



Weft Textiles
Sustainability Report 2023

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Abstract

This report uses current and alternative systems maps to investigate Weft Textiles Organic Cotton curtains. The focus is on waste impacts in agriculture, raw materials, manufacturing, distribution, use, and end-of-life phases.

This report is the culmination of the analysis, outlining the opportunity to learn from changes already underway in the textile industry. The report proposes how we, as Australia's textile sector, along with its stakeholders and all levels of government, can lead the way towards a sustainable and responsible system of production and use.

Within this report, a proposed circular systems map has been developed, supported by an evidence-informed framework for a sustainable transition to 100% biodegradable Australian-made Cotton curtains. The alternative product incorporates elements of a circular economy and aligns with United Nations Sustainable Development Goals.

The proposed circular life cycle transformation recommendations focus on waste opportunities and consider environmental and social impacts.

While acknowledging the complexities of transitioning the existing textile ecosystem, the report aims to inspire conversations and more profound dialogues, utilising a systems approach to outline pathways for action.

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Introduction

There has been a recent increase in textile organisations implementing Life Cycle Assessments (LCA) and sustainability reports to better understand their processes and environmental impacts and make more informed decisions. This report provides a current and alternative comprehensive systems map focusing on waste impacts and identifying materials and processes used. Supported by an evidence-informed framework, the report explores alternatives that can design out waste and reduce environmental and social impacts. (The BRICS countries: *Where next and what impact on the global economy?* 2022).

When assessing the environmental impact of organic cotton's agricultural, production, and use phases, it is essential to consider the effect of production delocalisation on emerging countries such as India.

This study selected 100% organic cotton tab top curtains for LCA assessment in the agriculture, production, use and end-of-life phases, considering both the agricultural and production phases in India and the use in Australia.

This sustainability report of Weft Textiles Organic Cotton tab top curtains considers and addresses waste impacts of the production-to-use phase, quantifying major atmospheric pollutants such as CO₂, SO₂, NO_x, and other particulates whilst offering an alternative circular life cycle assessment of a proposed product that has its design considered as a more holistic alternative to the existing product.

The Study

A SUSTAINABILITY REPORT AND CASE STUDY ON LIFE CYCLE OF CURRENT ORGANIC COTTON TAB TOP CURTAINS &
PROPOSED ALTERNATIVE LIFE CYCLE FOR AUSTRALIAN MADE COTTON TAB TOP CURTAINS

Written by Samia Fisher (Weft Textiles) 2023

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Weft Textiles Background

Weft Textiles, founded in 2017 by Samia Fisher, is a socially and environmentally responsible soft furnishings studio, located in Melbourne.

Utilising natural and recycled materials and adopting design principals, Weft aims to create a more sustainable environment. Through Weft's commitment to designing out waste and regenerating natural systems, the designs are centered around functionality and sustainability.

Weft collaborates closely with Australian-based, family-owned manufacturers to create ethically-made soft furnishings and garments.



Fig 1.

Traditional Owners

Weft Textiles would like to acknowledge the traditional custodians of the land on which I live and work on, the Wurundjeri Woi-wurrung and Bunurong Boon Wurrung peoples of the Eastern Kulin.

Weft recognise the significance of their deeply spiritual connection to land, waters, and community, as well as the importance of the wisdom and knowledge within this culture, paying respect to Elders, past present and emerging.

Methodology

Research for this report was conducted in 2023. The information and data collected were supported by evidence-informed frameworks and a resource provided through RMIT University.

Here, the study aims to report on the current and proposed life cycle of Weft's Organic Cotton tab top curtains, highlighting the highest environmental impacts in life cycle inventory and proposing an alternative Life Cycle Assessment for the same product, focusing on circularity and designing out waste.

Weft Textiles

Organic Cotton Tab Top Curtains

Weft's textile applications for curtains are centred around sustainable practices focusing on specifying natural and recycled fibres. Weft's selection of innovative woven fabrics is designed to suit any space, elevating the design of the interior.

