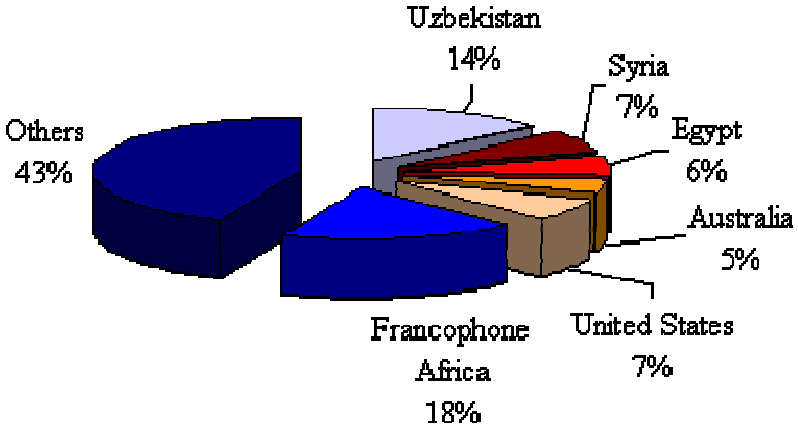
Source: UNCTAD secretariat (Data: Comtrade statistics - SITC Rev.3, 2631: "Cotton -other than linters- not carded or combed")

With an annual average export of 1.6 million tonnes since 1980 (that is, 26% of the world's cotton exports), the United States are by large the dominant exporter with regard to cotton fibre.

In terms of direction of trade flows, 48% of US cotton exports went to Asia in the 2000-2004 period, with four Asian countries (China, Japan, the Republic of Korea and Indonesia) accounting for one third of imports from the USA. The United States is also the single largest exporter of raw cotton to Mexico, which has relied heavily on US imports to supply its export assembly plants, known as Maquiladoras. Up to 1992 these transactions were only recorded by the Central Bank of Mexico. Starting from 1992, they have been incorporated into official international trade statistics, which explains the (apparent) sharp rise in Mexico's imports from the USA since then.

Four percent of US exports during the period 2000-2004 went to Canada. Over the same period, Turkey absorbed 11% of cotton exports from the USA.

Breakdown of EU imports (UE15), by country of origin, avg 2000 - 2004



Source: UNCTAD secretariat (Data: Comtrade statistics - SITC Rev.3, 2631: "Cotton -other than linters- not carded or combed")

Since the collapse of the former Soviet Union, Uzbekistan has been the second major cotton exporter, accounting for 12% of world exports over the period 1990-2004 (around 700'000 tonnes exported per annum over the reference period). According to ICAC projections, exports from Uzbekistan would decrease significantly over the years, declining in volume from 760,000 tonnes in 2001 to below 600,000 tonnes in 2006 (11% lost in world exports).

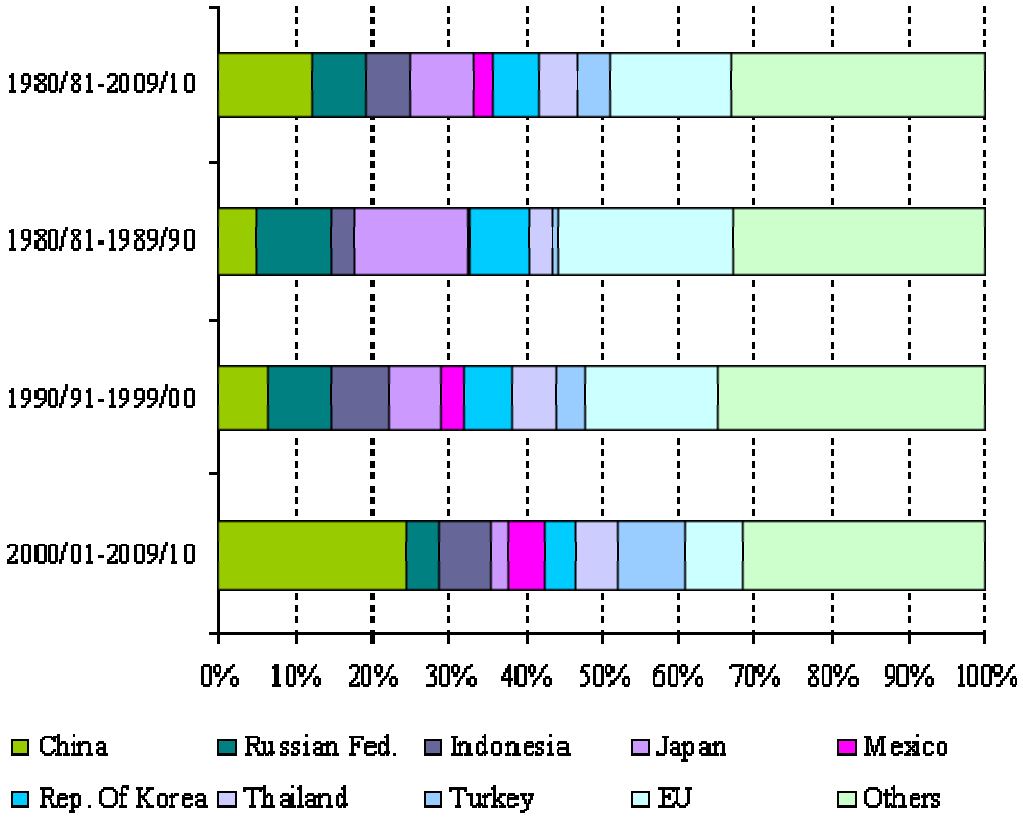
Seed cotton contribution to foreign exchange earnings
(relative to other agricultural commodities)

1st	2nd	3rd	4th	5th
- Benin - Chad - Yemen - Egypt - Iran - Mali - Paraguay - Sudan - Syria	- Afghanistan - Bolivia - Burundi - El Salvador - Pakistan - Turkey - Uganda - Tanzania	- Colombia - Mexico - Senegal - Togo - Central African Rep. - Zimbabwe	- Honduras - Mozambique - Nigeria - Peru	- Ivory Cost - Malawi - Cameroon

Source: "Le coton : deuxième partie - le coton entre le Nord et le Sud : une fibre menacée, une industrie combative", by Françoise de Morsier et Simone Forster (revised by the UNCTAD secretariat)

Though West African countries together account for a small share of world exports, their cotton production is largely for export. According to Marchés tropicaux, 22 March 2002, West African countries would export 95% of their production.

Share of selected countries in cotton fibre import, decades 1980 to 2000



Source: UNCTAD secretariat, based on: "Cotton: World Statistics - International Cotton Advisory Committee (ICAC)"

Since the early 1980s, imports of raw cotton have become less concentrated, and the trend is expected to continue over the time. The number of cotton importing countries rose from 85 in 1980 to 104 in 2004. The share of traditional cotton importers has fallen over the past decades. The European Union, the Russian Federation, Japan, the Republic of Korea, and China together accounted for slightly more than one third of world cotton imports in the 2000s, compared to about three fourths over the 1980 decade. Especially in Asia, new important cotton importers have entered the market. This is notably the case of Thailand and Mexico, whose share in world cotton imports rose from less than 10% in the 1980s to almost 30% in the 2000s.

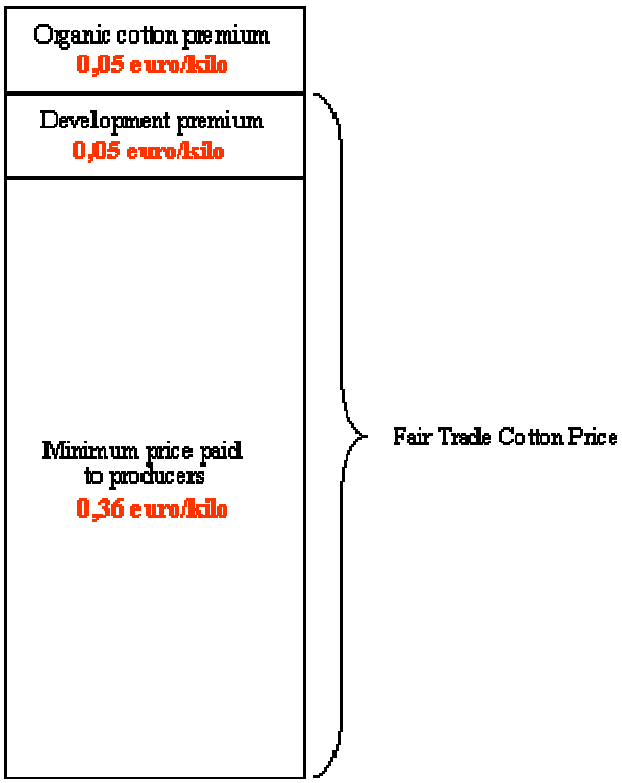
Fair Trade Cotton Market

Max Havelaar, one of the main fair trade associations, launched, in March 2005, the first fair trade label for a non-food commodity: cotton. To achieve its aim, Max Havelaar has worked with small producers from Cameroon, Mali and Senegal (about 20'000) organised in association and certified by the international standardisation body: FLO. Cotton growers from Burkina Faso are expected to join this enterprise by the end of 2005. Then, cotton farmers from this country are likely to account for the greatest share of the global fair trade cotton production.

In order to implement this new fair trade segment, Max Havelaar entered into partnerships with the French company DAGRIS and benefited from the financial support of several bodies (e.g. French Ministry of Foreign Affairs and the Centre for the development of enterprise*). Fair trade cotton products are sold off by using different brand names (e.g. Armor Lux, Célio,

Cora/influx, Eider, Hacot, Colombier, Hydra, Kindy, La redoute et TDV industries). In order to benefit from better price (including fair trade premium) for cottonseeds (which corresponds to, according to Max Havelaar, an increase of 46% compared to the price paid for the traditional cottonseeds originated from Senegal and 26% compared to the one from Mali, over the period 2004/05) producers must be certified (costs assumed by them). They also have to meet particular specifications (e.g. use cotton-made bags rather than polypropylene ones, ensure a better sorting of the cotton seeds).

Price granted under fair trade cotton seeds scheme



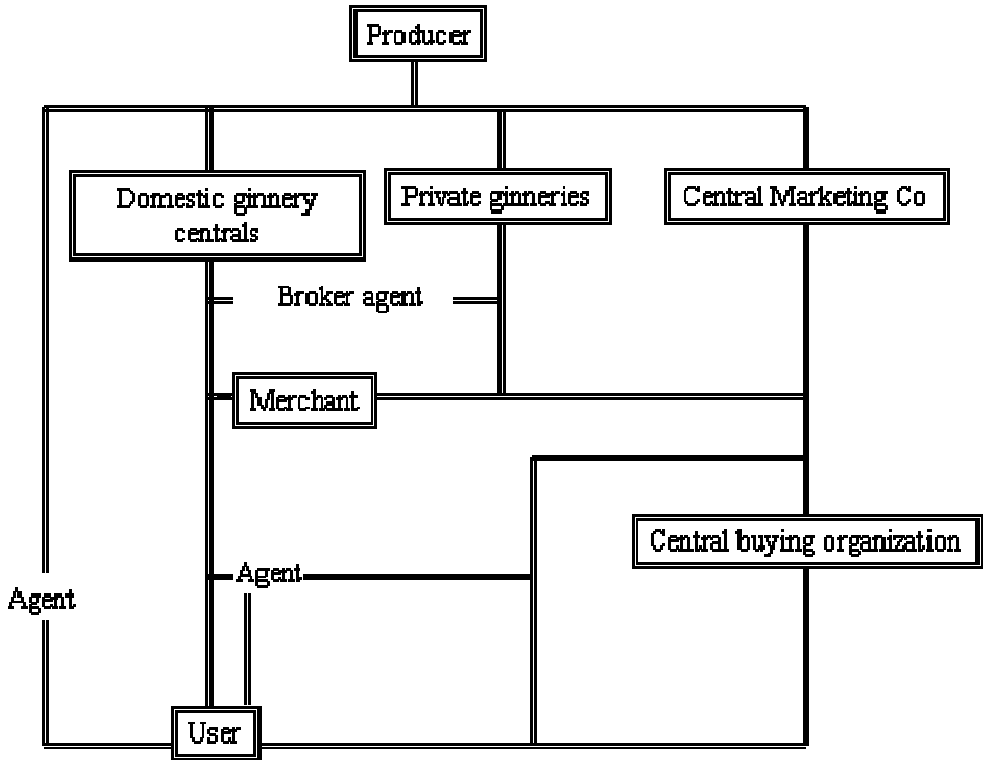
Source: UNCTAD Secretariat according to an article issued by Marchés tropicaux on March 11 2005

For further information, see:
- Max Havelaar
- FLO
- DAGRIS
- Centre for the development of enterprise (CDE)

Chain

- Brief overview of world cotton chain
- Production and marketing of cotton in China
- The US cotton industry
- Cotton marketing systems in Eastern Europe and Central Asia (with special reference to Uzbekistan)
- Cotton sectors in Africa
- Cotton chain in Pakistan

World cotton chain



Source: Training Manual on Cotton Trading Operations (UNCTAD/WTO International Trade Centre)

Full-scale vertical integration, from growing cotton to the marketing of end-use products, is unusual in the developed countries' cotton sectors. One notable exception regarding the United States (US) cotton industry is the Plains Cotton Cooperative Association (PCCA). This cooperative accounts for about 15% of US production. In addition to growing, ginning, warehousing cotton and producing cottonseed oil, PCCA owns a number of textile mills for the manufacture of end-use products. By contrast, although to varying extents, liberalised cotton sectors in developing countries still exhibit a relatively high degree of vertical integration.

As in the case of some Francophone West African countries, foreign companies have acquired equity interests in the former parastatals, as they seek to secure consistent and timely supplies of cotton.

The cotton sectors of developed and developing countries differ in various respects, including: the size of cotton farms; the level of mechanisation (in harvesting, processing, and grading systems -visual and instrumental); and uses of harvested cotton.

Production and marketing of cotton in China

China has been producing cotton for 2000 years. The major cotton producing areas are the Yellow and Yangtze River Valleys, accounting for more than three fourths of China's cotton output. Traditionally, the most commonly cultivated species of cotton was Gossypium hirsutum. New cotton varieties were introduced from the United States in the 1950s and 1960s. The most important cultivars now include Deltapine, Stoneville and Coker.

China's cotton sector became fully centralised in 1953, after the introduction of the first Five-Year Plan. The procurement and marketing of cotton was monopolised by the government procurement agency, the Supply and Marketing Cooperatives (SMC) system. Farmers were assigned compulsory quotas for delivering cotton to the local branches of the SMC at administered low prices. SMC controlled the whole marketing process, from purchasing through processing to marketing. State intervention distorted domestic supply and demand, and also affected movements in world cotton prices.

