Additional sector guidance
Apparel, accessories and footwear

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SICS® industry:
Apparel, Accessories & Footwear (CG-AA)

tnfd.global

Taskforce on Nature-related Financial Disclosures

Contents

1. Introduction

1.1. The purpose of this guidance

In September 2023, the TNFD published its recommendations for disclosure of nature-related issues and supporting implementation guidance. This document provides sector-specific additional guidance for the apparel, accessories and footwear sector, covering:

- The assessment of nature-related issues using the TNFD's LEAP approach (Section 2); and
- The disclosure of sector-specific metrics in line with the TNFD's recommended approach to metrics (Section 3).

The TNFD's Guidance on the identification and assessment of nature-related issues: The LEAP approach is designed as an iterative process – across business locations and business lines – in line with established risk management processes and corporate reporting cycles. Organisations may choose to start with a narrow scope for a LEAP assessment and gradually expand the scope of the assessment as they gain experience and insight.

The TNFD recognises that there can be significant differences across sectors for corporates applying the LEAP approach. It has published this additional guidance with significant input from a range of knowledge partners and market participants, to help apparel, accessories and footwear sector participants apply the LEAP approach to their context. The overall structure of the LEAP approach is set out in Figure 1. This guidance follows that structure and sets out the elements of LEAP for which this document provides additional guidance.

The Taskforce also recognises that investors and other stakeholders require quantitative information to compare performance and nature-related issues within sectors. To facilitate that sector-level analysis, this guidance also includes:

- Guidance on the application of the core global disclosure indicators and metrics to the apparel, accessories and footwear sector (Section 3.1); and
- Core and additional sector disclosure indicators and metrics (Sections 3.2 and 3.3).

Figure 2 provides an overview of the TNFD disclosure measurement architecture and where indicators and metrics are listed in the TNFD recommendations and relevant sector guidance.

Figure 1: The TNFD approach for identification and assessment of nature-related issues – LEAP

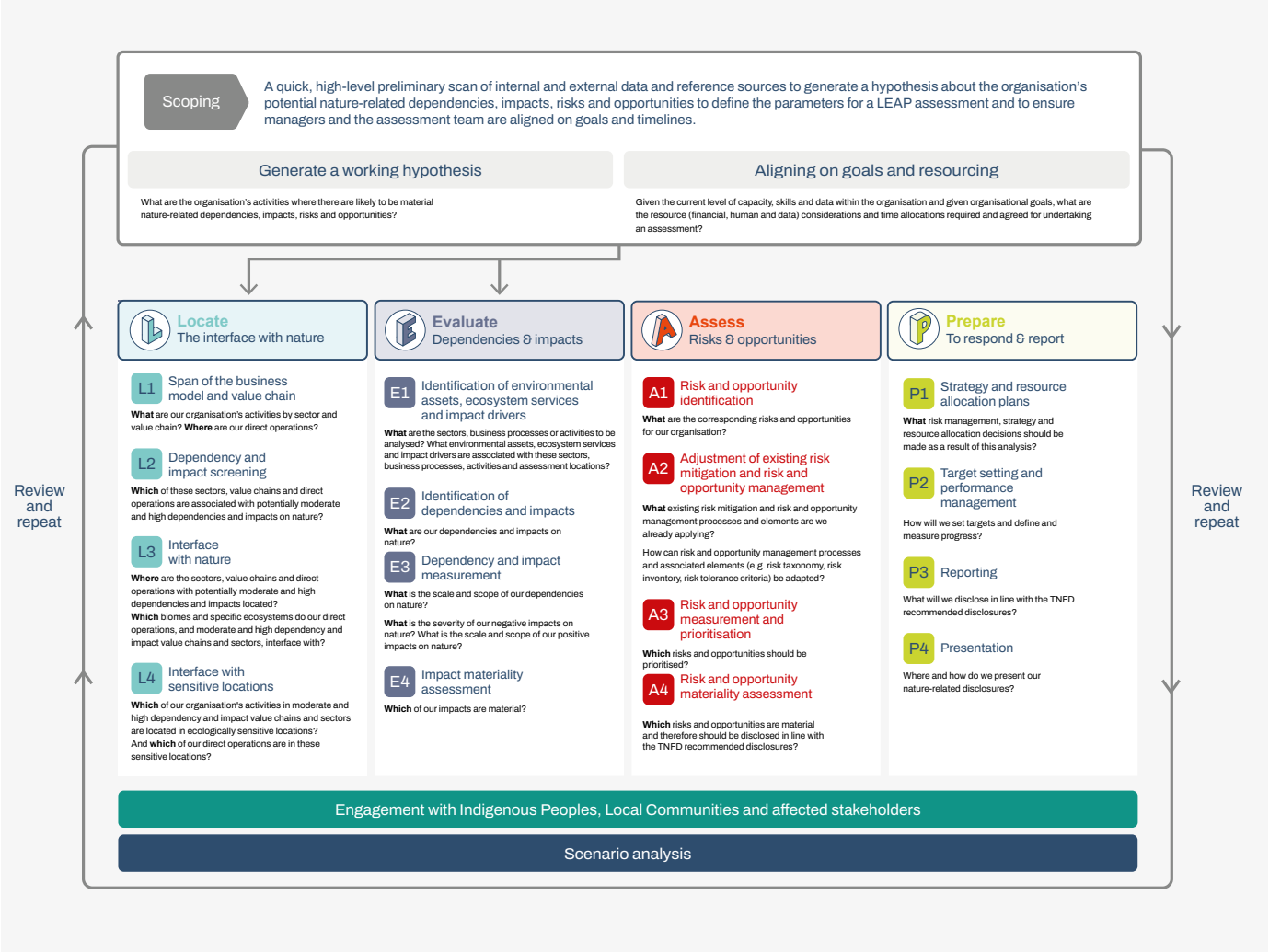
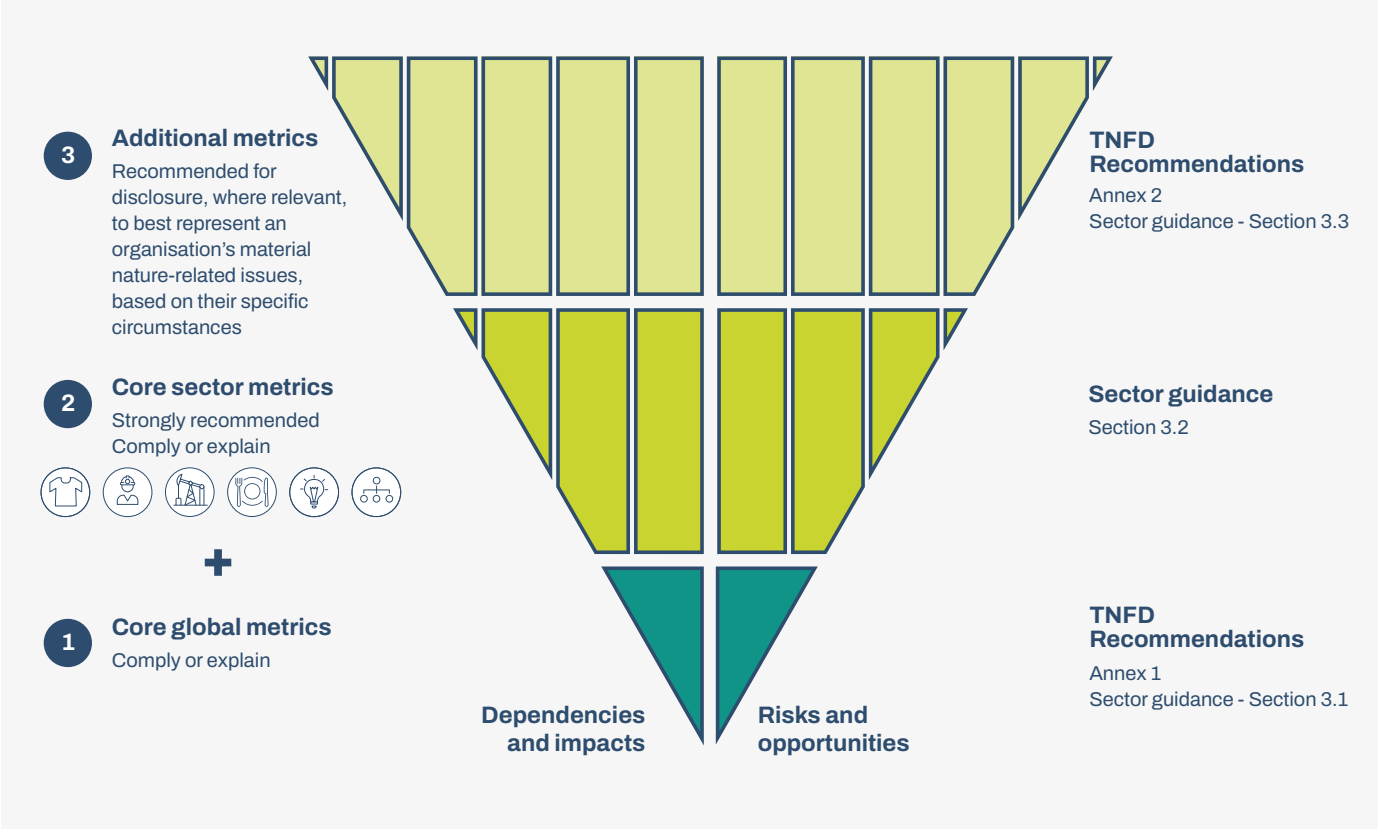


Figure 2: TNFD disclosure metrics architecture signposted to metrics lists



The guidance in Section 3 on the application of the TNFD core global metrics for this sector, as well as the core and additional sector metrics outlined, expand on the disclosure indicators and metrics outlined in Annexes 1 and 2 of the TNFD recommendations. The TNFD has incorporated and sought to build on existing industry standards and disclosure metrics wherever possible to build on current data collection and reporting practices and minimise additional assessment and reporting costs.

