Cotton in Africa: Sustainability at a Crossroads

On behalf of Textile Exchange's
Pan-Africa Sourcing Working Group

June 9, 2020 • A white paper outlining the risks of scaling genetically modified cotton in Africa and the opportunities for organic and other preferred cotton initiatives.

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Executive summary

Of the world's key cotton-growing regions, Africa currently grows the least amount of genetically modified (GM) cotton. As of May 2020, only seven of Africa's 54 countries – South Africa in 1997, Eswatini and Sudan in 2012, Ethiopia, Kenya, Malawi, and Nigeria in 2018 – had adopted GM technology. Four others – Algeria, Burkina Faso, Egypt, and Madagascar – have stopped or prohibited the use of GM cotton or genetically modified organisms in general. While GM adoption in Africa may seem low now, the number of countries granting, or considering granting, permission for the use of the technology is increasing.

GM cotton has been created by altering the plant's genetic material (DNA) in a manner that does not occur naturally by mating or by natural recombination. While GM cotton offers many promises, adoption of the technology comes with several concerns. These include economic risks for farming communities, due to higher costs of production associated with higher input requirements, as well as increased pesticide resistance, genetic drift, seed ownership monopoly, and the irreversibility of the technology.

In Africa, several initiatives have been developed to increase the sustainability of cotton production on the continent. Most of them – such as organic, Fairtrade and Cotton made in Africa (CmiA) – prohibit the use of GM cotton seed due to the concerns previously mentioned. Textile Exchange has characterized cotton grown within such sustainability programs under the term "preferred cotton." Preferred cotton initiatives exist within a continuum, and Textile Exchange sees regenerative organic cotton production systems operating under fair trade principles as the "gold standard."

Cotton certified to organic agricultural standards is currently grown in eight African countries – Benin, Burkina Faso, Egypt, Mali, Ethiopia, Senegal, Tanzania, and Uganda. With production in the region increasing by 20 percent between 2016/17 and 2017/18, Africa now accounts for more than four percent of global organic cotton production.

With five of these eight organic cotton producing countries being among the continent's top ten cotton producers, there is considerable potential for additional growth and for further disseminating organic agricultural practices and their associated environmental benefits.

Given that organic production standards prohibit the use of GM technology, which the majority of African nations have not adopted, the continent is ideally situated to become a significant player in the organic cotton market. Indeed, African organic cotton is well-positioned to be integrated into the continent's own manufacturing infrastructure as well as by companies in nearby European and Middle Eastern manufacturing markets searching for smaller textile trade footprints.

As a growth sector, the burgeoning organic cotton production and manufacturing sectors also represent significant opportunities and a sustainable future for Africa's rapidly expanding population.

This paper highlights the growing interest across the African continent in both GM and preferred cotton programs. Textile Exchange's Pan-Africa Sourcing Working Group believes it is important to describe the risks and opportunities for African countries that are deciding their next steps regarding the approval of GM cotton and/or the expansion of preferred cotton production. It makes a case for preferred cottons, especially organic cotton grown under fairtrade principles, as the most viable option for a thriving and sustainable African cotton sector. The paper also calls for policymakers to create an enabling environment that will answer consumer and industry market demand for organic and preferred non-GM cotton production.

Should countries move forward in adopting genetic engineering, the Working Group urges governments to adopt the precautionary principle, develop stringent biosafety regulations addressing the research and use of GM crops, including strict liability provisions for seed patent holders and clear rules to support coexistence with GM-free preferred cotton supply chains, starting with seed development, production, and supply systems. The Working Group will continue to track the use of GM cotton in Africa and advocate for cotton production and processing standards that avoid the use of the technology.

1. Introduction

While many major cotton-growing countries around the world have adopted GM technology at a rapid pace, Africa has generally remained on the sidelines – until recently. Over the last few years, an increasing number of African countries have approved or are considering accepting this technology.

The growing interest in GM cotton in Africa comes despite concerns over the threats posed by the technology globally, including a corporate monopoly on seed ownership, increasing pest resistance and secondary pest outbreaks resulting in increased pesticide[i] use, and the concern that the technology exists within a production system that is proving unsustainable in many social and environmental contexts.[2–7]

On the African continent, GM cotton has not yet made the same inroads as it has in countries such as the United States, China, and India, where it can make up more than 90 percent of overall cotton production.[8] However, this could be changing. While only four African countries adopted GM technology between 1997 and 2012 (Burkina Faso has since suspended its approval),[9] another four countries permitted the technology in 2018 alone, and there are others that are seriously considering its adoption under the promise of considerable financial benefits.[10,11]

At the same time, both the production of and demand for more sustainable cotton is increasing worldwide.[12,13] Africa is well poised to capitalize on this growth, particularly given its proximity to manufacturing centers in Europe and the Middle East, as well as increasing intra-continental interest in sustainable textile production.

According to the United Nation's Intergovernmental Panel on Climate Change (IPCC), the agriculture, forestry, and other land-use sectors are responsible for an estimated 23 percent of anthropogenic greenhouse gas (GHG) emissions,[14] mainly from deforestation and agricultural emissions from livestock, soil, and nutrient management.[15] Therefore, there is a clear and urgent need to adopt and promote agroecological production methods that sequester carbon, are climate-resilient, and work with nature rather than against it,[16] such as organic farming.[17,18]

Organic production contributes to all 17 of the United Nations Sustainable Development Goals (also known as the "SDGs" or "Global Goals") by storing carbon in the soil, building fertile soils and biodiversity, eliminating exposure to toxic chemicals that can pollute the air and water and cause illness, and providing healthy farming opportunities with higher returns and increased food security that can attract farmers to stay on the land, to name just a few of the benefits.[19]

Africa is at a crossroads. Governments, farmers, and other stakeholders are at the point where they need to make an informed decision as to whether to take the path of genetic modification or embrace agroecological practices that are based on cooperation with nature. Which way will they turn?

This paper begins by outlining the concerns regarding the social and financial consequences of GM cotton and its impacts on human health and the environment. Then it describes the benefits and current status of GM-free preferred[ii] organic cotton production and manufacturing in Africa. Finally, it lays out key recommendations for the different interest groups, including governments, brands, farmers/farmer organizations, and other institutions such as NGOs and foundations.

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[i] In this document, "pesticide" is used as a generic term to describe any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating pests. Though often misunderstood to refer only to insecticides, the term "pesticide" also applies to herbicides, fungicides, and various other substances used to control pests. The term also includes any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant.[1]

[ii] Textile Exchange defines "preferred cotton" as that which results in improved environmental and/or social sustainability outcomes and impacts in comparison to conventional production. Typically, conventional cotton production involves the use of synthetic chemicals (pesticides and fertilizers) and is likely genetically modified.