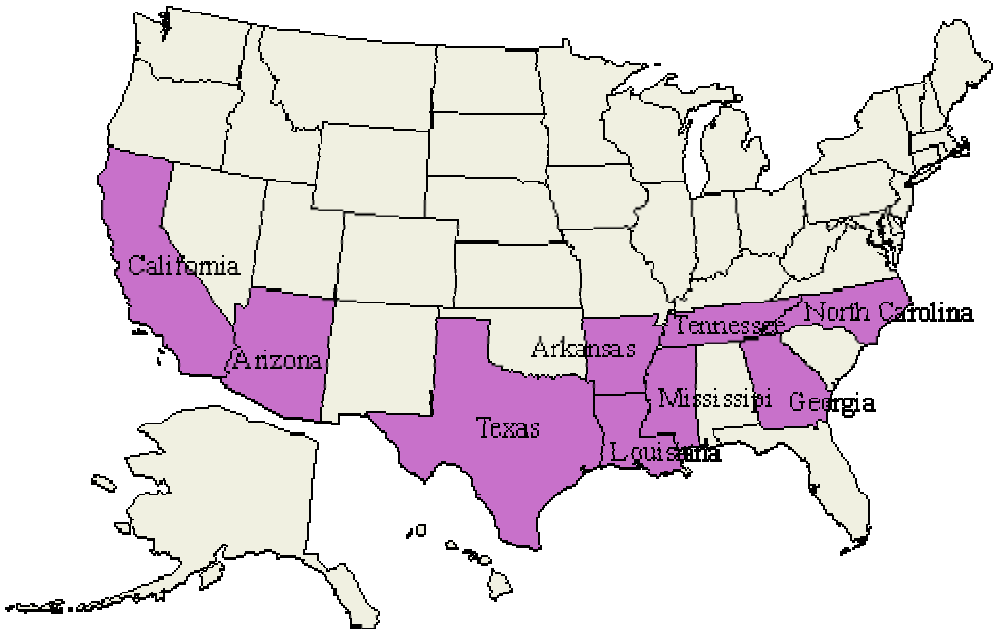
Since the 1980s, China has made changes to its cotton policy toward an increased market orientation. A major institutional change occurred in 1978 when land use rights were contracted to individual farmers under the "Household Responsibility System" (HRS). In 1985 a "contracted purchasing" scheme replaced the united procurement system.

Another step toward market-oriented system was eventually established in the early 2000s. For instance, under the new system, domestic textile firms granted from authorisation delivered by provincial authorities were allowed to purchase cotton directly from growers, the growers association, or the local branches of the SMC.

The US cotton industry

The cotton industry has generated considerable revenue in the United States (by value, cotton ranks fifth among agricultural commodities). The United States is the second-largest producer of cotton, supplying approximately 20% of world output. The United States remains by far the largest exporter of cotton in the world, accounting for about one fourth of world exports.

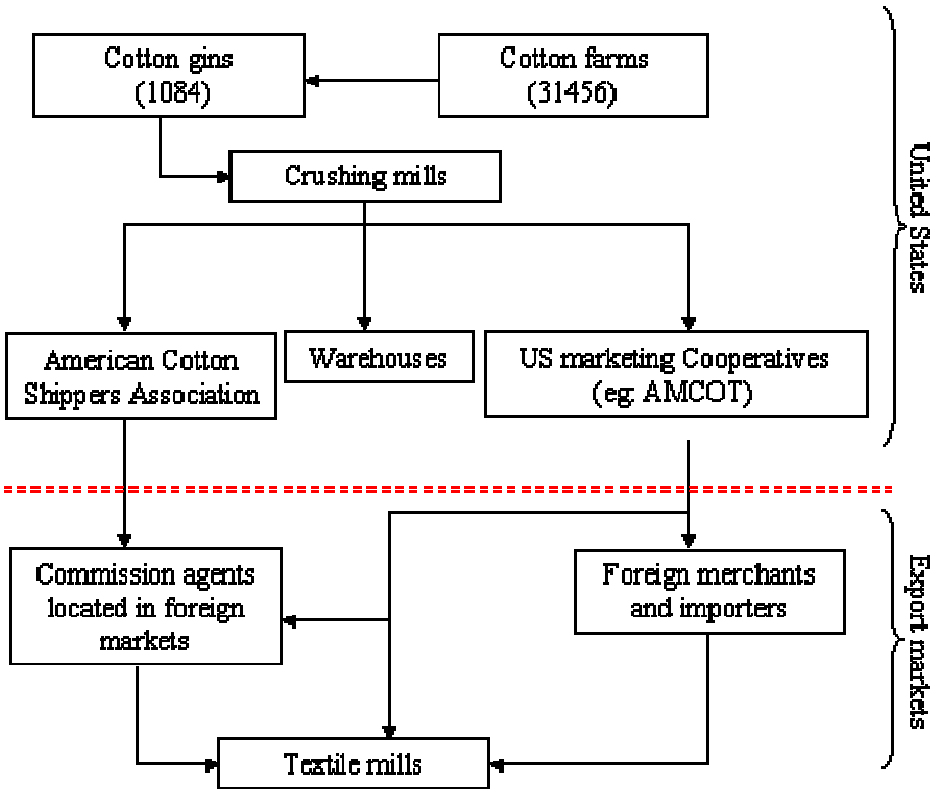
Main cotton producing States in the United States



Source: UNCTAD secretariat

The main cotton producing States include Texas, Mississippi, and California. In the period 1965 to 2003 they accounted for a combined 60% of US production. Cotton acreage began shifting to Western States in the 1960s and 1970s, but has started shifting back to traditional cotton-growing regions since the 1980s. Texas still remains the largest single cotton-producing State (above one fourth of domestic output since the mid 1960s), despite the fact that its share has been declining. Most of the cotton grown in the United States is of two varieties, upland cotton (*Gossypium hirsutum*) and extra-long staple (ELS) cotton (*Gossypium barbadense*), which is also referred to as American Pima cotton.

US cotton chain



Source: UNCTAD secretariat

Cotton farming has consolidated into larger farms since the second world war. Over the last fifty years, the number of cotton farms dropped by 98% (down to 31,500 in 2000 from 2 millions in the 1930s), whereas cotton acreage has declined by 25%. Therefore, the average farm size has increased. Cotton farms are primarily owned by individuals and families (according to US figures - Industry Trade Summary- 80% of farms are individual or family-owned) and are dedicated to cotton monoculture. Cotton gins are located in close proximity to cotton farms.

As for cotton farms, ginning capacity has consolidated into larger gins, especially in the 1980s and 1990s. In 1999 there were less than half the number of active gins in the 1980. Cotton gins are predominantly owned by farmers either individually or through cooperatives. The cotton is harvested using mechanical pickers or strippers. After harvesting, cotton is either ginned immediately or stored in field modules. The ginned cotton fibre is then compacted into bales. Samples are taken from each bale and classed for quality by means of High Volume Instrument (HVI).

Concerning domestic marketing, farmers can either store the classified bales in a government-approved warehouse, or sell them immediately. When cotton bales go into storage, farmers can borrow money against them (using the cotton as collateral), and sell the bales at a later stage. Ownership is retained by farmers through storage until final sale. On the other hand, farmers can sell the classified bales immediately to textile mills (which does not occur frequently) or independent merchants (brokers and intermediate processors of textile products).

For more information on the US cotton industry, please refer to Industry&Trade Summary, US International Trade Commission, January 2001 (PDF 1.31 MB)
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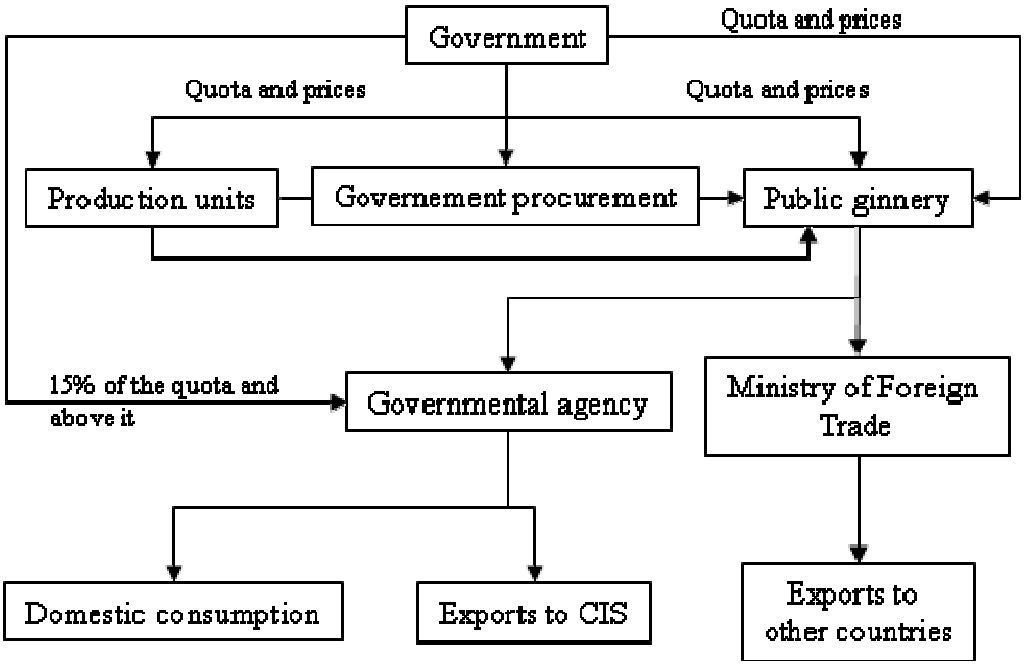
Cotton marketing systems in Eastern Europe and Central Asia (with special reference to Uzbekistan)

The former Soviet Union's share in world cotton production rose considerably in the 1960s and early 1970s (the region contributed one fourth of global output in 1975). But since then the share had been declining (20% in 1983 and 13% in 1991). The levels eventually dropped following the collapse of the Soviet Union. In 2003, the former Soviet Union contributed only 8% of world cotton. Over the period (1991-2003) cotton production was concentrated in four countries, namely, in order of importance, Uzbekistan (accounting for one third of supply), Turkmenistan (18%), Tajikistan (8%), and Kazakhstan (5%). Uzbekistan still plays a prominent role in world cotton production. Its share had declined over the first half of the 20th century, compared with the early 1900s (in 1913, the levels stood at 150,000 tonnes, or 75% of the then Russian Empire's output). But since the 1960s Uzbekistan has partially recovered its position.

The Central Asian Republics have continued the system of central planning in the cotton sector that prevailed in the former Soviet Union.

Cotton marketing structures in Uzbekistan



Source: International Cotton Advisory Committee

Cotton farms vary considerably in size (ranging between 10 to 2,000 hectares in Uzbekistan). Output per hectare has declined over the years (please, refer to the crop section). The decline in cotton yields is attributable to specific difficulties affecting productivity in several Central Asian Republics, including the low level of mechanisation and shortages of spare parts (an

exception being Uzbekistan, which has the industrial capacity to manufacture parts), as well as lack of fuel (despite the compensatory exchange agreement in force between the Central Asian Republics and the Russian Federation). Low soil fertility and difficulties with procuring inputs added to the stagnation of production levels. Finally, yield fell due to poor quality of planting material (with the exception of Uzbekistan, at the forefront of agricultural research in Central Asia).

There are approximately 250 active gins in the Central Asian Republics, predominantly handled by State-enterprises. Ginning capacity is under exploited (it is used at 50%) and the equipment involved is often outdated and therefore unsuitable to meet market requirements. In addition, active ginning facilities are relatively energy-intensive, and an increase in domestic prices for fuel would likely affect their economic viability.

Government agencies set cotton-specific plans and production quotas, as well as prices for seed cotton and for most of the inputs used in cotton production. The national targets are implemented by signing, with growers. contracts stipulating the minimum quantity of seed cotton to be delivered at administered prices. When the specified conditions are not met, cotton is sold at state procurement prices (30% of the market price for cotton). Since 2002, approximately 50% of cotton production has been handled in this way. By contrast, when the desired quantity of cotton is produced at the specified conditions, it would theoretically be possible for growers to sell cotton on the international market. All exporters shall require a special license. However, trading posts have been set in Uzbekistan, Kirghizstan and Kazakhstan free to export without license.

Similarly, export restrictions have been set as regards cottonseeds in order to sustain the domestic cottonseed oil market.

Fore more information, please refer to "Cotton Taxation in Uzbekistan", World Bank, August 2005.

Cotton sectors in Africa

- Benin
- Burkina Faso
- Central African Republic
- Ivory Coast
- Mali
- Niger
- Senegal
- Chad
- Togo

Although Africa is not the largest cotton exporter (it would account for an estimated 10-15% of world exports), cotton is of critical importance to many African countries. Cotton is the largest source of export receipts in several West and Central Africa (WCA) countries. The cotton sector is also key to rural poverty reduction, with cotton-related activities accounting for a large share of rural employment (about 6 million people are involved in the cotton industry in WCA).

Although each country is organized in a different way, it is possible to give a brief review of some common features and of recent developments in Sub-Saharan Africa (SSA) cotton production and marketing chains. The cotton sectors in the CFA franc zone countries in WCA

have until recently been characterized by a single parastatal company that controlled the provision of inputs and other services to farmers, and operated as the sole buyer of the entire cotton harvest. In certain countries, some services that were previously performed in-house have then been contracted to external operators, such as the subcontracting of cotton harvesting to private companies (as in the case of Togo). However, reliance on external operators has remained confined to large-scale farms (generally, more than 20 hectares). Under a regime of public monopoly, government agencies supplied most of the inputs used in cotton production by issuing invitations to tender based on producers estimates. With the reform of the system, procurement of inputs was delegated to producers associations and private traders. A major disadvantage is now the lack of credibility of domestic private actors (with no track record) vis-à-vis the financial institutions concerned. For example, as documented in an article by "Tropical and Mediterranean Markets" (issued on 12/7/02), "... Invitations to tender were launched for the supply of seeds, but a bank guarantee problem did not make it possible for these calls to succeed...".

Productivity continues to be hampered by outdated production techniques and equipment, problems related to storage and the poor state of the infrastructure. All these factors make transactions more expensive and accentuate still further the fluctuations in the price of food crops throughout the year.

In particular, ginning facilities in West African countries are old and their equipment is often obsolete (only one factory out of four integrates pneumatic systems for cotton loading, cotton bailing press are old, and the like), leading to numerous inefficiencies. The poor state of infrastructure often hampers timely delivery of inputs to producers (which in turn might delay the season and increase exposure to phytosanitary risks) and the delivery of seed cotton for ginning factories (which might jeopardise efficiency in processing operations and affect lint quality).

Almost all export from West African countries is in raw cotton. According to Enda, only 6% of cotton would be locally made into end products, which means that processing opportunities at the domestic level are not fully exploited. Several factors have contributed to this situation.

First, selling prices received by domestic producers in foreign markets are sometimes more remunerative than local prices. Such a price differential may encourage export of cotton in raw forms to the detriment of diversification into cotton yarn and fabric exports and cottonseed production. For example, producer price differentials have been largely responsible for raw cotton exports from Cameroon and Benin to Nigeria. Ivory Coast reported a remarkable outflow of cotton in raw form (an estimated 40,000 tonnes of seed cotton went to Mali and Burkina Faso in 2003-2004) as a consequence of political instability in the North of the country.

