

Global Commodities Forum
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Promoting natural fibres in the climate action agenda

In the coming years, natural fibres may assume a crucial role across various industries. They may serve as eco-friendly substitutes or in blends with synthetic fibres and materials such as plastics, including polyester, primarily derived from non-renewable fossil fuels.

Natural Fibres are Engines of Opportunity

Cotton remains the most significant natural fibre in terms of both quantity and value. Approximately 25.5 million metric tonnes of cotton were produced in 2021-2022, from a total quantity of natural fibres of approximately 30 million metric tonnes.¹ Exports of cotton accounted for about US\$81 billion in 2022, compared to slightly less than US\$6 billion in exports of other natural fibres.²

Between 40 million and 50 million households produce natural fibres, and when seasonal labour is considered, around 150 million to 200 million people earn at least some of their annual cash income from natural fibre production.³ Natural fibres provide employment to between 2% & 3% of the world's population.

Natural fibres are durable, storable commodities. Bales of natural fibre do not require refrigeration. They are not attacked by pests. They do not spoil. If handled properly and not exposed to fire or water, they can be stored nearly indefinitely without losing value. Bales are nearly indestructible, allowing them to be transported over rough roads with basic equipment.

Natural Fibres have high ratios of value to weight and volume and can be economically transported over long distances. Natural fibres are not grown in Los Angeles, Tokyo or Geneva. Rather, natural fibres are raised on the frontiers of the world economy, often thousands of kilometres from ports or regions of consumption. Farmers in Burkina Faso are linked to consumers in Japan via cotton clothing. Farmers in New Zealand are linked to consumers in China via wool blankets and carpets. Farmers in the state of Bahia, Brazil are linked to households in Saudi Arabia via sisal used in construction material. Farmers in the Andes are linked to consumers in Europe via alpaca sweaters.

¹ Both figures are retrieved from the FAOSTAT databases which includes production information for Abacá/Manilla Hemp, Cotton, Flax, Jute, Industrial Hemp, Ramie and a miscellaneous category for other natural fibers. For additional information see Discover Natural Fibres Initiative at <https://dnfi.org/>

² Only exports of raw materials as represented in the HS classification and reported in the UN-COMTRADE database are considered here.

³ Discover Natural Fibres Initiative, January 2024.





Recent analytical work conducted by UN Trade and Development (UNCTAD) points to the strong potential of emergent natural fibres such as flax-linen, industrial hemp⁴ and bamboo to enhance sustainability across various industries, increase value addition in producing countries and diversify production and trade.

Technology Drives Improvement and Growth

The shift towards more responsible production and consumption patterns, and away from fossil fuels, represents an opportunity to expand sustainable natural fibre production, especially in developing countries.

Broadly speaking, consumers appreciate natural fibre products for their quality and comfort.⁵

While consumer preferences alone may not drive a transition to natural fibres, well-designed climate policies and regulations could shift incentives in favour of lower-carbon, more sustainable natural fibres over polyester and other synthetic fibres.

Advancements in agricultural practices, such as the increased use of digital technologies, including precision agriculture, offer opportunities to enhance the quality and yield of natural fibre crops, while reducing the need for the use of synthetic fertilizers and pesticides.

In round numbers, 120 million metric tonnes of fibres are used in the world as of 2024. Of that total, natural fibres account for just 33 million. Manmade cellulosic fibres (viscose) account for about 8 million tonnes, and synthetic fibres account for the balance of 80 million tonnes. If the world is going to transition away from plastics toward the use of biodegradable products, the kilograms of fibre harvested per hectare must increase.

A common challenge facing all farmed fibres is that yields are stagnant, and production is not expanding. World production of natural fibres nearly doubled from 18 million tonnes in 1970 to more than 30 million by 2005, but there has been no growth since the two decades. Trends in yields vary by fibre and by country, but the common story is one of no growth in two decades.

