# Sustainable sourcing in the fashion industry

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# What sustainable sourcing practices are relevant in the fashion industry?

# Agenda

- What is sustainable sourcing?
- What are the issues?
- Sustainable practices.
- Methods.
- Criteria for evaluating sourcing factors.
- Results.
- Implications of the result.
- In conclusion.

# What is sustainable sourcing?

- Minimize environmental impacts
- Promotes ethical considerations
- Energy consumption
- Pollution
- Human rights
- Workers wages

Source: (Van Wheele & Rozemeijer, 2022)

# What are the issues?

- Despite growing awareness
- Many struggle to identify and prioritize effective strategies
- Consumers prefer environmentally friendly products
- According to the EU 10% of global emissions originate from fashion sector
- Compelled to adopt sustainable practices
- Sustainable development goals
- Pressing need for strategies to reach goals

Source: (McKinsey&Company, 2023)

# Sustainable practices

- Life cycle assessment
- Supply Chain Optimization
- Material Substitution
- Investment in Innovation
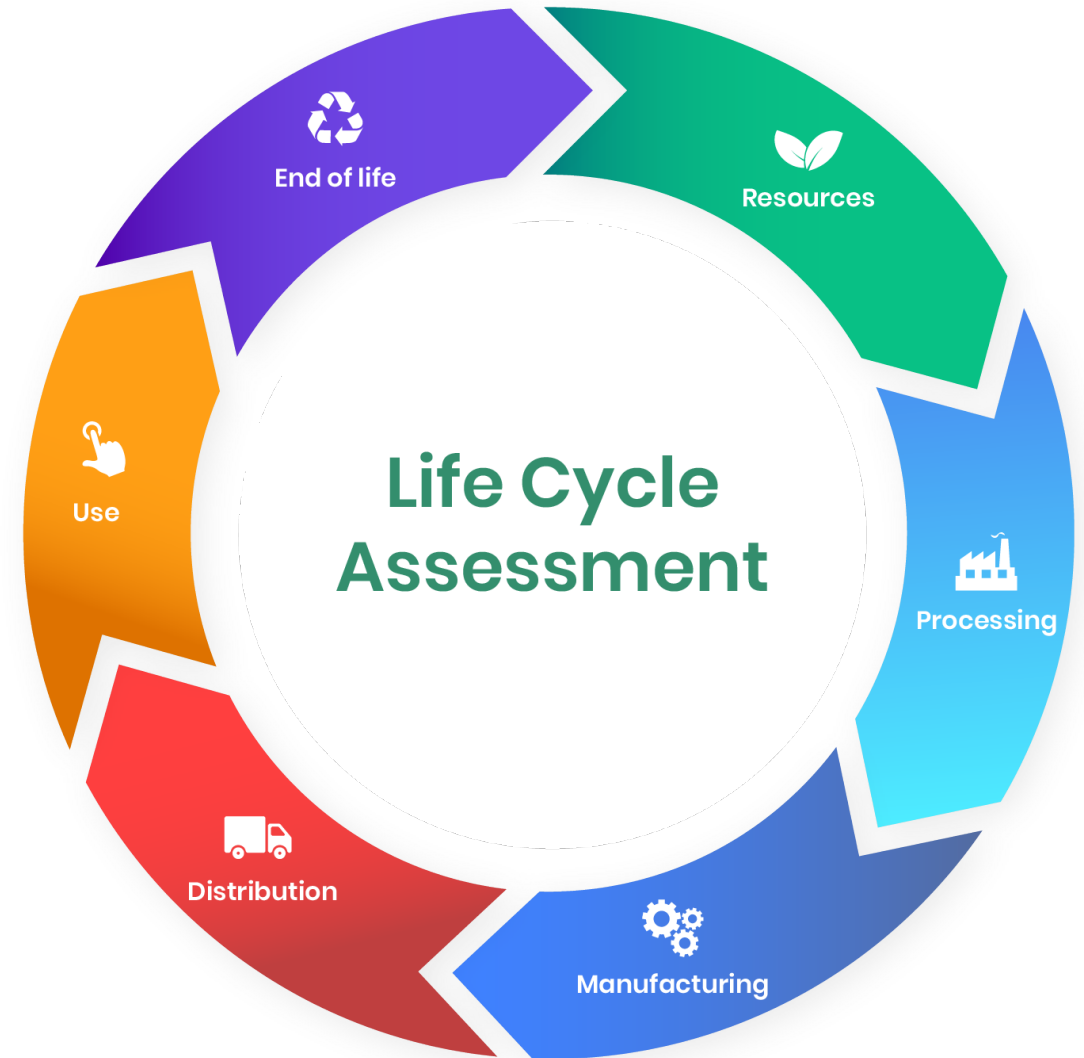
# Methods

