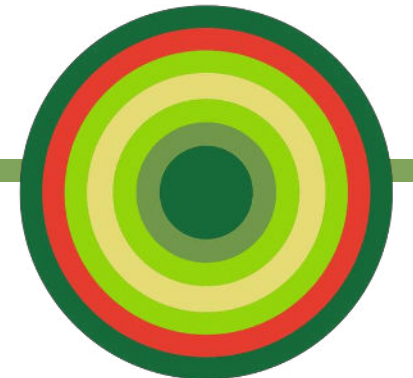


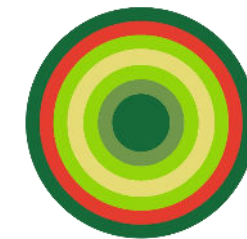
Pannel: Transformative interventions to strengthen prioritisation of biodiversity in decision making

Understanding interventions for pro-biodiversity behaviour in a sectoral context: An example of the Tuscan textile, apparel, and fashion industries (TAF)

Pedro NAVARRO-GAMBÍN, Marta BONETTI, Giacomo LAMPREDI, Matteo VILLA,
Gianluca BRUNORI, Daniele VERGAMINI

University of Pisa (UNIFI)





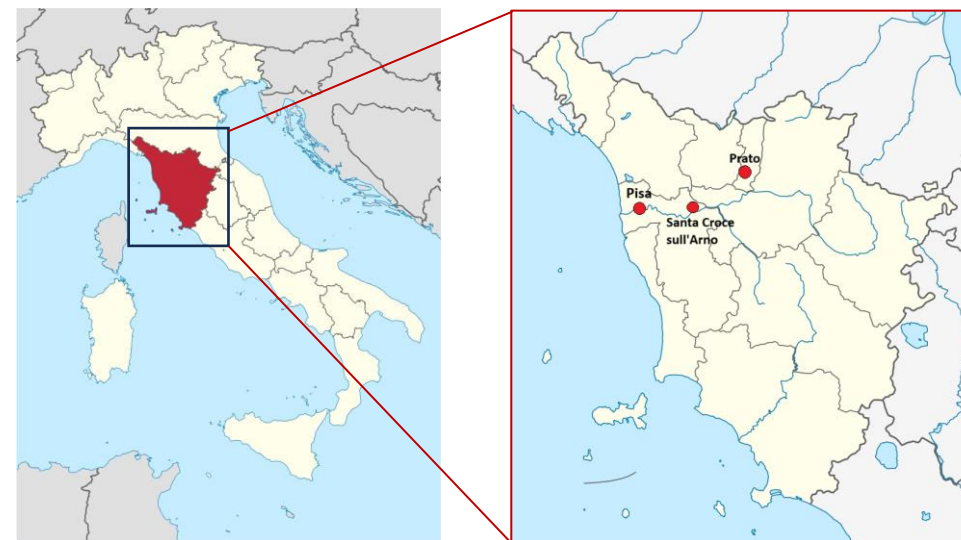
How can the governance of Tuscany's textile, apparel, and fashion sector (TAF) enable transformative change towards biodiversity prioritisation?

1. Explorative Phase (interviews and documents content analysis):

- ✓ Map the **impacts** of the different stages of the TAF supply chain on biodiversity loss.

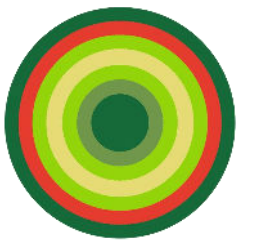
Unexplored topic in the academic literature.

- ✓ Reconstruct actors' constellation and **problem definitions**
- ✓ Map potential **interventions**.