1.2. Audience for this guidance

This guidance covers those organisations with business models or value chains in the Sustainable Industry Classification System (SICS®) Apparel, Accessories & Footwear industry, part of the Consumer Goods sector (Box 1).[1] These are referred to as 'apparel, accessories and footwear organisations' in this guidance.

1 SASB Standards (2023) Sustainable Industry Classification System (SICS®).

Box 1: SICS® industries in the scope of this guidance document

Apparel, Accessories & Footwear (CG-AA)

This industry includes organisations involved in the design, manufacturing, wholesaling and retailing of various products, including adult and children's clothing, handbags, jewellery, watches and footwear. Products are manufactured primarily by vendors in emerging markets, thereby allowing organisations in the industry to focus on design, wholesaling, marketing, supply chain management and retail activities.[2]

Note: This guidance does not address nature-related dependencies, impacts, risks and opportunities for the jewellery and accessories industries in detail, although approaches, tools and examples for the apparel sector in this guidance may be useful. Additionally, practitioners may find it helpful to refer to the TNFD metals and mining guidance to identify these issues for the upstream segments of the jewellery and accessories industries. For more specific information and guidance on nature-related issues for accessories, the Watch & Jewellery Initiative 2030 provides several useful relevant resources.

The guidance is a supplement to the TNFD's Guidance on the identification and assessment of nature-related issues: The LEAP approach and should be read in conjunction with that guidance. Organisations in the apparel, accessories and footwear sector should also refer to the TNFD biome guidance and Guidance on engagement with Indigenous Peoples, Local Communities and affected stakeholders.

The examples provided in this guidance for the apparel, accessories and footwear sector are intended to be illustrative. They are not exhaustive, universally applicable or recommended by the TNFD as examples of measures for all organisations within the industry. Each company's context, location and nature-related interactions are unique. The TNFD encourages all companies to consult additional relevant sources, including scientific references and relevant industry standards or best practice guides, and conduct thorough assessments to identify and assess nature-related dependencies, impacts, risks and opportunities specific to their operations and value chains. This guidance aims to support, not replace, a tailored assessment, which will be necessary for each organisation.

Table 1: Areas of LEAP with additional guidance for the apparel, accessories and footwear sector in this guidance document

Scoping	✓

L1	✓	E1	✓	A1	✓	P1	✓
L2	✓	E2	✓	A2		P2	✓
L3	✓	E3	✓	A3	✓	P3	
L4	✓	E4		A4		P4	

2 SASB Standards (2023) Apparel, Accessories & Footwear.

2. Sector-specific LEAP assessment guidance

2.1. Scoping a LEAP assessment

Working hypothesis generation:

What are the organisation's activities where there are likely to be material nature-related dependencies, impacts, risks and opportunities?

Goals and resource alignment:

Given the current level of capacity, skills and data within the organisation and given the organisational goals, what are the resource (financial, human and data) considerations and time allocations required and agreed for undertaking an assessment?

For the apparel, accessories and footwear sector, important nature-related dependencies, impacts, risks and opportunities are likely to occur across the entire value chain:

- Upstream, at the raw material production level, requiring significant agricultural, forest, wildlife or petrochemical raw materials;
- At processing and manufacturing levels, where the use of chemical agents and dyes is necessary;
- At the consumer level, where the use of products can cause microfibre release; and
- At the end-of-life stage of products, often turning into high quantities of waste that are typically poorly recycled.

Organisations may find it useful to refer to the TNFD food and agriculture, forestry pulp and paper, and oil and gas sector guidance documents to identify these issues at the production phase.

The variety of business models and supply-chain relations means that textile value chains can be relatively complex and opaque. Over time, apparel, accessories and footwear sector organisations will need to build the processes and capabilities to collect more nature-related data from their value chain partners, both upstream and downstream. For example, organisations may find it useful to review and update standard supply contract terms to include nature-related requirements. There may also be opportunities to partner with other organisations in the sector (including supply chain partners) to collaboratively assess nature-related issues across the value chain. In the interim, apparel, accessories and footwear organisations may find it useful to apply a phased approach to assessing and disclosing

nature-related issues within the value chain, increasing their value chain coverage and the breadth and depth of the data captured, assessed and reported as the organisation's nature-related assessment capabilities develop.

Organisations should prioritise the areas of the value chain where material dependencies, impacts, risks and opportunities have arisen, or are assessed as most likely to arise (see guidance for the Locate phase). Further guidance is available in the TNFD guidance on value chains.

List of datasets and tools

Tools that are likely to be helpful for initial scoping and component L2 of the Locate phase include:

- Textile Exchange's Material Impact Explorer, a sector-specific tool that provides risk ratings framed around potential impacts and dependencies on nature;
- ENCORE;
- SBTN's High Impact Commodities List (HICL) and Materiality Screening Tool;
- WWF Biodiversity Risk Filter;
- Integrated Biodiversity Assessment Tool (IBAT);
- Global Farm Metric;
- Agrimetrics;
- SAI; and
- TNFD guidance for the food and agriculture sector.

2.2. Locate the organisation's interface with nature

This section provides additional guidance to help apparel, accessories and footwear sector organisations with the Locate phase of the LEAP approach.

L1 L1: Span of the business model and value chain

Guiding questions:

What are our organisation's activities by sector, value chain and geography? Where are our direct operations?

Figure 3 provides an illustrative representation of apparel, accessories and footwear value chains. Each company is encouraged to build and assess its specific value chain activities to capture its own specificities.

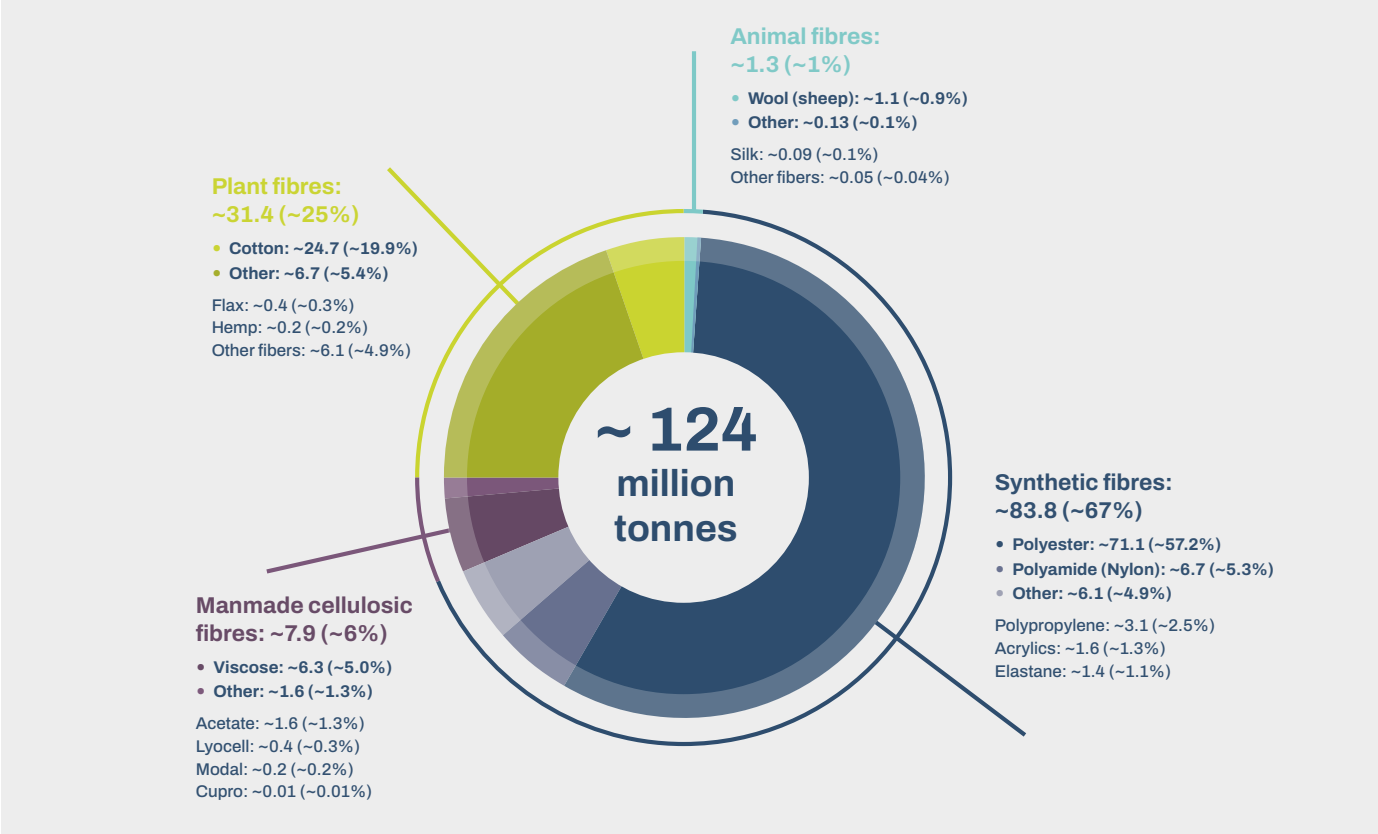
Figure 3: Supply chain tiers of the apparel, accessories and footwear value chain

