



Identifying bottlenecks and opportunities for pathways in the sustainable textile transition using participatory modelling

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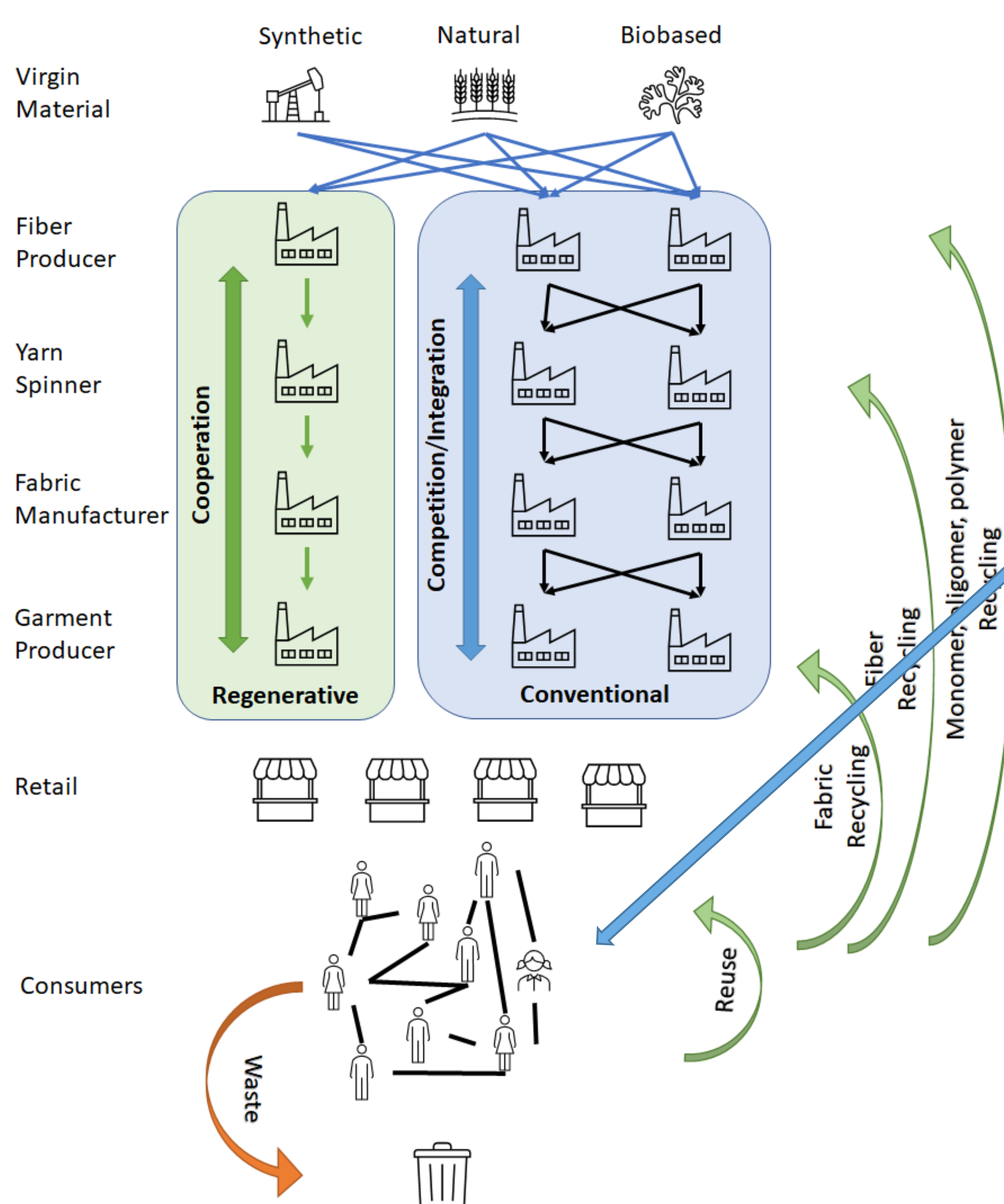
Promote the textiles transition

The textile industry is heavily carbon-based, and responsible for 10% of the global CO₂ emission, because of

- Production of polyester clothing
- Chain actors geographically distributed and often in coal-based countries
- Emission from dumped textiles

The **aim** is to analyze options for a material transition using system thinking and identifying leverage points for facilitating a transition.

