

HUGO BOSS Cotton Commitment

This cotton commitment outlines the priority issues using cotton fibers for high quality garments as part of the HUGO BOSS sustainability strategy.

The various topics described are based on publicly available research work, and illustrate the complexity of bringing together all relevant issues with the intention to create additional value for all stakeholders. Cotton is grown in an extremely diverse range of geographic, ecological, social, economic and cultural conditions, all of which influence or affect the extent of the impact of growing cotton, and how the impacts can be best managed.

1 Why cotton

Cotton is a very old fiber and still is an essential raw material for the whole fashion industry thanks to its natural properties. The share of cotton fibers within the HUGO BOSS product portfolio is 46%, which is equal to 6.2 thousand tons in 2016 (*Source: HUGO BOSS sustainability report*).

Cotton is a soft, absorbent and breathable natural fiber. It provides good thermal insulation, keeping the body cool in summer and warm in winter; it provides good fabric odor management; and it is hypoallergenic, which makes it perfect also for bandages and gauze. Using high quality cotton fibers guarantees a long lasting fashion garment. Unlike synthetic fibers, during washing procedures cotton does not release any critical synthetic microfiber particles that would get into the natural water cycle and be taken up by marine organisms and enter the food chain (*Source: Napper I, Thompson R (2016), Release of synthetic microplastic plastic fibers from domestic washing machines: Effects of fabric type and washing conditions, Marine Pollution Bulletin, Vol. 112, Nov. 2016*).

2 Sustainability issues of cotton

The valuable knowledge concerning the issues of cotton in terms of sustainability has benefitted from the research done for the World Apparel and Footwear Life Cycle Database (WALDB), the studies conducted for the EU Product Environmental Footprint (PEF), the deep-dive pilot project on the Natural Capital Protocol, the white paper on the Natural Capital Valuation, and the close collaboration with cotton experts.

Cotton cultivation is an important economic driver for farmers and it is crucial to the economic development of many countries. On the other hand, cotton requires natural resources and a good social framework needs to be in place to protect the farmers.

Hereafter some facts to set the focus on the relevant sustainability issues.

2.1 Climate change

Climate change is probably today's most challenging environmental concern. Cotton is a renewable raw material generating limited contribution to the greenhouse gas emission. The production of cotton emits about 3 times less greenhouse gas than the production of synthetic fibers, such as polyester (*Source: Kirchain R, Olivetti E, Miller T R, and Greene S, Sustainable Apparel Materials, 2015*). Furthermore, the greenhouse

emissions of cotton farming account to **only 10% to 15% of the whole cotton textile supply chain** (Source: *Natural Capital Valuation White Paper*).

2.2 Chemical Management

Pesticides

Pesticides are any kind of biological or chemical deterrent to natural crop predators. Roughly, 40% of world's agriculture is lost each year to pests (Source: *Journal of Agricultural Science* (2006), Cambridge University Press.); hence, an efficient pest management in both conventional and organic production systems is required. Thanks to improved farming methods, and a focus on integrated pest management (including a reduced reliance on pesticides), the sales of global pesticides for cotton cultivation, that in the mid-1990s accounted for about 24% of total **pesticides sales, decreased worldwide to a rate of 6% in 2009** (Source: *ICAC Expert Panel on the Social, Environmental and Economic Impacts of cotton Production (SEEP) Fact Sheet, Pesticide use in cotton production, 2012*).

The World Health Organization's efforts in emphasizing the importance of minimizing the potential health and environmental risks is outlined in the WHO Pesticide Evaluation Scheme (WHOPES) through the application of the WHO Pesticide Management and the WHO Classification of Pesticides.

2.2.1 Fertilizers

Crop nutrition is essential for maximizing cotton yield. Too little nutrition reduces the yield potential, while too much fertilizer affects profitability because of increased costs, contamination of groundwater, excessive vegetative growth in the crop and related pests, disease and harvest problems.

Research shows that the ability of a crop plant to resist or tolerate insect pests and diseases is bound to optimal physical, chemical and biological properties of the soil. Soils in organically farmed crops are characterized by high organic matter and active biology. Crops grown in such soils usually attract fewer herbivorous insects, which may be explained with the lower nitrogen content. A lower nitrogen content, however, could potentially result in lower yields. Furthermore, farming practices, such as excessive use of inorganic fertilizers, can cause nutrient imbalances and lower pest resistance (Source: *Miguel A. Altieri, , Clara I. Nicholls, Soil fertility management and insect pests, 2003*). Monitoring and managing nutrient levels in both conventional and organic farming is important to ensure that the yield potential is reached, while minimizing risks to soil and water.