- Mixed method approach
- 3 key phases
- Combined with key factors
- 3 illustrative examples: Cotton, Hemp and Polyester



| Data collection | Material data analysis | Weighted SUM & Weighted product model (WSM & WPM) |
|---|---|---|
| • Literature<br>• Industry reports<br>• Research papers | • Granta EduPack<br>• Industry reports | • Quantitative approach<br>• Systematical assessment |

# Criteria for evaluating sourcing factors

- Prioritize sourcing factors effectively
- Using supplier sustainability audit and industry reports
- 3 factors were identified and established
- Complicated by sourcing practices in the fashion industry
- 3 illustrative materials were chosen: **Cotton**, **Hemp** and **Polyester**

Cotton

Polyester

Hemp



| Environmental impact | Economic Consideration | Material characteristics |
|---|---|---|
| Carbon footprint | Price per kilo | Quality and strength |
| Water usage | Annual world production | Biodegradable |
| Energy efficiency | | |

Source: (Van Wheele & Rozemeijer, 2022)

# Results

- Material
- Manufacturing: cutting and trimming
- Manufacturing in China
- Transport from Shanghai to Gothenburg (20730km)
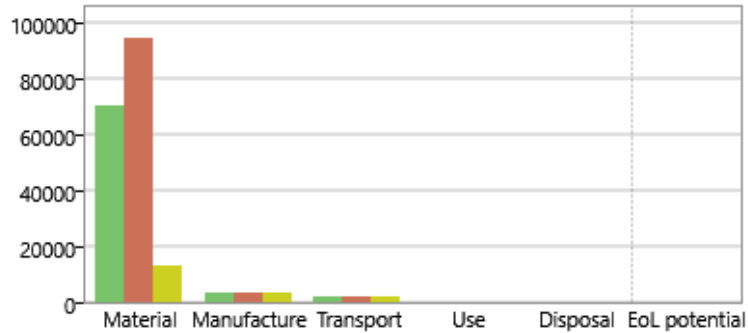- Sea cargo, 1000kg of product



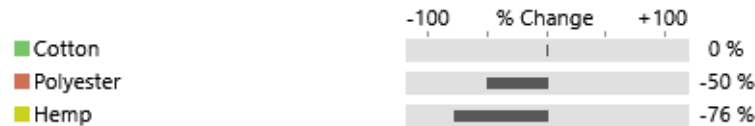| Material | Mass (kg) | Length of rolls (m) | Removed material from cutting and trimming (%) | Percentage assumed to be recovered at end of life (%) | Shipping distance (km) |
|---|---|---|---|---|---|
| Cotton | 1000 | 1000 | 25 | 100 | 20730 |
| Hemp | 1000 | 1000 | 25 | 100 | 20730 |
| Polyester | 1000 | 1000 | 25 | 100 | 20730 |

