

Summary for policymakers | Textile

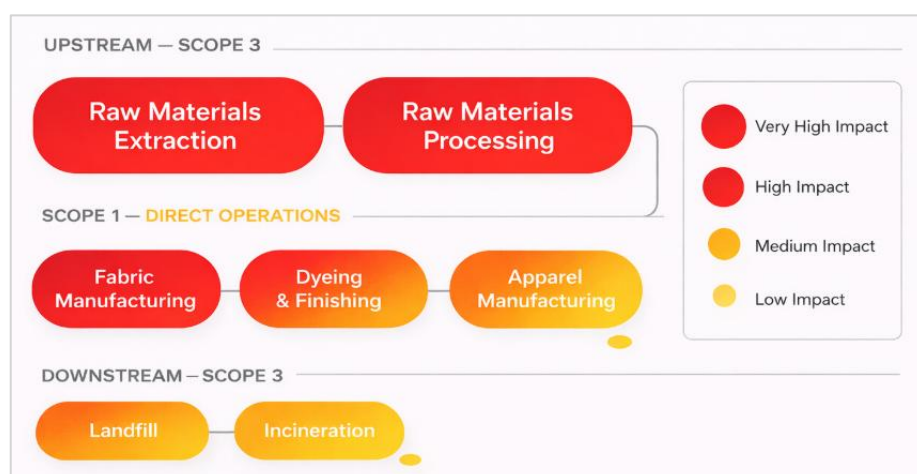
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ANALYSING THE IMPACTS OF THE TEXTILE SECTOR ON BIODIVERSITY

The relationship between biodiversity and business involves both **impacts** and **dependencies**. Organisations interact with biodiversity in two main ways: through their **reliance on ecosystem services**, and through the **impacts their activities** have on biodiversity. These interactions can create **risks** that affect operations, turnover, and profitability by influencing costs, sales, and even access to capital. When impacts and dependencies are high, they can amplify these risks for organisations, making them more vulnerable to disruptions and financial losses. Physical, transition, and systemic risks linked to biodiversity loss can also be transmitted to the financial sphere and, through contagion, spread throughout the wider financial system.

This analysis is designed to provide a **clearer understanding** of how the **sector interacts with biodiversity**. It highlights the main **impacts** and **dependencies**, as well as the potential **risks** and **opportunities** that may arise. It can therefore be useful not only for companies and financial institutions, but also for public authorities and anyone interested in gaining broader knowledge about biodiversity challenges. The findings are grounded in an extensive review of existing literature, combined with a quantitative assessment using the **Global Biodiversity Score**, a tool that measures biodiversity footprints. All detailed results and further findings are provided in a sectoral report.

KEY MESSAGES – A BIODIVERSITY IMPACT DRIVEN BY UPSTREAM ACTIVITIES



- The sector's impacts are **overwhelmingly driven by the upstream supply chain** (70-90% of the impact), due to the use of land and resource intensive inputs (natural and synthetic fibres, dyes, chemical auxiliaries).
- End-of-life management amplifies biodiversity pressures, as **landfilling and incineration** remain the dominant pathways while reuse and circular design offer the greatest mitigation potential.
- The heterogeneity of impacts across the value chain calls for **targeted strategies at each step**.

MAIN DRIVERS OF BIODIVERSITY LOSS



KEY TEXTILE MATERIALS — BIODIVERSITY IMPACT OVERVIEW

An analysis of four dominant textile fibres (together representing of 80% of global fibre production) was conducted. Natural fibres appear more impactful, but their impacts are more reducible—unlike synthetics, which face persistent challenges like fossil dependency, microplastic pollution, and limited recyclability.

MATERIAL	GLOBAL SHARE	DEGRADATION	TERRESTRIAL IMPACT	AQUATIC IMPACT	MAIN TERRESTRIAL DRIVER	MAIN AQUATIC DRIVER
COTTON	19%	20-50 cycles	HIGH	MEDIUM-HIGH	Land use (crop occupation)	Freshwater eutrophication
POLYESTER	59%	100-200 + cycles	MODERATE	MODERATE	Climate change (GHG emissions)	Ecotoxicity – freshwater
VISCOSE	6%	30-70 cycles	HIGH	HIGHEST	Land use (forest plantation)	Ecotoxicity – freshwater (organics)
POLYPROPYLENE	5%	80 – 150 cycles	LOW	LOW	Climate change (polymerization)	Minor contributions across categories

Source: GBS Product Tool / ecoinvent APOS 5 | Production phase only — excludes transport, retail & use | Global Biodiversity Score (MSA.km²)

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DEEP DIVE INTO THE SECTOR

KEY RESULTS ON DEPENDENCIES, IMPACTS, RISKS AND OPPORTUNITIES

IMPACTS

UPSTREAM VALUE CHAIN IS THE MAJOR DRIVER

The sector's greatest biodiversity impacts lie within its Scope 3 upstream suppliers, terrestrial and aquatic pressures representing between 70 and 99% of its total footprint across the value chain.

The four primary impact drivers are: **land use, climate change, water consumption and eutrophication.**

- Significant spatial pressures and pollution emissions linked to **agricultural and forestry activities** throughout the supply chain.
- Highest-impact materials: **cotton cultivation, leather production and synthetic fibre manufacturing.**
- Most critical processes: raw material growing, **dyeing, finishing and washing** operations.

