

Transforming the Cotton Industry: Achieving Sustainability and SDG Values through Social Impact

The fashion industry—often lauded for its creativity and economic contributions—is also responsible for significant environmental and social repercussions. Clothing production, from raw materials to finished garments, generates substantial waste and greenhouse gas emissions, often exploiting cheap labour in developing countries (Bick et al., 2018). Cotton, a key raw material in this industry, presents its own distinct challenges. It demands vast quantities of water and pesticides, contributing to pollution and environmental degradation (Chapagain et al., 2006). This post explores how prioritising social impact in the cotton industry, using a Life Cycle Assessment (LCA) approach, could pave the way for sustainability and the realisation of the UN Sustainable Development Goals (SDGs) across the full industry globally.

A Social Impact Approach to Cotton Production

Prioritising social impact within the cotton industry offers a pathway to both sustainability and the realisation of SDG values. By focusing on the well-being of workers, communities, and the environment, the industry can create a positive ripple effect throughout its entire value chain. This approach is aligned with the increasing awareness among stakeholders about the climate and human rights implications of the textile, apparel, and fashion (TAF) industries (Fletcher & Tham, 2019). Here are some key strategies that can be employed to promote sustainability while improving social impact:



Sustainable Practices for Environmental Protection

Addressing environmental protection in cotton production must go hand in hand with improving social impact. Sustainable practices not only preserve natural resources but also enhance the livelihoods and health of cotton farmers and their communities, thereby supporting SDG targets.

- **Water Management:** Cotton cultivation is water-intensive, consuming approximately 2,700 litres of water to produce a single T-shirt (WWF, 2013). Implementing efficient irrigation techniques, such as drip irrigation, and promoting rainwater harvesting can significantly reduce water consumption and alleviate water stress in cotton-producing regions. These practices not only help preserve the environment but also empower farming communities by providing better access to water resources, improving their quality of life. This aligns with the LCA's emphasis on resource efficiency as a key metric for sustainability (Sandin et al., 2019).
- **Organic Farming:** Transitioning to organic cotton farming eliminates the use of harmful pesticides and herbicides, protecting biodiversity, soil health, and water quality. This shift also safeguards the health of farmers and agricultural workers, ensuring a safer working environment (Textile Exchange, 2021). Organic farming contributes to improved community health and enhances economic stability by allowing farmers to access premium markets for organic cotton. According to lifecycle assessment studies, organic farming results in reduced ecological toxicity and supports long-term soil fertility (Shahbandeh et al., 2022).
- **Alternative Feedstocks:** Research into alternative, non-wood plant-based materials, such as hemp and bamboo, for textile production is crucial (Van Dam et al., 2005; Li et al., 2015). These alternatives can reduce reliance on conventional cotton and lessen the environmental

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burden associated with its production. Supporting the adoption of such alternatives helps create diverse income streams for farming communities, thereby fostering economic resilience. This contributes to enhanced social impact, supporting SDG 9 (Industry, Innovation, and Infrastructure).

The Example of the Humble T-Shirt

A simple cotton T-shirt may seem unassuming, but its production involves significant environmental impacts at each stage of its lifecycle (Use Again, 2023). Each phase of the T-shirt's journey presents an opportunity to improve social impact and sustainability.

1. **Material Phase:** Cotton cultivation involves sowing, fertilizing, irrigating, harvesting, and ginning—all of which contribute to pollution through pesticide and water use. By prioritising fair labour practices and reducing harmful inputs, we can protect farmers' health and ensure safer working conditions. LCA analysis highlights the importance of managing these inputs to minimise both environmental and social harm (Sandin et al., 2019).
2. **Production Phase:** The cotton is then spun, knitted, bleached, dyed, cut, and sewn into a T-shirt. Each step uses chemicals and dyes that pollute waterways and create hazardous waste. Providing workers with adequate protective gear and safe working environments can minimise these risks and support SDG 3 (Good Health and Well-being). In addition, lifecycle assessments stress the need for transparency regarding chemical inputs and the importance of using less hazardous substances to protect both workers and the environment (Shahbandeh et al., 2022).
3. **Transport Phase:** The T-shirt is transported through multiple supply chain stages, with pollution from carbon emissions at every step. Investing in low-emission transportation options can reduce the environmental impact, while ensuring fair wages for transport workers enhances social outcomes. LCA methodologies highlight the transportation phase as a major source of carbon emissions, necessitating careful selection of logistics strategies (Stevenson & Hayes, 2020).
4. **Use Phase:** Once in the hands of the consumer, washing and drying the T-shirt contribute to carbon dioxide emissions, with an estimated 18.3 pounds of CO₂ produced after 50 wash and dry cycles. Educating consumers on sustainable laundry practices and providing access to energy-efficient appliances can reduce this impact. Encouraging consumers to adopt behavioural changes is an essential element of achieving SDG 12 (Responsible Consumption and Production) (Jones et al., 2021).
5. **Disposal Phase:** Finally, the end-of-life phase for the T-shirt involves either landfill disposal or incineration, both of which lead to pollution and wasted resources. Encouraging recycling and circular economy initiatives can help extend the life of cotton products, reducing waste and providing additional income opportunities for local recycling initiatives. Integrating circular economy principles is also recommended within LCA to minimise waste and enhance resource efficiency (Khan et al., 2022).