Weft's tab top curtains are constructed from 100% organic cotton sourced from India. Organic cotton is grown, spun into yarn and woven into fabric in India. The production of cutting and sewing is completed in India. Weft's tab top curtains are finished with removable velcro tabs.

The undyed curtains are shipped by air freight to Australia, dyed with GOTS-certified reactive dye in Melbourne, Australia.

The curtains are dispatched directly from the dye house in Melbourne to the customer in Australia via road freight.

Bill of Materials

- 100% Organic Cotton
- Polyester Thread
- Nylon Velcro
- Polyester name label
- Polyester care label
- GOTS certified fiber reactive dye
- Fabric softener



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Cotton Farming

This report highlights the global issue of cotton farming, focusing on the adverse impacts of farming methods and the importance of transitioning to regenerative farming practices.

The report discusses Weft's current contribution to supporting organic cotton farming and manufacturing processes, which align with sustainable practices to reduce the adverse impacts of cotton farming. Organic agriculture is a production management system that enhances biodiversity and soil biological activity. However, there are many challenges when considering organic cotton, as Australia does not yet have certifications and regulations in place. Regenerative farming practises in Australia are a more holistic method of farming since conventional cotton production has the disadvantage of overuse or misuse of pesticide/crop protection products, which has adverse effects on the environment.

The report looks at a sustainable transition to regenerative cotton farming in Australia for the proposed alternative circular map.

Weft's contribution to organic cotton farming:

As a company, Weft is sourcing fair trade and organic cotton grown, spun, and woven in India from GOTS-certified farms in North India. The company ensures that the cotton is spun and woven by GOTS-certified units in the South Indian state of Tamil Nadu.

Organic cotton fiber production does not consume most synthetically compounded chemicals (fertilizers, insecticides, herbicides, growth regulators and defoliants) which are suggested for only conventional cotton production leading to a more sustainable and ecological production.

Organic cotton farming bans chemical pesticides and fertilisers, reducing the soil's toxicity and promoting the growth of other crops, such as vegetables, intercropped between harvests. This practice promotes sustainable agriculture and is critical given the increasing global demand for organic cotton.

Adopting sustainable farming practices like crop rotation, use of natural fertilisers, and practising natural pest control are essential for the future of organic farming. Companies should ensure they source organic cotton from farmers and suppliers who employ ethical and sustainable practices.

Material & Manufacturing Certification

GOTS Certifications

The GOTS certification comprises four member organisations: Organic Trade Association (OTA), IVN (International Association of Natural Textile Industry), Soil Association, and Japan Organic Cotton Association. The GOTS6 standard establishes requirements that companies should meet during the knitting and manufacturing process.

Weft achieved GOTS certification in 2019 to establish transparency and ensure compliance with GOTS standards throughout our production process. By communicating GOTS at the product level, we can provide credible assurance of our commitment to sustainability.

Weft recognises the significance of certifications and labels in facilitating transparency and validation and fully supports measures that encourage sustainable transformation in the industry.

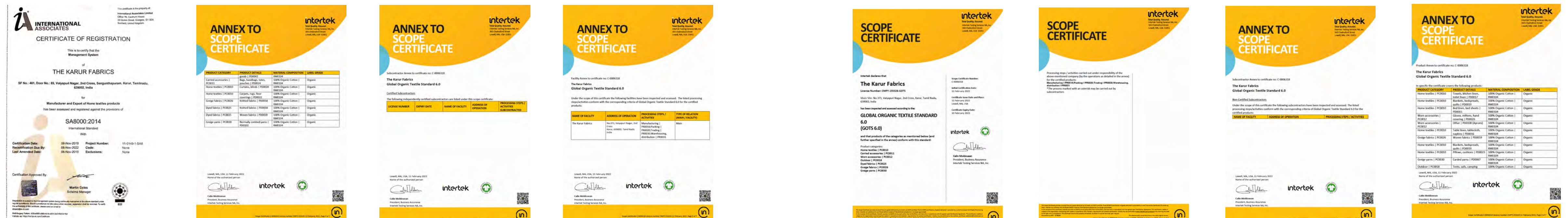
Weft's endorsement of the ECA and GOTS certification is one of the many ways the company shows their dedication to responsible manufacturing practices.