2.3 Land use

Cotton's global land use has declined by 30% over the last 30 years, according to a report by Field to Market, the Alliance for Sustainable Agriculture; it amounts now to **less than 3% of the world's agricultural land** (Source: *faostat. 2013. Food and agriculture organization of the United Nations, based on data from the 2012 crop year*). Cotton production provides two products at each seasonal harvest: cotton fibers, which currently meet 30% of the world's textile fiber needs, and cottonseeds, a source of nutritious cooking oil and protein-rich supplement for dairy cattle and aquaculture feed.

Crop rotation, stubble retention and minimum tillage practices can all help to reduce soil loss, increase water-holding capacity and show other benefits for overall soil health, such as nitrogen replenishment, management of pests and the prevention of pathogen build-up.

2.4 Water

Fresh drinking water is one of the world's most critical resources and in some regions the situation will further deteriorate. A number of approaches have been developed to assess the impact of water use, including water footprinting. The water footprint includes three components: **green water consumption** (water from rainfall), **blue water consumption** (irrigation) and **grey water** (volume necessary to dilute any pollution to an established concentration at the point of emission).

2.4.1 Water resource depletion (blue water)

Cotton products are perceived as water intensive. The virtual global average water content of seed cotton is 3644 m³/ton, with nearly an equal share of green and blue water (Source: UNESCO-IHE *The water footprint of cotton consumption*, 2005). The amount of blue water used for cotton production differs considerably between countries. Climatic conditions are least attractive in Syria, Egypt, Turkmenistan, Uzbekistan and Turkey because evaporative demand in all these countries is very high (1000-1300 mm) while effective rainfall is low (0-100 mm). Climatic conditions are most attractive in the USA and Brazil, where evaporative demand is low (500-600 mm) (Source: UNESCO-IHE *The water footprint of cotton consumption*, 2005). This crucial factor can vary significantly also within the same country. Another critical factor to consider is the importance of irrigation technologies, which combined with the application of advanced and efficient farming technologies, supports increased yields of cotton, and reduced water use per ton. This topic has already been well outlined in the Natural Capital Valuation White Paper, supplied with the example of the Australian cotton industry, which has achieved a 40% increase in water productivity over the last decade (Source: *Australian Grown Cotton Sustainability Report 2014*).

Given that organic cotton seems to result in lower yields compared with either IPM (Integrated Pest Management) or conventional cotton, particular attention has to be paid to climatic conditions (water scarcity) where organic cotton is grown (Source: *Six-year comparison between organic, IPM and conventional cotton production systems*, 2007, Cambridge University Press).

2.4.2 Freshwater ecotoxicity and grey water

Freshwater ecotoxicity and eutrophication is caused by the amount of fertilizers and pesticides used (conventional and organic) and the crop's fertilizer uptake rate. The latter depends on the soil type, the available quantity of fertilizer and the stage of plant growth. There is also the potential for pesticides to reach either groundwater or surface water bodies. For both origins of the freshwater ecotoxicity, a well-managed usage of pesticides and fertilizers is required at farm level (see 2.3 Chemicals).

2.5 Socio – economic

Cotton plays a significant role for many millions of people around the world. Growing cotton provides work, and work provides vital income. Cotton employs 7% of the total labor force in developing countries (Source: *Cleaner, greener cotton: Impacts and better management practices*, WWF-International, October 2007), usually organized in small farms. Small cotton farms use almost all of the global labor employed in cotton to produce 65% of the world's output, on 72% of the planted area (Source: *The Contributions Of Cotton To Economy And Food Security In Developing Countries*, P. Fortucci (Commodities And Trade Division – FAO), 2002). Cotton has also allowed farmers to organize themselves into associations at the village level, and these local groups belong to national professional organizations, regarded as an instrument to professionalize the rural world. The

intensive techniques used for cotton production have been transferred to the other crops employed in the crops rotation, leading to food production increase.

However, there is considerable research (*Source: Ergon study for the ICAC Expert Panel on Social, Environmental and Economic Performance (SEEP), 2008*) detailing the ways in which people's participation in cotton growing is not always to their benefit, with a particular attention to debt among farmers due to factors such as high input costs, high interest rates or other structural financial conditions, health and safety, child labor, forced labor, and the role of women in cotton cultivation. Therefore, the application of the ILO 'core conventions' as outlined in the "*OECD Due Diligence Guidance for Responsible Supply Chains in the Garment and Footwear Sector*" must be enforced as well in cotton farming.