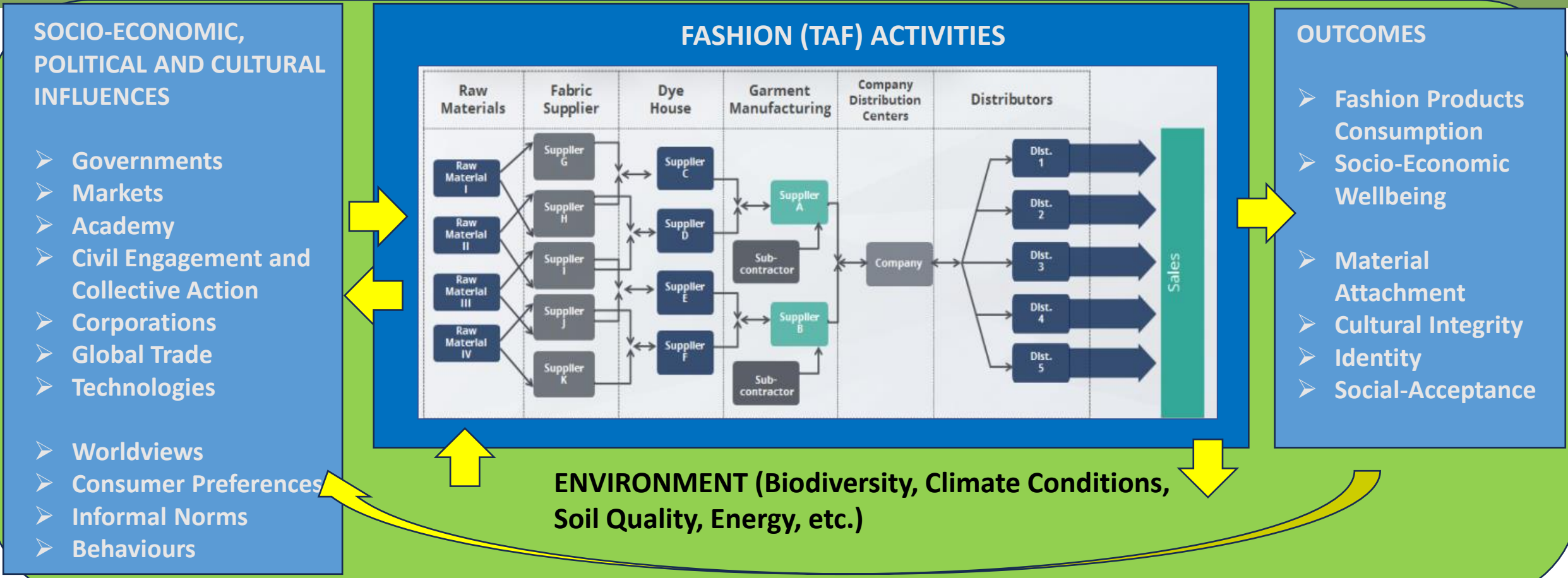


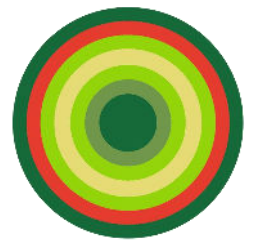
Transformative change:

- Focus on **indirect drivers of biodiversity loss**.
- Place biodiversity as a **priority**.
- *Focus on **deep leverage points**.*



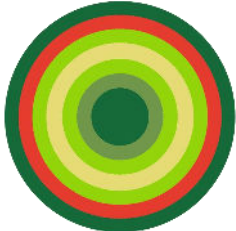
The 'Fashion System'





Results: general insights


- Biodiversity as an **emergent topic**.
- Biodiversity for Fashion Businesses:
 - Next frontier of Sustainable Fashion?
 - Matter of Regulation, Reputation and Dependencies.
 - Primary Production of Raw Materials (e.g., cotton, leather, synthetic fibers).



Results: Impacts

Apparel value-chain pressure on biodiversity,¹ (not exhaustive) impact areas, and assessment of impact level