Secondly, it is often economically more viable to import vegetable oil at more competitive prices (for example, palm oil from South East Asia), rather than to locally process cottonseeds into cottonseed oil. Similarly for cotton yards and fabrics, and clothing, since textile and apparel imports from China and Pakistan are more competitive

Finally, food commodity aid might depress prices for cottonseed oil in the receiving country and severely limit incentives to invest in the sector. This explains why oil mills in some cases function at 25-30% of their capacity (Syfia international) and meet their supply requirements by importing cotton from abroad (in this respect, see the cotton chart for Nigeria).

Benin

Company	No. factories	Capacity (tonnes)	Company	No. factories	Capacity (tonnes)
Sonapra	12	312,500	MCI	1	
LCB	1		Socobe	1	
Sodicot	1		ICB	1	
Ibeco	1		CCB	1	
SEICB	1	206,291	Total	20	518 791

Source: Marchés tropicaux (22 March 2002)

Cotton is the main cash crop and the largest source of export receipts for Benin. It accounted for one third of Benin's exports in the period 1995 to 2000, or approximately 164 million US dollars per annum. Cotton production is also critically important to rural welfare, since cotton-related activities employ about 45% of rural households. In the early 2000s, about 20% of the cultivated area in Benin was under cotton (the Borgou province in the North was the main cotton producing region).

Benin also has productive capacity in cottonseed oil through the companies Fludor-Benin S.A. and SHB-Bohicon ("Sociétés des huilleries du Bénin"). Their oilseed-crushing capacity is 210,000 tonnes of cottonseeds per annum, or 30,000 tonnes of oil.

Benin has made major efforts to restructure and privatise the cotton sector. Major reforms have led, *inter alia*, to (i) the transfer of the industrial and commercial activities of the "regional action centres for rural development" (CARDER) to the State-owned National Agricultural Promotion Company (SONAPRA); (ii) a formal lifting of the purchasing monopoly of SONAPRA for seed cotton; (iii) the entry of new ginners; (iv) the progressive liberalisation of the input market; (v) the fixing of cotton prices more closely related to export; and (vi) preparations for privatising the State enterprise SONAPRA.

Benin still prohibits the export of seed cotton. This ban makes it possible to guarantee supplies to domestic factories, which grind seed cotton as a raw material. Benin has an installed ginning capacity of 20 units. Ten plants belong to SONAPRA, while private actors, either foreign companies (LBC/Aiglon, Louis Dreyfus, Kamsal, IBECO, MCI, Sodicot) or the local private sector (Talon and cooperatives) have invested in the private plants (SONAPRA retained a 35% share in each of them). Each cotton company was allocated a quota proportional to its installed capacity, which contributed to segment the market and restrict entry.
High world prices for cotton from 1989/90 to 1995/96 led to an investment boom in the ginning sector. However, since cotton prices in CFA francs declined and production stabilised, Benin ended up with a significant over-ginning capacity (600,000 tonnes of seed cotton against an actual production between 350,000 and 400,000 tonnes). The low utilisation rate combined with a high ratio of borrowings over owned capital has resulted in high financial burden for new ginneries.

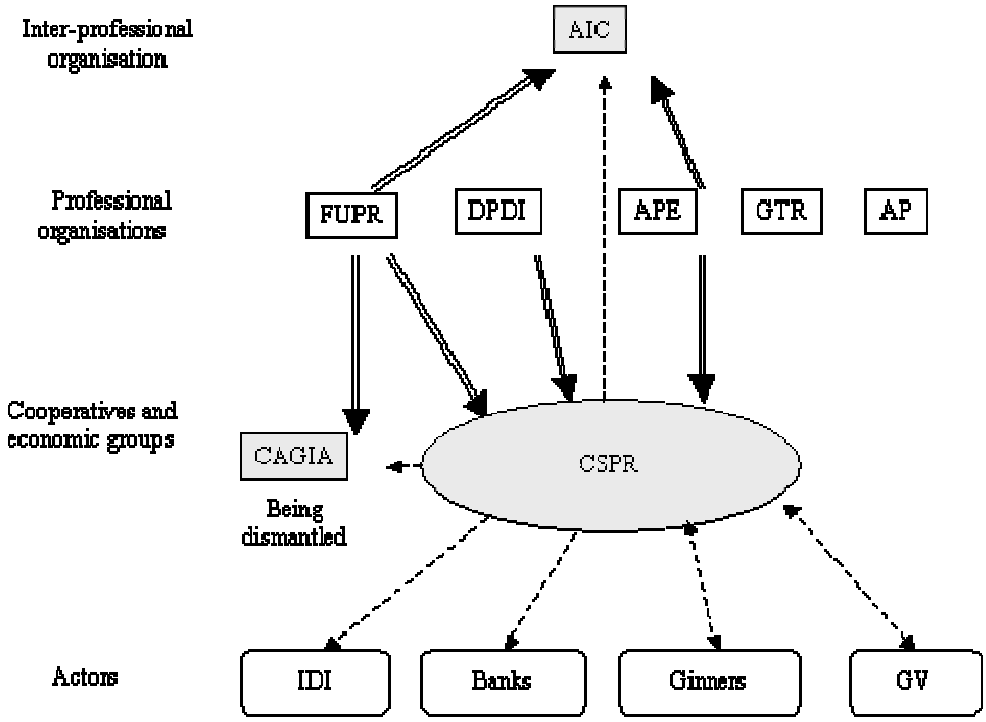
Management of the supply chain is by large in the hands of the industry stakeholders' organisations. At the private level, three main bodies can be identified:

(i) The Professional Association of Distributors of Agricultural Inputs (CAGIA): established in 1988 by the 77 farmers' associations at the sub-prefectoral level, CAGIA is a cooperative of input providers responsible for the allocation of licences for the supply of inputs.

(ii) The Interprofessional Cotton Association (AIC): established in 1999 by the Federal Union of Producers (FUPRO) and the Professional Association of Cotton Ginners of Benin (APEB), AIC coordinates marketing of inputs and seed cotton and arbitrates financial and economic claims among the key stake holders. By means of the SDI corporate vehicle, AIC is the main importer and distributor of cotton insecticides.

(iv) The Agency for Guaranteeing Payment and Collection (CSPR): set in 2000 by FUPRO, APEB and CAGIA, the C.S.P.R. is a clearing house for all financial transactions dealing with the sale of cotton inputs and seed cotton.

Cotton production and marketing structures in Benin



Source: French Embassy in Cotonou, Economic Commission (dossier on cotton - *French only*)

Two companies (CSI et Fruitex) operate outside this framework, having set up their own marketing channels for the distribution of inputs.

The State's withdrawal from the cotton sector has favoured the emergence of private business. Since 2000, the private sector has been in control of the import and distribution of inputs (seeds, pesticides, etc.) and has provided about half of the country's ginning capacity. Since the advent of the private sector, there have been some difficulties in having access to inputs in sufficient quantity. In volume terms, cotton inputs per producer fell from about 30,000 tonnes in the early 1990s to less than 10,000 at the beginning of the 2000s. Over the same period, input prices doubled, from 100 francs CFA/kg in 1990 to approximately 200 francs CFA/kg in 2000.

Burkina Faso

Cotton exports accounted for approximately 40% of exports from Burkina Faso over the period 1995-2000, or approximately 105 million US dollars per annum. Cotton is the main exported commodity in terms of value, and generates income for approximately 2 million people in the country.

Cotton production is concentrated in West Burkina Faso (the main producing areas are Comoé, Kossi, Mouhoun, and Kénédougou). Most cotton-farms are family-owned and small-scale (on average one hectare, although the level of planted area may rise to 20-30 hectares). Burkina Faso is the first West African country to have officially authorised, as of 2003, field trials of transgenic cotton.

Burkina Faso's cotton sector is one of the strongest agro-industries in Africa. SOFITEX, the former State enterprise, is still responsible for most of the commercial and industrial activities of the sector. Producers' involvement moved forward in 1999, when the national cotton producers' association ("Union nationale des producteurs de coton du Burkina Faso" - UNPCB) purchased a 30% share in SOFITEX. DAGRIS ("Developpement des Agro-Industries du Sud"), a French public holding company dedicated to cotton cultivation in the franc zone, holds a 34% share, whereas the Government has retained a share of 35%. Private sector banks hold the residual 1% share. Despite State's divestiture, the enterprise is still integrated along the value chain (purchasing of seed cotton, sale of inputs, processing, marketing). Transport has been liberalised.

A distinguishing feature of the sector is the organisation of producers at the local level in cotton producers' associations, which interface with SOFITEX.

Transport of seed cotton from primary markets to the ginning plants is mainly carried out by SOFITEX. Producers' associations are paid net of inputs purchased from SOFITEX. Proceeds are then distributed among the members of the association. Seed cotton is ginned and the lint is exported to South-East Asia (66%) and Europe (20%), with Africa and South America accounting for the balance. The guaranteed base price to the producers is set before the crop year and may include bonus payments (in case of profit, producers receive a higher premium the following season), the return premium being 50% to growers, 25% to the State, and 25% to Sofitex. The same system is applied in Ivory Coast and Benin, although extra payments tend to be less frequent and more modest.

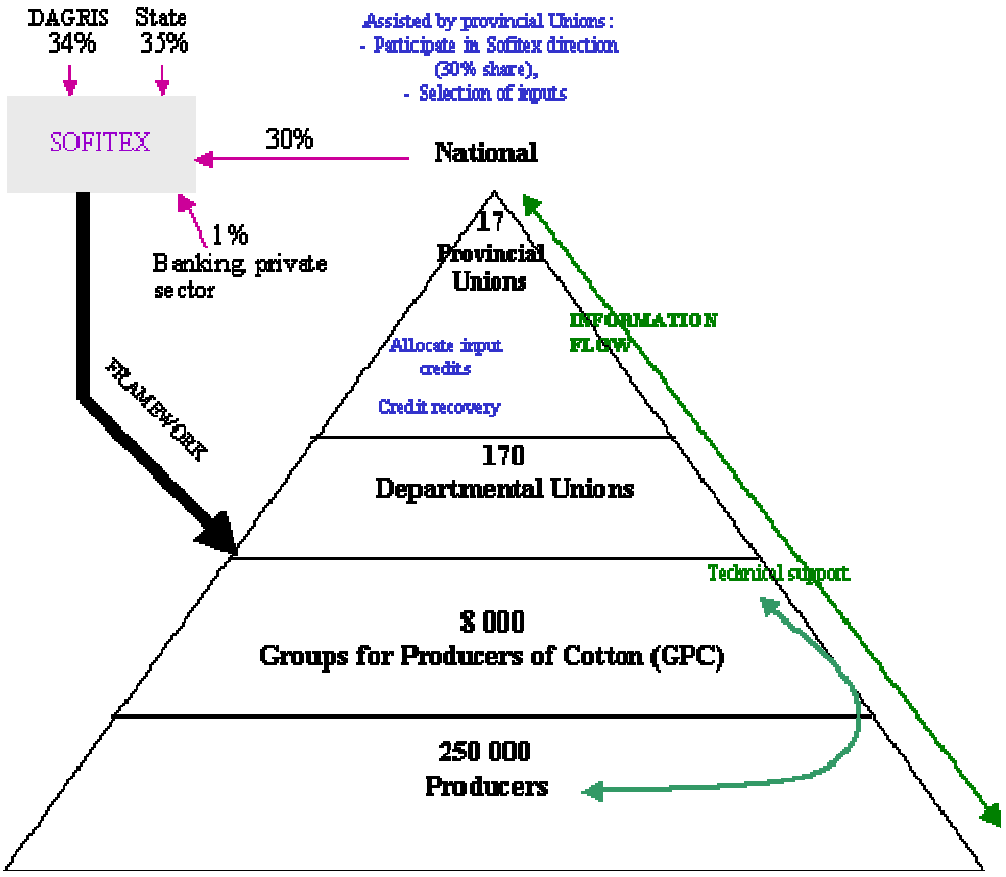
Burkina Faso also produces cottonseed oil (Citec).

Companies	No. factories	Capacity (tonnes)
Sofitex	12	373,000
Total	12	373,000
For the time being	Two factories at Kourouma and Diedougou (season 2003-04)	

Source: Marchés tropicaux (22 March 2002). Notice that since 2005 some changes have occurred.

Burkina Faso has well-established cottonseed processing activities. Among the operating oil mills is SN-Citec (in which SOFITEX maintains equity interests).

The National Union of Burkina Faso Cotton Producers ("Union nationale des producteurs de coton du Burkina Faso" - UNPCB) is the umbrella organisation that co-ordinates producer organisations with representation at departmental, provincial and national levels.



Source: UNCTAD secretariat

A management committee ("comité de gestion de la filière coton" - CGFC) sets prices for seedcotton and cotton inputs and manages a fund for the stabilisation of producer prices jointly with UNPCB.

The IPS/Reinhart consortium and Dagris have extended their control over the Centre and East zones respectively; SOFITEX has kept its position in the West zone.

Central African Republic

Cotton is the second largest source of export receipts in Central African Republic, with an annual average of approximately 18 million US dollars over the period 1995-2000. Cotton cultivation employs more than 100,000 people and another 800,000 are involved in cotton-related activities.

SOCADETEX (" Société Centrafricaine de Developpement des textiles") is the main corporate actor in the cotton sector. SOCADETEX was established in 2002 following liquidation of the State enterprise SOCOCA ("société cotonnière centrafricaine"). It is controlled by foreign investors (49%). The State holds a 15% share and the local private sector accounts for the remaining 36%.

The sector was partially liberalised in 1999 (price flexibility for seed cotton), which led inter alia to an increase in the price of inputs. Input prices almost doubled between 1995 and 2000. In the early 2000s, inputs would account for almost 40 percent of the producer price (up to 50% if taxes and other additional charges were included).

Cotton is grown primarily in the North-West and the South-East, where small-scale cotton farming prevails. Productivity continues to be hampered by the outdated equipment. Seed cotton harvested from the field (picking occurs in September-November) is transported to the ginning facilities by old trucks. The 6 active gins are equipped with outdated machineries. Virtually all of the ginned cotton is exported. Oil is extracted from cottonseeds in the Bangui factory or in Chad. SOCADETEX plays a major role in the marketing of cotton by-products.

Ivory Coast

Cotton accounted for about 3% of Ivory Coast's agricultural exports over the period 1995-2000. As a source of export earnings cotton ranks far behind cocoa or coffee, which accounted for a combined 40% of exports over the same period. Nonetheless, cotton generated more than 140 million dollars of export earnings a year.

Company	No. factories	Capacity (tonnes)
LCCI (L'Aiglon)	4	201,100
CIDT nouvelle	4	100,300
IPS/Reinhard (Aga Khan)	3	118,500
Uresco-Ci	1	n.a.
Total	12	419,900 (+n.a.)