GOTS & OEKO-TEK Certified dyes

Weft Textiles work closely with Melbourne Dyers Richmond Laundry for hand dyeing. Richmond Laundry is known in the commercial and industrial textile industry for providing quality textile processing, garment dyeing and finishing services using GOTS certified dyes.

All dyes used for Weft's organic cotton curtains are GOTS & OEKO TEX certified reactive dyes, ensuring high efficiency and yield.

The Swiss group OEKO-TEX specialised in developing standards for the textile industry and issuing two certifications: Standard 100 by Oeko-Tex, for detecting harmful substances and Standard 1000 by Oeko-Tex for environmental management.



Current Systems Map

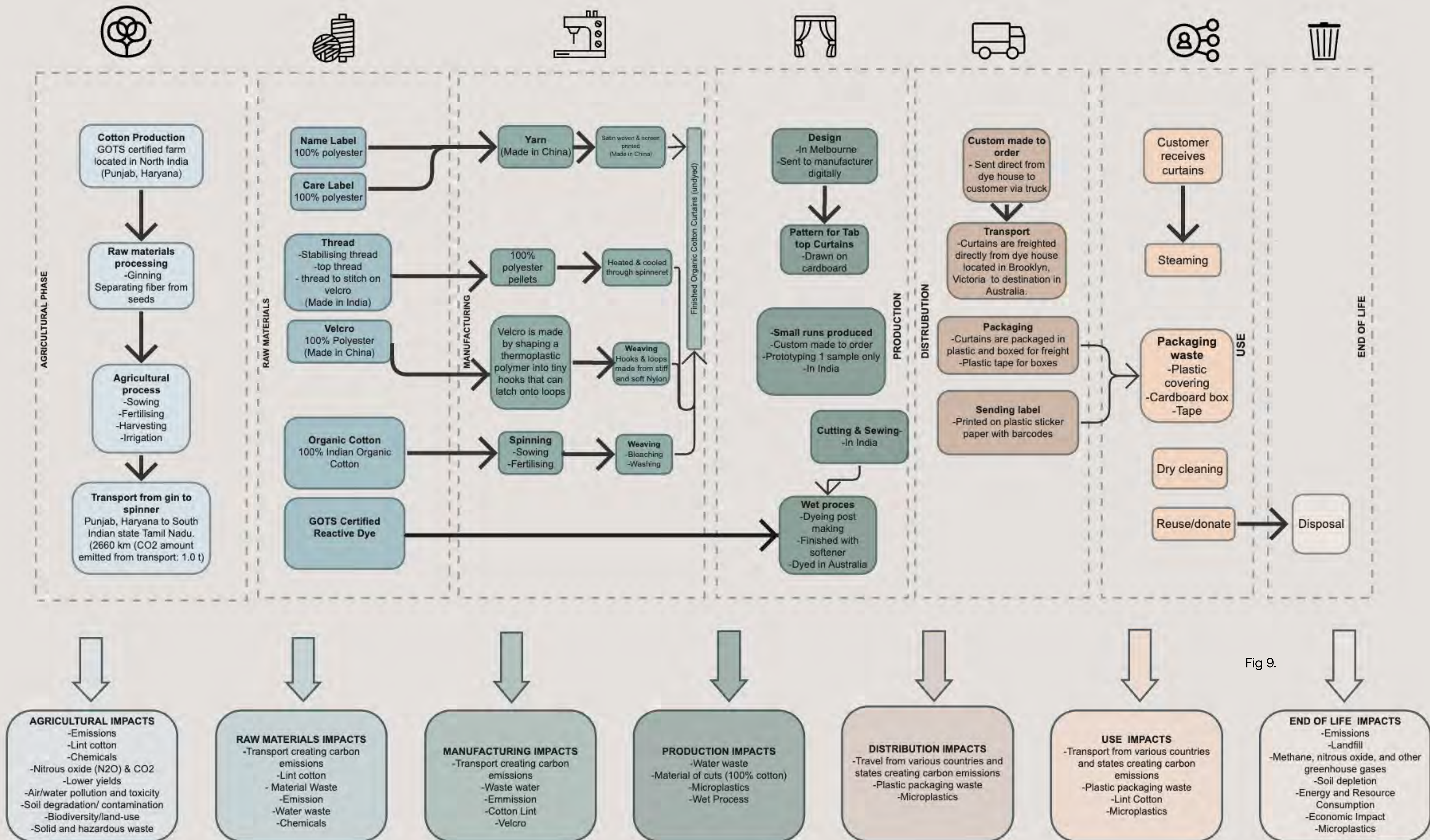


Fig 9.

Alternative Circular Comparative Product

By using design methods that focus on circularity, ease of disassembly and designing out waste, it is possible to propose an alternative product with fewer environmental and social waste impacts.