High impact █ █ Low impact

	Land and water	Pollution	Climate change ²	Overexploitation ³
Raw-material production for natural and synthetic fibers 	Cotton agriculture Soil degradation from excessive water use and habitat loss from area expansion	Cotton agriculture Chemically intensive crop production		
	Wood-based natural fibers Deforestation and biodiversity loss through monocultures	Wood-based natural fibers Agrochemicals used in plantation forests and pollutants discharged by pulp mills	Greenhouse gas Emissions from deforestation and pulp production	Monocultures for tree-based natural fibers Replace natural forest and threaten native biodiversity
	Livestock breeding Deforestation due to land use for grazing and feed grain production	Livestock breeding Water pollution from animal waste, antibiotics/hormones, fertilizers, etc.		Livestock breeding Proliferation in the wild of species used in fur farms (mink, possum, raccoon)
	Natural fibers from wild animals Disruption of food chains and trapping of nontarget species			Natural fibers from wild animals Over-exploitation of certain species for their skins, fur, and wool (vicuña)
	Synthetic fibers Destruction of natural habitats for mining of coal and petroleum for polyester	Synthetic fibers Antimony-contaminated wastewater from production	Energy use For synthetic-fiber production	

Land and water

Pollution

Climate change²

Overexploitation³

Material preparation, processing, and product manufacturing



Textile dyeing and treatment
Freshwater contamination through chemical runoff and non-biodegradable waste

Energy use
For fabric preparation, dyeing, and washing

Leather tanning
Air, ground, and water pollution from chemicals and toxins

Transport and distribution



Transport mode
Emissions from air, sea, road, or rail freight

Spread of alien species
Existing species endangered by imported alien species

Retailing, product use, and end of life



Waste disposal by landfill
Habitat loss for use as landfills

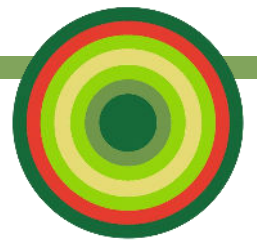
Washing
Waterway pollution from microfibers

Pollutants
From landfills, incineration, and leakage into waterways



Granskog et al. (2020)





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Results: Problem Definition ‘*The Business Case*’.

- **Business Documents** describe the problem in economic terms (impacts and dependencies, raw materials, risks, etc.):

*“The global fashion, apparel, textile, and footwear **industry relies heavily** on the continued existence of **healthy ecosystems and the resources that nature provides.**”*

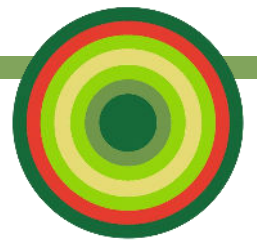
*At the same time, **the industry has contributed significantly to the loss of global biodiversity.** This is in part due to its **demand for land-based raw materials** sourced from around the globe”*

Textile Exchange (2023)

- Their objective is to find **win-win solutions**, and multistakeholder collaborations in which the **fashion industry is the key actor.**

*“Achieving sustainable development which delivers **economic growth whilst simultaneously allowing nature to thrive**, is both the greatest challenge and opportunity of our generation.”*

CISL (2020)



Results: Problem Definition ‘Slow Fashion’.

- **Interviews** broadly refer to **indirect drivers** of biodiversity loss as causes of the problems: ‘fast fashion’ (**overproduction**, consumerism, obsolescence), ‘telecoupled’ impacts, misleading interventions and policies, lack of knowledge and capacity, etc.:

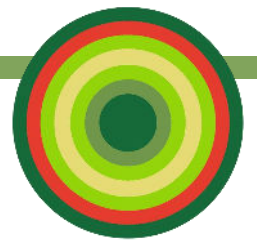
*“ [...] from the old two collections a year, we move on to those of **Fast Fashion**, which are one a week and therefore this concept of stabilizing in my opinion must be reviewed and goes a bit against sustainability, that is, there is an intrinsic difficulty in **a world that is consumerist by definition**. And in fact, **the big elephant in the room of this sector is ‘that’ we never talk about: overproduction**”*

Interview 5

- **Reconnection** with clothes and traditional local agriculture, shift from ‘quantity’ to ‘quality and sufficiency’, address biodiversity problems and **social/labour issues** together, and **go beyond economic valuation**.

*“The theme of sufficiency and the theme of time and quantity are all related to what is, in my opinion, the **equally central theme of quality**. [...] What will a quality textile product be tomorrow? It will be a product that will have to be **socially and environmentally valuable**, therefore it will have to contain a series of values that at this moment a product, any product, does not contain”*

Interview 8



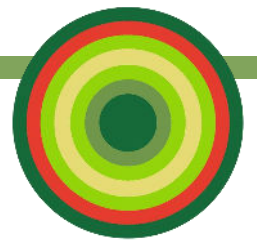
Results: Interventions.