2. The premise of GM cotton

GM cotton was created with the aim to sustain an intensive agricultural system by reducing the use of pesticides, thereby limiting their harm to human health[20] and the environment.[21,22] Developed as a tool to improve pest management, it has been presented as a technology that will bring economic growth to cotton farming communities.[23–25] However, as discussed in this section, there are several concerns with the technology and how it affects the environment, society, and farmer finances.

2.1 What is genetically modified cotton?

Genetic modification has been defined differently by governments depending on whether the focus is on the engineering process or the final product.[26] For this white paper, we will use the process-based definition of the European Union legislation, which defines GM crops as "organisms in which the genetic material (DNA) has been altered in a way that does not occur naturally by mating or natural recombination."[27]

There are three main types of GM cotton currently commercialized: insect-resistant (IR), which includes genetic coding for toxins from *Bacillus thuringiensis* (*Bt*); herbicide-tolerant (HT), which are tolerant to glyphosate, glufosinate, 2,4-D, and dicamba; and a third type which combines both attributes.[28,29]

2.2 Regulatory status of GM cotton in Africa

GM cotton has not been vital to the success of cotton in Africa to date; none of the top five countries producing cotton in Africa (Benin, Mali, Côte d'Ivoire, Burkina Faso, and Cameroon) currently permit genetic modification, and those that do are lower-ranked (by yield): Sudan (tied with Egypt for sixth place), South Africa (10th), Malawi (14th) and Kenya (20th) (Eswatini was not listed).[30]

Use of GM cotton was slow to start on the continent, with South Africa being the first country to permit its use in 1997[10] followed by Burkina Faso 11 years later in 2008 (Burkina Faso has since suspended its approval),[iii] then Eswatini[31] and Sudan in 2012.[32] However, in 2018 alone, Eswatini started growing *Bt* cotton and another four countries - Nigeria, Ethiopia, Kenya, and Malawi - granted approvals for its use, an indication of increased governmental support for the technology.[8] Kenya began commercial GM cotton production in 2020.[11] Currently, seven of Africa's 54 countries permit GM cotton production.

In 2018, South Africa had approximately 40,000 hectares of GM cotton under cultivation,[33] Sudan 243,000 and Eswatini 250.[34] GM cotton currently commercialized in Africa is exclusively *Bt* (IR), except for South Africa which also uses HT and HT + IR seeds.[35]

The lack of GM cotton in Africa stands in stark contrast to the high adoption rate of GM cotton technology in most other major cotton-producing regions (Turkey being an exception). In 2018, 76 percent of global conventional cotton was grown in 15 countries using GM cotton seed, with the share likely to rise even higher.[34]

However, GM cultivation is officially prohibited in roughly the same number of countries around the world as it is approved, reflecting the scientific controversy and concerns that surround this technology. As of mid-2020, at least 26 countries worldwide had adopted genetic modification for at least one crop (not necessarily cotton).[35] However, in the European Union, for example, 19 of 28 member states have prohibited the cultivation of GM crops. Other countries to have opted out include Algeria,[36] Burkina Faso,[9]

[iii] Burkina Faso returned to using traditional (non-GM) seed varieties in 2016 after the country phased out Monsanto's (now Bayer Crop Science's) GM cotton variety, Bollgard II, citing a decline in the quality of the fiber over a multi-year period.[9]

Egypt,[37] and Madagascar[38] in Africa; Turkey, Kyrgyzstan, Bhutan, and Saudi Arabia in Asia/EMENA; and Belize, Peru, Ecuador, and Venezuela in South and Central America.[39]

2.3 Socioeconomic and environmental concerns

The reason so many countries have prohibited GM technology is that it raises numerous concerns, especially regarding the long-term implications of introducing GM cotton. This section presents the socioeconomic risks and the environmental issues associated with the coexistence of GM and non-GM agriculture.

Economic risks for farmers

Research results vary, and economic benefits associated with GM crops have yet to be proven over the longer term,[40,41] especially for resource-poor smallholder farmers.[25] Uncertainty about the financial benefits of GM adoption is one of the most significant risks to farmers who also experience ever-rising production costs (inputs, labor, and equipment) and cotton price fluctuations on the world cotton market.[2,42] Findings also show that the adoption of GM crops can be a particularly costly risk to cash-poor farmers when financial loss occurs as a result of crop failure, which could limit their ability to purchase GM seed and associated inputs for the following season.[2,41] This, often input- and capital-intensive cotton farming production system, poses a significant risk of debt, bankruptcy, and even farmer suicides if returns do not pay off, especially for smallholder farmers in countries that do not provide economic safety nets.[2,4]

A study in India highlighted the rising input dependence of conventional cotton farming. It showed that in the decade following 2005, when *Bt* seed began its rapid spread across Indian cotton farms, per hectare costs for seed rose by 78 percent, insecticide by 158 percent, and fertilizer by 245 percent, with the overall production cost of seed cotton increasing by 143 percent. The researchers found that changes in other inputs, including irrigation, insecticides, and particularly fertilizer use, correspond to better yields, and noted that *Bt* cotton's primary impact on Indian agriculture was its role in the rising capital-intensiveness rather than any enduring agronomic benefits.[2]

In addition to affordable inputs, factors such as access to markets, credit, labor, extension services, and research play a critical role in economic success.[2,3,41,43] These enablers are arguably as important to improving farm-level profitability as physical inputs.

Concerns over resistance to pesticides and adverse environmental effects

With the increasing use of GM cotton comes concerns over insect and weed resistance to *Bt* toxins and pesticides. The ubiquitous use of *Bt* in GM cotton agriculture is already creating resistance among bollworms, and the emergence of secondary pests, such as whitefly, has been observed in India's cotton production.[2,3,22,42] Secondary pest attacks can result in additional pesticide applications being needed, which comes with additional costs for producers.[2–4,6,7]

A similar phenomenon can be observed with weeds becoming resistant to the herbicides used in combination with herbicide-tolerant (HT) crops. The HT crops have been designed to tolerate specific broad-spectrum herbicides that are intended to kill the surrounding weeds and leave the cultivated crop intact. A review of 900 studies found that adoption of GM crops initially reduced the use of herbicides, but that resistant weeds later evolved, and resistance to the herbicide glyphosate has led to increased usage of the herbicides dicamba and 2,4-D.[39]

The growing resistance of bollworms to *Bt* also creates concern over food security as the pests inevitably also attack food crops (e.g., okra, pigeon pea, and chickpea).[42] It is also a key concern to the organic sector as *Bt* is one of the most popular materials in the limited toolbox of products organic farmers are

using to manage pests. Organic farmers use *Bt* preparations as a treatment against specific pests. It is the same bacteria – but naturally occurring – that is used to produce *Bt* cotton by inserting genetic strains producing the toxins into the cotton DNA.[7,44]