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This example highlights the need for comprehensive changes throughout the entire lifecycle of cotton products to minimize their environmental impact and enhance social sustainability.

Social Impact for Human Well-being

Social impact must be at the core of every step in the cotton production process. Addressing systemic issues such as poverty, gender inequality, and poor working conditions is critical to achieving sustainability goals.



- **Fair Labour Practices:** Ensuring fair wages, safe working conditions, and the elimination of child labour is essential for promoting social welfare within the cotton industry. By prioritising the well-being of workers, the industry can contribute to poverty reduction, improved health, and quality education (SDGs 1, 3, 4) (ILO, 2019). Fair wages and safe working environments empower workers, improving their standard of living and enabling them to invest in their families and communities. LCA approaches support the inclusion of social impact assessment as part of evaluating production systems (Sandin et al., 2019).
- **Empowerment of Women:** Women play a significant role in cotton production, yet they often face inequitable access to resources and fair wages. Supporting women farmers through training, access to resources, and fair market opportunities promotes gender equality and economic empowerment (SDG 5) (UN Women, 2020). Empowered women are more likely to invest in their children's education and health, leading to stronger communities and better social outcomes. Gender-focused social impact assessment, as part of LCA, can further aid in identifying gaps and driving targeted interventions.
- **Community Development:** Investing in infrastructure and social services within cotton-producing communities can enhance livelihoods, improve access to healthcare and education, and contribute to overall community well-being. For example, funding for local schools or health clinics can have far-reaching positive effects (Smith et al., 2022). Community development initiatives not only support the immediate needs of cotton farmers but also build long-term social resilience, an essential aspect highlighted in social LCA (Shahbandeh et al., 2022).
- **Health and Safety:** Cotton farming often involves the use of toxic pesticides that have detrimental effects on workers' health. By prioritising organic practices and providing personal protective equipment, the industry can significantly reduce health risks for farmers, contributing to SDG 3 (Good Health and Well-being) (WHO, 2018). A healthy workforce is crucial for sustaining productivity and ensuring that social benefits are distributed equitably.

Collaboration and Transparency for Systemic Change

Collaboration among stakeholders is essential for fostering systemic change in the cotton industry. Transparency in supply chains can enhance accountability, ensuring that social impact remains a priority.

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- **Stakeholder Engagement:** Fostering partnerships among farmers, manufacturers, brands, consumers, and policymakers is vital to drive industry-wide change. Open dialogue and collaboration can facilitate the adoption of sustainable practices and social responsibility standards, leading to systemic improvements (Kogg & Mont, 2012). Engaging stakeholders also ensures that all voices, especially those of farmers and workers, are heard and considered in decision-making processes. Lifecycle assessments recommend multi-stakeholder engagement to achieve comprehensive sustainability (Stevenson & Hayes, 2020).
- **Supply Chain Transparency:** Implementing traceability systems that track cotton from farm to finished product allows for monitoring and verification of social and environmental standards throughout the cotton supply chain. Transparency empowers consumers to make informed choices and holds brands accountable for their sourcing practices (Gardetti & Muthu, 2015). Transparent supply chains help prevent labour exploitation and ensure fair practices are upheld. LCA tools combined with supply chain mapping are effective in enhancing transparency and impact tracking (Sandin et al., 2019).
- **Multi-stakeholder Initiatives:** Engaging stakeholders such as governments, NGOs, and international organisations in initiatives to set common sustainability standards can create a unified approach. These initiatives can also help share knowledge and resources, making it easier for small-scale farmers to adopt sustainable practices (FAO, 2021). Multi-stakeholder collaborations can address both environmental and social challenges, promoting a balanced approach to sustainability.

Measuring Impact for Continuous Improvement

To create lasting social impact, it is essential to continuously measure and improve practices. Impact assessment helps ensure that the cotton industry's efforts align with social sustainability goals.