# Results

- Material is a big contributor
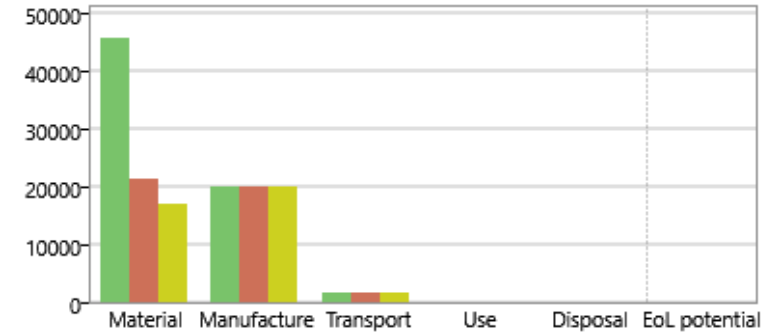- Consider material quality (cost)
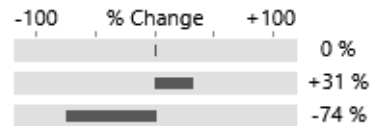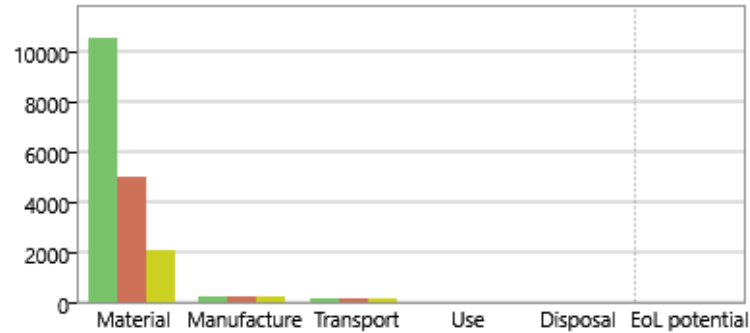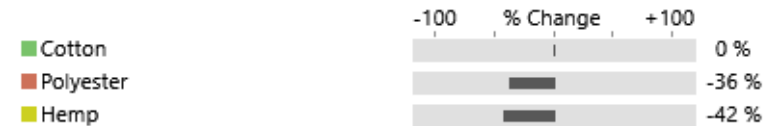
# Results

- Normalization of the data from EduPack and industry reports

| Material | Non benificial | | | | | Benificial | |
|---|---|---|---|---|---|---|---|
| | CO2 footprint (kg) | Water usage (liter/ usable kg) | Energy(MJ) | Cost(SEK/kg) | Biodegradable (years) | Annual world production (tonne/yr) | Tensile strength (MPa) |
| Cotton | 110000 | 10229 | 76900 | 19,2 | 0.5 | 21100000 | 360 |
| Hemp | 2620 | 2123 | 19800 | 21,3 | 0.5 | 85400 | 550 |
| Polyester | 5500 | 127 | 101000 | 18,2 | 200 | 54000000 | 573 |

| Material | Non benificial | | | | | Benificial | |
|---|---|---|---|---|---|---|---|
| | CO2 footprint (kg) | Water usage (liter/ usable kg) | Energy(MJ) | Cost(SEK/kg) | Biodegradable (years) | Annual world production (tonne/yr) | Tensile strength (MPa) |
| Cotton | 0,2381818182 | 0,01241568091 | 0,2574772432 | 0,9479166667 | 1 | 0,3907407407 | 0,6282722513 |
| Hemp | 1 | 0,05982100801 | 1 | 0,8544600939 | 1 | 0,001581481481 | 0,9598603839 |
| Polyester | 0,4763636364 | 1 | 0,7613861386 | 1 | 0,0025 | 1 | 1 |

# Results

- WSM and WPM
- Hemp ranks highest
- Focus on CO2, cost, energy and breakdown/biodegradable

**Weighted SUM**

| Material | CO2 footprint (kg) | Water usage (liter/ usable kg) | Energy(MJ) | Cost(SEK/kg) | Biodegradable (years) | Annual world production (tonne/yr) | Tensile strength (MPa) | Preformance score | Rank |
|---|---|---|---|---|---|---|---|---|---|
| | 0,3 | 0,08 | 0,1 | 0,3 | 0,1 | 0,08 | 0,04 | | |
| Cotton | 0,07145454545 | 0,0009932544726 | 0,02574772432 | 0,284375 | 0,1 | 0,03125925926 | 0,02513089005 | 0,5389606736 | 3 |
| Hemp | 0,3 | 0,00478568 0641 | 0,1 | 0,2563380282 | 0,1 | 0,0001265185185 | 0,03839441536 | 0,7996446427 | 1 |
| Polyester | 0,1429090909 | 0,08 | 0,07613861386 | 0,3 | 0,00025 | 0,08 | 0,04 | 0,7192977048 | 2 |