Raw material production & primary processing	Intermediate material processing	Material manufacturing	Finished product manufacturing	Branding, retailing & distributions	Use phase	End-of-life
Tier 4	**Tier 3**	**Tier 2**	**Tier 1**	**Tier 0**	**Downstream**	
The extraction and farming of primary raw materials from the earth (e.g., fossil fuels), plants (e.g., cotton), or animals (e.g., wool), and the collection of secondary raw materials (e.g., reclaimed textiles), as well as the processing of these raw materials into a commodity state.	Processing of raw materials into yarn and equivalent state.	Production and finishing of materials (e.g., fabrics, trims) that go directly into finished product.	Assembly and manufacturing of final products.	Marketing and distribution of final products without production process.	Consumer care, such as washing, drying, dry cleaning.	Reuse, recycle, landfill.

Source: Textile Exchange (2024) Supply Chain Taxonomy *– adapted by TNFD*

The sector's main impacts on nature are mostly linked to raw materials production activities, and potentially at the use and end-of-life phase, due to microfibre leaks and waste generation. During the Scoping phase of LEAP, organisations can leverage existing supply chain data on sourcing locations and procurement data on volumes and raw materials to assess the relative importance of raw material inputs (e.g. by size of operations in the location, volume of production in units or kilogrammes of material sourced, revenue or spend) and to identify business critical locations. For textiles, depending on quantity and geographic location, existing environmental Life Cycle Assessment (LCA) and footprints can already highlight sources for the following fibres: cotton, leather, wool and precious wool such as cashmere, silk and man-made cellulosic fibres. Figure 4 shows global fibre production in 2023 by type of fibre.

Figure 4: Overview of most common fibre sources (2023) (in million tonnes and % of global fibre production)



Source: Textile Exchange (2024), Materials Market Report 2024, based on data from CIRFS, FAO, ICAC, IVC, IWTO, Maia Research and its own modelling

L2 L2: Dependency and impact screening

Guiding question:

Which of the sectors, value chains and direct operations are associated with potentially moderate and high dependencies and impacts on nature?

Tables 2 and 3 provide the ENCORE materiality ratings for ecosystem services and impact drivers associated with apparel, accessories and footwear activities. The ENCORE dependency and impact materiality ratings provide a useful screening tool for apparel, accessories and footwear sector organisations to inform whether a specific commodity or production process may warrant a more detailed dependency and impact assessment. ENCORE outputs should be considered as guidance only, and further analysis may be needed, using the tools outlined below.

Note: The ecosystem service classification used by ENCORE, the source of this table, differs from the classification used in TNFD guidance, based on the UN SEEA. A crosswalk is available from UN SEEA.

Table 2: Materiality ratings of ecosystem services the apparel, accessories and footwear sector typically depends on

Ecosystem services		Raising of sheep and goats	Raising of cattle and buffaloes	Growing of fibre crops	Other land transport	Manufacture of other textiles	Manufacture of manmade fibres	Extraction of crude petroleum	Manufacture of refined petroleum products	Manufacture of other chemical products	Manufacture of basic chemicals
Provisioning services	Water supply	High	High	High	Very low	Medium	Medium	Medium	Low	Medium	Medium
	Genetic material	Medium	Medium	Very high	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Other provisioning services	N/A	N/A	Medium	Medium	N/A	N/A	N/A	N/A	N/A	N/A
	Biomass provisioning	High	Very high	Very high	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Regulating and maintenance services	Solid waste remediation	Low	Medium	Medium	ND	Low	Low	Low	Low	Medium	Low
	Soil and sediment retention	Very high	Very high	Very high	Low	Low	Low	Low	Medium	Medium	Medium
	Water purification	High	High	Very high	ND	Medium	Medium	Very low	High	Medium	Medium
	Soil quality regulation	High	High	Very high	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Ecosystem services		Raising of sheep and goats	Raising of cattle and buffaloes	Growing of fibre crops	Other land transport	Manufacture of other textiles	Manufacture of manmade fibres	Extraction of crude petroleum	Manufacture of refined petroleum products	Manufacture of other chemical products	Manufacture of basic chemicals
Regulating and maintenance services	Other regulating and maintenance service – Dilution by atmosphere and ecosystems	Low	Low	Medium	Very low	Low	ND	Medium	Low	Low	Low
	Biological control	Medium	Medium	High	ND	N/A	N/A	N/A	N/A	N/A	N/A
	Air filtration	Medium	Medium	Medium	Very low	Very low	Very low	Very low	Very low	Very low	Very low
	Flood control	Medium	Medium	Medium	Medium	Medium	Medium	High	Medium	Medium	Medium
	Climate regulation	Medium	Medium	Very low	Medium	Very low	Very low	High	Very low	Very low	Very low
	Nursery population and habitat maintenance	Very low	Very low	Very low	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Noise attenuation	Very low	Very low	N/A	Very low	Very low	Very low	Very low	Very low	Very low	Very low

Ecosystem services		Raising of sheep and goats	Raising of cattle and buffaloes	Growing of fibre crops	Other land transport	Manufacture of other textiles	Manufacture of manmade fibres	Extraction of crude petroleum	Manufacture of refined petroleum products	Manufacture of other chemical products	Manufacture of basic chemicals
Regulating and maintenance services	Other regulating and maintenance service – Mediation of sensory impacts (other than noise)	Very low	Very low	N/A	N/A	Very low	Very low	Low	N/A	Very low	Very low
	Local (micro and meso) climate regulation	Medium	Medium	Very high	Low	Low	Low	Low	Low	Low	Low
	Pollination	N/A	N/A	Very high	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Storm mitigation	High	High	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
	Water flow regulation	High	High	High	Low	Medium	Medium	Medium	Medium	Medium	Medium
	Rainfall pattern regulation	Very high	Very high	Very high	Medium	Very low	N/A	ND	N/A	N/A	Very low

Ecosystem services		Raising of sheep and goats	Raising of cattle and buffaloes	Growing of fibre crops	Other land transport	Manufacture of other textiles	Manufacture of manmade fibres	Extraction of crude petroleum	Manufacture of refined petroleum products	Manufacture of other chemical products	Manufacture of basic chemicals
Cultural services	Recreation related services	N/A	ND	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Visual amenity services	N/A	ND	N/A	Very high	N/A	N/A	N/A	N/A	N/A	N/A
	Education, scientific and research services	N/A	Very high	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Spiritual, artistic and symbolic services	Very high	Very high	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A = Non-applicable ND = No data

Source: ENCORE Partners (Global Canopy, UNEP FI, and UNEP-WCMC) (2024). ENCORE: Exploring Natural Capital Opportunities, Risks and Exposure. Cambridge, UK: the ENCORE Partners. DOI: https://doi.org/10.34892/dz3x-y059.