2.6 Summary of sustainability issues

While there are still challenges to be addressed, there are also positive trends, thanks to new technology for highly efficient crop growing, training of farmers and, generally speaking, to the broader awareness of cotton's environmental impacts. There are examples of significant improvements in water efficiency, reduced levels of pesticide application and increasing yields that enhance the efficiency of agricultural land usage.

The relevant areas for more sustainable cotton farming need to be addressed to eliminate violations of the ILO core conventions, to continuously decrease the water footprint and to improve the chemical management.

3 Cotton sourcing

3.1 Cotton market

The worldwide production of cotton amounts to 23 million tons per year (*Source: ICAC 2016*). The two largest cotton producers, China and India, consume most of the production in their own textile industries, whereas the biggest cotton exporting countries with a total volume of 7.4 mio tons are USA (34%), CFA Africa (14%), India (11%), Brazil (11%) and Australia (9%) (*Source: ICAC 2016*).

Organic cotton produced worldwide amounted to a little over 1% of total cotton grown (*Source: ICAC 2011*).

The cotton used for HUGO BOSS products are sourced via the finished goods or fabrics suppliers. Some of the HUGO BOSS partners are vertically integrated, which enables a better control of the full supply chain, including cotton farming. In general, we encourage our partners to use local sources of cotton, whenever possible.

3.2 Cotton Quality

HUGO BOSS garments are of high quality and durability. Cotton fibers for HUGO BOSS products have to fulfil demanding quality requirements with a particular focus on fiber length and strength, purity and a guaranteed availability.

Cotton contamination has a serious impact on quality since automated equipment at spinning mills can detect and eliminate contamination or foreign matter only to a limited degree. In the case of plastic material - one of the most vicious forms of contamination - the damage is becoming visible only by the time the fabric leaves the final finishing process, at which stage it is too late to apply any remedy (*Source: ITMF Cotton Contamination Survey - 2016*).

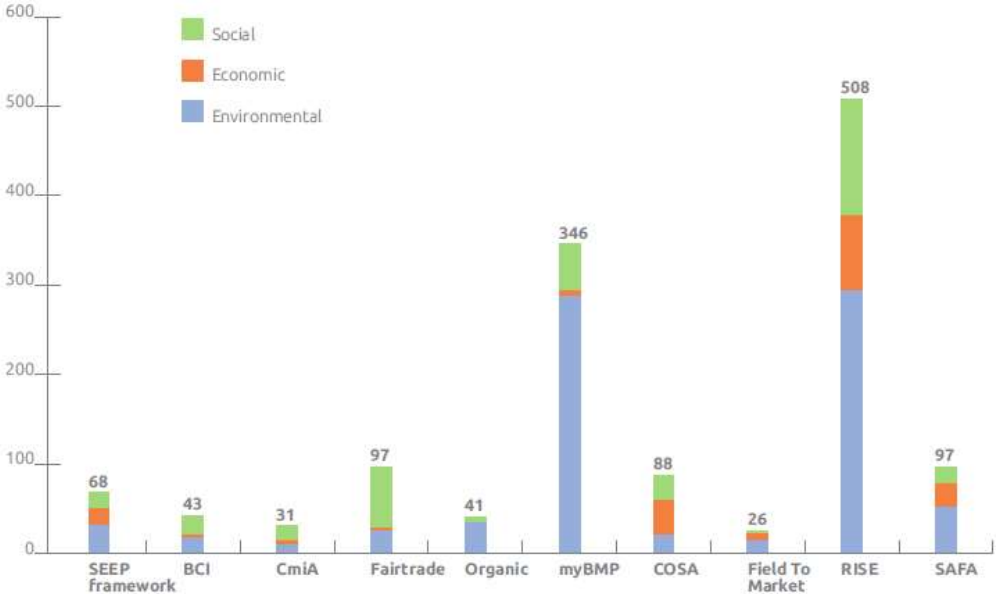
For a large variety of HUGO BOSS products (shirts, jersey and others) long staple (LS) and extra-long staple (ELS) fibers are prerequisite to get the yarn counts needed to fulfil our high quality requirement on fine fabrics. ELS and LS cottons represent only about 3% of the entire world's cotton production.

Not all cotton fibers, be they recycled fibers or virgin cotton existing on the market, meet our quality requirements, and even less meet the quality requirements and possess specific sustainability certifications.

Manufacturing garments with the appropriate cotton fiber quality is crucial for two aspects of sustainability: high durability and reduced waste during production. The durability is an important part of our quality standards and determines the product's life cycle, which of course determines lower social and environmental impacts when good and long lasting wearing quality can be guaranteed. Waste during production coming from impure or inadequate fiber strength increases the material consumption and consequently affects negatively the environment.