DEPENDENCIES

WATER, A CRITICAL DEPENDENCY FOR THE SECTOR

The textile sector is intrinsically dependent on biodiversity. Water-related services are consistently critical across all subsectors: dyeing, finishing and washing operations require stable access to large volumes of clean water.

A dependency on biodiversity through the value chain

- Natural fibres (cotton, wool, cellulose) **rely directly on pollinators and living soils.**
- Manufacturing activities, due to intensive water uses and need for built-up infrastructures, rely heavily on the **supply and quality of water**, and climate related services such as flood control and storm remediation.
- **Solid waste remediation services**, are critical for incineration and landfill subsectors. As the ecosystems' natural capacity to decompose and assimilate materials is becoming overstretched, the sector is exposed to serious operational risks.

RISKS

WELL ESTABLISHED BIODIVERSITY RISKS

PHYSICAL RISKS

The sector is exposed to acute disruptions from ecosystem degradation due to its strong dependence on nature, such as cotton supply shocks driven by droughts or crop failures, as well as chronic declines in fibre quality as soils degrade and water basins become increasingly stressed over time.

TRANSITION RISKS

Transition risks arise as textile production practices face increasing regulatory, market and technological pressure: stricter due diligence on supply chains (e.g. sourcing of cotton and viscose), shifting consumer preferences away from fast fashion, and the need to invest in low-impact processes such as water-efficient dyeing and alternative fibres.

OPPORTUNITIES

NATURAL FIBRES AS A KEY LEVER

01 TRANSITION TO REGENERATIVE AGRICULTURE

Cotton, wool and cellulose are biologically derived fibres, meaning their production can shift toward agroecological systems that actively restore soil health, reduce synthetic inputs and rebuild ecosystem function, converting a major impact driver into an opportunity for nature recovery.

02 TEXTILE RECYCLING AS PRODUCTION DECOUPLING

Mechanical and chemical recycling reduce virgin raw material extraction, land use, water consumption and agricultural pollution. Designing for recyclability from the outset: mono-material construction, no mixed fibres is a prerequisite for viability at scale.

03 NATURE RISK IN PROCUREMENT & SUPPLIER ENGAGEMENT

Integrating nature risk assessments into procurement strategies and supplier engagement enables companies to systematically identify and act on the highest-impact points across their entire value chains.

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ENGAGING THE SECTOR: WHAT'S NEXT?

REDUCING BIODIVERSITY IMPACTS IN THE TEXTILE SECTOR REQUIRES ACTING PRIMARILY UPSTREAM IN THE VALUE CHAIN

Actions are ranked by priority level based on their position in the value chain and magnitude of biodiversity impact. Direct operations provide the most immediate leverage, followed by upstream supply chain interventions and downstream measures.

01 DIRECT OPERATIONS	Direct Operations Phase — <i>Highest immediate control & accountability</i> › Apply the mitigation hierarchy (avoid, reduce, restore, offset) to all site-level impacts, starting with eliminating unnecessary land take for new facilities › Conduct site-level biodiversity assessments to identify sensitive ecosystems near production sites and adapt operational footprint accordingly › Set internal biodiversity KPIs linked to operational decisions, including land occupation, water withdrawal, and chemical discharge at owned facilities
02 ENERGY USE DIRECT OPS	Energy Use for Direct Operations › Transition owned and operated facilities to 100% renewable energy (solar, wind, certified green electricity) to eliminate fossil-fuel-linked climate impacts on biodiversity › Conduct energy audits across all manufacturing sites to identify efficiency gains and reduce total energy consumption per unit of output › Engage key suppliers on renewable energy adoption, prioritising high-energy-intensity processes such as dyeing, finishing and synthetic fibre production
03 UPSTREAM PHASES	Upstream Phases — <i>Greatest leverage on biodiversity — raw material sourcing drives 70–80% of impacts</i> › Improve raw materials traceability (using certifications for example) to identify suppliers from high-risk locations › Prioritise the transition to regenerative or agroecological farming systems for natural fibres (e.g. Regenerative Organic Certified) — these offer a uniquely actionable lever to reduce impacts at source compared to synthetic alternatives › Enforce no-deforestation and no-conversion commitments across suppliers › Prioritise supply from basins exempt of water stress or require suppliers in water-stressed basins to adopt precision irrigation to reduce freshwater withdrawal
04 DOWNSTREAM PHASES	Downstream Phases › Integrate end-of-life recyclability criteria into product design to reduce virgin material demand and associated upstream pressures › Partner with certified sorters and recyclers to ensure post-consumer garments re-enter the material cycle

INDUSTRY BEST PRACTICES

Responsible Fibre Sourcing › Obtain GOTS, Better Cotton, FSC/PEFC or RCS certifications to verify responsible sourcing claims › Map full supply chain to Tier 3 level to identify biodiversity hotspots and deforestation-linked origins › Prioritise recycled or bio-based inputs where technical performance allows	Circular Design & End of Life › Design for disassembly using mono-material or easily separable blends to enable fibre-to-fibre recycling › Partner with certified sorters and recyclers to ensure post-consumer garments re-enter the material cycle › Apply Extended Producer Responsibility (EPR) frameworks and engage in take-back schemes	Measurement & Transparency › Use biodiversity footprinting to track impacts over the value chain and direct activities › Align reporting with TNFD and SBTN frameworks to meet regulatory expectations (CSRD, EU taxonomy) › Share supplier environmental data via collaborative platforms (e.g. Worldlee, Higg Index) to reduce duplicated audits
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