Table 3: Materiality ratings for impact drivers typically relevant for the apparel, accessories and footwear sector

Drivers of nature change	Impact drivers	Raising of sheep and goats	Raising of cattle and buffaloes	Growing of fibre crops	Other land transport	Extraction of crude petroleum	Manufacture of refined petroleum products	Manufacture of other chemical products	Manufacture of other textiles	Manufacture of man-made fibres	Manufacture of basic chemicals
Land, freshwater and ocean-use change	Land ecosystem use	High	Very high	High	Medium	Low	Low	Low	Low	Low	Low
	Freshwater ecosystem use	High	High	High	N/A	Very high	N/A	N/A	N/A	N/A	N/A
	Ocean ecosystem use	N/A	N/A	N/A	N/A	Very high	N/A	N/A	N/A	N/A	N/A
Climate change	Greenhouse gas (GHG) emissions	High	High	Medium	Medium	High	Medium	Medium	Low	Medium	Medium
Pollution/ pollution removal	Non-GHG air pollutants	High	High	High	Low	Medium	High	Medium	Medium	Medium	Medium
	Emissions of toxic soil and water pollutants	High	High	High	Low	Very high	Very high	Very high	Medium	Medium	Very high
	Emissions of nutrient soil and water pollutants	High	High	High	Medium	N/A	N/A	N/A	Medium	N/A	N/A
	Solid waste	High	Very high	High	Very low	Low	Medium	Medium	Medium	Medium	Medium
	Disturbances (e.g noise, light)	Medium	Medium	Medium	Medium	Very high	Very high	Very high	Medium	Medium	Very high

Drivers of nature change	Impact drivers	Raising of sheep and goats	Raising of cattle and buffaloes	Growing of fibre crops	Other land transport	Extraction of crude petroleum	Manufacture of refined petroleum products	Manufacture of other chemical products	Manufacture of other textiles	Manufacture of man-made fibres	Manufacture of basic chemicals
Resource use/ replenishment	Water use	High	High	High	Low	Low	Low	Medium	Medium	Medium	Medium
Introduction of invasive alien species		Medium	High	Medium	Low	Low	N/A	N/A	N/A	N/A	N/A

N/A = Non-applicable; ND = No data

Source: ENCORE Partners (Global Canopy, UNEP FI, and UNEP-WCMC) (2024). ENCORE: Exploring Natural Capital Opportunities, Risks and Exposure. Cambridge, UK: the ENCORE Partners. DOI: https://doi.org/10.34892/dz3x-y059.

Organisations can use these tables as initial filters to develop lists of activities with potentially high dependencies and impacts. An organisation using the ENCORE ratings to inform prioritisation should consider their applicability to the specific context, bearing in mind that ENCORE ratings refer to global sector averages.

In addition, organisations may find it helpful to prioritise by:

- Developing lists of key commodities produced or procured;
- Using Textile Exchange's Materials Impact Explorer;
- Identifying value chains of any deforestation or conversion-driving commodities, consulting SBTN's High Impact Commodity List (HICL) and/or EU deforestation-free regulation;
- Mapping activities to areas with high water stress using WWF's Water Risk Filter or WRI Aqueduct;
- Mapping activities to areas with high soil degradation;
- Mapping activities upstream in markets with high air pollution concentration and/or high degrees of eutrophication, referring to the UNEP Urban Air Action Platform; and
- Using Fashion Nature Risk Lens, a tool mapping the main biodiversity risks and impacts, at the production level, of the main apparel raw materials (cashmere, cotton, cattle leather, goat leather, sheep leather, man-made cellulosic fibres, silk, synthetics and wool).

Useful additional tools and sources for the apparel, accessories and footwear sector for the L2 component of the Locate phase include:

- Regulation (EU) 2023/1115 of the European Parliament and of the Council;
- The Ceres and Valuing Water Finance Initiative (2022) Global Assessment of Private Sector Impacts on Water to identify the level of potential impact textile/apparel production has on water quality and quantity depending on the value chain stage;
- UNEP's Urban Air Action Platform;
- Our World in Data database on plastic pollution; and
- OECD Due Diligence Guidance for Responsible Supply Chains in the Garment & Footwear Sector.

L3 L3: Interface with nature

Guiding questions:

Where are the sectors, value chains and direct operations with potentially moderate and high dependencies and impacts located?

Which biomes and specific ecosystems do our direct operations, and moderate and high dependency and impact value chain and sectors, interface with?

There are several challenges for brands and retailers when tracing the origin of the raw materials used in their products:

- Supply chains can be long and fragmented, spanning several countries and suppliers, resulting in a lack of transparency on the origin of units of production for downstream/ retail organisations;
- Growers/farmers and other raw materials providers can be small scale and difficult to track precisely to their farm or plantation. This means that often the most feasible point of tracking is at the aggregator or primary processor level;
- Often there is no commitment made by brands or other processing tiers (e.g. garment makers) to keep sourcing from the same suppliers, growers or regions, year after year; and
- Certain materials such as leather are difficult to trace, because brands are utilising the co-product of another industry, which reduces the ability of an apparel company to influence that industry's value chain.

This lack of supply security/commitment can result in a volatile or constantly shifting supply base, making it difficult for nature-related dependencies, impacts, risks and opportunities to be assessed in detail and action plans to be implemented. Chain of custody (CoC) can help connect final products back to source, and as digital and electronic tracking becomes more mainstream, this information will be visible between tiers.

Where possible, an approach based on an organisation's actual sourcing footprint is preferred, but in the absence of traceability, companies can use information about sensitive locations for materials. While doing this, they can also implement systems to improve traceability to the fibre/raw material origin (i.e. farm, forest, site), investing in industry-wide initiatives where possible, to understand sourcing at a sub-national or even more granular level. For the apparel, accessories and footwear sector, cotton, leather, wool and precious wool such as cashmere, as well as man-made cellulosic fibres, are all raw material categories that are at risk of being sourced from biodiversity hotspots. Synthetic fibres sourced from the petrochemical industry may also experience a similar risk.

For farming and natural fibre production:

- Organisations buying directly from farms (directly procured commodities) should be able to locate supplier farms precisely.

- Organisations buying indirectly from cooperatives, traders, brokers (indirectly procured commodities) and direct suppliers should map points of procurement and geolocate the sourcing area and progressively increase granularity with the aim of reaching farm-level traceability in a set timeframe. Organisations may refer to the TNFD Additional sector guidance for food and agriculture for further detail on reaching farm-level traceability over time.

Organisations in the apparel, accessories and footwear sector can at this stage deepen their use of tools such as the IUCN Species Threat Abatement and Restoration (STAR) metric to conduct site-specific assessments.

Organisations can also identify the biomes and ecosystems with which their identified direct, upstream and downstream locations interface. The apparel, accessories and footwear sector typically interfaces with the following biomes:

Land:

- Tropical-subtropical forests (T1);
- Savannahs and grasslands (T4);
- Intensive land use systems (T7); and
- Vegetated wetlands (TF1).

Freshwater:

- Rivers and streams (F1);
- Lakes (F2); and
- Artificial wetlands (F3).

Ocean:

- Shoreline systems (MT1);
- Coastal inlets and lagoons (FM1); and
- Brackish tidal systems (MFT1).

This list can be considered as a reference. However, organisations should review all applicable biomes connected to their specific interfaces across their value chains and associated activities where significant dependencies and impacts on those biomes exist.

Organisations may also refer to the TNFD biome guidance for further guidance when analysing their interfaces with these biomes.

L4

L4: Interface with sensitive locations

Guiding questions:

For our organisation's activities in moderate and high dependency and impact value chains and sectors, which of these are in ecologically sensitive locations? And which of our direct operations are in sensitive locations?

As for all components, refer to the Guidance on the identification and assessment of nature-related issues: The LEAP approach.

List of datasets and tools

Table 4 provides a list of tools that apparel, accessories and footwear sector organisations may find useful for the Locate phase of LEAP, in addition to those listed in the cross-sector LEAP guidance and mentioned above. Organisations may also find it helpful to reference tools in the TNFD Tools Catalogue and SBTN's Step 1 Toolbox.

Table 4: Additional tools for apparel, accessories and footwear sector organisations for the Locate phase of LEAP

Tool name	Description
Global Forest Watch	An online platform that provides data and tools for monitoring forests.
Canopy Forest Mapper	An interactive tool that visually represents ancient and endangered forests at a global scale.
Trase (cotton)	Trase combines data on commodity production and trade with material flow analysis to map supply chains linking consumer markets, via traders, with regions of production. Trase quantifies exposure to deforestation and other environmental impacts for consumer markets sourcing commodities from regions of production.
WWF's Biodiversity Risk Filter	Industry-agnostic biodiversity-related risk mapping tool, that assesses physical and reputational risks.
WRI Aqueduct	Aqueduct's tools use open-source, peer reviewed data to map water risks such as floods, droughts and water stress.
WWF's Water Risk Filter	Corporate and portfolio-level screening tool to assess physical, regulatory and reputational water-related risks based on direct impacts and dependencies.