Organic agriculture uses agroecological practices, the principles of which are based on cooperation with nature, the sustainable use of natural resources, and the dynamic equilibrium of the entire agroecosystem.[16] The modification of GM crops was aimed initially at offering an agronomical solution to pesticide use and the associated risks to human health[20] and nature.[21] However, in practice, it is reinforcing a type of intensive agriculture that relies on chemical inputs, treating the symptoms of agricultural problems rather than the causes.[23] As such, the introduction of genetically modified organisms (GMOs) intensifies certain chronic issues in agriculture and comes with a new source of problems such as disruption of biotic communities including agroecosystems, development of resistance in the targeted pest/pathogen population, reduction or loss of farmland biodiversity, and negative changes in physical, chemical and biological soil characteristics resulting in decreased soil quality. [2,23]

Monopoly and seed ownership issues

The introduction of GM cotton raises concerns about farmers' dependence on the agrochemical industry. For example, farmers do not save GM seeds from previous harvests because GM cotton plants are F1 hybrids (i.e., the first-generation offspring from two distinctly different parent plants). As a result, farmers planting GM cotton must buy new seeds each year to avoid having uneven plant types with lower production. [2,4,42] They must also pay technology fees associated with GM seeds.[45]

Global biotech companies have been known to exercise a monopoly on the seed sector.[46] While estimated numbers prove hard to get, especially in China, India, and sub-Saharan Africa, there is strong evidence of global market concentration.[47,48] One study estimated that the four biggest seed companies represented 51 percent of the total commercial seed market in 2016,[49] while a second study estimated that one company alone owned up to 95 percent of the cotton seed market in India through its GM seeds.[50] In 2018, 76 percent of conventional cotton production worldwide was genetically modified.[33]

The introduction of GM cotton has disconnected farmers from the plant breeding process, risking the loss of agricultural know-how that has been passed down for centuries. In India, indigenous "desi" cotton seed used to be the target of strong on-farm selection and adaptation, but now farmers have difficulty purchasing local non-GM seed.[4] *Gossypium hirsutum* hybrids are more-input intensive and lack the resistance of "desi" seeds to Asian pests.[2] Seed chains have therefore had to be re-established in the country by farmers wishing to use non-GM seed.[42] In Burkina Faso, the decrease in fiber quality (for both staple length and ginning ratios) of the *Bt* cotton cultivars was one of the main reasons why Burkina Faso stopped using GM seeds and returned to the previously selected cultivars.[9]

Contamination and coexistence with GM-free preferred cotton initiatives

It is next to impossible to stop the spread of GM crops as they can be intentionally or unintentionally mixed in non-GM seed packages, and transfer to areas where non-GM crops are growing through genetic drift and insect pollination, especially when farmers grow the same crop concurrently.[23] Once modified genes are released into the environment, it is irreversible, and it becomes impossible to recall them, posing risks that may not be foreseen. It is contradictory to the precautionary principle[iv] from the Cartagena Protocol on Biosafety to the Convention on Biological Diversity[16,23,26]

[iv] The precautionary approach in Principle 15 of the 1992 Rio Declaration on Environment and Development was enshrined in the Cartagena Protocol on Biosafety to the Convention on Biological Diversity, adopted the same year under the auspices of the United Nations Environment Programme.[51] (Continued next page)

In the cotton supply chain, contamination of GM-free fibers does not only occur at the farm level but also via material mixing (whether unintentional or intentional) during storage, transport, ginning, and further processing, which can result in compromised product and costly integrity issues.[53] For organic farmers, GM contamination can lead to loss of certification.[54]

Beyond providing fiber for the textile industry, cotton production creates byproducts that have many uses, including in the food industry. Cottonseed is used as feed for livestock and even as fertilizer. The seed can be refined into oil for human consumption or used in the cosmetic industry.[55] When certified as organic, it can fetch a substantially higher price than conventional cottonseed. This is the case for organic cottonseed that is often sold to organic dairies. If contaminated with GM cotton, farmers can no longer capitalize on this opportunity or, if the presence of GM cotton goes undetected, it may contaminate the whole food chain.[56]

To limit the risk of contamination, preventive measures must be put in place by organic and non-GM farmers to enable coexistence. These include creating buffer zones around fields, record-keeping, GM testing, segregation, maintenance, and cleaning at all steps of the supply chain.[57] If no clear coexistence rules are implemented, the introduction of GM cotton forces GM-free farmers to make additional expenses to protect their crops and impedes their freedom of choice. The introduction of GM cotton threatens the existence of agricultural systems which forbid GM seeds and focus on enhancing the resilience of the whole farming system.[16]

Contending values and visions are competing in the debate over the future of agriculture.[23] As we face significant uncertainties and challenges like climate change and food security, it is vital to allow for a diversity of solution pathways to develop.[16]

Consumer concerns about GM cotton

At the other end of the value chain, consumers are increasingly asking for more sustainable clothing and textiles free from chemicals and GM cotton.[12,13]

Rejection of GM technology arises in part from concerns over the above-mentioned ecological risks linked to its introduction, such as irreversibility of genetic modification, little control over GM contamination, loss of biodiversity, and unknown consequences on the environment.[23]

Genetic engineering also goes against certain values and can be perceived as incompatible with the principles of sustainability and violating the intrinsic integrity of life.[16]

The Protocol states that: “lack of scientific certainty due to insufficient relevant scientific information and knowledge regarding the extent of the potential adverse effects of a living modified organism (LMO) on biodiversity, taking into account risks to human health, shall not prevent a Party of import from taking a decision, as appropriate, with regard to the import of the LMO in question, in order to avoid or minimize such potential adverse effects. […] Lack of scientific knowledge or scientific consensus should not necessarily be interpreted as indicating a particular level of risk, an absence of risk, or an acceptable risk.”[52]

3. Organic and preferred cotton: A valuable investment for Africa

Today, there is a rapidly growing demand from brands and retailers for organically grown food and fiber as companies make ever more significant sustainability commitments and strive to reduce their carbon footprints.[58–60] These provides an important opportunity for Africa to become a major source of organic and preferred cotton, and several African countries are particularly ready to step into that role.

3.1 What are organic and other preferred cotton standards?

Textile Exchange defines a preferred cotton as one which "results in improved environmental and/or social sustainability outcomes and impacts in comparison to conventional production." Preferred cotton initiatives exist within a continuum, and Textile Exchange sees regenerative organic cotton production systems operating under Fair Trade principles as the "gold standard." There are a number of preferred cotton initiatives currently active in Africa but, for this white paper, we will focus on those that prohibit the use of GM seed – Organic, Fairtrade, and Cotton made in Africa (CmiA).