- **Impact Assessment:** Developing robust metrics to measure the social and environmental impact of cotton production and processing is vital (Ramia et al., 2021). A data-driven approach helps identify areas for improvement and facilitates evidence-based decision-making, allowing for continuous progress. Social impact metrics should include indicators such as worker health, education access, and community development outcomes. The integration of LCA approaches allows for detailed environmental and social assessments to be conducted, helping to highlight areas of improvement (Shahbandeh et al., 2022).
- **Certification and Standards:** Promoting the adoption of credible sustainability certifications, such as Fairtrade, GOTS (Global Organic Textile Standard), and BCI (Better Cotton Initiative), helps ensure adherence to social and environmental best practices. Such certifications provide a framework for ensuring fairness and ecological responsibility across the supply chain (Better Cotton Initiative, 2020). Certification can also improve market access for farmers, allowing them to earn a premium for sustainable practices.
- **Outcomes Measurement:** Utilising frameworks such as the Theory of Change or Logic Model can help cotton producers and stakeholders map out the intended social and environmental impacts of their activities, ensuring that all efforts align with achieving broader SDG targets (Ramia et al., 2021). Continuous monitoring of outcomes ensures that social impact remains a priority.

Empowering Cotton Communities for Lasting Social Impact

To truly transform the cotton industry, efforts must extend beyond the fields and into the communities that depend on cotton farming. By focusing on long-term community empowerment, the cotton industry can create lasting social impact that aligns with multiple SDGs.

- **Education and Training:** Providing training in sustainable agricultural practices and business management helps farmers optimise productivity and sustainability. Education initiatives can also target youth, ensuring the next generation is equipped with the skills needed for a more sustainable future (SDG 4) (FAO, 2021). Education empowers individuals, enabling them to innovate and drive change within their communities.
- **Financial Inclusion:** Access to financial services such as microloans can empower smallholder farmers to invest in sustainable farming techniques and improve their livelihoods. Financial inclusion efforts can alleviate poverty and help farmers become more resilient to economic shocks (SDG 1) (World Bank, 2018). Financial independence is a cornerstone of social impact, enabling farmers to make decisions that benefit their families and communities.
- **Health Initiatives:** Cotton-producing communities often lack access to healthcare. Partnering with NGOs to provide health services and education can improve community well-being and ensure healthier, more productive workers (SDG 3) (WHO, 2018). Access to healthcare is fundamental to social impact, improving the quality of life for entire communities.
- **Climate Resilience:** Climate change poses a significant threat to cotton farming, particularly in vulnerable regions. Supporting climate adaptation initiatives, such as the development of drought-resistant cotton varieties and climate-smart agricultural practices, can help communities mitigate the risks of climate variability (SDG 13) (IPCC, 2021). Climate resilience initiatives ensure that farmers can continue to thrive despite environmental challenges, contributing to long-term social stability.

A Holistic Approach to Transformation

By adopting a holistic approach that integrates sustainability with social impact, the cotton industry can transform itself into a force for positive change. This transformation supports the realisation of the SDGs and contributes to a more just and equitable world, where both people and the planet thrive. Social impact is not a secondary consideration; it is central to achieving long-term sustainability. With collaboration, transparency, and commitment to ethical practices, the cotton industry has the potential to become an exemplar of how responsible practices can lead to positive global impact (Ramia et al., 2021).

Communicating Impact and Scaling Success

- **Storytelling and Advocacy:** Sharing success stories from cotton farmers who have benefitted from sustainable practices can inspire others and attract support. Effective communication of positive social impact can also help shift consumer behaviour towards more ethical purchasing decisions (Jones, 2020). Storytelling helps highlight the human element of the cotton supply chain, making the case for ethical production more compelling.

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- **Scaling Best Practices:** Successful models of sustainable cotton production and community development should be scaled up to reach more farmers and regions. Governments and international bodies can play a crucial role in funding and facilitating the expansion of best practices, thereby amplifying social impact across the industry (UNCTAD, 2019). Scaling successful initiatives ensures that positive social impact is experienced by more communities.
- **Policy Advocacy:** Advocating for supportive policies, such as subsidies for organic farming or stricter regulations on pesticide use, can create an enabling environment for sustainable cotton production. Policy changes at national and international levels are essential to drive systemic change and support the long-term goals of sustainability and social impact (OECD, 2021). Advocacy for fair policies ensures that social impact remains central to the cotton industry's evolution.

Conclusion

The cotton industry stands at a pivotal moment. By embracing a social impact-focused approach, the industry can not only reduce its environmental footprint but also uplift the lives of millions of workers and communities worldwide. Achieving sustainability and SDG values requires a commitment to fair labour, gender equality, community empowerment, and environmental stewardship. Through collaboration, transparency, and the adoption of innovative practices, the cotton industry can transform into a model for sustainable and ethical production, contributing to a healthier planet and more equitable society.

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