The recommended approach involves using 100% Australian Cotton fabric and thread to construct the curtains, compliant with Environmental Management Accounting (EMA) practices. The agricultural phase of organic cotton is in Australia as is the cut, sew and wet process.

The existing velcro for the tab tops are replaced with recycled Australian-made wooded buttons. The name and care label has been redesigned and replaced by printing straight onto Australian cotton with GOTS & Oeko-Tek certified reactive dyes.

GOTS & Oeko Tek-certified dyes are also used to dye the curtains with a focus on reducing water waste.

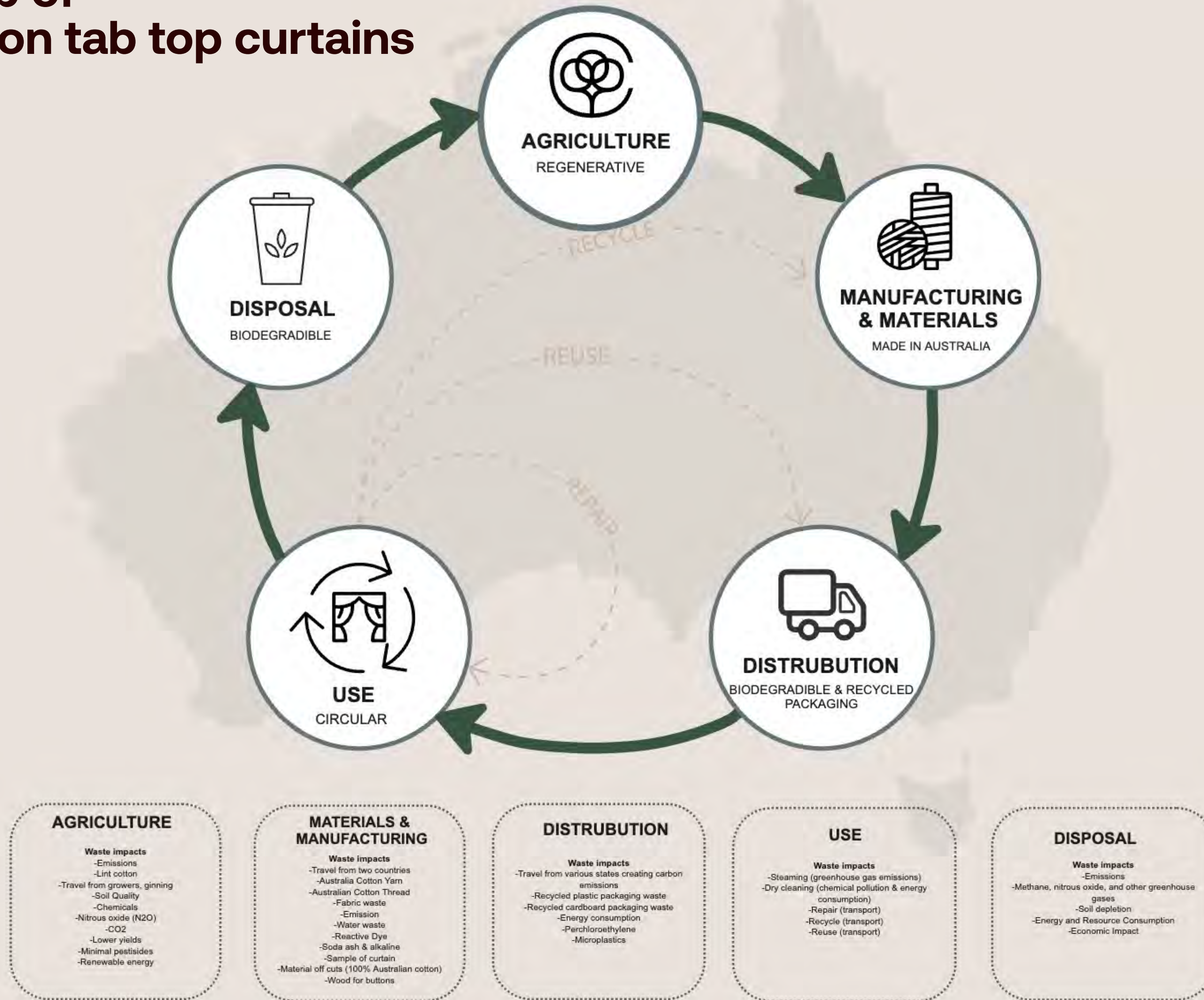
The life cycle has been considered at all phases, starting with the implementation of regenerative farming practices where Australian cotton is being grown. All packaging is replaced with biodegradable plastics and cardboard.