One standard that companies often turn to when creating cotton sustainability commitments is the Better Cotton Initiative (BCI). While BCI prohibits the use of the most hazardous pesticides – the same as Fairtrade and CmiA, detailed below – it nonetheless permits the use of genetically modified seed.[61,62]

Organic cotton

IFOAM-Organics International, the worldwide umbrella organization for the organic agriculture movement, defines organic agriculture as that which is grown within "a production system that sustains the health of soils, ecosystems, and people. It relies on ecological processes, biodiversity, and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation, and science to benefit the shared environment and promote fair relationships and good quality of life for all involved."[63]

Organic agriculture prohibits the use of hazardous synthetic pesticides and fertilizers, as well as genetically modified seed. [64] Third-party certification bodies verify that organic producers meet strict regulations addressing methods and materials allowed in organic production.[65]

Fairtrade

Representing farmers and workers in Africa and the Middle East, Fairtrade Africa offers training and support focused on climate change resilience, gender equality, and sustainable livelihoods.[66] Cotton is a growing category for Fairtrade and Fairtrade Organic standards, with sales of 8,311 metric tons (MT) in 2017, 73 percent of which was organic.[67] Fairtrade cotton is grown in five countries in Africa, including Burkina Faso, Mali, and Senegal in West Africa,[68] Uganda in East Africa, and Egypt in North Africa.[69] Africa's production of Fairtrade cotton totaled 1,210 MT in 2017/18.[58]

The Fairtrade standards prohibit genetic engineering.[71] They also forbid the use of the most highly hazardous pesticides and restricts the use of those chemicals on the Stockholm Convention (Persistent Organic Pollutants), the Rotterdam Convention on Prior Informed Consent, the Montreal Protocol on Substances that Deplete the Ozone Layer; and/or World Health Organization (WHO) Recommended Classification of Pesticides by Hazard, 2009, Class 1a (Extremely hazardous) lists.[70]

Cotton made in Africa

Cotton made in Africa (CmiA) is an initiative of the Aid by Trade Foundation that supports African smallholder farmers in improving their living conditions while promoting more sustainable cotton production. The organization's standards include both the CmiA and the CmiA-Organic standards, each addressing social, environmental, and economic criteria from the field to the gin.[72] The CmiA-Organic dual certification program offers African farmers the choice of several markets seeking preferred cotton fiber, and potentially paying higher prices.[73]

The requirements in the CmiA standards contain exclusion criteria, including a prohibition on the use of genetically modified seed, irrigation, and child labor, while requiring equal pay for men and women.[72] The CmiA standard lists the same prohibited pesticides as Fairtrade (see above).[74]

3.2 Benefits of developing Africa's organic cotton sector

Millions of people around the world – including organic cotton farmers in Africa – live in rural communities depending on farming. Holistic, organic farming systems based on the organic principles of health, ecology, fairness and care have the potential to build thriving and resilient communities in partnership with nature. These communities attract people to stay on the land rather than move to cities, thus regenerating and nurturing the earth, its resources, and its people.[75] For these reasons, organic production can contribute to the achievement of many of the Sustainable Development Goals (SDGs) including reducing poverty (goal 1), gender equality (goal 5), greater economic potential (goal 8), as well as responsible production and consumption (goal 12).[16]

An economic opportunity for smallholder farmers

In Africa, organic cotton is grown primarily by smallholder farmers.[76] In West Africa, for example, smallholder farmers generally cultivate between 0.5 and 5 hectares of cotton, and even farmers on the biggest organic cotton farms cultivate only up to 10 hectares.[77] In East Africa (Tanzania) the average organic cotton area is 7 hectares (17 acres).[78]

Organic agriculture offers a market-oriented solution to poverty among smallholder farming communities and increases food security through crop rotation.[79] This helps to create incentives for farmers to stay on their land, supporting the development of rural economies. Without jobs and economic opportunities, social stresses such as unemployment can lead to unrest. A 2014 UN report highlighted this risk, stating: "lack of meaningful work among young people is playing into the frustration that has in some instances contributed to social unrest or unmanaged migration."[80]

Economic performance is a key parameter for farmers to choose whether to grow cotton organically, especially for smallholder farmers. Organic farming often results in similar yields as conventional cotton and provides a competitive gross margin due to the reduction of input costs.[22]

In Benin, conversion to organic production resulted in an increase in net income of almost 50 percent per hectare of cotton, while yields were maintained or increased, and production costs were 185 and 307 percent lower than conventional producers in 2017/18 and 2018/19, respectively.[81]

Another study in Benin showed that organic cotton is more profitable than conventional cotton despite somewhat lower yields. Organic cotton farmers make use of locally available inputs, which are cheaper than the chemical inputs employed by conventional farmers. Moreover, organic cotton farmers benefit from a differential, which, combined with the low costs of production, compensates for any yield gap. According to the study, "overall, the main determinants of the profitability of cotton (conventional and organic) include the intensity of technical support, amount of credit, quantity of family labor force, level of education, practice of fallow, and the quantity of family labor devoted to pesticide sprays."[82]

A 2012-14 study undertaken in Burkina Faso with the Syprobio project that analyzed the financial profitability of organic, genetically modified and conventional cotton systems found that despite a significant difference in yield between the transgenic and conventional systems and the organic system, there was no significant difference between the profit margins generated by these different modes of cotton production given the cost of synthetic inputs shouldered by producers of conventional or GM producers. Indeed, the relative weakness of the yield of the organic system is compensated for by the relatively low production costs and the selling price which is approximately 30 percent higher.[83]

In Ethiopia, organic farmers had similar or higher yields than their conventional counterparts and often earned considerably higher incomes.[84,85]

In Tanzania, organic and conventional cotton farmers showed that the production practices had similar yields but that organic farming practices had "relatively higher economic benefit than conventional."[86] The adoption rate of good agronomic practices has continuously increased performance and yields for organic farmers over the past 25 years due to continuous organic extension services by the organic program implementers and effective measures to control pests.[78,87]

Studies in India of yield gaps between organic and conventional cotton production indicate the gaps should not only be attributed to organic production systems; both systems can exhibit a similar pattern of variation in cotton yields and technical efficiency, a situation that needs to be addressed through extension and training.[88] Capacity building and the implementation of seed breeding programs to develop varieties adapted to organic growing conditions are essential to bridge the potential yield gap.[16,42]

The improvement in income is partly because organic cotton often commands a price differential over conventional cotton. The price for Fairtrade organic cotton can be even higher as a "community premium" is paid on top of the selling price so that farmers or workers can invest the income in community projects of their choice.[89] In some cases, the price paid for Fairtrade organic cotton can be up to 30 percent higher than conventional cotton and comes with a purchase guarantee.[78] It is important to note that, while some farmers do receive a better price for organic cotton, there remain significant issues in some areas in ensuring that the price differential reaches farmers.[90]

The burgeoning organic cotton sector will need farmers to stay on the land, and the higher returns can afford them this ability. Given that 60 percent of the 1.25 billion people in Africa are under 25,[91] and that Africa's total population is expected to double to roughly 2.5 billion by 2050,[92] organic cotton farming presents an attractive opportunity. Developing organic cotton production and manufacturing in Africa provides crucial potential for the economy by providing local jobs and reducing rural depopulation and the incentive to emigrate.