Source: Marchés tropicaux (22 March 2002)

Up to the late 1990s, a single vertically integrated state enterprise ("Compagnie ivoirienne de développement des textiles" - CIDT) was responsible for organising virtually all services needed for cotton production and marketing. CIDT was broken down into three companies of comparable sizes (by allotted zone) in 1998. However, this did not lead to competition: the price of seed cotton remained the same for the three zones; in addition, each company retained exclusive purchasing rights within its zone.

The following three new companies were set up:

- "CIDT nouvelle". The Company is active in the South of the country, against the background of the North-South conflict, which recently dominated the political landscape of Côte d'Ivoire. The government has expressed its readiness to relinquish its share (a proposed deal was to sell 80% of the State's shares to producers for "un franc symbolique"). Negotiations on the purchase of CIDT nouvelle are temporarily stalled.
- "Cotton-Ivoire" is an equity joint venture active in the North-West of the country. The Aga-Khan group and the Suisse-based cotton-trading firm "Paul Reinhart" have join-venture interests in the company. The State retains a 30% share in the venture.
- LCCI is a subsidiary of the Switzerland based Aiglon group. LCCI is primarily active in North-East. A new ginnery (SICOSA) was constructed in this zone during the season 2002/03, with a ginning capacity of 450 tonnes per day (or 900 cotton bales). The new ginnery is operated by URECOS-CI, which is the most dynamic producers' association (it represents

1,200 village-level co-operative, or 130,000 producers). According to some sources, the new ginnery would benefit financial support from the Louis Dreyfus group.

Each company is responsible for the purchasing of cotton throughout its allotted area. This is often implemented by signing contracts with growers stipulating the area to be planted and the quantity of seed cotton to be delivered.

In a context of low producer liquidity, URECOS-CI developed an ingenious scheme to import inputs (fertilisers) for the 2002/03 crops. It consisted in selling forward a share of the forthcoming seed cotton crop to ginners and using the forward contracts to secure the credits needed to import the fertilizers. To facilitate implementation of the scheme, a new financing institution (*Société de Financement des Intrants Coton en Côte d'Ivoire*, *Society for the financing of Cotton Inputs in Côte d'Ivoire* SOFICOCI) was created in March 2002.

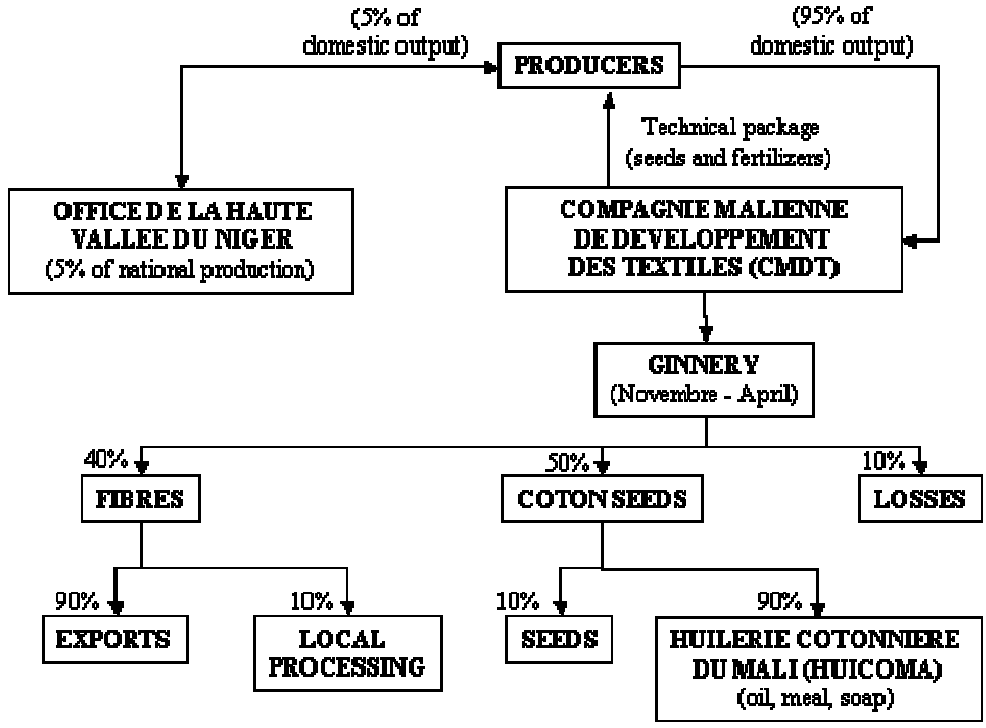
According to some commentators (refer in particular to L. Goreux, "Reforming the Cotton Sector in Sub-Saharan Africa", Africa Region Working Paper Series No. 47, March 2003), URECOS-CI could recreate a “filière intégrée” whereby producers would own the ginneries.

One active factory exists in Ivory Coast for the extraction of oil from cottonseeds.

Mali

Over the period 1995-2000, cotton exports accounted for an important share of total export revenues (35%, or approximately 178 million US dollars). In value terms, cotton was the second major source (behind gold) of foreign exchange earnings. Cotton is primarily grown on small farms in the Sikasso, Segou and Koulikoro areas, South of the river Niger, as well as in the Western district of Kita. Cotton is grown on almost 160,000 farms, covering about one third of the cultivated land. About 40% of rural households, or 2.5 million people, rely on cotton production and related activities for their income. Power source is for a large extension animal traction.

The cotton chain in Mali



Source: UNCTAD secretariat

Company	No. factories	Capacity (tonnes)
CMDT	17	599,800
Total	17	599,800

Source: Marchés tropicaux (22 March 2002)

Virtually all of seed cotton (95%) is handled by the *Compagnie Malienne des Textiles* (CMDT). In 2004 CMDT was co-owned by the Malian government with 60% of the share, and the French company DAGRIS, with the other 40%. State's withdrawal from CMDT is envisaged, and producers are currently allowed to buy into CMDT capital. The farmers' union, the "Syndicat des Producteurs Cotoniers et Vivriers du Mali" (SYCOV) has become a full partner with the CMDT and the government in negotiations over fixing input and cotton prices.

CMDT is responsible for ensuring prices to producers through its procurement operations. Within the framework of cotton- and food-producers' unions (GSCVM), producers' organisations are encharged with ensuring supply of the inputs used in cotton and cereals production. Privatisation of input distribution has been thoroughly considered. Moreover, CMDT progressively disengaged from rural development activities outside the cotton sector (in particular, structuring of the food crop industries, input supply in cereals, participation in the Huicoma oil mill). By controlling 17 gins through the country, CMDT also exerts substantial influence over the ginning sector. Independent operators perform other downstream activities, including processing of cottonseed oil (two oil mills -Huicom and Sepom- are active, with an annual combined capacity of 300,000 tonnes per annum).

Niger

Cotton production is concentrated in the Gay, Maradi, and Tohua areas, which account for a combined 80% of Niger's cotton output (global cotton production in Niger is about 10,000 tons a year). Most cotton production activities are carried out by farmers working on small family farms using traditional methods. Producers are provided with seeds imported by the state enterprise "Société Cotonnière du Niger" from Benin.

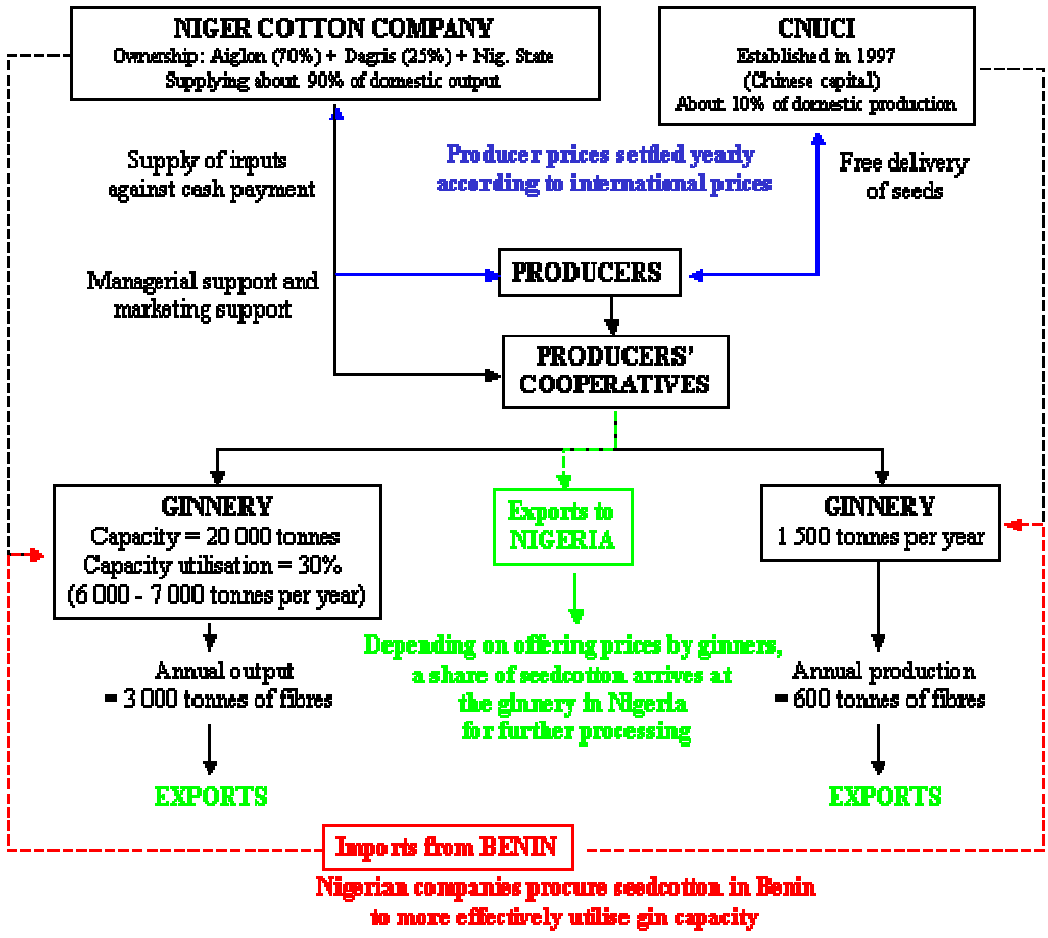
Two companies dominate cotton production and processing in Niger:

- The "Société Cotonnière du Niger" (SCN), jointly owned by Aiglon (70%), DAGRIS (25%) and the Niger Government. SCN handles about 90% of domestic cotton production.
- The Niger United Cotton Industries (CNUCI), controlled by Chinese interests. Established in 1998, it primarily markets cotton from the South-Western Gay and Dosso regions.

Société	Nombre d'Usines	Capacité (tonnes)
SCN	1	25,000
Cnuci	1	40,000
Total	2	65,000

Source: Marchés tropicaux (22 mars 2002)

Marketing structures in Niger



Source: UNCTAD secretariat
* Note: SNUCI's share in cotton production is around 10%.

Senegal

Cotton accounted for approximately 3% of total exports in Senegal during 1995-2000. Cotton was the third source of export earnings for Senegal (some 28 million US dollars over the 1995-2000 period). Cotton is grown in nearly every region (it covers almost one third of cultivated acreage). However, production is concentrated in the South-Eastern part of the country (South of the Kahone-Tombouctou belt, as well as in the Casamance and Kédougou regions).

Senegal's cotton production was managed through the parastatal SODEFITEX ("Société de développement des fibres textiles"). SODEFITEX was privatised in November 2003. Producers acquired 30% of the company's shares (they had no equity interest prior to privatisation). Sodefitex's ownership structure is as following:

- 51% DAGRIS (against 20% prior to privatisation);
- 30% producteurs (0% before privatisation);
- 10% Government (down from 77.5% prior to privatisation);
- 8% spinners.

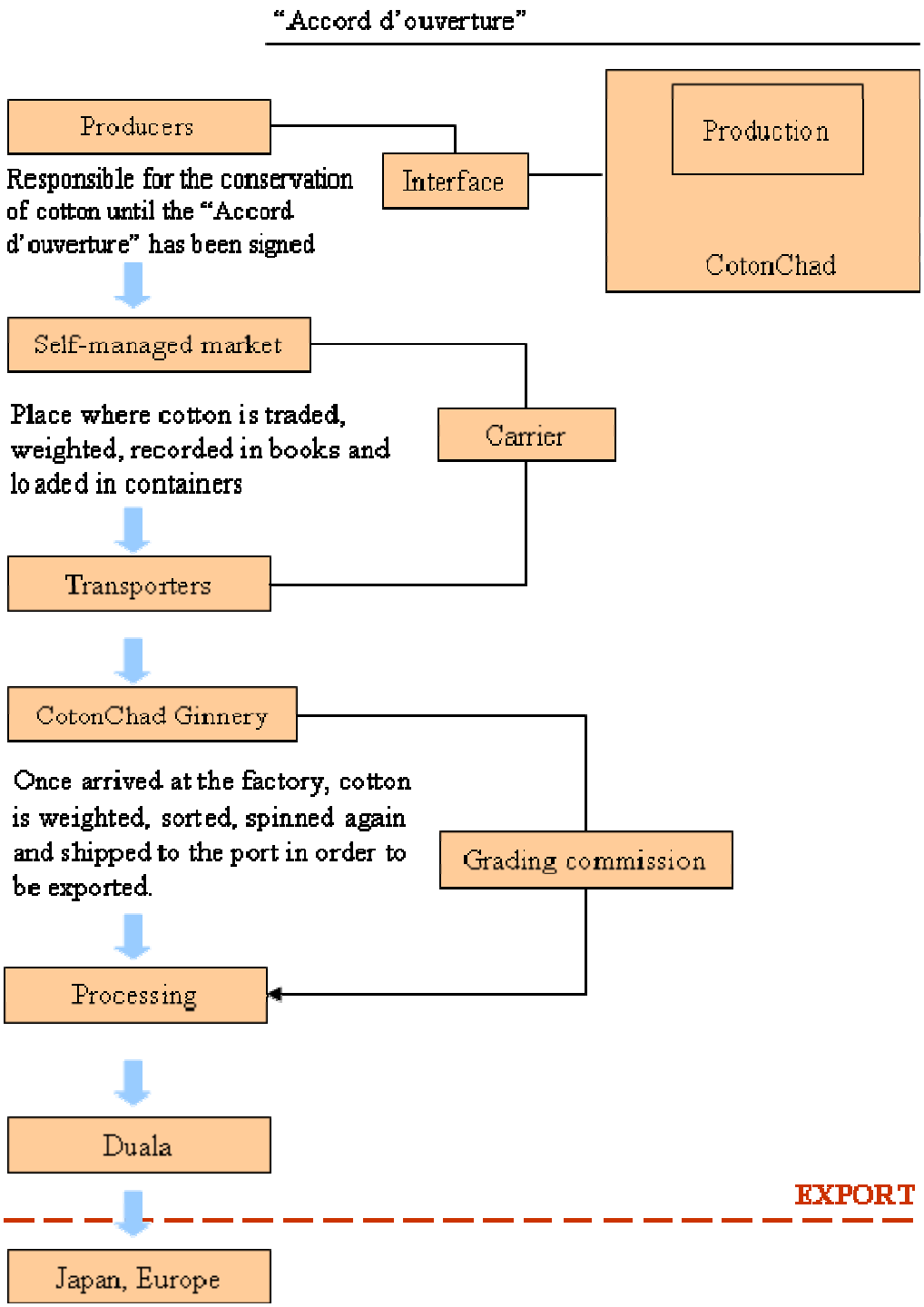
On the production side, the company supervises around 70,000 cotton farmers, who sell their production to Sodefitex. In addition to providing inputs (seeds), the company is responsible for ensuring prices to producers through its purchasing operations. Sodefitex processes the cotton grain into fibre at five ginning units (with a combined capacity of 65,000 tonnes of seed cotton).