Yields in agriculture, whether plant or animal-based, are driven by technology. Mechanization, directed breeding programs, synthetic fertilizers and pesticides, and developments in the life sciences are driving change in agriculture. The agricultural segments of natural fibre value chains create employment for up to 200 million people, but if natural fibre industries cannot grow, the industries will wither. Natural fibres could benefit greatly from the adoption of technologies that enhance yields, reduce resource use, and improve technical fibre performance characteristics.

⁴ UNCTAD 2022. Commodity at a glance special issue on industrial hemp. UNCTAD, Geneva and New York. <https://www.un-ilibrary.org/content/books/9789210019958>

⁵ See for instance results from the 2021 Global Sustainability Survey, conducted by Cotton Council International (CCI) and Cotton Incorporated Detailed available at https://lifestylemonitor.cottoninc.com/wp-content/uploads/2021/10/2021_Sustainability_Concerned-Consumers_forDownload-1.pdf. For a general assessment about bio-based products see Ruf J, Emberger-Klein A, Menrad K 2022. Consumer response to bio-based products – A systematic review. Sustainable Production and Consumption. 34 : 353-370. <https://doi.org/10.1016/j.spc.2022.09.022>.



Innovation in processing techniques also allows for reduced production costs and the development of higher-value fibre products.

To capitalise on the low-carbon potential of natural fibres, producing countries must overcome several challenges. For example, to compete with synthetics, they must mitigate risks posed by changing weather patterns on production costs and on the reliable supply of raw material for downstream industries. They must also procure the technology and expertise to expand local value addition.

Overcoming these challenges will require improved coordination among countries and stakeholders. Trade will also play a vital role in establishing resilient natural fibre value chains.

Dynamic regulatory landscape

Across a range of sectors, from energy to transport and construction, policymakers employ regulation to drive a transition towards more sustainable materials and production processes. Extending this regulatory effort to garments, textiles, composites, construction materials, packaging & home textiles, and related sectors could propel global demand for natural fibres as an eco-friendly alternative to synthetic fibres like polyester.

Carbon pricing schemes aim to set efficient prices for industrial emissions that may otherwise go uncosted in the production of fossil fuel-derived synthetic fibres. Fully costing these emissions sets an incentive for their reduction and improves the competitive position of natural, plant-based fibres.

Meanwhile, the mounting issue of microplastic pollution has spurred discussions on potential restrictions on certain synthetic fibres that shed microplastics during washing and wear. Such measures would create a clear advantage for natural, biodegradable fibres like cotton, wool, and cellulosic fibres.

Eco-labelling and disclosure requirements are also gaining traction, aiming to increase transparency and empower consumers to make more informed, environmentally conscious choices. If consumers value such information, it could boost demand for lower-impact natural fibres.

Legislative and regulatory proposals in some countries could impose sustainability standards on natural fibre producers that negatively impact the livelihoods of millions. There is broad recognition that regulation is essential to achieve sustainability goals, but there is a danger that the metrics will penalize producers without achieving meaningful sustainability targets.

Mounting climate change risks

While natural fibres are often promoted for their perceived environmental benefits, climate change nonetheless poses significant risks to their production and supply chains. Variations in rainfall and temperature patterns, exacerbated by climate change, can disturb the agricultural cycle and plants' growth phase, impacting crop yields. Rising temperatures can also compromise fibre quality, diminishing their competitiveness relative to industrially produced synthetic options. The increased risk of extreme weather events, including floods and droughts, further threatens economic viability in the chain and the reliable supply of raw materials.



In the long run, the most competitive fibres—whether natural or synthetic—may not be those marketed for their climate-friendly attributes. Instead, the most competitive fibres will likely be those with resilient supply chains that can consistently provide the desired properties and quantities at competitive prices. This will be crucial in the face of increasing climate change risks and evolving regulatory landscapes. Ensuring supply chain resilience and adaptability will, therefore, be crucial for natural fibre producers in a climate-impacted future.