**WPM**

| Material | CO2 footprint (kg) | Water usage (liter/ usable kg) | Energy(MJ) | Cost(SEK/kg) | Biodegradable (years) | Annual world production (tonne/yr) | Tensile strength (MPa) | Preformance score | Rank |
|---|---|---|---|---|---|---|---|---|---|
| | 0,3 | 0,08 | 0,1 | 0,3 | 0,1 | 0,08 | 0,04 | | |
| Cotton | 0,6502383529 | 0,703910824 | 0,8731198967 | 0,9840814554 | 1 | 0,9275794011 | 0,9815804842 | 0,3580734897 | 3 |
| Hemp | 1 | 0,7982672243 | 1 | 0,9539102938 | 1 | 0,5969323683 | 0,9983626444 | 0,4538050088 | 1 |
| Polyester | 0,8005373155 | 1 | 0,9731067758 | 1 | 0,5492802717 | 1 | 1 | 0,427893883 | 2 |

# What are the implications?

- Material choice is extremely important in this instance

- Sustainable attributes

- Water usage

- Worker's salary and conditions



CO2 Footprint (kg)
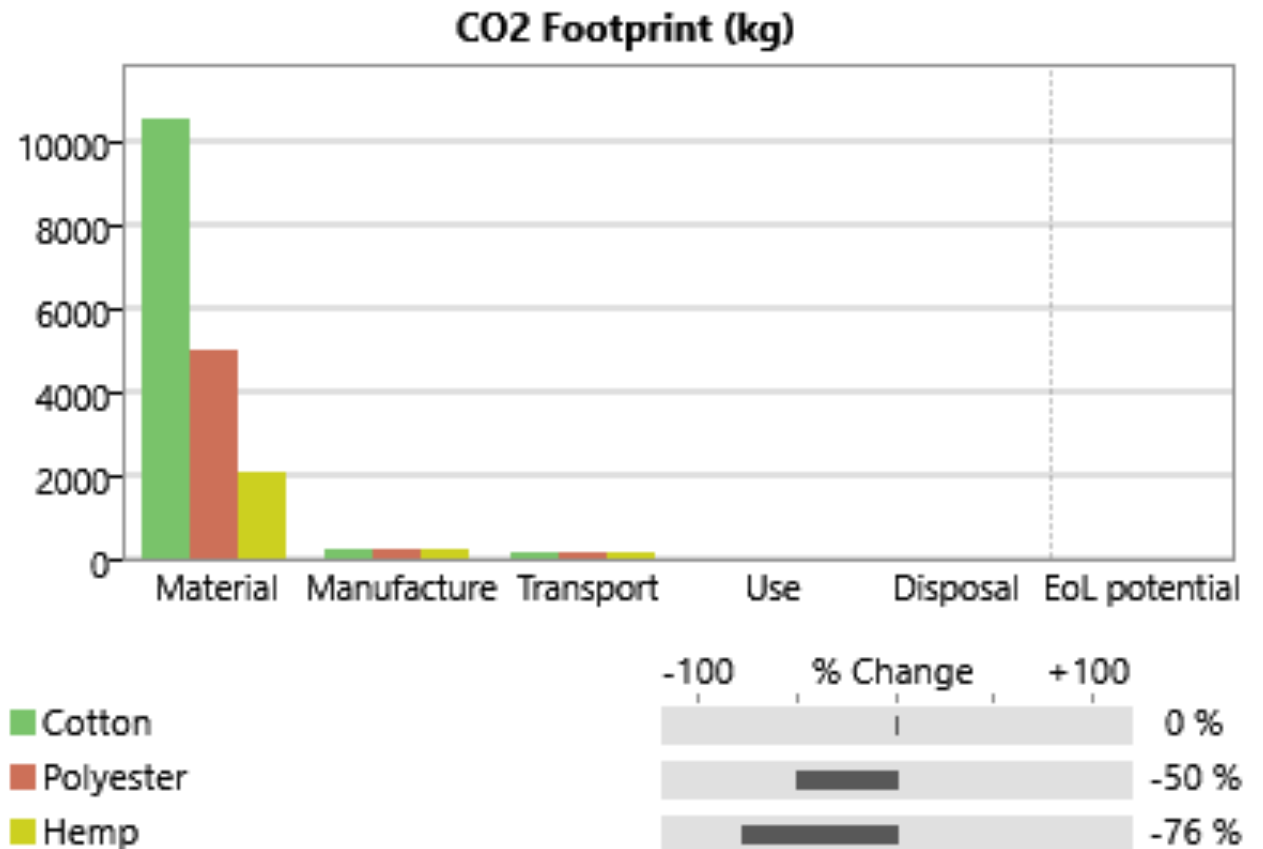
# Changes to implement