Social benefits of organic cotton production

Impact assessment studies indicate that social benefits are a major reason for farmers to adopt organic practices. A study of cotton farmers in India showed that while conventional farmers value their reputation in their community the most, organic farmers are motivated by the sustainability of cotton production, growing safer food without pesticides, and a wish to hand over their land to their successors in a favorable condition.[22]

Organic production also pays close attention to incorporating women into the workforce. It was estimated in 2014 that more than 35 percent of organic cotton producers in Africa were female.[93] The involvement of women in organic cotton farming in Africa is often promoted through organic training programs and gives them the opportunity to operate as independent cotton producers. In the Burkina Faso-based CRS RECOLTE project, 58 percent of the 8,403 farmers are women, making for inclusive and sustainable development.[76]

A study in Benin showed organic farming was more attractive to women compared to conventional farming, and that women often had their own cotton farm, thus increasing their economic independence

while strengthening the resilience of their household. It also found that organic cotton farming is attractive to vulnerable groups in society such as older, less educated, and poorer producers, and therefore suggests that organic cotton should be considered as a policy option for reaching and strengthening the livelihoods of these groups, while also benefiting the environment.[94]

A Helvetas study of 14-year-long organic and Fairtrade cotton projects in West Africa and Central Asia showed that other benefits include improved access to land, a greater quantity of cash crops for women farmers, more resilient production and marketing thanks to enhanced soil fertility and diversification, access to capacity building and rural advisory services, food security through crop rotation, increased independence from seed companies, and improved local infrastructure.[95]

Organic farming: A solution to the environmental challenges faced by agriculture

Agriculture, together with forestry and other land-use sectors, is responsible for an estimated 23 percent of anthropogenic greenhouse gas (GHG) emissions.[14] In 24 countries around the world, agriculture is the top source of emissions.[96] Several cotton-producing African countries, including Burkina Faso, Mali, and Niger are among those with the highest share of emissions from agriculture, and GHG emissions from agriculture in Africa are among the fastest growing in the world.[97]

Organic farming is recognized as a vital tool in climate change mitigation. The United Nation's Intergovernmental Panel on Climate Change (IPCC) states explicitly that healthy soils – a significant focus in organic agriculture – store carbon from the atmosphere, serving as a carbon sink.[14]

Many agroecological practices used in organic agriculture (such as crop rotation with green manure, reduced tillage, and the recycling of crop residue) increase the return of carbon to the soil by building up the organic matter content, raising productivity and helping sequester carbon – a crucial component of climate change mitigation.[98,99]

Beyond carbon sequestration, organic farming reduces the risks to health caused by contamination of air and water by eliminating exposure to hazardous pesticides.[100] Organic farming systems have shown an improved water quality per unit area and also greater biodiversity.[101]

3.3 Current status of organic cotton production in Africa

There is a rapidly growing demand from brands for organically grown fiber, with both African and global brands increasing their use of organic cotton year over year.[12,13] Production of the fiber is increasing in Africa, and there is the potential to scale its production much further to capitalize on the growing demand, particularly from European brands and retailers which are the closest to the Africa.[76]

Organic cotton production in Africa

The production of organic cotton is increasing worldwide, with global production growing by 56 percent in 2017/18.[76] This growth stems predominantly from India, China, and Kyrgyzstan, but also from Turkey, Tanzania, and Tajikistan. In 2017/18, organic cotton made up 0.7 percent of global cotton production. 180,871 metric tons of organic cotton fiber was grown by 182,876 farmers on 356,131 hectares (880,019 acres) of land across 19 countries (including eight in Africa).[v]

[v] Nineteen countries (including eight in Africa) produced organic cotton in 2017/18 (in order by rank): India (47 percent), China (21 percent), Kyrgyzstan (12 percent), Turkey (6 percent), Tajikistan (5 percent), the United States (3 percent), Tanzania (3 percent), Greece (0.5 percent); Uganda (0.4 percent); Benin (0.4 percent); Burkina Faso (0.3 percent); Peru (0.3 percent); Egypt (0.2 percent), Mali (0.04 percent), Ethiopia (0.02 percent), Brazil (0.01 percent), Senegal (0.003 percent), Argentina (0.001 percent), and Thailand (0.001 percent).

These eight African countries together accounted for 4.05 percent of the world's total organic cotton production in 2017/18. Tanzania is by far the largest organic cotton producing country on the continent, followed by (in order of volume) Uganda, Benin, Burkina Faso, Mali, Egypt, Ethiopia, and Senegal.

There were 36,110 organic cotton farmers in Africa (including Egypt) growing 7,335 metric tons of cotton on 68,540 hectares of land. An additional 2,755 hectares were in transition to organic certification in Tanzania (1297), Egypt (1,043), and Mali (415). Compared to 2016/17, this represents a 20 percent increase in organic cotton production overall, and 46 percent more land certified to grow organic cotton on the continent.

With five of Africa's organic cotton-producing countries - Benin, Burkina Faso, Egypt, Ethiopia, Mali, and Tanzania - being among the continent's top ten conventional cotton-producing countries,[30,76] there is considerable potential for growth and for further disseminating organic agricultural practices and their associated environmental benefits.

Organic cotton programs in Africa

This section provides insights into several existing organic cotton programs being implemented in the eight countries in Africa where organic cotton is grown, including Benin, Burkina Faso, Ethiopia, Tanzania, and Uganda.