The broad goal of Senegal's cotton policy over the next fifteen years is to raise levels of production, especially by means of irrigated cotton projects and mechanisation. The proposed objective in terms of output is to reach 100,000 tonnes (seed cotton), and 45,000 tonnes (high quality cotton fibres) by 2020.

Chad

Cotton is crucially important to the national economy, both in terms of income generation for farmers and for export revenue. More than 2 millions people (almost 40% of the country's total population) are occupied in the sector. Cotton accounts for two thirds of total exports from Chad. Chad's cotton production is largely exported to the European Union. France, Germany, Belgium, Portugal, and Spain are the largest importers of Chadian cotton.

Chad's cotton sector



Source: UNCTAD secretariat, based on Cotton sector reform in Chad: an institutional analysis (study commissioned by the World Bank)

The cotton belt lies in the Southern part of the country. Most cotton farms are still family-owned and operated (with average household size of 5 to 6 people). The average farm size is 1-2 hectares.

The Chadian cotton industry exhibits a structure of vertical integration, dominated by CotonChad, the only cotton processing company largely owned by the Chadian state (75%) and DAGRIS (19%). The local banking sector accounts for the residual 6%. CotonChad provides farm inputs to farmers on credit and manages the distribution of such inputs;

purchases, collects and transports seed-cotton from the villages to its cotton ginneries; gins the seed-cotton, and commercialises the lint. The producer price for seed-cotton is set each year by a committee consisting of representatives of farmers and CotonChad. The main structural problems concern the lack of an adequate transport and communication infrastructure.

Nine ginning factories are active in the South of the country (Sahr, Koumra, Moundou, Kelo, Gounou-Gaya, Léré, Pala, and Kyabe). Besides, Chad has installed capacity with respect to cottonseed processing activities, particularly oil and soap mills. The oil and soap marketing segments of CotonChad were reorganised in 2003 as part of a broader reform program under the auspices of the International Monetary Found (IMF). Under the program, cotton seed processing activities (oil and soap production) had been separated from cotton-ginning operations and privatised, essentially abandoning the structure of vertical integration.

In 1999, the Government of Chad set up a Cotton Sector Reform Committee (CTRC) that would evaluate the potential scenarios for reform. CTRC was concerned with improving the incomes of cotton farmers through the liberalisation of the sector and the promotion of strong cotton producer organisations.

Togo

Cotton accounted for about 18% of total exports from Togo during 1995-2000, averaging 18 million US dollars per annum over the period. Cotton is the largest source of export receipts (it superseded phosphates as the main foreign-exchange generating commodity in the early 2000s). More than 200,000 people (half of rural labour) are occupied in the sector.

Company	No. factories	Capacity (tonnes)
Sotoco	3	100,000
Socosa	1	40,000
Sicot/Aiglon	1	40,000
Sopic	1	25,000
Total	6	205,000

Source: Marchés tropicaux (22 March 2002)

Cotton is primarily grown in the South of the country on small, rain fed farms, with an average land area of 1 hectare. Although other commodities are also grown as cash crops, cotton represents the single largest source of household income, accounting for up to 70% of farmers' income.

There are about 2000 producers' associations responsible for input distribution and seed cotton delivery. Producers' associations operate under the technical supervision of SOTOCO ("Societe Togolaise de Coton"). Cotton is picked manually, although mechanical means are being introduced (most often by external service providers). Harvested cotton is made into fibres or further processed to extract oil. NIOTO ("Nouvelle industrie des oléagineux du Togo") manufactures edible oil from raw cotton. As regards fibre processing activities, liberalisation of the ginning and spinning sectors have allowed the entry of three new companies: SICOT-SA ("Société industrielle de coton"), whose main commercial partner is the controlling Suisse company "Aiglon"; SOPIC ("Société de production industrielle de

coton"); and SOCOSA ("Société cotonnière des savanes") established (as for SOPIC) by the Continental Eagle corporation (65%) and the trading company Louis Dreyfus (20%).

For further information, please refer to:

- Cotton: Market Setting, Trade Policies, and Issues (J. Baffes, *World Bank Policy Research Working Paper* 3218, February 2004)

- Reforming the Cotton Sector in Sub-Saharan Africa (L. Goreux & J. Macrae, *Africa Region Working Paper Series* No. 47, March 2003)

- Importance of Cotton production and trade in West Africa (Sahel and West Africa Club / OECD, K. Hussein, *Contribution to WTO Regional Workshops on Cotton*, Cotonou 23-24 march 2004)

- L'avenir des filières cotonnières ouest africaines : quelles perspectives après Cancun ? (K. Nubukpo, Centre de coopération internationale en recherche agronomique pour le développement) - *French only*

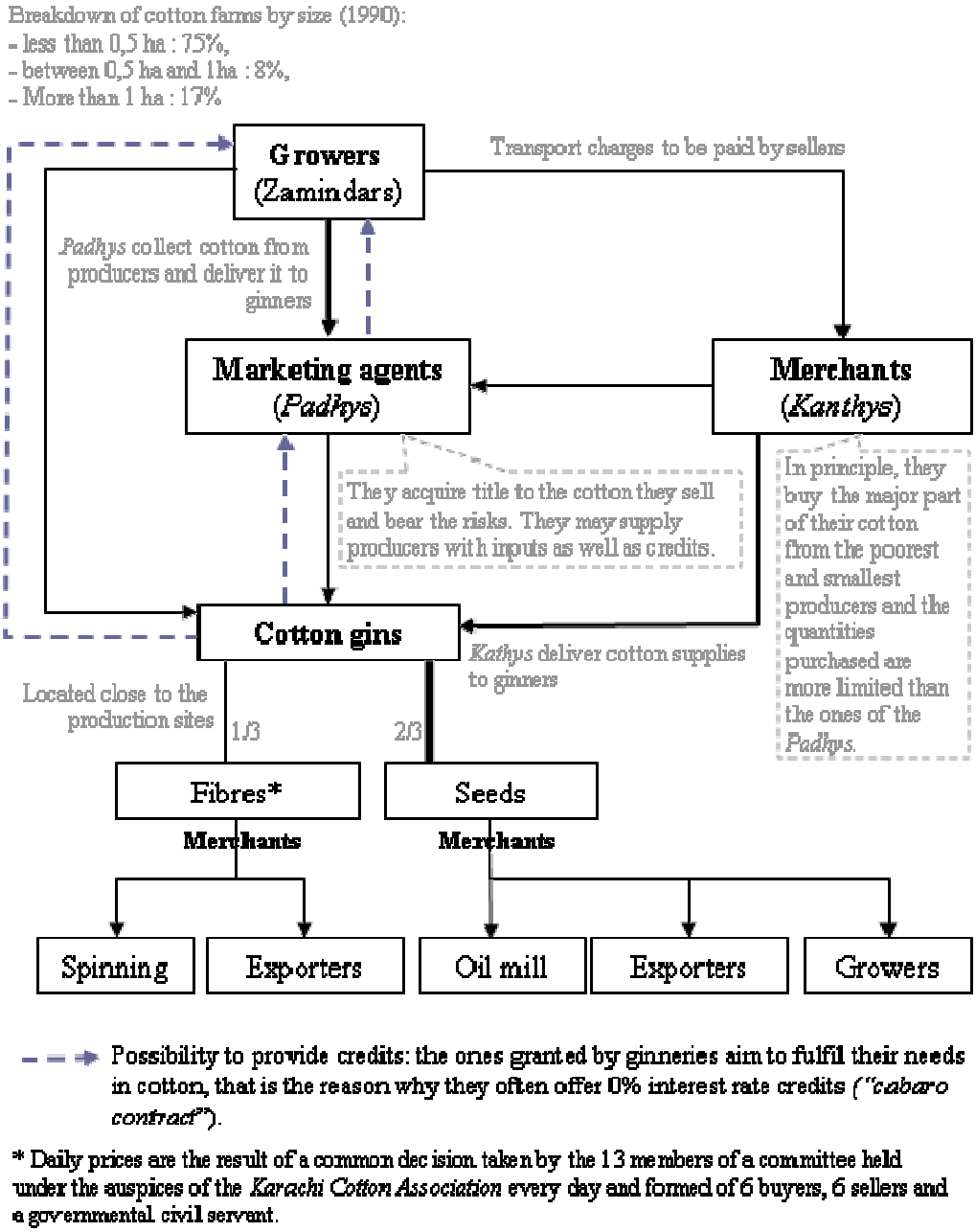
- "Le Coton" à Madagascar (Centre d'Information Technique et Economique de Madagascar) *French only*

- Market intelligence and recent information as regards cotton in Western Africa, USDA, December 21, 2005

Cotton chain in Pakistan

According to *UK Trade & Investment* cotton and cotton by-products account for more than one third of total exports from Pakistan.

Cotton marketing structures in Pakistan



Source: Comparing the Seed cotton and Wheat Marketing Chains in Sindh (H. R. Lohano, L. E. D. Smith, M. Stockbridge) - The Pakistan Development Review (spring 1998)

For more information on marketing structures in Pakistan, please refer to the following websites:

- Central Cotton Research Institute, Multan-Pakistan
- Cotton Standardization and Grading: Pakistan (PDF, 189 KB)
- Pakistan Central Cotton Committee
- pakissan.com

Companies

International organisations

- International Cotton Advisory Committee (ICAC)

Professional associations and national bodies

International	OECD - Sahel and West Africa Club
	International Center for Trade and Sustainable Development (ICTSD)
	Committee for International Co-operation between Cotton Associations (CICCA)
	International Textile Manufacturers Federation (ITMF)
Africa	African Cotton Association (ACA)
Germany	The Bremen Cotton Exchange
Australia	Australian Cotton Research Institute
Benin	Association interprofessionnelle du coton (AIC)
	Société SONAPRA
Burkina Faso	Union nationale des producteurs de coton du Burkina Faso (UNPCB)
	Société burkinabé des fibres textiles (Sofitex)
	Union nationale des producteurs de coton du Burkina
Cameroon	Société de développement du coton (Sodécoton)
	Organisation des producteurs de coton du Cameroun
Central African Rep.	Société centrafricaine de développement des textiles - Sodecatex (anciennement : Société cotonnière centrafricaine - Sococa)
Chad	Coton Tchad
China	China National Cotton Exchange
Ivory Coast	Compagnie ivoirienne de développement des textiles (CIDT)

	Union régionale des entreprises coopératives de la zone des savanes de Côte d'Ivoire (Urecos-CI)
United States	American Cotton Shippers Association (ACSA)
	Cotton Board
	Cotton Council International (CCI)
	Supima Association of America
	California Cotton Ginners Association and the California Cotton Growers Association
	National Cottonseed Products Association
	National Cotton Council of America
France	Association Française Cotonnière (AFCOT)
Mali	Compagnie malienne de développement des textiles (CMDT)
	Syndicat des producteurs de coton et vivriers du Mali
Poland	The Gdynia Cotton Association (G.C.A.)
United Kingdom	Liverpool Cotton Association (LCA)
Senegal	Fédération nationale des producteurs cotonniers (FNPC)
	Société de Développement et des Fibres Textiles (Sodefitex)
Togo	Société togolaise de coton (Sotoco)

DAGRIS : The former "Compagnie française pour le développement des fibres textiles" (CFDT), renamed DAGRIS in 2001 holds shares in cotton enterprises in a number of countries (notably Senegal, Burkina Faso, Cameroon, Central African Republic, Mali and Mozambique). This company is also involved in different level of cotton marketing chains. For an overview of the company's organization, please consult Dagris website.

Privatization of the French company DAGRIS (January 23rd 2006)

Since December 2004 and the "Loi de finance rectificative", a debate as regards the privatization of the French company DAGRIS had been launched. On January 23rd 2006, the French Ministry of Economy announced its decision to privatize DAGRIS and signified that the remaining shares held by the French government in the company (64.7%) will be sold over the counter through the Rothschild & Cie bank.

Companies

Companies with an output of over 200,000 tonnes a year

Australia	Namoi Cotton Cooperative Ltd.
	Weil Cotton Inc
	Queensland Cotton Corporation Ltd
Belgium	Louis Dreyfus Cotton International NV
United States	Allenberg Cotton Co.
	Cargill
	Dunavant Enterprises, Inc.
	Calcot Ltd.
	Plains Cotton Cooperative Association
	Ecom Agroindustrial Corp Ltd
	Staple Cotton Cooperative Association
France	Compagnie cotonnière Copaco
Japan	Toyo Cotton (Japan) Co
Uzbekistan	State Joint Stock Foreign Trade Company "Uzmarkkazimpex"
	Uzprommashimpeks
	Joint Stock Company Innovatsia
United Kingdom	Plexus Cotton Ltd
Switzerland	L'Aiglon S.A.