Tool name	Description
Textile Exchange Materials Impact Explorer	A tool to identify the potential risks and opportunities associated with the fibres and raw materials in their portfolios. The tool provides tailored recommendations on mitigating risk, reducing environmental impact and supporting local and global sustainability initiatives.
Textile Exchange Biodiversity Dashboard	The dashboard's purpose is to enable the identification of the nature interface and biodiversity hotspots within production areas.
SBTN High Impact Commodity List	Includes commodities known to have significant contributions to environmental pressures at a global or regional level.
The Fashion Pact Biodiversity Strategy Tool Navigator	Site that is designed to guide a fashion company through the stages of developing a biodiversity strategy that is aligned with the Science Based Targets Network (SBTN) and to find the tools and resources that can help.
The Fashion Pact/Conservation International: Fashion Nature Risk Lens	An interactive website and dashboard to understand land-use footprint and deforestation risk across the globe for select raw materials.
Textile Exchange – Certified Materials Trackit	Data exchange platform for documentation related to certified materials and their traceability throughout the supply chain.
SBTN's guide for setting, implementing and tracking progress on science-based targets for nature and SBTN's Materiality Screening Tool	A company can get a quick overview of the issue areas associated with the economic activities (and associated sourced raw materials) of its sector and use this at the first Scoping phase.
Textile Exchange and The Fashion Pact (2023) Biodiversity Landscape Analysis Report	Report helping companies understand the landscape of biodiversity tools and initiatives, focused on raw materials produced in agricultural systems.

2.3. Evaluate dependencies and impacts on nature

This section provides additional guidance to help apparel, accessories and footwear sector organisations with the Evaluate phase of the LEAP approach.

E1 E1: Identification of environmental assets, ecosystem services and impact drivers

Guiding questions:

What are the business processes and activities to be analysed?

What environmental assets, ecosystem services and impact drivers are associated with these business processes, activities and assessment locations?

Guidance for components E1 and E2 is provided together under E2.

E2 E2: Identification of dependencies and impacts

Guiding question:

What are our dependencies and impacts on nature?

This section focuses primarily on dependencies and impacts in the direct operations of apparel, accessories and footwear organisations. Organisations should refer to the relevant TNFD sector guidance for forestry, pulp and paper, oil and gas, and food and agriculture for dependencies and impacts upstream and downstream.

Impacts

Table 5 and Table 6 provide examples of business activities in the apparel, accessories and footwear sector, the associated impact drivers, and examples of environmental assets and ecosystem services that the impact drivers typically affect. These tables describe impacts over different environmental assets, and organisations should consider how relevant these impacts are and where they may apply, given their specific locations and areas of influence. Table 5 covers natural fibre and animal livestock farming for animal-based fibre production. Table 6 covers man-made fibre production.

To note, animal welfare is not covered extensively in this guidance, but the Taskforce recommends that organisations include this issue from the SASB Meat, Poultry & Dairy Standard if relevant to their business model and pay particular attention to animal welfare-related issues of Concentrated Animal Feeding Operations (CAFOs).

Table 5: Examples of impact pathways for natural fibre and livestock farming for animal-based fibre production

Drivers of nature loss	Example environmental assets and ecosystem services affected	Guidance to identify impacts
Land/freshwater/ocean-use change **Land and land-use change:** Natural fibre and livestock farming for animal-based fibre production can cause changes in land use and drive land degradation by increasing demand for specific crops and accelerating deforestation through the procurement of leather, a co-product of the meat sector. For instance, cotton production accounted for 2.5% of the world's arable land in 2015. Approximately 20% of pastureland worldwide is considered degraded because of livestock overgrazing, compaction and erosion due to livestock farming.	*Environmental assets:* Terrestrial land-based ecosystems Land ecosystems *Ecosystem services:* Soil fertility Biological control Soil and sediment retention Flood mitigation Biomass provisioning Nursery population and habitat maintenance Pollination Other cultural services	Natural fibre production can lead to pressures on land, to high prevalence of monoculture planting, intensive agrochemical usage and ecosystem conversion.[3] Growing the same crop year-on-year reduces the availability of certain nutrients and can lead to soil exhaustion. Additionally, ecosystems and ecological functions are affected due to reduced habitat extent, degradation and fragmentation. Fragmentation impedes species' feeding and reproduction patterns, reducing populations and increasing extinction risk. Large-scale livestock farming for animal-based fibres can result in soil depletion and biodiversity loss. Overgrazing can lead to bare unprotected soil with higher erodibility, higher temperatures and reduced soil microbes and organic matter, causing structural changes that affect the soil's ability to infiltrate water. Further, the income dependency of landscape stewards, such as herders, can increase the pressure driver that can affect an ecosystem, exceeding the grazing capacity of the land by the livestock[4], when demand for a specific product from a specific location remains high. Finally, the construction of new assets or transportation routes could affect communities, including the rights of Indigenous Peoples, and potentially their displacement.

3 For more impacts associated with farming for natural fibres, refer to the TNFD Additional sector guidance for food and agriculture.

4 The grazing capacity is the number of grazing animals a piece of land can support. Piipponen, J. et al. (2022) Global trends in grassland carrying capacity and relative stocking density of livestock.

Drivers of nature loss	Example environmental assets and ecosystem services affected	Guidance to identify impacts
Pollution/pollution removal **Water pollutants:** Major sources of pollution from livestock farming include wastes, antibiotics and hormones, fertilisers and pesticides used for feed crops, chemicals from tanneries and sediments from eroded pastures. Pollutants mentioned in the soil pollutant section can also be released into waterways. Wastewater discharge from production sites can be a significant source of hazardous chemicals and pollution in key production regions. 20% of industrial water pollution globally is attributable to the dyeing and treatment of textiles. Microplastics from packaging waste entering waterways and the ocean are also a material issue for the sector. It has been estimated that around half a million tonnes of plastic microfibres shed during the washing of plastic-based textiles such as polyester, nylon or acrylic end up in the ocean annually. According to the IUCN, 35% of primary microplastics entering the ocean are released through the washing of textiles.	*Environmental assets:* Freshwater and subterranean freshwater ecosystems Water resources Terrestrial and subterranean terrestrial ecosystems Marine (ocean) ecosystems *Ecosystem services:* Water flow regulation Water supply Water purification Biological control Nursery population and habitat maintenance Soil and sediment retention Flood mitigation Cultural services	The release of untreated wastewater can contaminate water resources. Nitrogen-, phosphate- and potassium-based synthetic fertilisers can leach into groundwater, polluting waterways and leading to oxygen depletion in aquatic and marine ecosystems, the acidification of soils and waters, and reductions in bird, insect, amphibian and soil biological diversity. Moreover, plastic microfibres may escape wastewater treatment plants and can enter rivers, lakes and oceans. Aquatic organisms throughout the food chain consume microplastics and microfibres both directly and indirectly. Water pollution may also lead to the deterioration of health and living conditions of surrounding local communities. For more impacts associated with farming for natural fibres, refer to the TNFD Additional sector guidance for food and agriculture.

Drivers of nature loss	Example environmental assets and ecosystem services affected	Guidance to identify impacts
Pollution/pollution removal **Soil pollutants:** It has been estimated that producing 1 kg of textiles requires 0.58 kg of chemicals. The production of cotton was estimated in 2017 to require 200,000 tonnes of pesticides and 8 million tonnes of fertilisers annually. Cotton production uses 2.5% of the world's arable land while accounting for 16% of all pesticides used in 2014. Cotton production also accounts for 4% of nitrogen and phosphorus fertiliser use globally. Animal-based fibre, such as sheep wool, also typically uses pesticides during production processes. For instance, to protect the sheep fur from parasites, pesticides can be released into the environment without proper management.	*Environmental assets:* Terrestrial and subterranean land-based ecosystems Freshwater ecosystems Marine (ocean) ecosystems *Ecosystem services:* Water flow regulation Biological control Water purification services Nursery population and habitat maintenance Soil and sediment retention Flood mitigation Air filtration Cultural services	**Natural fibre farming:** Soil pollutants in agriculture can lead to soil contamination, a decline in insect populations including pollinators and in soil microorganisms, soil erosion and compaction issues, and freshwater contamination. To identify the impacts on ecosystem services of soil pollutants of pesticide and excess nitrogen and phosphorus, an organisation can: • Identify pesticide-intensive crops and source data from suppliers to account for actual pesticide use per toxicity hazard level in the business model; • Identify nitrogen and phosphorus-intensive commodities, for example, by using IFA fertiliser-use data to identify the most nitrogen and phosphorus-intensive crops and regions in its value chain; • Leverage eDNA to measure changes to pollinator abundance and complexity; • Measure changes to nutrient and pathogen regulation and sequestration services; and • Measure changes to soil structure and soil organic carbon content. Organisations can refer to the TNFD additional sector guidance for food and agriculture for additional information on identifying material impacts.