- **Business Documents:**
 - Better defining impacts (measurements, targets, standards, monitoring).
 - 'Good-practice' technologies and processes.
 - Self-regulation (CSR, strategies).
 - Regenerative agriculture and land restoration.

- **Interviews:**
 - **Regulations:**
 - Soft (subsidies, tax reduction, guidelines).
 - Strong (i.e., due diligence, deforestation-free trade, legally-binding targets).

- **Both:**
 - Education/Consumer awareness.

CISL (2020)



Conclusions: Room for transformative change?

➤ Indirect drivers:

- **Impacts** defined with direct drivers.
- **Identified causes:** overproduction and overconsumption, weak and unfit policies and governance, misleading goals and valuation, trade and 'telecoupling' dynamics.
- **However...** Do the interventions address indirect drivers?
 - Impacts, measurements and standards? Better information = Transformations?
 - Do regulations change values and informal norms?
 - Education and consumer awareness towards what?

➤ Prioritisation:

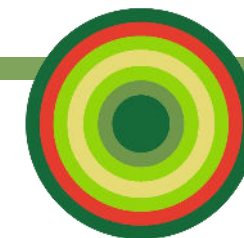
- The '**Business Case**' does not prioritise biodiversity.
- **Slow Fashion?**
- Reconnection, just-transition, values beyond economy, quality > quantity; **how do they relate to prioritization?**

Thank you!

Contact:

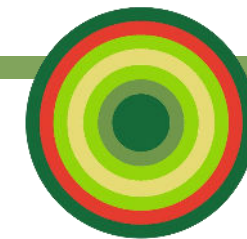
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Year	Organization/s	Title
2012	International Union for Conservation of Nature (IUCN) Global Business and Biodiversity Programme Hugo Boss AG	Biodiversity risks and opportunities in the apparel sector
2016	Natural Capital Coalition (NCC)	Natural capital protocol - Apparel sector guide
2020	The Fashion Pact, promoted by Kering Group	First step to transform our industry
2020	McKinsey & Company	Biodiversity: the next frontier in sustainable fashion
2020	Biomimicry Institute	The nature of fashion. Moving towards a regenerative system
2020	University of Cambridge Institute for Sustainability Leadership (CISL), Kering Group The Conservation Hierarchy Team	Developing a corporate biodiversity strategy: a primer for the fashion industry
2023	University of Cambridge Institute for Sustainability Leadership (CISL), The Fashion Pact, Conservation International, and the Global Environment Facility (GEF).	Raising the ambition for nature. A fashion, textile and apparel sector primer on the first science-based targets for nature.
2023	Kering Group	Biodiversity Strategy. Bending the Curve on Biodiversity Loss. Version 2.0
2023	Textile Exchange	Biodiversity landscape. Analysis for the fashion, apparel, textile, and footwear industry



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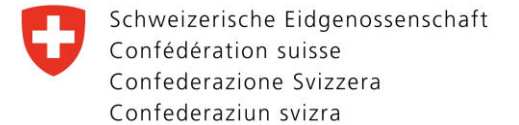
	Sector	Connection with the topic	
		Position/role	Organization
1	Academy	Full Professor of Business Administration	National Biodiversity Future Center
2	Public Sector	National Sustainable Development Strategy Coordinator	Ministry of Environment and Security
3	Public Sector	“Agritessuti”- sustainable textiles Project Manager	Institute for Environmental Protection and Research
4	Private Sector	Sustainability and Communication Manager	Luxury Tannery in Tuscany
5	Private Sector	Sustainability Consultant	Consulting Company
6	Private Sector	CEO Slow Fiber Network Promoter	Textile Manufacturing Company
7	Civil Society	Sustainable Fashion - Journalist and Blogger	Independent
8	Civil Society	Campaigner	Clean Clothes Campaign
9	Environmental Association	National Detox Campaign Coordinator	Greenpeace Italy
10	Environmental Association	Conservation Director	WWF Italy
11		‘Business & Industry’ Responsible	
12		Head of Sustainability Program	



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