Source: UNCTAD secretariat (based on ICAC, Cotton: Review of the World Situation)

Companies with an output ranging from 50,000 to 200,000 tonnes a year

Germany	Albrecht, Müller-Pearse & Co GmbH & Co
	Otto Stadtlander GmbH
Australia	Colly Cotton Marketing Pty Ltd - (Twynam)
	Dunavant Enterprises Pty Ltd
	Auscott Ltd
Austria	Forte Handelsgesellschaft Mbh

Chad	Société cotonnière du Chad
China	Chinatex
Republic of Korea	Daewoo Corporation
Ivory Coast	Ivoire Coton (Industrial Promotion Services, IPS - Groupe Aga Khan)
Spain	SA Goenka
United States	Anderson Clayton Corp
	Paul Reinhart Inc
	Bruce Allbright Cotton
	Deca International Inc
	Volcot America Inc
	Eastern Trading Co, Inc
	Tokyo Cotton Co
	Colly-Houchin, Inc
	American Cotton Suppl. Intl
	Dyer Cotton Co Inc
	J. G. Boswell Company
	Montgomery Co Inc
	Jess Smith & sons Cotton Ltd
Russian Federation	Power International
	FCA Comexim Ltd
France	Société d'importation et de commission
	Mambo Commodities
	Devcot SA
India	C.A. Galiakotwala & Co Ltd
	Kotak & Co Pvt Ltd
	Gill & Co Ltd
Italy	Arco Cotton Agents (International Cotton Trading)
	Battistel Amiotti Srl

	Cottagon Italia Srl (Paul Reinhart)
	Indutech Spa
Japan	Toyoshima & Co Ltd
Pakistan	Trading Corporation of Pakistan Pty Ltd
Netherlands	Glencore Grain Rotterdam Bv
United Kingdom	Cargill Cotton
	Baumann Hinde & Co Ltd
	Weil Brothers & Stern Ltd
Singapore	Olam International Ltd
Switzerland	International Cotton and Textile Trading Co Ltd
	Cottip S.A.
	Cogecot Cotton Company SA
	Newcot Ltd
Syria	Syrian Cotton Marketing Organisation
Turkey	Cukurova Cotton Cooperatives Association Cukobirlik
Zimbabwe	The Cotton Company of Zimbabwe

Source: UNCTAD secretariat (based on ICAC, Cotton: Review of the World Situation)

Companies with an output between 20,000 and 50,000 tonnes per annum

Afrique du sud	Clark Cotton Group of Companies
Allemagne	Friedrich W. Kaemena & Co GmbH
	Rhein-Schelde Handelgesellschaft Fp Mostert Kg
	Brünig, Anft & Co GmbH
Australie	Weil Brothers Cotton Aust Pty Ltd
Bangladesh	Bangladesh Textile Mills Corporation
Belgique	Taevertex
Bénin	Société nationale pour la promotion agricole (SONAPRA)
	Compagnie cotonnière du Bénin

	Industrie cotonnière béninoise
	Label Coton
	Ritis international
	Société béninoise de représentation Sobere
Côte d'Ivoire	Compagnie ivoirienne pour le développement des textiles (CIDT)
Egypte	Modern Nile Cotton Co
Espagne	Luis Jover SA
Etats-Unis	Esteve Brothers & Co, Inc
	Savannah River Cotton Company
	ACM, Inc
	M. Schiefer Trading Co.
	Toyoshima USA, Inc
	First American Cotton Co
	Francis & Company, Inc
	Knowles-Taylor Cotton Co Inc
	Lyons Cotton Inc
	Queensland Cotton Corp Ltd
Féd. de Russie	Quetta Corporation Ltd
	WIS Logistics (Ivanovo) Ltd.
Inde	Sekhsaria Exports
Israël	The Cotton Production & Marketing Board Ltd
Italie	Castellano & C. Snc
Grèce	Violar SA
Royaume-Uni	Central Cotton Company Limited
Soudan	The Sudan Cotton Company Ltd
Suisse	Glencore International Ag
	Volcot Switzerland Ltd
	Cotton Distributors Inc

	Ecom Agroindustrial Corp Ltd
Tanzanie	Cargill Tanzania Ltd
Turquie	Etem Ozsoy Tarim Ticaret Ve Sanayi As
	Pamteks A.S.
Uruguay	TCT United SA
Zimbabwe	Cargill Zimbabwe Pvt Ltd

Source: UNCTAD secretariat (based on ICAC, Cotton: Review of the World Situation)

Industry directories

World	http://www.cotton-net.com/directory/
	http://www.textilefiberspace.com/trade/index.html
France	http://www.info-textile.com/
	http://www.textile.fr:81/fet/annuaire/index.htm
	http://www3.kompass.com/kinl/fr/ (une fois la page accédée, compléter les cases bleues en haut de la page)
US	http://www.cottonusa.org/applications/SuppliersDir/index.cfm

Technology

- Spinning
- Further finishing processes

Picking occurs in dry season. After seed cotton (i.e. unginned cotton) is collected, spotted or immature bolls are discarded. The process of separating lint from the seed (cotton ginning) is then performed (most often) by mechanical means. The first ginning machine was developed by Eli Whitney in the late 18th century.

Quality of cotton lint may be hampered by the lack of an efficient ginning system. Once lint has been cleaned to remove trash (cotton cleaning), staple fibres are compacted by mechanical means into bales (bailing). Metallic ties are used to hold bales together, thus facilitating transport and storage.

Important developments have occurred in the crucially sensitive areas of cotton plant breeding and biotechnology (genetically modified (GM) cotton in particular). A gene conferring resistance to glyphosate (an active ingredient in herbicides) was transformed into cotton for the first time in 1987. Another milestone in genetic engineering of cotton occurred in 1989, when Monsanto developed the "Bt cotton" variety. Bt cotton is a pest- (rather than pesticide-) resistant variety. It contains a foreign gene obtained from *bacillus thuringiensisa*, which protects the plants from bollworm. In 1996 the Bt crop was first planted on a commercial scale in Australia and the USA. Since then, cotton crop varieties developed by genetic engineering (particularly Monsanto's Bt cotton variety) have been planted on more than one fifth of land under cultivation. Genetically modified cotton would cover 50% of cultivated land in Mexico and South Africa, compared to 80% in the USA and 66% in China. Argentina, Australia, India, and Indonesia also approved commercial planting of genetically engineered cotton in 2005.

According to estimates from CropLife International, cotton is the third largest GM commodity worldwide, behind soybeans and corn, with a market of approximately 430 million US dollars in 2002-2003.

In Francophone Africa, plans are being finalised to convert some cotton crops into transgenic cotton varieties over the next years. In Mali, for example, the government signed a research agreement with the US Agency for International Development (USAID), Monsanto, Syngenta and Dow Agrosciences in 2004 to develop and commercialise transgenic cotton by 2009. Field-testing of Bt cotton started in Burkina Faso in 2003. Field trials are now underway at research stations of the "Institut national de l'environnement et de recherche agricole" (Inera) in Farakoba (South-east) and Fada N'Gourma (East). The trials aim to assess the viability of Bt cotton and to develop varieties resistant to the caterpillars (which affects approximately half of the country annual cotton output).

For more information, please please refer to the following document: "Développement de la culture du coton génétiquement modifié au Mali" (Ministry of Agriculture, Livestock and Fisheries).

According to an article published in "Le Monde" on February 3, 2005 ("Avec les OGM, réduire la fracture agricole mondiale", by Gilles Peltier), in 2005, 24% of world cotton under

cultivation are estimated to be under GM varieties against 2% in 1997, corresponding to 34% of world cotton production and more than 30% of world exports.

According to the International Service for the Acquisition of Agri-biotech Applications (ISAAA), India increased its area of approved Bt cotton from approximately 100,000 hectares in 2003 to 500,000 hectares in 2004 when approximately 300,000 small farmers used Bt cotton. After suffering severe drought in 2002 and 2003, Australia increased its total cotton plantings to about 310,000 hectares of which 80%, equivalent to 250,000 hectares, were planted with biotech cotton in 2004. China increased its Bt cotton area for the seventh consecutive year; an increase of one-third from 2.8 million hectares in 2003 to 3.7 million hectares in 2004, equivalent to 66% of the total cotton area of 5.6 million hectares in 2004, the largest national cotton hectarage planted in China since the introduction of Bt cotton in 1997. Globally growth rate in commercialised biotech cotton from 2003 to 2004 was at 25%.

For more information the reader is referred to the website of the National Institute for Agricultural Research (INRA).

Spinning

Spinning is the process of making yarn from unbundled fibres. It includes the following operations.

Upon arrival at the spinning mill, cotton bales are sampled according to lint quality and origin to ensure yarn homogeneity. They are then opened to make the lint fluffy by passage though bale-openers. The following important step in the spinning process is cleaning. Bale fibres are usually fed to air-jet (vortex) cleaners to remove extraneous matter from cotton lint (which may hamper further cotton processing and affect lint quality). At this stage loose fibres are not aligned and parallel in a single continuous strand. Carding is the process of straightening or paralleling the fibres.

Carding separates fibres from each other, straightens fibres, aligns and condenses them into a single continuous strand, and removes impurities. A sliver of approximately one-meter width is then obtained.

Cotton that has already been carded may be combed. Combining is an optional step in the ginning process. This process is only used to produce superior quality yarn and long- or extra long-staple fibres.

As a result of drawing (or doubling) the sliver is condensed into a thinner strand and becomes more uniform. The sliver is fed to several rubber rollers rotating at increasingly higher speed. Cotton bleaching (using either hypochlorite or peroxide) and dying often occur at this stage.

Eventually, several slivers are drawn and twisted together to form the final yarn. Twisting is made by two mechanical actions. First, a drawing frame condenses slivers into a thinner strand (slubbing) and winds it on a bobbin. A spinning frame then reduces roving to required size of single yarn (fine spinning). A suitable amount of twist is introduced according to the intended use of the fibre.

Further finishing processes

• Mercerization

Mercerization, a textile process named after its inventor, the English chemist John Mercer (1791-1866), was first developed in 1844. In 1889 Horace Lowe discovered the additional effect of enhancing the lustre by stretching the swollen materials while wet with caustic alkali and then washing off. Mercerization is a finishing process used to produce high quality fabrics, such as damasks. It consists essentially of impregnating stretched cotton with caustic soda (although other alkalis may be used). The treatment enhances the lustre of cotton (the fibres are swelled), making it similar to silk. It also increases the fibre strength and affinity for dyes. A related process (liquid ammonia treatment) produces some of the effects of mercerization. Double mercerization means both the yarn and the knitted fabric are mercerized.

For further information, please refer to the following sites:
- Lectures on Mercerization (Y. Matoba): textileinfo.com
- Glossary terms - textiles: textile.org.uk

• Gassing

Gassing refers to passing a cotton thread at high speed through a flame to eliminate the fluff. Because 6-10% of the fibrous mass is lost in the process, the gassing of cotton yarns is a costly operation. A related process is singeing the fabric (rather than gassing the yarn), by passing cotton fabrics though a flame. However, singeing is less effective than gassing, in that only those hairs which protrude out of the fabric can be burned off.

• Sanforisation

A manufacturing process invented by Sanford Cluett in 1933, sanforisation is a treatment applied to fabric to reduce cloth shrinkage after washing. During the sanforising process, the fibres of the cotton fabric are stretched both in length and in width so that cloth that is washed and dried will not shrink much.

• Twisting

Many fine filaments or yarns are plied together (by inserting S or Z twists) to increase the diameter and tensile strength. In principle strands are twisted together in the opposite direction to the spinning twist.

Prices

Price developments

Differences in cotton prices may be attributable to a number of factors. Cotton prices vary, in particular, depending on the variety grown and the quality of the harvested cotton. For examples, ad hoc quotations are set for long-staple Egyptian cotton.

In addition, cotton-pricing mechanisms are affected by government support programmes, especially in the United States. Subsidisation regimes in several producing countries have added to the relative fragmentation of price formation for cotton. According to a communication from the Commission of the European Communities to the Council and the European Parliament (COM(2004) 87), due to subsidisation, prices paid to domestic cotton farmers were 90% and 154% above world prices in 2001/02 in the US and EU respectively.

It should be pointed out here that there is no world futures contract currently used as an international cotton price benchmark. Indeed, standard specifications of futures contracts traded on the New York Commodity Exchange correspond mainly to US cotton market fundamentals. For the same reason, quotations at the Osaka Mercantile Exchange are not representative of world prices for raw cotton. Despite a punctual reduction of basis risk due to the increasing importance of US cotton on the world sector (and on price discovery mechanism), the use of futures instruments for the other origins (with the exception of Mexico, member of Alena and which might be in a position to use US futures markets as both prices are well correlated) is not always easy as spot and futures prices might suddenly diverge. Any exogenous changes (e.g. trade policy) might eventually bring on the re-emergence of an important basis risk, with devastating spillovers on cotton hedgers.

The point of departure is generally the cash price for cotton set in actual transactions or through relatively short-term contracts for forward delivery (2 to 4 months). World prices are monitored by means of price indexes (the "Cotlook Indexes", A and B) compiled by Cotlook Limited, a private UK cotton consultancy, and published daily in the Cotton Outlook. The Indexes are intended to be representative of the price level on the international raw cotton market:

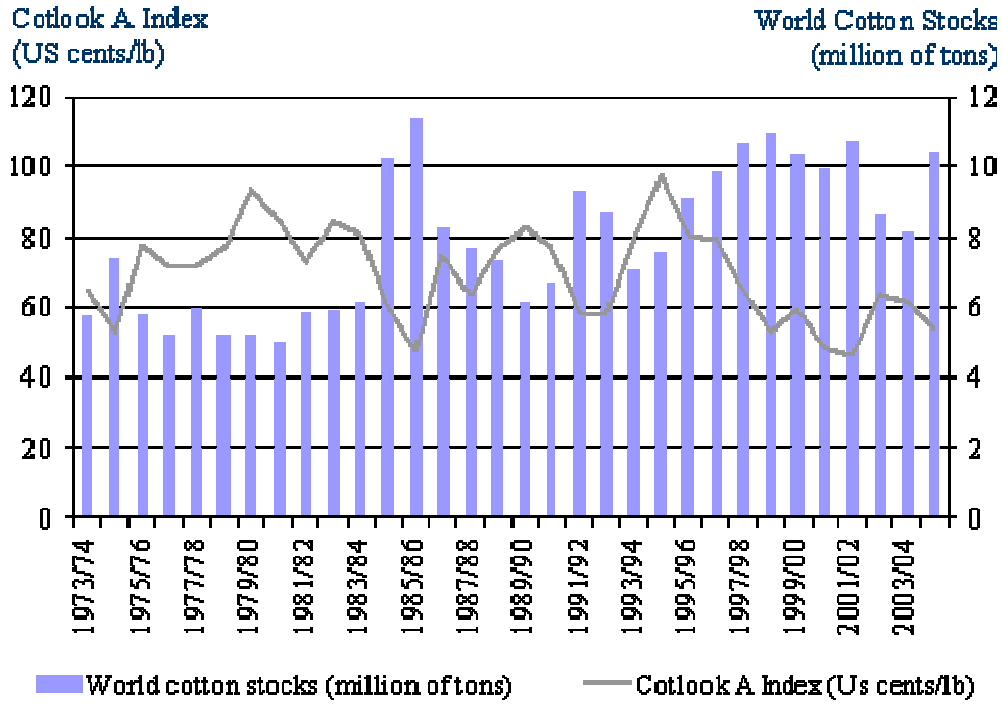
- The Cotlook A-Index is the average of the cheapest five quotations from a selection of the main upland cottons traded internationally (19 origins*). The prices are CIF cash against documents on arrival of a vessel at a Far East port**.

- The Cotlook B-Index is an average of the cheapest three quotations for "Coarse Count" cotton - commonly in use for spinning coarse count yarn over the nine origins *** shipped to European ports.

Overall, fluctuations in cotton prices are determined by several factors, in particular: shifts in the level of demand and supply, which reflect changes in producing countries' cotton policies.

* Memphis/East, California/Arizona, Orleans/Texas, Tanzania, Turkey, India, Uzbekistan, Paraguay, Pakistan, Côte d'Ivoire, Burkina Faso, Benin, Mali, Greece, Australia, Mexico, Syria, Brazil, China.
** Including Bangkok, Laemchabang, Jakarta, Hong Kong, Penang, Kelang, Singapore, Busan, principal Japanese and Chinese ports, Manila, Tainan, Keelung, Semarang, Surabaya.
*** Orleans/Texas, Argentina, Brazil, Turkey, Syria, Uzbekistan, China, Pakistan, India.