Drivers of nature loss	Example environmental assets and ecosystem services affected	Guidance to identify impacts
Pollution/pollution removal **Soil pollutants:** Additionally, fur requires significant chemical treatment, which has been identified by the World Bank[5] as one of the industries with the highest prevalence of toxic chemicals use. Chemical-based cleaning of silk may also enter freshwater ecosystems in the absence of adequate water treatment systems. Moreover, packaging waste that is dropped as litter or discarded in landfill sites can degrade and lead to microfibres leaking into soil.		**Manufacturing:** Complex effluent containing several dyes, heavy metals and other organic agents can accumulate in soil if disposed of without treatment or after incomplete treatment. This has negative effects on soil productivity, as the excessive concentration of pollutants in soil reduces fertility and the quality of soil and ingress in food web. For instance, heavy metal enriched soil adversely affects the density of earthworms. Additionally, landfills generate pollutants and microfibres that can runoff and impact, for example, water purification services, solid waste remediation, air filtration, nursery population and habitat maintenance services. Soil pollution may also lead to the deterioration of health and living conditions of surrounding local communities. For more impacts associated with farming for natural fibres, refer to the TNFD Additional sector guidance for food and agriculture.

5 Wheeler, D. et al. (1999). The industrial pollution projection system. The World Bank.

Drivers of nature loss	Example environmental assets and ecosystem services affected	Guidance to identify impacts
Pollution/pollution removal **Solid waste:** Currently, less than 1% of textiles produced for clothing are recycled into new clothes and 87% of material used for clothing production is landfilled or incinerated after its final use, generating considerable waste. It has been estimated that 92 million tonnes of textiles are wasted globally every year.	*Environmental assets:* Terrestrial, freshwater and marine (ocean) ecosystems *Ecosystem services:* Various	Solid waste contributes to the degradation of the ecosystems where it is disposed of and disrupts the ecosystem services those assets provide. Non-compostable textiles can harm wildlife when not disposed of appropriately. When waste is disposed in landfills, it decomposes or biodegrades slowly. Moreover, chemicals and constituents from the waste can leak into surface water, groundwater, soil and plants. This affects their physicochemical parameters and results in heavy metal concentration.

Drivers of nature loss	Example environmental assets and ecosystem services affected	Guidance to identify impacts
Resource use/replenishment **Water use:** Water is used for field irrigation, as well as throughout the fibre manufacturing process, from dyeing to fibre washing. The volume of fresh water consumed by the fashion industry in 2015 was estimated to be nearly 79 billion cubic metres, with an estimation that water use will increase by at least 50% by 2030.	*Environmental assets:* Water resources Freshwater and subterranean freshwater ecosystems *Ecosystem services:* Water flow regulation Water supply Water purification Biological control Nursery population and habitat maintenance Cultural services	Water use can lead to the depletion of aquifers, subterranean freshwater ecosystems and other water resources, especially in arid and drought-prone areas. This can lead to reduced water flow regulation and increased drought severity and frequency. Such water use affects the supply of water to other users and to nature, with many ecosystem services impacted such as water purification, water flow regulation, water supply and recreation-related services. At present, many of the key cotton-producing countries often experience high water stress, including China, India, the USA, Pakistan and Turkey. For further impacts associated with water use for nature-based fibre farming, refer to the TNFD Additional sector guidance for food and agriculture.

Drivers of nature loss	Example environmental assets and ecosystem services affected	Guidance to identify impacts
Resource use/replenishment **Other resource use:** Fibres made from wild plants and animals, such as wood pulp, skins or fur, can have significant impacts on nature when harvested unsustainably. Wild animals account for 15% of the world's fur trade and other wild species include pythons, crocodiles and vicuna (the latter two being farmed as well).	*Environmental assets:* Terrestrial and subterranean land-based ecosystems Freshwater ecosystems Marine (ocean) ecosystems *Ecosystem services:* Biological control Nursery population and habitat maintenance Cultural services	Organisations should understand the requirements of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), a multilateral treaty to ensure that international trade of animals and plants included does not threaten the survival of the species in the wild. CITES protects over 37,000 species of animals and plants. Wild animal and plant use can have significant ecosystem impacts when harvested unsustainably (e.g. diminished wildlife populations, local extirpations). It can also increase pressures on local communities and have knock-on effects on other species.[6]

Sources: Business for Nature (2023) Fashion and apparel: Priority actions towards a nature-positive future*; Changing Markets Foundation (2017)* Dirty fashion: How pollution in the textiles supply chain is making viscose toxic*; EEA (2023)* How pesticides impact human health and ecosystems in Europe*; EMF (2017)* A new textiles economy: redesigning fashion's future*; FAO (2006)* Livestock's long shadow: environmental issues and options*; Boucher, J. and Friot, D. (2017)* Primary microplastics in the oceans: A global evaluation of sources*; Aiama, D. et al. (2016)* Biodiversity risks and opportunities in the apparel sector*; Markandeya et al. (2022)* Hazardous consequences of textile mill effluents on soil and their remediation approaches*; Textile Exchange (2023)* Biodiversity landscape analysis*; UNEP (2023)* Sustainability and circularity in the textile value chain*; World Bank (2013)* The Industrial Pollution Projection System*; WWF (2021).* Open Letter: Covid-19 recovery is time to speed up sustainability of the fashion, apparel and textile sector*.*

6 Business for Nature (2023) Fashion and apparel: Priority actions towards a nature-positive future.

Table 6: Examples of impact pathways for man-made fibre production

Impact pathways	Example environmental assets and ecosystem services affected	Guidance to identify impacts
Land/freshwater/ocean-use change **Land and ocean-use change:** Man-made fibre production can cause land-use change, when manufacturers are sourcing from unverified wood pulp suppliers. Currently, most man-made cellulosic fibres (MMCF) products are produced by cutting down forests and processing the trees in a pulp mill to strip out the cellulose fibre and remove the lining, mainly through chemical processes. It is estimated that more than 300 million trees are logged every year and turned into cellulosic fabric such as viscose, and less than 60% of these forest-based fibres are being sourced from certified forests. Other man-made fibres, including polyester, require fossil fuel-based chemicals, the primary raw material of which is crude oil.	*Environmental assets:* Terrestrial land-based ecosystems Land ecosystems Marine (ocean) ecosystems *Ecosystem services:* Soil fertility Biological control Soil and sediment retention Flood mitigation Biomass provisioning Nursery population and habitat maintenance Pollination Other cultural services	If MMCFs are sourced from forests that are not certified by a reputable standard, there is a high risk that these forests experience deforestation and illegal logging, causing significant impacts on biodiversity and the communities that rely on forests. For more details, refer to the TNFD additional sector guidance for forestry, pulp and paper. Fossil fuel extraction to produce synthetic fibres requires site preparation for construction and surface mining. This includes seismic testing, drilling, asset and facility construction, infrastructure development, pipeline installation and road building. This can also be done offshore through deep sea mining and drilling and the construction footings of offshore structures, resulting in the destruction of marine and seabed habitats. For more impacts resulting from fossil fuel extraction, refer to the TNFD additional sector guidance for oil and gas.

Impact pathways	Example environmental assets and ecosystem services affected	Guidance to identify impacts
Pollution/pollution removal **Soil pollutants:** Chemicals and dyes used in the textile manufacturing process can pollute soils. Moreover, microfibres can infiltrate soil layers through various pathways, such as: • Airborne microplastics deposited on roads and pavements. Runoff then transports them to roadsides and sewers, and they are then transported to waste water treatment plants, the sewage sludge from which is used as fertiliser on fields; • Textile or packaging waste that is dropped as litter or discarded in landfill sites can degrade and lead to microfibres leaking into soil; • Organisms such as earthworms have the capacity to transport significant amounts of microplastics from the soil surface to deeper layers.	*Environmental assets:* Terrestrial and subterranean land-based ecosystems Freshwater ecosystems Marine (ocean) ecosystems *Ecosystem services:* Water flow regulation Biological control Water purification services Nursery population and habitat maintenance Soil and sediment retention Flood mitigation Air filtration Cultural services	Some synthetic fibres are non-biodegradable, causing major impacts on the environment. Chemicals and dyes used in the textile manufacturing process can result in soils in a poor physical and chemical state and susceptible to erosion, leading to loss of productivity, sustainability and diminished food chain quality. Microplastic pollution in soils significantly affects the composition and abundance of the effects of soil fauna. Additionally, microplastics strongly cascade through the soil food webs, leading to the modification of microbial functioning, with further potential consequences on soil carbon and nutrient cycling. Soil pollution may also lead to the worsening health and living conditions of surrounding local communities.