Building sustainable, development-oriented natural fibre value chains

Natural fibre supply chains can face significant challenges in terms of sustainability and resilience. The current market structure involves many producing countries exporting raw lint to a small number of major textile hubs, which then export most finished textiles and apparel to consumer markets. This model raises concerns about the centralization of value addition, vulnerability to supply disruptions in the main processing hubs, and its overall environmental impact.⁶

Addressing these issues requires a comprehensive, multi-stakeholder approach involving governments, research institutions, producer associations and industry.⁷ Investing in research and development (R&D) is crucial for developing climate-resilient fibre varieties, enhancing sustainable farming practices, and driving product innovation.⁸ Implementing accessible traceability systems, especially for smallholders, can bolster ethical sourcing, fair labour practices, and forest conservation. Harmonisation and capacity-building for the many fair-trade brands and voluntary sustainability reporting standards can avoid the burden of compliance falling on small producers and improve the development impact of these programmes. Expanding smallholder farmers' access to finance, training and technology can boost productivity, resilience and income.

To de-risk supply chains, it is essential to develop redundancies by diversifying the global supplier base. Diversification can reduce reliance on a few key supply markets, thereby enhancing resilience against the risk of disruptions by threats such as climate change, pests, or political instability.

⁶ See for instance R Shanthi (2017). Sustainable cotton production. In ed S Muthu 2017. In The Textile Institute Book Series, Sustainable Fibres and Textiles. Woodhead Publishing. <https://doi.org/10.1016/B978-0-08-102041-8.03001-8>.

⁷ For a general discussion see UNGC (2015). "Supply chain sustainability - a practical guide for continuous improvement.", Second Edition. Available online: https://www.unglobalcompact.org/docs/issues_doc/supply_chain/SupplyChainRep_spread.pdf. For a systemic discussion see Gurzawska A 2020. Towards Responsible and Sustainable Supply Chains – Innovation, Multi-stakeholder Approach and Governance. *Philosophy of Management*. 19:267–295. <https://doi.org/10.1007/s40926-019-00114-z>

⁸ See for instance Lybbert T and Sumner D 2012. Agricultural technologies for climate change in developing countries: Policy options for innovation and technology diffusion. *Food Policy*. 37(1). <https://doi.org/10.1016/j.foodpol.2011.11.001> .



As well as diversifying global value chains (GVCs), producing countries can pursue regional value chain (RVC) strategies as a development approach.⁹ By leveraging preferential trade agreements, countries can expand regional market access for natural fibre products. This would allow producing countries to reduce their dependence on a few key export markets, bolster resilience against demand fluctuations, and pursue domestic value addition. Incentivizing product diversification and value-addition through R&D investment and collaboration can stimulate local economies and create job opportunities.¹⁰

In this context, panellists and participants at the 2024 Global Commodities Forum will address the following key questions:

- What opportunities and threats does the climate action and energy transition agenda represent for natural fibres?
- What is the trade potential of the main natural fibres in the context of the climate emergency?
- How can natural fibres generate additional revenues for farmers while responding to increasing demands for climate-friendly agricultural practices and supply chains? How can producers of natural fibres, particularly smallholders, gain access to 21st-century technologies necessary to sustainably increased yields and production?
- What role for regional value chains for natural fibres in strengthening development outcomes in producing countries?
- What role for international cooperation and multilateralism in shifting consumption towards sustainably produced, low-carbon natural fibre products? How can governments and industries ensure that the crucial role of natural fibres in the world economy is recognized and sustained?

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⁹ Evidence on the positive relationship between trade policy and GVC gains has been gained relevance in international economy studies. For a description of the mechanism at play see for instance Ornelas E, Turner J and Bickwit G 2021. Preferential Trade Agreements and Global Sourcing. *Journal of International Economics*. 128. 103395. <https://doi.org/10.1016/j.jinteco.2020.103395>.

¹⁰ See for instance Galli, R 2017. The role of investment incentives for structural transformation A comparative analysis of investment incentives legislation in developing countries in sub-Saharan Africa, South Asia and South-East Asia. ILO Employment Working paper No 211.