Long-term price developments for cotton (Cotlook A-Index, 1973/74-2004/05) and world cotton stocks



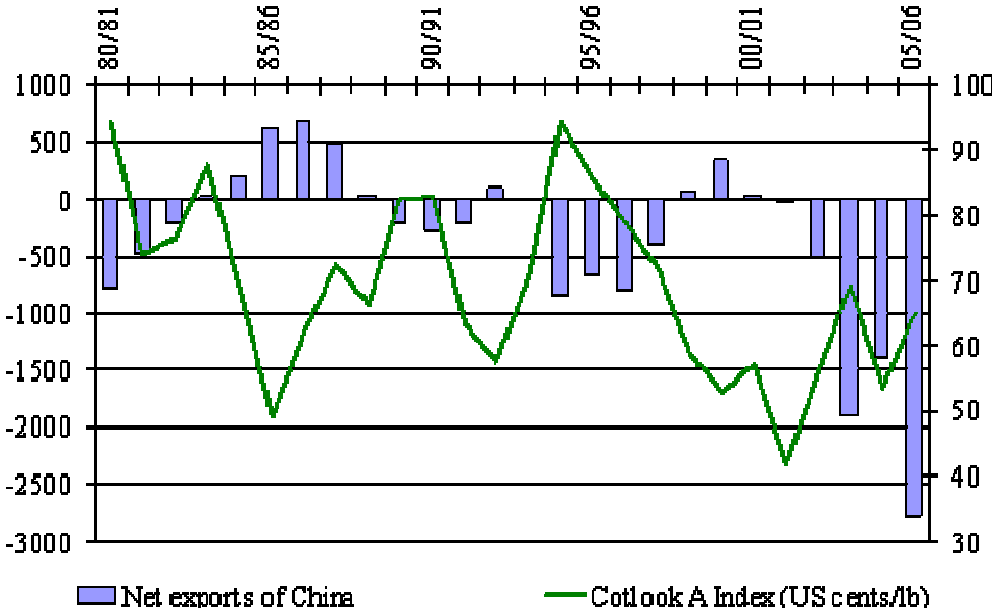
Source: UNCTAD secretariat (Data: UNCTAD Commodity Price Bulletin)

With output exceeding demand, world cotton stocks rose steadily in the middle of the 1980s, up to 10.3 million tonnes in 1985 and 11.4 million tonnes in 1986. There have then been continued increases in cotton stocks during the late 1990s and early 2000s, with stocks remaining high above 10 million tonnes. The rise in cotton stocks is attributable to excess supply, notably in China and the United States, were government incentives stimulated oversupply and added to the general downward pressure on prices. Cotlook A Indexes declined consistently during this period, with prices falling at 35 US cents/lb in August 1986. Prices stood at 59.8 US cents/lb on average in 1985 and 48 US cents/lb in 1986, compared to 80.9 US cents/lb in 1984 and 74.7 US cents/lb in 1987 respectively. Following a meagre upward movement in 1987 (74.7 US cents/lb) and 1990 (82.6 US cents/lb), the A-Index dropped again in the early 1990s, with major downward shifts occurring in 1992 and 1993. Prices averaged 57.9 US cents/lb in 1992-1993. The lowest peak was recorded in November 1992 (52.7 US cents/lb). Several factors contributed to drive cotton prices down, including: 1) A rise in cotton production. World cotton production increased from 19 million tonnes in the 1990/91 season to 20.7 million tonnes in 1991/92, at a growth rate of 9% over the period. Production sharply increased mainly due to the huge increase of China, whose production rose from 3.8 million tonnes in 1989/90 to 5.7 million tonnes in 1991/92. 2) On the demand side of the ledger, pricing was negatively impacted as cotton consumption declined in the former Soviet Union (consumption levels, which stood at 2 million tonnes in 1990, fell to 1.9 million tonnes over the next year and to 1.8 million tonnes in 1992).

Prices performance was more robust in the following years, with prices reaching the highest peak at 120 US cents/lb in 1995. This upward movement was recorded in conjunction with a steady decrease in cotton production in a number of countries (whose supply levels were closely linked to cotton quotations). In the first half of the 1990s, production of raw cotton dropped sharply in South America (it divided by 1.5), as the cotton area reduced in size. However, this regional slowdown in production was compensated by huge increases in the largest producing countries, notably China and the United States.

With one fourth of global output, one fourth of cotton stocks, and approximately 30% of world consumption, China plays a major role in cotton, affecting the movements in prices.

Parallel movements in cotton prices (Cotlook A-Index, US cents/lb) and net exports from China



Source: UNCTAD secretariat (Data: International Cotton Advisory Committee - ICAC)

For an example of national price discovery mechanism, please refer to the Oxfam/Cirad/IER Ecofil case study in Mali "'L'Impact sur l'Economie Malienne du Nouveau Mécanisme de Fixation du Prix du Coton Graine", August 2005.

The futures market and contracts

Futures contracts and options traded in the United States and Japan are hereafter detailed. Contract specifications may be subject to change. Please, verify information with the specified sources.

United States:

Futures contracts and options are traded on the New York Board of Trade.

Cotton No. 2 Futures Contract

Trading Unit 50,000 lbs. net weight (approximately 100 bales). **Trading Hours** 10:30 am to 2:15 pm; closing period commences at 2:14 pm	**Daily Price Limits** 3 cents above or below previous day's settlement price. However, if any contract months settles at or above $1.10 per pound, all contract months will trade with 4 cent price limits. Should no month settle at or above $1.10 per pound, price limits stay (or revert) to 3 cents per lb. Spot month - no limit on or after first notice day.
Price Quotation Cents and hundredths of a cent per pound **Trading Months** Current month plus one or more of the next 23 succeeding months. Active trading months: March, May, July, October, December. **Ticker Symbol** CT	**Position Limits** Delivery Month 300 contracts Any other month 2,500 contracts All months combined 3,500 contracts Futures & options have a combined limit in futures equivalents. Contact the Exchange for more information. **Basis Grade** Quality: Strict Low Middling Staple Length: 1 2/32nd inch *Contact the Exchange for more information an other specifications.*
Minimum Fluctuation 1/100 of a cent (one "point") per pound below 95 cents per pound. 5/100 of a cent (or five "points") per pound at prices of 95 cents per pound or higher.* N.B.: Spreads may always trade and be quoted in one point increments, regardless of price levels.	**Point Value** $5.00
	Delivery Points Galveston, TX; Houston, TX; New Orleans, LA;. Memphis, TN; Greenville/Spartanburg, S.C.
	Last Trading Day Seventeen business days from end of spot month. **First Notice Day** Five business days from end of preceding month.

Source: New-York Board of Trade

Options Contract on Cotton No. 2 Futures

Trading Unit One New York Cotton Exchange Cotton No. 2 futures contract. **Trading Hours** See cotton futures **Price Quotation** Prices quoted in cents and hundredths of a cent.	**Daily Price Limits** None **Strike Price Increments** 1 cent increments **Minimum Price Fluctuation** 1/100 of a cent. **Point Value**

	$5.00
Trading Months Mar, May, Juy, Oct & Dec. The nearest ten delivery months will be available for trading. Example: In Aug 1999, the Oct 1999, Dec 1999, Mar 2000, May 2000, July 2000, Oct2000, Dec 2000, Mar 2001, May 2001 & Jul 2001 contracts will be available for trading. **Ticker Symbol** CT **Minimum Fluctuation** Prices quoted in cents and hundredths of a cent.	**Position Limits** See Cotton Futures specifications for combined Futures/Options Limits. **Last Trading Day** The last Friday which precedes first notice day for the underlying future by at least five business days. **Expiration Date/Time** Until 5 p.m.(NY time) on any trading day including last trading day. Automatic exercise at one tick or more in-the-money at expiration on last trading day.

Source: New-York Board of Trade

Japan:

In Japan futures contracts are traded at the Osaka Mercantile Exchange but they concerns cotton yarn.

Cotton Yarn 20'S and 40'S

Commodity	Cotton Yarn of 20 and 40 count of single gray, waving, "Kingyo" branded by Toyobo
Trading Hours	Morning Session 9:50 10:50 Afternoon Session 13:50 14:50 In any sessions, count 20 is traded first, then followed by count 40.
Trading Method	Open outcry floor trading with 4/5 sessions per day, fixing a single contract price for each contract month in each session.
Contract/Delivery Unit	6,000 lbs. or 2,721.54 kg per unit for Cotton Yarn 20 4,000 lbs. or 1,814.36kg per unit for Cotton Yarn 40
Price Quotation	Japanese yen per lb or 0.45359 kg ex. Warehouse in Osaka and Hyogo
Tick Value	0.1 yen per lb or 0.45359 kg
Contract Months	Current contract month and next five months
Last Trading Day	The 4th business day prior to the last business day of the month.

Delivery	Any positions remaining in the current contract month as of the expiry are to be settled with the delivery of physical cotton yarn 20 or 40 designated by the Exchange on the last business day of the month.

Source: Osaka Mercantile Exchange

Futures contracts on cotton fibers have recently been developed in China, India and Brazil. This is the case under the ZCE ("Zhengzhou Commodity Exchange") which launched in June 2004 it contract N°1 on cotton with 5988 contracts traded in 2004 and around 50,000 contracts traded mid-2005. Similarly, NCDEX ("National Commodity and Derivatives Exchange") introduced a futures contract in December 2004 while the contract traded on ("Brazilian Mercantile and Futures Exchange") is also seen as a relevant domestic benchmark.

E-commerce

Dealcotton.com (UK)

Cottonchina.org

Theseam.com: Internet-based marketplace for the buying and selling of cotton and cotton by-products, promoted by, among others:
- Allenberg Cotton Co. (Louis Dreyfus Corporation),
- Dunavant,
- Hohenberg (Cargill),
- Plains Cotton Cooperative.

Fiber-trading.com

Fibre2fashion.com

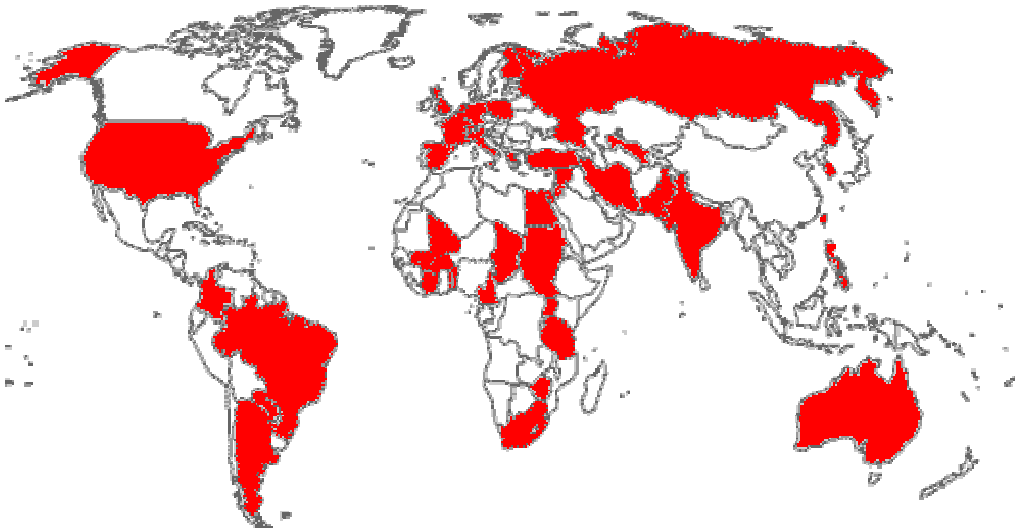
Yarnsandfibers.com

Economic Policies

International Cotton Advisory Committee

The International Cotton Advisory Committee (hereinafter referred to as ICAC) is the authoritative forum for international discussions on matters related to the cotton economy. It met for the first time in Washington, D.C. in April 1940. Membership in ICAC is open to all members of the United Nations or of the Food and Agriculture Organisation of the United Nations, expressing an interest in cotton (although any other interested government shall be eligible to apply for membership).

Members and accession date (roll mouse over the chart)



As established in Article I of the Rules and Regulations adopted by the 31st Plenary Meeting (June 16, 1972), the functions of ICAC are:

1. To monitor developments affecting the world cotton situation;
2. To provide statistics and other information relating to world production, trade, consumption, stocks and prices of cotton and other textile fibres, or of textiles, insofar as they affect the cotton economy;
3. To suggest to member governments of ICAC, as and when advisable, any measures ICAC considers suitable and practicable for the furtherance of international collaboration directed towards developing and maintaining a sound world cotton economy;
4. To be the forum for international discussions on matters related to cotton prices.

ICAC meets in plenary session ("Advisory Committee") at least once per calendar year. Between Plenary Meetings, a Standing Committee represents the Advisory Committee at Washington. The Standing Committee gives practicable effect to all directions, decisions, and recommendations of the Advisory Committee. In this connection, it prepares work programs and monitors their implementation; makes recommendations for consideration by the Advisory Committee; establishes practicable cooperation with the United Nations and other international organisations concerned with matters of interest to ICAC. ICAC Secretariat, headquartered in Washington, comprises an Executive Director and his staff.

Overview of selected trade and economic policies

World cotton trade and production are highly affected by government policy intervention, notably in the US, China and the EU. Direct support to producers through price interventions is of particular concern as regards the efficiency of the global cotton market. According to ICAC, the aggregate level of direct production assistance across all subsidising countries reached $5.8 billions in the season 2001/02. Support was $3.8 in the 2002/03 season.

Direct assistance to cotton producers, 2001/02 - 2002/03

Countries	2001/02			2002/03		
	Production	Assistance per kilogram produced	Production assistance	Production	Assistance per kilogram produced	Production assistance
	'000 tons	US cents	Million US$	'000 tons	US cents	Million US$
United States	4.420	31	3.001	3.446	26	1.996
China	5.320	10	1.196	4.920	7	750
Greece	435	77	735	355	92	718
Spain	107	104	245	97	112	239
Turkey	922	3	59	900	3	57
Egypt	317	3	23	290	5	33
Mexico	92	9	18	41	8	7
Brazil	766	1	10			
India	2.686	8	500			
Benin	172	5	20			
Mali	240	3	14			
Colombia	26	16	9			
Ivory Coast	173	2	8			
Argentina	65	5	7			
World total	**15.741**	**17**	**5.844**	**10.049**	**17**	**3.800**

Source: UNCTAD secretariat, based on: "Lower Subsidies This Season" (C. Valderrama, ICAC)

According to ICAC, only the United States and China have subsidised their cotton exports.