West Africa

Between 2011 and 2015, FiBL conducted a EuropeAid-funded development research project (Syprobio) with its partners in West Africa to test and develop organic cotton-based production systems that enable farmers to improve their income and food security in the context of climate change. Over 12 farmer-driven production technologies were tested and promoted, covering biopesticides, soil fertility, intercropping, and seed management. The project looked at Mali, Burkina Faso, and Benin and found that organic cotton grows well in these countries, that the system is at least as profitable as conventional and GM cotton, and that it has the best socio-ecological resilience, especially for producers with less than 10 ha of cotton.[102]

In December 2017, the CCBE (West Africa Organic & Fairtrade Cotton Coalition) was launched in Bamako, focusing on Senegal, Mali, Burkina Faso, and Benin. The coalition, initiated by FiBL and ecos, aims to achieve a market share for organic and Fairtrade cotton in the sub-region of five percent by 2030. The CCBE was created following the end of the 14-year programs run by Helvetas in West Africa which were supported by the Swiss government.[68,103]

Benin

The Pesticide Action Network (PAN) UK's program implementing partner, the Beninese Organization for the Promotion of Organic Agriculture (OBEPAB), provides 3,700 certified organic farmers with high-quality training and technical support that covers, for example, organic alternatives to pesticides and fertilizers.[81,104]

Surveys carried out for the 2018-19 season with 500 organic and conventional farmers in Benin showed that converting to organic production resulted in:

- An increase of almost 50 percent in net income per hectare of cotton.
- Maintained or increased yield.
- Annual production costs 185 percent and 307 percent lower than conventional producers in 2017/18 and 2018/19, respectively.

Surveys also showed that approximately half of conventional farmers experienced acute pesticide poisoning incidents during the previous 12 months, while organic farmers experienced none as a result of toxic chemicals not being used.[104]

West Africa

Burkina Faso

From 2013 to 2019, the Revenue through Cotton Livelihoods, Trade and Equity (RECOLTE) project run by Catholic Relief Services provided technical support to the National Union of Cotton Producers of Burkina Faso (UNPCB). It provided infrastructure and tools to put in place an enabling environment for organic cotton in the country. These included the creation of organic seed farms; the implementation of strategies for training and capacity building; farmer access to equipment, marketing, sales, and income-generating activities for women; and the establishment of a monitoring, evaluation, and electronic data collection system. The project was funded by the United States Department of Agriculture (USDA) which also supported the construction of a gin – which opened in 2020 – dedicated to organic cotton.[76,105]

East Africa

Ethiopia

Since 2015, PAN Ethiopia has worked closely with PAN UK to ensure that crop yields and production costs of both trained organic producers and local conventional producers are recorded each year.[84,85] Trained organic farmers have experienced consistently higher yields compared to their conventional neighbors, though the exact difference depends on climatic conditions and other local factors.

2017 was a bumper year for cotton production in the area. Local (untrained) conventional farmers achieved an average of 2,100 kilograms/hectare (kg/ha) of seed cotton, compared to an average of 2,650 kg/ha among trained organic farmers. The program's "lead," or most experienced among the trained organic farmers, achieved an average of 3,080 kg/ha in the same year, 46 percent higher than the untrained conventional producers.

In 2016, conditions were not so favorable for cotton, but organic cotton production still outpaced conventional, with conventional farmers averaging 1,200 kg/ha and trained organic farmers averaging 1,390 kg/ha (lead farmers averaged 1,570 kg/ha).

The team also works hard to tease out the complex differences in production costs between conventional and organic so that comparisons could be made between net income per ha. In 2017 and 2018, the average net income per hectare was 55-64 percent higher for organic cotton compared to conventional production under local practice.

This program also supported improved productivity in rotation and field boundary crops, which are often food crops, planting alongside, or and even among the organic cotton plants. Currently, PAN is introducing agronomic practices to improve tomato production as a rotation crop in Ethiopia.

In addition, a PAN UK-funded crop monitoring study of organic and conventional farms in Ethiopia found that dependency on synthetic insecticides, which have negative impacts on human health and biodiversity, can be reduced by using eco-friendly pest management options such as a food spray made from natural and local materials (including maize or yeast and sugar). The spray attracts natural enemies of pests into the crops, thereby enhancing natural biological control and biodiversity without the need for synthetic insecticides.

Tanzania

A dissertation comparing organic and conventional farmers in Tanzania found that organic farmers, on average, owned larger farms, were wealthier, and had a lower prevalence, breadth, and depth of poverty than their conventional counterparts.[106]

Another study of Tanzanian organic and conventional cotton farmers showed that the production practices had similar yields, but that organic farming had "relatively higher economic benefit than conventional." They also found that the use of neem and cow urine as pest control had similar effects as synthetic pesticides, allowing for a higher return as a result of their lower cost.[85]

East Africa

Tanzania (continued)

In Tanzania, bioRe Tanzania Ltd. and BioSustain Tanzania Ltd. are two companies implementing organic cotton programs in Tanzania.

- bioRe Tanzania Ltd. was the first organic cotton project in Tanzania, initiated in 1994 and formed as a company in 2000. The company provides farmers with training and technical assistance, offers seed and organic inputs on credit, pays an organic premium of 15 percent for the cotton, and guarantees the purchase of organic cotton from farmers. bioRe Tanzania works with over 2000 family farms and is promoting full farm conversion, including the introduction of mung beans or sunflowers to enhance soil fertility and natural pest control. The Swiss company Remei AG is the primary customer of bioRe Tanzania Ltd. and supports the project with pre-financing, purchase guarantees, and premium payments. Remei AG uses the cotton for its product line sold to brands and retailers under the bioRe® Sustainable Textiles Standard.[107,108]
- BioSustain Tanzania Ltd. was established in 2006 to work with approximately 14,000 smallholder farmers in the Singida region. The company provides farmers with training and technical assistance, offers seed and organic inputs on credit, and pays an organic premium for the cotton. The company also has a cotton gin and an oil mill. It has signed a memorandum of understanding with seven districts to promote organic farming and incorporates the production of rotational crops for food security, including sunflower seeds, rice, legumes (yellow and green gram) and groundnuts.[109]

  In addition, an organic cotton program project implemented by GIZ and Helvetas Swiss Intercooperation and funded by Laudes Foundation supports BioSustain Ltd. and Alliance Ginneries in their efforts to scale up their organic cotton production. Since 2017, the project has helped 18,000 farmers on 16,218 hectares gain organic certification and will be increasing to 30,000 organic cotton farmers by 2023. The organic cotton is sold with a premium to European brands and spinning/weaving companies in South Asia.

  The project aims to create organic farming zones, or clusters, with a strong focus on “climate smartness,” or becoming more resilient to climate change with a combination of activities at the field, community, and local policy level. This includes addressing forestation and water management and making market linkages for organic cotton and rotational crops, including organic chickpeas and maize. The program also offers a Farmer Business School that demonstrates the benefits of switching to organic cotton and teaches the specific business management skills to do so.[110,111]

Uganda

The Gulu Agricultural Development Company (GADC) offers an established training system to organic farmers, with 16 modules covering topics from opening the land, to pest management and harvesting, to financial literacy. The training is in high demand, and GADC is not able to train as many farmers as have requested it. In 2018, approximately 10,000 farmers were certified organic, 50,000 farmers were trained in organic methods, and another 50,000 farmers were waiting to join the training.[112,113]

3.4 From Field to Finished Product: Organic cotton manufacturing in Africa

Africa is not just where organic cotton is grown, but it is a growing hub for organic cotton processing and manufacturing as well.