- For this case study
- Focus on material choice in ideation phase
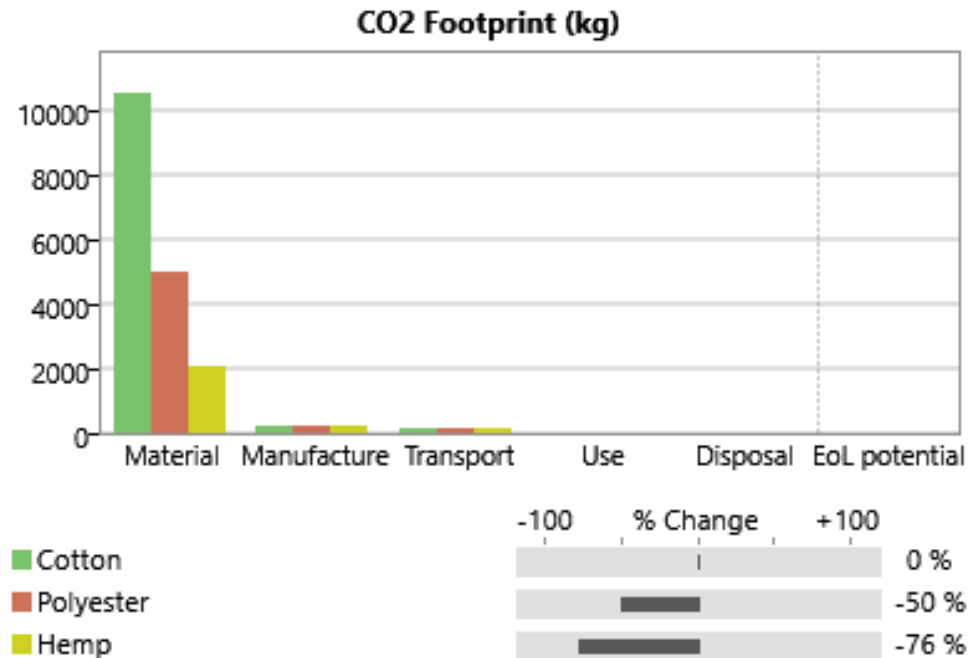- Material substitution with similar properties

# Sustainable practices

- Life cycle assessment
- Supply Chain Optimization
- Material Substitution
- Investment in Innovation

# In conclusion



CO2 Footprint (kg)

