Towards a sustainable supply chain

This project

Sustainable production and consumption are becoming increasingly important to both consumers and businesses. Sustainability is defined as development that meets the needs of the present without compromising the ability of future generations to meet their needs. A distinction is made between social, environmental and financial sustainability, this thesis focuses on environmental sustainability.

The fashion industry has a significant impact on the environment, mostly because the textile industry relies heavily on non-renewable resources. When looking closer at the fashion supply chain, textile wet processing, which includes dyeing and printing of fabrics, contributes significantly to the environmental impact of the fashion industry by consuming and polluting significant amounts of water. Therefore, this thesis focuses on decreasing environmental impacts of textile wet processing for marlies|dekkers (MD).

Fashion supply chains are highly decentralised and therefore, traceability of lacking. This leads to a lack in transparancy. Supply chain integration or supply chain alignment could overcome these challenges.

The design challenge for this thesis is formulated as follows:

How can marlies|dekkers collaborate with suppliers in its supply chain to decrease the environmental impact of its textile wet processes?

Findings

There are three major issues that hamper sustainability in a garment production supply chain:

- There is a lack of transparency and traceability. A garment supply chain is dispersed, hampering relationships with suppliers.
- The industry is complicated. Textile wet processing exists of extensive, technical processes that are hard to understand and it is difficult to measure and compare environmental impacts.
- There is relatively little alignment within MD's supply chain.

Regarding MD's relationship with suppliers, three important remarks can be made:

- Due to the complexity of the product, specific knowledge and expertise is needed. Therefore, MD is dependend on the suppliers they currently use.
- Even though MD has relatively little leverage, MD employees visit suppliers in China regularly, which contributes to a closer relationship with the suppliers.
- Solutions to commit suppliers are needed, but there are opportunities to collaborate with nominated suppliers.

Regarding the environmental impact of textile wet processing, three conclusions are drawn:

- Dope dyeing could be a way to decrease environmental impacts of textile wet processing, but it is not yet clear what the actual environmental impact of dope dyeing is.
- The most evident way to decrease environmental impacts is to decrease resource consumption. By using less water, less chemicals and less energy, environmental impact decreases. Additionally, cost can be reduced as well.
- Digital printing has a significant lower impact on the environment than screen printing.

These findings lead to the definition of the problem statement:

Due to the complexity of the production process, the lack of transparency in the supply chain and the absence of collaboration and communication between suppliers, MD can hardly improve the sustainability of the production process.

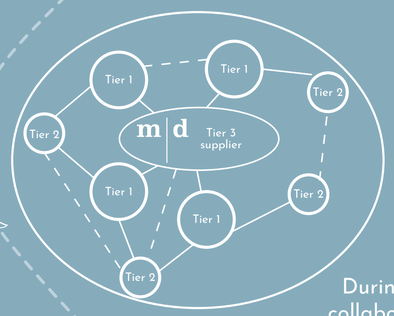
All findings and the definition of the problem statement lead to the following proposal of the solution space:

A network of suppliers that enables them to share knowledge and expertise and collaborate on sustainability improvements.

Results

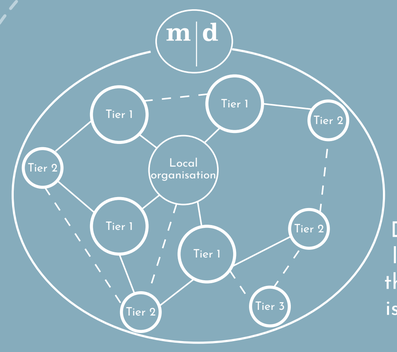
In the final collaboration model, MD would connect tier 1 (garment suppliers), tier 2 (fabric suppliers) and tier 3 (yarn suppliers) in a network. It is proposed to set up the network in three phases, as explained in the image below.

Set up



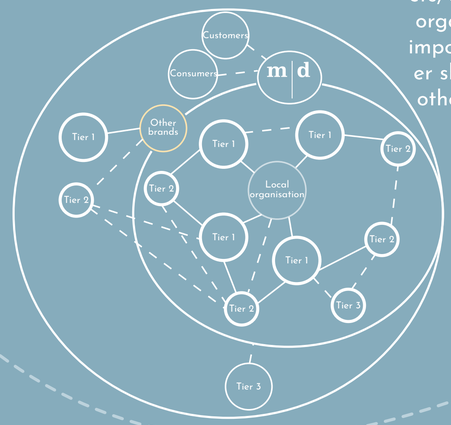
During the first phase, MD collaborates with a tier 3 supplier to commit tier 1 and tier 2 suppliers to reduce resource consumption.

Build



During the second phase, a local organisation supports the network and the network is further extended, connecting more suppliers.

Continue



During the last phase, the network is carried by suppliers, and the role of the local organisations becomes less important. MD could consider sharing the network with other brands, customers or consumers.

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