A changing market landscape

The fashion industry alone is responsible for approximately eight to ten percent of global carbon emissions.[114] In response, consumers are increasingly seeking to buy more sustainable apparel and home products.[12,13] As a result, from the local to the global level, brands and retailers are rapidly growing

their use of preferred fibers year on year, setting new targets and signing commitments to increase their use of preferred cotton and make it an important part of their portfolio[58,60]. Manufacturers and brands also have corporate environmental and social responsibility goals driving them to be more responsible stewards of our planet.[59]

Several important initiatives have been created to support the demand for more sustainable cotton, including the 2025 Sustainable Cotton Challenge. This challenge has seen 36 of the world's biggest textile brands and retailers commit to using 100 percent sustainable cotton by 2025.[60,115] In addition, leading fashion companies in 2019 signed on to the UN Climate Change's Fashion Industry Charter for Climate Action, which aims to achieve net-zero emissions by 2050.[116] 2019 also saw the launch of the Fashion Pact, focusing on three areas: reducing global warming, restoring biodiversity, and preserving the oceans.[117]

The global organic market is growing rapidly, providing an incentive for the adoption of organic methods in Africa's numerous cotton-growing nations. The global organic food market exceeded $100 billion in 2018, and the US organic market alone exceeded $50 billion in sales the same year.[118] Organic fiber product sales in the US alone increased 15 percent over 2017 to $1.8 billion in 2018 (most of those products were made of organic cotton), and the organic fiber sector continued to be the largest and fastest-growing sector in the US organic non-food industry.[119]

Similarly, sales of just Soil Association Certification organic textiles (certified to the Global Organic Textile Standard and/or the Organic Content Standard) grew by ten percent in 2019, with the market worth £45.4 million. The figures are based on Soil Association Certification licensee sales and do not reflect all organic cotton sold in the UK.[120]

Voluntary traceability standards

Companies using organic cotton are increasingly becoming certified to voluntary traceability standards.

The two most common chain of custody standards are Textile Exchange's Organic Cotton Standard (OCS) and the Global Organic Textile Standard (GOTS).

- The Organic Content Standard (OCS) verifies the amount of organic cotton in a finished product. There were 6214 OCS-certified facilities in 2019, a 47 percent increase over 2018.[121] This included 87 OCS-certified facilities in six African countries including Morocco (41), Mauritius (22), Egypt (17), Ethiopia (3), Madagascar (2), and Tunisia (2).[122]

- The Global Organic Textile Standard (GOTS) is a stringent voluntary global standard for the entire post-harvest processing (spinning, knitting, weaving, dyeing, and manufacturing) of apparel and home textiles made with organic fiber. The standard prohibits the use of toxic inputs during the processing stages and establishes strong labor provisions, including a prohibition on child labor. In 2019, there were 7,765 GOTS certified facilities in 70 countries, a 35 percent increase over 2018. There were 66 GOTS certified facilities in Africa in 2019, a 50 percent increase over 2018. They were located in Egypt (24), Tunisia (8), Morocco (9), Tanzania (4), Burkina Faso (1), Mozambique (1), and Uganda (1).[123,124]

Most recently, in January 2020, the UNPCB, together with the Company for the Development of Textile Fibres (SOFITEX), opened a gin dedicated to organic cotton with the support of CRS' RECOLTE project.[105]

In addition, the Fairtrade International Textile Standard addresses which fibers and schemes are considered "responsible" and applies to textile manufactures employing workers in the textile supply chain, including ginners, spinners, dyers, cut-make-trim factories, as well as brand owners. Cotton fiber certifications accepted include organic (US NOP and EU), and CmiA (non-GM) cotton.[125]

Companies sourcing in Africa

The following are just a handful of companies that are manufacturing apparel in Africa using the region's organic cotton.

Examples of apparel and home textile companies sourcing organic cotton in Africa

- bioRe Tanzania Ltd. (introduced above) was founded by the Swiss company Remei AG and incorporates its organic cotton into a line of GOTS-certified bioRe® sustainable textiles, which includes traceability from fiber to finished products. By utilizing a code in every piece of clothing, one can trace each product as far back as farm groups. All the process steps along the fully transparent value chain ensure strict social and environmental criteria, and since 2013, all products are CO2-neutral. Customers include Mammut and Elkline as well as retailers Grune Erde and Coop Schweiz (for its private label "Naturaline.)[107,108]
- Cotonea/Elmer + Zweifel, a manufacturer of GOTS-certified apparel, fabrics, and home textiles, has sourced organic cotton from Uganda since 2009. Cotonea/Elmer + Zweifel offers a transparent value chain from Uganda (and Kyrgyzstan) to brands in Europe via its manufacturing facilities in Germany, the Czech Republic, and Switzerland.[113,126]
- UK-based imprintable wear brand Mantis World sources from Sunflag Tanzania Ltd. The family-owned, fully vertical mill founded by the Mantis World founder's grandfather uses Tanzanian-grown organic cotton to make certified organic garments "from seed to sewer." The factory has a spinning, knitting, dyeing, and cut/sew facility certified to both GOTS and OCS.[127,128]

4. Recommendations

This section presents key recommendations based on the risks of GM cotton and the opportunities of organic and other preferred cottons outlined in this white paper.

4.1 Collective action applicable to all sectors

- Create locally rooted and internationally linked organic clusters along the value network. Work with traders and other agents who prioritize the linkage of sustainable supply to the market to:
    - Support long-term economic sustainability by creating stable business networks and building a strong reputation and demand for African grown organic and GM-free preferred cotton.
    - Increase effectiveness and resource use efficiency in production and understanding long-term risks of organic production systems by stimulating the exchange of experiences and supporting research and development activities.
    - Bring added value for crops grown as part of the organic crop rotation.

4.2 Recommendations to governments

- Support national and local initiatives in Africa promoting organic cotton and GM-free preferred cotton production and textile networks by providing legislative, financial, and technical support for:
    - Capacity-building and advisory strategy to coordinate farmer engagement, facilitate technical advice by public extension services, and stimulate local innovation platforms. This development would help to close the knowledge gap, improve access to locally developed technologies, and improve agroecological practices, including the on-farm production of quality organic inputs.
    - Expanded farmer access to credit to improve the ability to obtain organic inputs (on-farm production and purchased).
    - Price incentives for the uptake of organic and other preferred cotton production systems, including during the conversion period, and taxation schemes to reduce the risk of conventional inputs on health.
    - Research into bio-inputs.