3.3 Cotton certification and initiative for more sustainable cotton

Many initiatives exist that promote more sustainable farming, including a number focused on cotton farming, and which have different emphases on the three dimensions of sustainability. The graph below includes initiatives exclusively focused on cotton (SEEP, BCI, CmiA, myBMP) and initiatives that do (organic, Fairtrade, Field to Market) or could include cotton. It outlines the number of indicators for each initiative by indicator type, i.e. social, environmental and economic (Source ICAC SEEP).



For the sake of optimizing our efforts, HUGO BOSS will focus on collaborations with a small number of organizations like Better Cotton Initiative (BCI), Cotton LEADS and Yarn Ethical and Sustainable Sourced (YESS), but also support supplier-specific initiatives that show clear actions for more sustainable cotton.

The BCI system is a well-accepted and fast growing initiative, training farmers worldwide to improve in all three areas of sustainability, guaranteeing the best possible access to the cotton market. Additionally, the Cotton LEADS program in Australia and USA that is committed to five core principles that are consistent with sustainability, the use of best practices and traceability in the supply chain.

Finally, the YESS initiative, which tackles forced and child labor issues according to the OECD due diligence guidelines, comes in place whenever no other initiative is present.

3.4 Cotton Recycling

Textile waste can be classified as either pre-consumer or post-consumer. Pre-consumer textile waste results from small waste produced during manufacturing or leftover material due to risk disposition, in addition to any by-product materials from the textile, fiber and cotton industries.

Post-consumer textile waste results from any type of garments and manufactured textile product that is no longer needed and therefore discarded by the final customer. Garments are often given to charities or disposed into the trash, ending up in landfills. A major difference regarding the two classes of cotton recycling is that the cotton fibers from post-consumer waste result in shorter textile fibers of a lower quality, when compared to virgin fibers.

3.4.1 Pre-consumer

At different stages of production, there is the generation of waste that can be recycled. The fiber is not damaged and it is at the initial stages of the refinement process, ideally without any dyes or other treatments.

- a) Recycling of fibers from fiber, yarn, and fabric processing. During the first part of the garment manufacturing at various steps cotton waste is produced and it can be recycled. The cotton fiber is not damaged and the applied refinements are known, therefore recycled fibers can be re-used with limited efforts.
- b) Recycling of fabrics left overs.
Due to seasonal fabric designs, colors, qualities and minimum production quantity orders, often fabrics are not completely used up for the garment manufacturing. The re-use of this left overs is not always easy, especially with a highly seasonal fashion statement.

3.4.2 Post-consumer

The two main post-consumer recycling methods are 'mechanical fiber recycling', which degrades the fiber quality at each recycling cycle (down-cycling), and 'chemical fiber recycling'. For mechanical fiber recycling pure and clearly identifiable cotton products are easier to recycle. Blue jeans is one of the most promising product for recycling, allowing the usage of a limited amount of recycled fibers (around 20%) that already contains the denim dyestuff.

For chemical recycling, only polyester and certain nylons can currently be reprocessed on a large scale. However, new technologies are being developed and chemical recycling for cotton products into a new manufactured cellulosic yarn is an emerging technology.

3.5 Monitoring the supply chain

Gaining full transparency in the cotton supply chain is one of HUGO BOSS' key targets. With this aim, the company has made available a well-structured questionnaire in which data on origin and farming methods are collected, along with information on any applied sustainability standards and certifications and on the n-tier suppliers. Based on the obtained results, HUGO BOSS will focus and increase its sourcing on available "more sustainable cotton" standards and initiatives as described under 3.3.

This periodically requested information will allow HUGO BOSS to steer its supply chain towards more sustainable sources of cotton, and to capture and promote refinement processes with lower impacts. Together with the HUGO BOSS social compliance, the environmental performance program and other programs like the impact valuation, improvements for the whole supply chain can be implemented, measured and monitored.

4 Taking action

HUGO BOSS will continue to make transparent the impacts throughout the whole supply chain based on scientifically recognized methods like Life Cycle Assessment and Impact Valuation. Based on this knowledge, HUGO BOSS will closely collaborate with organizations like BCI and Cotton LEADS, its suppliers and various experts, to mitigate efficiently the relevant impacts.

HUGO BOSS will elaborate targets mid and long term in 2017, discuss them with its partners and make them public. All achievements related to defined targets will be monitored, published and, if necessary, the improvement programs will be strengthened.