Impact pathways	Example environmental assets and ecosystem services affected	Guidance to identify impacts
Pollution/pollution removal **Water pollutants:** It is estimated that about 20% of global water pollution is caused by dyeing and finishing textile product. During production, facilities producing polyester, other fibres or leather have a high risk of causing environmental harm without treating wastewater through the release of heavy metals and toxic chemicals. The washing and disposal of polyester contributes to a significant amount of water pollution in terms of heavy metals, toxic chemicals and plastic pollution (in the form of microplastics). Additionally, viscose production is acknowledged to be a particularly polluting process when manufactured irresponsibly, as the process of breaking down cellulose to transform and regenerate it into viscose fibre is highly chemical and mechanical.	*Environmental assets:* Freshwater and subterranean freshwater ecosystems Water resources Terrestrial and subterranean terrestrial ecosystems Marine (ocean) ecosystems *Ecosystem services:* Water flow regulation Water supply Water purification Biological control Nursery population and habitat maintenance Soil and sediment retention Flood mitigation Cultural services	It is estimated that globally about 80% of all wastewater produced is discharged into the environment without adequate treatment, although the levels vary across regions. Dye wastewater is extremely toxic and is comprised of suspended solids, dyes, different chemicals as well as high concentrations of heavy metals like cadmium, zinc, antimony, copper and nickel. Such effluents pollute the water surface, making it hazardous for irrigation purposes. Furthermore, an excessive amount of textile dyes in water bodies affects aquatic life and hinders the photosynthesis process for plants and algae. Additionally, heavy metals can cause serious health problems for aquatic organisms and the people that consume them. Chemical pollution and contaminants from the textile industry additionally runoff and significantly impact the marine environment. Moreover, plastic microfibres escape wastewater treatment plants and can enter into rivers, lakes and oceans. Aquatic organisms throughout the food chain consume microplastics and microfibres both directly and indirectly.

Impact pathways	Example environmental assets and ecosystem services affected	Guidance to identify impacts
Microplastics from textile or packaging waste entering waterways and the ocean are a significant issue for the sector. It has been estimated that around half a million tonnes of plastic microfibres shed during the washing of plastic-based textiles such as polyester, nylon or acrylic end up in the ocean annually. According to the IUCN, 35% of primary microplastics entering the ocean are released through the washing of textiles.		Viscose production is also chemical-heavy. Central to the process is carbon disulphide, a highly volatile and flammable liquid, which can have negative impacts on human health. Other chemicals include hydrogen sulphide, sodium hydroxide and sulphuric acid, which all present hazards to human health. The viscose production process is carried out with strong alkaline or acidic water conditions, so poor treatment of wastewater can have a significant localised impact on water bodies such as lakes and rivers surrounding factories. Pollutants characteristically found in wastewater from viscose production are sulphuric acid, sulphates, sulphur and sulphides, as well as metals (e.g. zinc salts: zinc sulphates and zinc sulfonate cellulose). Inadequately treated wastewater can also contain significant amounts of organic material, which can lead to high levels of chemical oxygen demand (COD). High levels of COD mean less dissolved oxygen available for aquatic organisms, such as fish, resulting in their death.

Impact pathways	Example environmental assets and ecosystem services affected	Guidance to identify impacts
Resource use/replenishment **Water use:** Many stages of the manufacture of apparel are significant users of water, from dyeing to raw material manufacture. Textiles production (including cotton farming) uses around 93 billion cubic metres of water annually, representing 4% of global freshwater withdrawal. Clothing accounts for over two-thirds of this water use. Beyond production, washing clothing using washing machines is estimated to require an additional 20 billion cubic metres of water per year globally.	*Environmental assets:* Water resources Freshwater and subterranean freshwater ecosystems *Ecosystem services:* Water flow regulation Water supply Water purification Biological control Nursery population and habitat maintenance Cultural services	Water use from areas that are under high water stress may impact water supply. Water stress, i.e. a potential lack of water, is expected to be a growing issue in many areas which have significant parts of the textile supply chain as a result of climate change, inefficient use and untreated disposal. In China, for instance, 80%-90% of fabric, yarn and plastic-based fibres are made in water-scarce or water-stressed regions.

Impact pathways	Example environmental assets and ecosystem services affected	Guidance to identify impacts
Resource use/replenishment **Other resource use:** Producing plastic-based fibres for textiles uses an estimated 342 million barrels of oil every year. Polyester is the most widely used fibre in the world, and accounts for roughly half of the overall fibre market and around 80% of synthetics fibre. Polyester alone had a market share of around 57% of global fiber production in 2023, with approximately 71 million tonnes produced. Manmade cellulosics fibers (MMCFs) – including viscose, lyocell, modal, acetate and cupro – are commonly made from wood pulp and have a global production volume of around 7.9 million tonnes. MMCFs had a market share of around 6% in 2023 and this production increased from 6.5 million tonnes in 2020. Viscose is the most important manmade cellulosic, having a market share of roughly 80% of all MMCFs and a production volume of around 6.26 million tonnes in 2023. Like other MMCFs, viscose is mostly derived from pulp from wood, but other raw materials in use or under development include bamboo and agricultural by-products, as well as post-consumer and industrial waste. This also includes upstream mining of minerals for jewellery and accessories production.	*Environmental assets:* Terrestrial and subterranean terrestrial ecosystems Mineral and energy resources Underwater mineral and energy resources Marine (ocean) ecosystems *Ecosystem services:* Soil and sediment retention Biological control Nursery population and habitat maintenance Soil and sediment retention Flood mitigation Cultural services	Synthetic fibres are made out of petroleum, a natural non-renewable resource, thus contributing to its depletion. Synthetic fibre production also requires substantial energy, which further requires non-renewable resources. For the impacts associated with timber and wood pulp for man-made fibre production, refer to the TNFD additional sector guidance for forestry, pulp and paper. Extraction of metals and minerals, as well as oil and gas, also result in a variety of impacts on nature. For more information, refer to the TNFD additional sector guidance for metals and mining and to the TNFD additional sector guidance for oil and gas.

Sources: Canopy (2023) Canopystyle initiative*; Changing Markets Foundation (2017)* Dirty fashion, how pollution in the global textiles supply chain is making viscose toxic*; Ekpo, F.E. (2013)* Influence of heavy metals concentration in three common fish, sediment and water collected within quarry environment, Akamkpa L .G. area, cross river state, Nigeria*; EMF (2017)* A new textiles economy: redesigning fashion's future*; European Environment Agency (2019)* Textiles in Europe's circular economy*; European Environment Agency (2022)* Microplastics from textiles: towards a circular economy for textiles in Europe*; European Investment Bank (2022)* Wastewater as a resource*; Forest Stewardship Council (2023)* Forest friendly fashion: are MMCFs sustainable?*; Global Fashion Agenda and the Boston Consulting Group (2018)* The pulse of the fashion industry 2018*; International Union for Conservation of Nature (IUCN) (2017),* Primary microplastics in the oceans: A global evaluation of sources*; Lin, D. et al. (2020)* Microplastics negatively affect soil fauna but stimulate microbial activity: insights from a field-based microplastic addition experiment*; Mehta, R., and Yadav, K. (2013)* Soil contamination due to textile effluent-case study on the printing cluster of Jaipur*; Panhwar, A. et al. (2024)* Water resources contamination and health hazards by textile industry effluent and glance at treatment techniques: A review*; Planet Tracker (2024)* Ripple effect quantifying water risks in the apparel supply chain*; Muthu, S. S. (2020)* Assessing the environmental impact of textiles and the clothing supply chain*; Textile Exchange (2024)* Materials Market Report*.*

Dependencies

Table 7: Examples of dependency pathways for the apparel, accessories and footwear sector

Business activity	Environmental asset and ecosystem services depended on	Description
Natural fibre and livestock farming for animal-based fibre production	*Environmental assets:* Terrestrial and subterranean terrestrial land-based ecosystems Freshwater ecosystems Marine (ocean) ecosystems Water resources *Ecosystem services:* Nursery population and habitat maintenance Water supply Water purification Rainfall pattern regulation Biological control Soil and sediment retention Flood mitigation Storm mitigation Local and global climate regulation Cultural services	The production of natural fibres requires materials such as cotton, wool, leather, silk, rubber and dyes. Some of these are derived from plants and may rely on pollination, soil health and quality, pest and disease control, flood mitigation and soil and sediment retention to ensure the availability of functioning agricultural land for their production. Livestock farming for animal-based fibres also depends on soil health owing to the plant and animal material required for fodder and fertiliser use. Agricultural processes are further supported by provisioning services such as the supply of clean water and regulating services protecting sites from landslides, floods and storms. The sector is highly dependent on water supply for the mining of raw materials and rainfed crops through regular irrigation. Fabric dyeing is also very dependent on water resources. Where water is sourced from third party providers, that organisation's dependencies on water resources should also be analysed. The use of wild plants and animals for fibres is highly dependent on healthy ecosystems for the provision of services such as soil and sediment retention, nursery population and habitat maintenance, as well as water supply and purification services. The fashion sector is dependent on feedstocks for energy supply as it is a critical input for every step of the fashion value chain.