Proposed Bill of Materials

- 100% Australian cotton
- 100% Australian cotton thread
- Care labels & name labels printed on Australian cotton
- 100% recycled wooden buttons
- Reactive dye GOTS & Oeko-tek certified



Life cycle map of Australia cotton tab top curtains



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Fig 7.

Life cycle

Weft's proposed circular system reduces the production of waste materials. At the same time, the sustainable supply chain ensures that sourcing raw materials from Australia does not contribute to bad farming practices or any form of environmental degradation.

Circularity

For the proposed alternative curtains, implementing a circular business model is recommended, with a focus on the use phase. The curtains are designed to have multiple cycles of life, introducing repairs and alterations and recycling into the product's life cycle. The curtains have been designed for reuse and have a take-back program where Weft Textiles offer re-dyeing and repair as a service to ensure the product stays circular.

Mechanical Recycling

If the product does reach its end of life, the fabric can be mechanical recycling, a process that ensures no harsh chemicals are used. To recycle in this way, waste fabrics are shredded back into separate fibres that can be spun into yarn and reused. They still need to be woven with virgin fibres to ensure the product's strong weave and longevity, but this is still much better than using 100% virgin fibres. The mechanical recycling process of the cotton offcuts could be considered, shredding or cutting the cotton into small pieces and then using them to create new products such as clothing, bags, or home furnishings. This method avoids the use of harsh chemicals and conserve significant amounts of water and energy.

Dyeing

If the curtains end up in the mechanical recycling phase, we suggest that the curtains be dyed a single colour for easy recycling. All dyes used are GOTS certified, ensuring no chemicals are involved if the curtains are eventually composted.

Biodegradation

The curtains have been designed for easy disassembly. The fabric, thread and wooden buttons can all be biodegraded. Eventually, once the product has gone through multiple cycles, it can be composted, which allows the Australia cotton and recycled wooden buttons to return nutrients to the soil. This can be done by either home composting or using a commercial composting service.



Life cycle impacts

The proposed circular method focuses on reducing waste and supporting a sustainable supply chain. It recognises the importance of responsible production practices and focuses on the impacts of waste in all its phases.