- Work with both the public and private sectors, including NGOs and brands, to promote and ensure a supporting marketing framework for the African organic cotton supply chain - from field to finished textile products. Such an environment would enable market pricing, purchase structures, and subsidies for pest management inputs that can be used in organic crop production.

If countries move forward in adopting genetic engineering, governments must:

1. Define a clear framework for the research and use of GM crops, and proactively manage their potential impacts:
    - Ensure that the process is accompanied by a transparent stakeholder analysis and does not happen behind closed doors.
    - Develop stringent biosafety regulations addressing the research and use of GM crops, including strict liability provisions for seed patent holders and clear coexistence rules.
    - Consider implementing an independent governmental advisory group whose role is to consider the social-economic implications of each new GM crop or GM research program and whether it is likely to inadvertently or directly displace agroecological solutions.
2. Ensure the ability for coexistence with organic/GM-free preferred cotton supply networks, starting with seed (development, production, and supply):
    - Require GM seeds and their packaging to be a different color to distinguish them and prevent inadvertent use of the seed in organic production.

- Guarantee the availability of high-quality, non-GM cotton seeds for organic farmers by establishing participatory seed breeding research programs, and production adapted to the local conditions and practices.

4.3 Recommendations to brands

- Incorporate organic and other non-GM preferred cottons from Africa, particularly into regional, continental, European, and Middle East-based manufacturing supply bases, helping minimize the carbon footprint of transportation.
- Require that supply networks be certified to strong, verifiable, and transparent standards for the production of organic and other preferred cotton fibers and the processing of organic textiles. Examples include:
  - IFOAM Family of Standards (a list of all standards officially endorsed as organic by the international organic movement).
  - Voluntary supply chain standards for organic textiles including the Organic Content Standard and the Global Organic Textile Standard, both of which are important for maintaining the identity of organic fiber/material content as it moves through production from farm to final product.
  - Fairtrade.
  - Cotton Made in Africa.
- Provide long-term volume planning with, and purchase guarantees to, organic farm groups to support conversion to organic agriculture and stabilize livelihoods.

4.4 Recommendations to farmers and farmer organizations

- Farmer organizations representing organic or other GM-free preferred cotton producers, as well as national and regional cotton unions, should intensify and strengthen their cooperation. A particular focus is needed to improve the organization of efforts toward common sustainability goals.
- Establish strong agreements between cotton producers, ginners, and state officials, as well as financial partners to:
  - Develop strong farmer groups as well as coalitions on all levels (local, regional, national, and continent-wide) to spread the cost of certification and leverage other benefits that come through improved organization.
  - Pool knowledge and resources, advocate for improved policies and undertake joint promotional activities.

4.5 Recommendations to other institutions including NGOs and Foundations

- Fund and support additional research into sustainable farming methods and processing practices.
- Support research into country-specific market data for organic cotton fiber and/or finished products, documenting their sale to track progress.
- Support the development and expansion of knowledge exchange between organizations in different countries and regions with strong organic and GM-free preferred cotton programs to help producers and the manufacturing infrastructure to scale up.
- Monitor developments in African countries concerning the introduction of GM seeds either for research or production and support the review of policy and legal processes regarding biosafety norms.

5. Conclusion

Cotton plays a vital role in the African economy, particularly in the sub-Saharan region. It is both a major export crop as well as a fiber extensively used in the domestic textile industry that is key to farmers' livelihoods and state revenue.

However, the recent push to expand GM cotton production on the continent without robust research into the long-term effects on farmer livelihoods and the environment is cause for alarm. Evidence from India and other GM cotton-growing countries points to higher economic, social, and financial risks as well as the potential for increased use of pesticides, brought about by resistance to commonly used pesticides, and outbreaks of secondary pests. Past experiences in these and other countries with the introduction of GM crops also pose concerns over seed sovereignty, biodiversity, and uncontrolled contamination of non-GM crops. On top of this are ethical concerns, with some perceiving genetic modification of seed as incompatible with the principles of sustainability and violating the intrinsic integrity of life.

At the same time, consumers are increasingly opposing GM agriculture while apparel and home textile brands – both locally and globally – are expanding their demand for organic and other GM-free preferred cotton and manufacturing certified to standards such as the Global Organic Textile Standard, which prohibits the use of GM cotton, and the Organic Content Standard.

There is increasing interest from within the industry itself, as well as pressure from NGOs, to set commitments for sourcing more sustainably grown cotton as indicated by the textile industry's involvement in the 2025 Sustainable Cotton Challenge and other initiatives. Leading designers, manufacturers, and retailers are increasingly making commitments to use more organic cotton as they develop their sustainability strategies, often focused on climate change mitigation. In so doing, they are supporting the more than 182,000 farmers growing organic cotton worldwide – including almost 37,000in Africa.

With increased production and vertical integration, Africa has the potential to become a significant hub for ethical and sustainable textile-based development. There are numerous benefits to sourcing organic cotton and GM-free preferred cotton from Africa. These include:

- Currently, much of Africa is GM-free. Countries that prohibit genetically modified seed will avoid the difficult and complex issue of crop contamination through genetic drift and handling, which has become a concern in countries such as India and the United States. This puts African countries at an advantage when it comes to organic production.
- Prohibiting or limiting GM production means that African farmers, national research institutes, and ginners will continue saving and breeding their own locally adapted seed, rather than needing to purchase seed every year from a foreign multinational corporation.
- Africa's proximity to European and Middle Eastern manufacturing facilities makes it an increasingly appealing sourcing destination for several reasons, not least is the lower carbon footprint of transportation to both mills and consumers in those areas.
- Increasing manufacturing capacity within Africa will provide added value to the organic cotton fiber produced on the continent (rather than it being exported in raw form).
- Developing organic cotton production and manufacturing in Africa will offer local job opportunities for Africans and create incentives to reduce rural depopulation and emigration.

The Textile Exchange Pan-Africa Sourcing Working Group supports and encourages the growth of preferred cotton programs that prohibit the use of genetic engineering. These currently include organic (specifically those in the IFOAM Family of Standards), Fairtrade, and Cotton made in Africa. These programs embrace organic practices that build organic matter in soils (increasing carbon sequestration), support smallholder farmers, and protect human health and the environment.

Key to expanding organic cotton production and manufacturing is creating institutions, networks, and the related infrastructure by governments, industry, farmers, civil society organizations, foundations, and more coming together. This collaboration includes having organizations funded and in place that can organize and train the farmers and manage internal control systems, among other roles. Until these additional needs in management capacity and technical expertise are addressed, increased demand will not automatically translate into increased production.

Today, Africa is at a crossroads. The Textile Exchange Pan-Africa Sourcing Working Group urges its nations' policymakers and the textile industry to take a path toward resilient and healthy rural communities and capitalize on the growing demand for organic and preferred cotton.

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