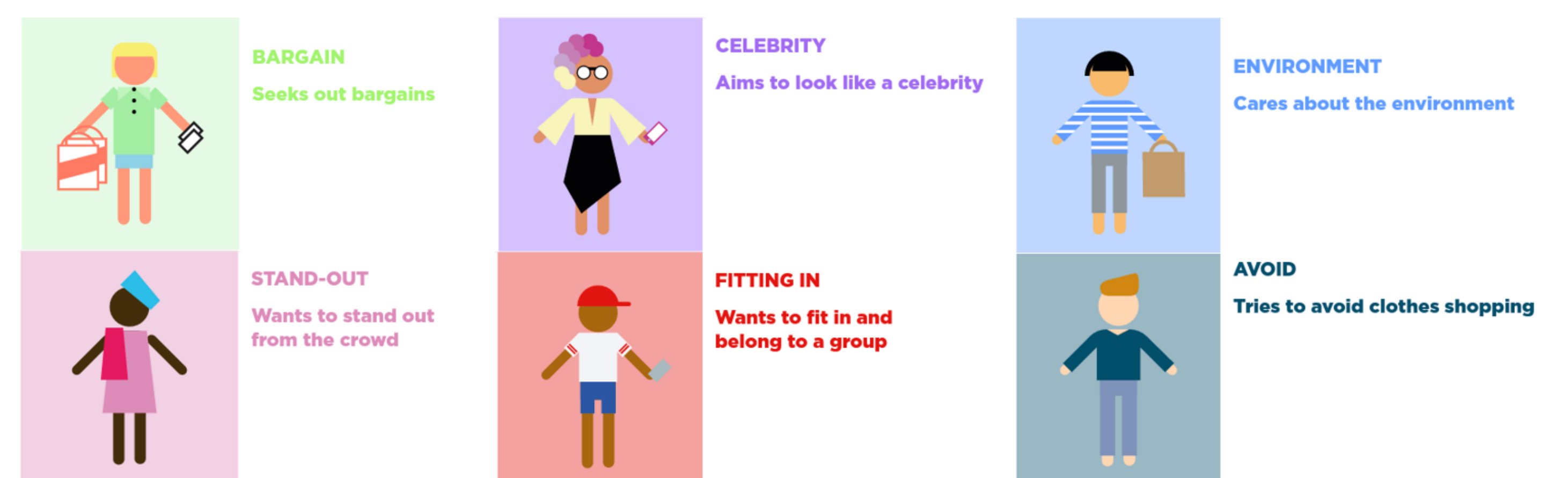
Fashion supply chains



Involving experts and stakeholders

- A participatory modelling process was followed to identify possible bottlenecks and opportunities for transitioning, including:
 - A model was developed to represent a typical textiles value chain
 - A workshop was held in June 2023 involving multiple stakeholders on recycled and regenerative clothing
 - Stakeholders were asked to comment on model results and provide possible leverage points based on their knowledge and experience

CONSUMER TYPES



Key results

- New ontology is required: words like 'value chain' promote linear thinking instead of circularity
- Fully recyclable and regenerative meets technical and biophysical boundaries
- Consumers display 'fixed ostrich behaviour' and opt for what is fashionable or desired over what is sustainable
- Some producers are intrinsically motivated by sustainability, but money is always limiting: e.g., high labour costs, and fair pricing is required
- Small sustainable initiatives cannot compete with large companies who follow no-risk, unsustainable strategies. Entrepreneurs need to be persistent and lead by example to convince consumers and change demand for more sustainable textiles
- Current legislation is insufficient and new legislation needs to be developed and enforced to push the transition

Scenario exploration

▪ We considered *four* potential chains from producers to consumers:

- 1) Traditional process involving synthetic materials;
- 2) Reselling existing clothing items brought back by consumers;
- 3) Recycling of materials from existing clothing items;
- 4) Regenerative: new textiles from fully degradable biobased material

Discussion

- A transition to a fully recyclable and regenerative textile industry is likely not achievable
- A combination of legislation, daring entrepreneurship, and technical and economic opportunities may promote a partial transition