1.2 Life cycle analysis

The production method relies on using Australian-farmed cotton using regenerative farming practices. The cotton is sourced from farmers who follow sustainable agricultural practices. Using regenerative cotton farm practices reduces the environmental impact on the soil, water, and the people involved in its production. The proposed product has a circular approach, giving the curtains multiple lives by introducing a re-dye and repair service. Mechanical recycling of any cotton waste has been introduced for the proposed product and turning them into new products, reducing waste and pollution in the environment.

1.3. Regenerative Australian cotton farming

Regenerative farming includes using crop rotation, intercropping, and companion planting to improve soil health, focusing on organic and holistic farming practises, which will increase farm biodiversity. The principal environmental consequences for cotton farming is the exchange of soil conditions diversification of culturing samples decreased arrival of dangerous agrochemicals to the earth and biodiversity conservation.

As indicated by agriculturists' perceptions, soil situations on fields are enhanced through regenerative development. Regenerating the biology in the soil using techniques such as cover cropping also helps sequester carbon, addressing the challenge of climate change while simultaneously preserving nutrients in the soil.



Fig. 11 Source: [Metabolic](#). The improvement of biodiversity from regenerative farming through measures such as adding wildlife habitat to farmland, reducing soil tillage, and enriching soil with organic matter

1.4 Local Manufacturing Impacts

The machinery used in the agricultural and manufacturing phase should be well-maintained, working towards replacing current technology with energy-efficient technology to reduce the amount of waste generated.

Additionally, implementing the agricultural phase and the cut-and-sew phase of the curtains from India to Australia promotes local manufacturing of textiles, providing job opportunities and creating economic growth for communities. Cotton farming also contributes to the economy by creating employment opportunities for thousands of workers throughout different communities and significantly contributes to the economy. It helps develop the local skillset and workforce and supports the local economy.

1.5 Renewable energy

To reduce energy consumption, it is proposed to utilise renewable energy, such as solar energy, in the manufacturing and dye phase to reduce the carbon footprint. Renewable energy sources, such as solar and wind power, could be incorporated into farm operations to reduce the reliance on fossil fuels.

1.6. Use Phase Impacts

In the consumption or use phase, a textile product's washing, drying, and ironing are the reasons for significant energy consumption and CO2 emissions causing environmental impacts. There is a significant difference in energy consumption between production and country because oil and gas use more energy. By using renewable energy, we can have less impact in these phases. Adopting more environmentally used cases, such as line drying and avoiding harsh chemicals in the washing phase, will reduce CO2 emissions.

1.7 Focus on Washing and Drying

The energy consumption and emission in the use phase depend upon several factors, such as; the number of washes and the weight of textile products.

The energy consumption in the consumption phase is case-to-case and country dependent, as the consumption of resources and machinery differs in different countries. On average, the energy required for one wash is about 1% of the washing energy regardless of the textile product. Any textile product washed less will have lower environmental impacts in its use phase.

Water Waste

By transitioning to renewable energy, water waste can be significantly reduced in the agriculture, manufacturing and use phases. To reduce water pollution and water waste, it is recommended the use GOTS and OEKO tek-certified low-impact reactive dyes.

During cotton production, the conventional process's cultivation and harvesting of the cotton crop is highly water-consumptive. The emissions of pollutants are totally country dependent, as the consumption of resources and processes are different in different countries.

.By transitioning to renewable energy, there can be a significant reduction in water waste in both the agriculture, manufacturing and use phase.

Life cycle impacts

1.8 Distribution impacts

The Australian Cotton is picked and shipped overseas to be spun and woven in Europe, then sent back to Australia to be made into curtains; this is due to Australia needing more machinery or technology to complete this stage on shore.

The fuel used by ships is low-grade and highly polluting. According to the [international transport forum](#), in 2014 it was estimated that shipping accounted for 3% of global emissions. In this case, we recommend sea freight, as air freight emissions are around thirty times greater again.

Once the curtains are dyed, they are shipped by road freight to the customer, contributing to carbon emissions.

Dyeing Phase

The name labels and curtains dyeing uses ecological wash-resistant dyes free from toxic substances certified with Standard 100 by Oeko-Tex. The conventional dyeing process for cotton fibres is a water, energy and time-consuming process leading to dye effluent, which may contribute to environmental problems unless treated in a controlled manner.