Cotton
Polyester
Hemp

% Change
-100      +100
0 %
-50 %
-76 %
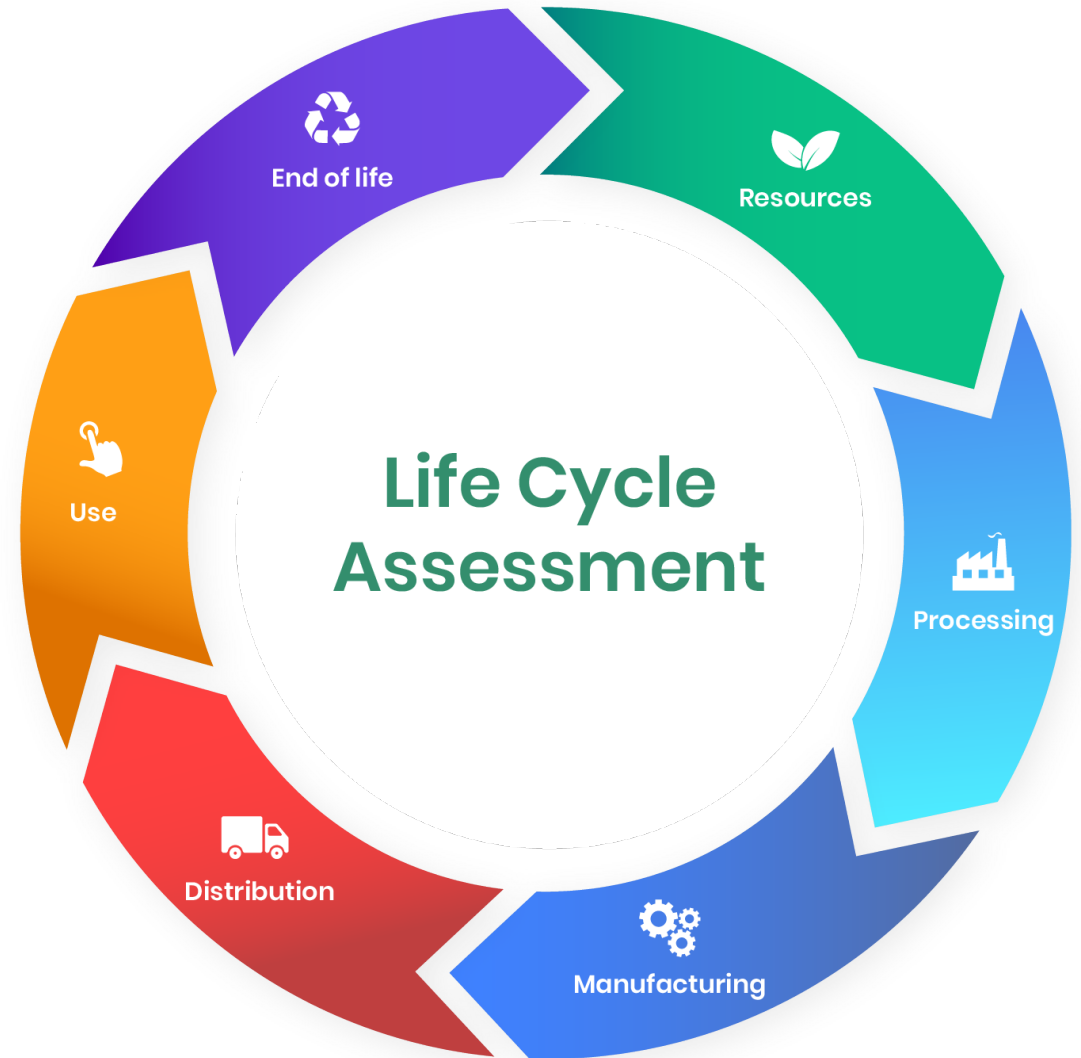
- What sustainable sourcing practices are relevant in the fashion industry?

- Life cycle assessment

- Material substitution

- Identify areas of improvement

- Strategize

# Citations

Aarjan J. Van Weele and Frank Rozemeijer. (2022) PROCUREMENT AND SUPPLY

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Rotterdam to Gothenburg is 992 km
https://www.fluentcargo.com/routes/amsterdam-nl/goteborg-se#ocean-routes
Shanghai to Gothenburg is 20,777 km
https://www.fluentcargo.com/routes/shanghai-cn/goteborg-se#ocean-routes

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Thank you for your attention