Support through export programmes, 2001/02 - 2002/03

Countries	2001/02			2002/03		
	Exports	Assistance per pound exported	Export support	Exports	Assistance per pound exported	Export support
	'000 tons	US cents	Million US$	'000 tons	US cents	Million US$
United States	2.395	2	100	2.306	4	182
China	74	13	21	180	13	50
World	**2.469**	**2**	**121**	**2.486**	**4**	**232**

Source: UNCTAD secretariat, based on: "Lower Subsidies This Season" (C. Valderrama, ICAC)

It is estimated that cotton subsidies artificially inflated production and depressed world cotton prices, damaging those developing countries that are heavily reliant on cotton exports for their foreign exchange earnings. Many studies have attempted to measure the impact of cotton subsidies, and have estimated the effects of subsidy removal. ICAC concluded that in the absence of direct subsidies, average cotton prices for the 2000/01 and 2001/02 seasons would have respectively been 17 and 31 cents/pound higher. As highlighted in a recent survey (ODI, 2004), different results are sensitive to different assumptions about the cotton market.

For further information on the impact of cotton subsidies, please refer to:

- Understanding the Impact of Cotton Subsidies on Developing Countries (Overseas Development Institute Working Paper, May 2004 - PDF file 657K)

- Cotton: Market Setting, Trade Policies, and Issues (World Bank Policy Research Working Paper, February 2004 - PDF file 617 KB)

- Cultivating Poverty: The Impact of US Cotton Subsidies on Africa (Oxfam Briefing Paper, September 2002 - PDF file 657 KB).

For specific information on cotton policies in the European Union, please refer to:

- EU-25 Cotton and Products, Cotton Policies in the European Union 2005, (USDA, February 2005 - PDF file 657 KB))

Trade disputes and negotiations

Within the World Trade Organization ("WTO"), action by developing countries to redress distortions in the cotton market has taken place in two different, although related, contexts: dispute settlement and negotiations.

- **Disputes: "US - Upland Cotton" (WT/DS267)**

In 2003, Brazil was the first country to submit a formal complaint under the WTO dispute settlement mechanism about US cotton subsidies, claiming that they depressed world cotton

prices and injured Brazilian farmers. Without the subsidies, according to estimates that Brazil commissioned from an American agricultural economist, United States cotton production would have fallen by 29% in 2001 - 2002 and its cotton exports would have dropped by 41%. According to these estimates, this contraction would have led to a rise in international cotton prices of 12.6%.

In a landmark ruling, the WTO dispute settlement Panel sided with Brazil on certain major substantive claims. The United States and Brazil each appealed certain issues of law and legal interpretations developed in the Panel Report. Finally, the Appelate Body upheld most of the Panel's findings.

The dispute	"United States - Subsidies on Upland Cotton" (WT/DS267)
Parties to the dispute	Complainant: Brazil
	Defendant: United States
	Argentina, Australia, Benin, Canada, Chad, China, the European Communities, India, New Zealand, Pakistan, Paraguay, China, Taiwan province of, and Venezuela reserved their rights to participate in the Panel proceedings as third parties
Chronology	On 27 September 2002, the Government of Brazil requested consultations with the Government of the United States
	On 6 February 2003, Brazil requested the establishment of a panel; At its meeting on 18 March 2003, the Dispute Settlement Body (the "DSB") established a Panel
	The Panel Report was circulated to Members of the the WTO on 8 September 2004 (WT/DS267/R, 8 September 2004)
	18 October 2004: Notice of Appeal filed by the United States
	The Appellate Body, on 3 March 2005, issued its report (WT/DS267/AB/R)

Products at issue:

The dispute principally concerned United States subsidies in respect of upland cotton (*Gossypium hirsutum*). The term "upland cotton" here means raw upland cotton as well as the primary processed forms of such cotton including cotton lint and cottonseed. Upland cotton would account for approximately 97 per cent of United States cotton production (United States Department of Agriculture, *Cotton: Background and Issues for Farm Legislation*).

Measures at issue:

It is worh recalling that the WTO Agreement on Subsidies and Countervailing Measures ("SCM Agreement") creates two basic categories of subsidies: those that are prohibited, and those that are actionable. Subsidies contingent, in law or in fact, on export performance ("export subsidies") are prohibited. Other domestic-support measures fall in the "actionable" category. They are subject to challenge, either through multilateral dispute settlement or through countervailing action, in the event that they cause adverse effects to the interests of another Member (including "serious prejudice" arising from export displacement).

The measures as identified in Brazil's request for the establishment of a panel were alleged prohibited or actionable subsidies provided to United States producers, users and/or exporters of upland cotton under various commodity support programmes. They included:

Measures	Description
Marketing loan programme payments	Interim financing to domestic producers to facilitate the gradual distribution of the commodity throughout the year
Production flexibility contract payments	Support to producers based on historical acreage and yields (not related to current prices of cotton)
Market loss assistance payments	Ad hoc emergency and supplementary assistance provided to producers for compensating potential losses should commodity prices fall under a certain level
Direct payments	Support to producers based on historical acreage and yields (not related to current prices of cotton)
Counter-cyclical payments	Support to producers based on historical acreage and yields (related to the current price of cotton)
Crop insurance payments	Insurance coverage to producers for losses due to natural disasters and market fluctuations
Cottonseed payments	Ad hoc emergency and supplementary assistance provided to first handlers and producers of cottonseed
User marketing payments ("Step 2" programme)	Marketing certificates or cash payments to domestic users and exporters of upland cotton when certain US cotton pricing benchmarks are exceeded
Export credit guarantee measures ("GSM 102", "GSM 103" and "SCGP")	Guarantees to US exporters against the risk of not being paid, in the event that the foreign bank failed to pay under the foreign bank letter of credit or the importer failed to pay under the importer obligation.
Export subsidies under the ETI Act of 2000	Tax breaks (non-taxation of a portion of extraterritorial income accruing from upland exports)

Marketing loans (including marketing loan gains and loan deficiency payments) were the largest of these price- and income-support measures. For further information on their functioning, please refer to this extract (PDF file 28k) from "Analysis of the U.S. Commodity Loan Program / AER-801", US Department of Agriculture, April 2001.

Parties' claims (substantive issues):

Brazil claimed, inter alia, that:

(1) Export credit guarantee programmes constituted prohibited export subsidies;

(2) Step 2 payments for cotton were both prohibited export subsidies and prohibited import substitution policies;

(3) the other U.S. domestic support measures caused (or threatened to cause) serious prejudice to the interests of Brazil by depressing world cotton prices and unfairly expanding or maintaining U.S. world market share.

The US had countered these allegations by arguing, among other things, that its subsidies did not artificially inflate supply or depress prices because they were "decoupled" from production. Their viewpoint was that farmers did not get extra handouts for extra cotton. They were instead paid according to the number of acres they planted and the cotton they produced in the past.

Findings:

Ruling in favour of Brazil, the Panel found that the US domestic support measures contingent on prices (in particular, the marketing loan programme payments, user marketing (Step 2) payments, market loss assistance payments and counter-cyclical payments) caused "serious prejudice" to Brazilian interests by unfairly depressing world cotton prices. Thus, it was recommended that the United States take appropriate steps to remove the adverse effects caused to the interest of Brazil or withdraw the subsidy.

The Panel further held that export credit guarantees and Step 2 payments to exporters of upland cotton were prohibited export subsidies and that Step 2 payments to domestic users of upland cotton were a prohibited import substitution subsidy. Hence, these measures had to be withdrawn "without delay."

The decision has apparently accepted the principles that direct payments to producers may be challenged under WTO rules even if they are formally decoupled from production. The ruling also acknowledges that the SCM Agreement may serve as a legal basis for action over agricultural subsidies (although the Agreement on Agriculture ("AoA") would take precedence).

The Appellate Body upheld most of the Panel's findings. Accordingly, the United States shall bring its cotton policy into line with the Panel's ruling within a reasonable time. If it fails to act, it has to enter into negotiations with Brazil in order to determine mutually-acceptable compensation (if no satisfactory compensation is agreed, Brazil may ask the Dispute Settlement Body for permission to impose limited trade sanctions).

Impact of the ruling:

Effective compliance with this ruling would contribute to restore a level playing field for cotton trade and production. This would help to enhance the competitiveness of agricultural exports from some developing countries.

Some commentators stressed that the ruling would increase pressure on the US to reform its national farm programs. In this regard, on February 2005, the US Agriculture Department considered the possibility to set a firm overall limit of $250,000 on subsidies (which can now exceed $1 million in some cases). Such a proposal would cut federal payments to farmers by $587 million, or about 5 percent, in 2006 and, according to some US estimates, might correspond to a diminution of $5.7 billion in the coming decade. In setting a firm overall limit of $250,000, the plan would tighten requirements for the recipients of such payments to be “actively engaged” in agriculture, and it would generally prevent farmers from claiming additional payments.

It was felt that the ruling would have an impact on negotiations. In that context, the decision could strengthen the case for the reduction and elimination of developed country subsidies in

the current Doha round, and weight on developed countries in the talks. It might thus create the necessary momentum in arriving at a successful conclusion of the ongoing agricultural trade talks.

It should also be noted that a number of West African countries, including Burkina Faso, Benin and Mali, are heavily dependent on cotton for the bulk of their export earnings. Nonetheless, African countries did not participate as complainants in the dispute (although Benin and Chad reserved their rights to participate in the Panel proceedings as third parties). The cautious stance of Africa in the cotton dispute has been attributed to political sensitivity (African countries are highly vulnerable to retaliatory action by major trading partners) and lack of resources (disputes are costly and require much legal expertise).

Access the official documents relating to the dispute:

Appeal	WT/DS267/AB/R (findings and conclusions)	Appellate Body Report
	WT/DS267/18	Appellate Body communication
	WT/DS267/17	US notification of appeal
Panel Report	WT/DS267/R (conclusions and recommendations)	Report of the Panel
Proceedings	WT/DS267/R/Add.1	Addendum
	WT/DS267/R/Add.1 (Part2)	Annex A: Initial briefs
	WT/DS267/R/Add.1 (Part 3)	Annex C: Oral statements
	WT/DS267/R/Add.1 (Part 4)	Annex E: Submissions
	WT/DS267/R/Add.1 (Part5)	Annex E-5: Submission
	WT/DS267/R/Add.1 (Part 6)	Annex F:

For further information on domestic support in agriculture and WTO rules, please refer to:

"Boxes" in domestic support (WTO Factsheet - PDF file 102 KB)

Agriculture gateway (WTO website section)

Agriculture negotiations gateway (WTO website section)

SCM gateway (WTO website section)

Negotiations: The Cotton initiative

Despite the fact that West and Central African (WCA) countries did not participate as complainants in the dispute, they continue to be actively engaged in the negotiating process. The "cotton initiative" (see document TN/AG/GEN/4) was originally launched in 2003 in the build-up to the Cancun ministerial by four WCA countries (Benin, Burkina Faso, Chad and Mali). The proponents called for (i) the phase-out of developed countries' subsidies for cotton production and export and (ii) a compensation mechanism to offset the income loss

experienced by the least developed countries pending the phase-out. Although the original proposal had been conceived as a sectoral initiative on a separate track within the trade negotiations, country members agreed, in September 2004, to make discussion on cotton an integral part of agriculture negotiations. However, cotton remains partially singled out within agriculture talks. In order to "ensure appropriate prioritisation of the cotton issue independently from other sectoral initiatives" (July Package on the Doha Round - WT/L/579), WTO Members agreed on 19 November 2004 to establish a sub-committee under the Committee on Agriculture (CoA) dealing specifically with the issue of cotton. The subcommittee on cotton will meet periodically and report to the Special Session of the Committee on Agriculture to review progress. Work shall encompass all trade-distorting policies affecting the sector in all three pillars of market access, domestic support, and export competition.

For more information, please refer to the following websites:

Sahel and West Africa Club (direct access to a range of regional case studies, regional actor and international agency perspectives on cotton);

International Centre for Trade and Sustainable Development (ICTSD) (selection of reports and articles related to cotton);

Technical Centre for Agricultural and Rural Cooperation ACP-EU

Ideas Centre International Trade Development Economic Governance Advisory Services

Cotton issue at the Sixth WTO Ministerial Conference

The final declaration of the Hong Kong Ministerial Conference reiterates the commitment of the July package. Thus, it was agreed that cotton export subsidies, which constitute only a small fraction of distortions affecting the sector, would be eliminated in 2006, and developed countries would give duty- and quota-free access to cotton exports from the least developed countries (LDCs). Duty- and quota-free access, however, is already available in some major markets (for instance, under the EU Everything But Arms and the Canadian Market Access initiatives), while Western African countries currently do not export cotton to the United States market. Furthermore, increased market access and the removal of export subsidy can mainly be seen as a plain enforcement of the decision of the WTO dispute settlement Panel on cotton. It was also agreed that trade-distorting domestic support on cotton production would be cut deeper and faster than other trade-distorting subsidies. The Ministerial Declaration, however, does not specify either the amount or the schedule for the implementation of such cuts.

Referring to the request of the C4 (Chad, Mali, Benin and Burkina Faso) to initiate an emergency fund to help deal with depressed international prices there are no binding commitment in spite of a reference made in the text calling for a mechanism for monitoring the commitments to be made by industrialized countries.

For more information, please consult paragraphs 11, 12 and 21 of Doha Work Programme, WTO Ministerial Declaration (WT/MIN(05)/DEC)

WTO Cotton Sub-Committee

WTO members on 19 November 2004 set up a body to focus on cotton, as required in the 1 August 2004 decision, sometimes called the "July Package", covering all the WTO negotiations.

The agreement to create a body to focus specifically on cotton is part of WTO member governments' response to proposals from four African countries — Benin, Burkina Faso, Chad and Mali — to tackle the sector.

In this framework, the African Group has circulated a text (dated 22 April 2005) called "Proposed Elements of Modalities in Connection with the Sectoral Initiative in Favour of Cotton".

For more information on this issue, please consult WTO website.

During the WTO Cotton Sub-Committee on January 31 2006, it was noted that with agreement for developed countries to eliminate export subsidies on cotton by the end of 2006, one of the key proposal of C4 was to set up a way to monitor this accordingly.

Furthermore, a new proposal from C4 (TN/AG/GEN/12) is calling for the reduction in trade-distorting domestic support to be three times higher than the cut agreed for domestic support in general, and the implementation period to be one third as long.

In order to be able to settle a specific rate of reduction of the AMS for cotton, the following formula has been proposed by the "Cotton Four" in the WTO document TN/AG/SCC/GEN/4:

$$Rc = Rg + ((100-Rg)*100)/3*Rg$$

Rg = reduction as a percentage; final result for reduction of the AMS

Rc = Reduction for cotton as a percentage; final result for cotton in order to meet the requirement for specificity and more ambition.

Source: Proposed modalities for cotton under the mandate of the Hong Kong ministerial decision, March 1, 2006 (TN/AG/SCC/GEN/4)

The EU stressed the fact that it had proposed duty-free and quota-free market access for cotton exports from all developing countries, not only the least-developed.

The US pointed out that the commitment is definite for cotton products even though the more general duty- and quota-free decision (for all products) allows some exceptions for 3% of products for countries facing difficulties.

For more information on latest development related to US cotton trade policy, you may wish to consult the website of the Office of the United States Trade Representative (USTR)