With the increased awareness and ecological production style, the cultivation, production and consumption of naturally coloured organic cotton fibres Weft would like to transition to no dyed, relying entirely on naturally dyed cotton for colouring and hue. This option does not currently suit the life cycle of the proposed curtains. However, it is certainly something of interest for the future as the natural, sustainable, renewable, biodegradable, eco-friendly quality would create a more sustainable product suited better to biodegradation.

1.9 Waste Reduction

Waste management and recycling are a concern through the latter stages of the life cycle. The curtains have been designed to be 100% biodegradable, allowing them to be composted.

Composting at a commercial scale has multiple steps. It is a closely monitored process with temperature regulation and measured inputs of water, air, and the correct balance of carbon-rich and nitrogen-rich materials.

Overall, it is essential to properly dispose of cotton lint waste to minimize its environmental impact. This can be done through recycling, composting, or other sustainable waste management practices.

Conclusions and Recommendations

An improvement in the environmental performance of cotton production depends largely on the agricultural phase. LCA results of any textile products over the entire production-to-use phase are usually case-dependent. The emissions values increase whenever filtration implementation, waste treatment, emission standards, dyeing and finishing processes are included in the study.

Social Summary

The proposed design and production of Australian-grown cotton curtains promote sustainable and responsible production practices whilst having positive social impacts locally in Australia.

Creating value for farmers, makers, dyers, and transport persons in the broader ecosystem will help the economy thrive in the long term. Creating education and employment opportunities for people and communities, directly supporting the proposed implementation, can be a positive source of growth, creativity, and innovation.

Implications from using biodegradable buttons, Australian cotton, thread, and Australian-made curtains with non-toxic dyes are addressed in a socially responsible way. These implications are hoped to further the education and empowerment of consumers in making more environmentally and socially conscious purchasing decisions.

Weft's alternative product, designed for circularity, eliminates all pre-existing synthetic fibres from the product. By replacing the thread, care labels and velcro with natural materials, the product is now 100% biodegradable.

Biodegradable and compostable materials can enhance social impact by improving the quality of life, health, and well-being of people who use or are affected by them. Biodegradable and compostable materials can also create opportunities for income generation, education, and empowerment for people involved in their production, distribution, or disposal.

Weft's commitment to sustainable development is emphasised by directly sourcing GOTS-certified Australian cotton from small-scale local farmers. This practice guarantees sustainable income and improved living standards for local farmers, ensuring that working conditions are safe and healthy. Studies indicate that regenerative farming benefits farmers primarily because it enhances soil quality and reduces exposure to hazardous chemicals,

Shipping via sea freight rather than air lowers CO2 and energy consumption, lessening greenhouse gas emissions and causing less environmental harm.

Additionally, implementing the agricultural phase and the cut-and-sew phase of the curtains from India to Australia promotes local manufacturing of textiles, providing job opportunities and creating economic growth for communities. Cotton farming also contributes to the economy by creating employment opportunities for thousands of workers throughout different communities and significantly contributes to the economy. It helps develop the local skillset and workforce and supports the local economy.

Adopting these changes creates a more sustainable production of Australian-made cotton curtains, creating a positive social impact on people and communities within Australia that promotes a healthier, well-educated, prosperous community with a better understanding and connection to nature to nature.

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Fig 1: Weft Textiles, photo, organic cotton field,

Fig 2: Weft Textiles manufacturing certifications, 2022

Fig 3: Miro current systems map

Fig 4: Weft Textiles images

Fig 5: Weft Textiles images

Fig 6: Weft Textiles images

Fig 7: Weft Textiles, photo, organic cotton curtain, 2023

Fig 8: Miro Systems map, Samia Fisher, 2023

Fig 9: Weft Textiles, photo, organic cotton curtain, 2023

Fig 10: Source: Patagonia, Photograph, regenerative-organics-drawing-a-line-in-the-soil, 2023

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