Business activity	Environmental asset and ecosystem services depended on	Description
Man-made fibre production	*Environmental assets:* Terrestrial and subterranean terrestrial land-based ecosystems Mineral and energy resources Underwater mineral and energy resources Freshwater ecosystems Marine (ocean) ecosystems Water resources *Ecosystem services:* Nursery population and habitat maintenance Water supply Water purification Rainfall pattern regulation Biological control Soil and sediment retention Flood mitigation Storm mitigation Local and global climate regulation Cultural services	The manufacturing process for man-made fibres is a highly water-intensive process and is particularly dependent on water supply for fabric dyeing. Where water is sourced from third-party providers, that organisation's dependencies on water resources should also be analysed. The production of man-made fibres is also dependent on fossil fuels. For instance, conventional polyester – the most widely used fibre worldwide – is made from fossil fuel-based chemicals, the primary raw material of which is crude oil. Other fossil-fuel-derived fibres include nylon, elasthane, polypropylene, polyurethane and acrylic. The manufacturing process is additionally dependent on protection from natural hazards (such as flood protection and erosion control). The fashion sector relies on energy feedstocks throughout its value chain, from growing raw materials to manufacturing processes, retail and consumer washing.

External factors

Organisations should also consider potential external factors that may affect the quantity and quality of environmental assets and ecosystem services they depend on. Climate change is of particular relevance, causing a higher frequency of extreme weather events, such as drought and floods, and affects ecosystem condition, for example, through longer-term changes to rainfall patterns and lowering of water tables. This affects many of the provisioning and regulating ecosystem services that the apparel, accessories and footwear sector depends on, such as soil and sediment retention and water supply. Water shortages as a result of climate change are expected to be a growing issue in many areas that have significant parts of the textile supply chain. This could affect crop yields as well as other activities such as dyeing and tanning.[7] Climate change could also increase the risk of flooding (both riverine and coastal) in many areas, potentially putting workers and factories at risk of inundation and damage.[8]

E3

E3: Dependency and impact measurement

Guiding questions:

What is the scale and scope of our dependencies on nature?

What is the severity of our negative impacts on nature? What is the scale and scope of our positive impacts on nature?

Organisations should refer to the apparel, accessories and footwear metrics in Section 3.

Suggested data sources and approaches for organisations in this sector to estimate impacts on nature include:

- Deforestation: If organisations have supplier geolocation data, they can use Copernicus open source satellite data, Global Forest Watch or another earth observation data platform to quantify the area deforested before and after business activity.
- Nitrogen and phosphorus excess: If farmgate nitrogen and phosphorus balance data are not available, organisations can use global fertiliser sales numbers per crop to estimate nitrogen and phosphorus usage. Our World in Data and FAOSTAT offer access to data on jurisdictional quantities of nitrogen and phosphorus inputs per crop or per quantities of fibre produced. These data sets can be used to create an initial estimate. Alternatively, organisations can use LCA methodologies, as nitrogen emissions are usually considered in life cycle assessments.
- Pesticides: Organisations can use pesticide sales numbers per crop type to create an initial estimate until location-specific data are available.

7 Planet Tracker (2024) Ripple effects – quantifying water risks in the apparel supply chain.

8 Bauer, A. et al. (2023) Higher ground? Report 2: Climate resilience and fashion's costs of adaptation.

- Plastic leakage: Organisations can research whether their products are likely to result in microfibre leakage and follow or participate in initiatives such as the Plastic Footprint Network and the Microfibre Consortium. On packaging, organisations can start by identifying their interface with the top ten rivers that account for plastic in the ocean. Seven of these ten rivers are in the Philippines, two are in India and one is in Malaysia.[9] Organisations can use sales numbers from these high leakage jurisdictions to estimate an impact. If the main landfills where packaging ends up are known, an organisation can use earth observation data such as the Plastic Watch database on landfills to estimate impacts.

Suggested data sources and approaches for organisations in this sector to estimate dependencies on nature include:

- Freshwater: Organisations can use the list of crops with a high freshwater dependency identified in E2 and identify water dependencies for processes such as dyeing, tanning and washing. Organisations can then overlay detailed location data on the catchment area of each crop category or water-intensive operation location, using spatial maps of current levels of water stress to estimate the size of the dependency. Organisations can use data sources such as the open source WRI Aqueduct Food Platform to access water stress spatial maps as well as water risk scores per crop per catchment area. Organisations may engage with the Water Resilience Coalition to build resilience in their own operations and the communities and ecosystems in which they operate where water-stressed basins have been identified.
- Pollination services: Organisations can use pollination dependency ratings for crop categories to classify procured or produced crops into groups of those with a moderate, high or essential dependence on pollinators. Thereafter, organisations can estimate the size of the dependency by the quantity of the crops procured.
- Biodiversity: Organisations can use the Integrated Biodiversity Assessment Tool (IBAT) to identify Key Biodiversity Areas (KBAs), protected areas and conduct site-specific assessments to identify actions that they can implement to deliver positive outcomes for identified areas. Organisations may find it useful to refer to the IUCN Species Threat Abatement and Restoration (STAR) metric. STAR is calculated from data on the distribution, threats and extinction risk of threatened species derived from the IUCN Red List of Threatened Species and can help identify actions that have the potential to bring benefits for threatened species.
- Global and local climate regulation and flood and storm mitigation: Organisations can use the lists of drought, storm and flood-sensitive crop varieties identified in E2 to develop an initial estimate of the size of their dependency on these regulating ecosystem services. For many organisations, this information is already part of the physical climate-related risk data disclosed as part of the IFRS S2 Climate-related Disclosures.

9 Ritchie, H. (2021) Where does the plastic in our oceans come from?

E4 E4: Impact materiality assessment

Guiding question:

Which of the identified impacts are material?

As for all components, refer to the Guidance on the identification and assessment of nature-related issues: The LEAP approach.

List of datasets and tools

The following tools can help organisations in the apparel, accessories and footwear sector with the Evaluate phase of LEAP, in addition to those listed in the cross-sector LEAP guidance. Organisations should also reference tools in the TNFD Tools Catalogue.

- ZDHC Roadmap to Zero
- Textile Exchange – Materials Impact Explorer
- eQosphere by Quantis, which includes the World Apparel & Footwear Life Cycle Assessment Database
- Cascale Higg Materials Sustainability Index
- Textile Exchange – Preferred Fiber and Materials Matrix
- Textile Exchange Regenerative Agriculture Outcome Framework
- Our World in Data – Total nitrogen used per crop
- FAO guidelines to quantitatively assess biodiversity impacts of livestock
- Polymer prioritisation framework
- Accountability Framework Initiative (AFI) Guidance on deforestation-free sourcing
- Plastic Footprint Network

2.4. Assess nature-related risks and opportunities

This section provides additional guidance to help apparel, accessories and footwear sector organisations with the Assess phase of the LEAP approach.

A1 A1: Risk and opportunity identification

Guiding question:

What are the corresponding risks and opportunities for our organisation?

Table 8 provides a list of illustrative nature-related physical and transition risks for the apparel, accessories and footwear sector.

Risks

Table 8: Illustrative nature-related risks for the apparel, accessories and footwear sector

Risk type		Illustrative risk in the apparel, accessories and footwear sector	Magnitude indicator
Physical, transition or systemic-type risk	Risk category		
Physical risk	Acute risk	Landslides as a result of declining soil stability damage infrastructure. Increased risk of damage from floods and storms if protective terrestrial ecosystems are degraded. Wildfires, tropical cyclones, extreme heat and other extreme weather events damage infrastructure or interrupt business activities. Decreased precipitation resulting in the disruption of water flows, affecting a number of processes (e.g. dyeing, washing). Droughts affect agricultural production.	Increased operational costs due to interruption of operations/ supply chain, including reduced productivity. Increased closure and rehabilitation costs (degradation in soil quality, insufficient material balance). Write-offs and early retirement of existing business assets. Decline in value of business assets due to availability of natural resources that may sustain continuity. Increased insurance costs.

Risk type		Illustrative risk in the apparel, accessories and footwear sector	Magnitude indicator
Physical, transition or systemic-type risk	**Risk category**		
Physical risk	Chronic risk	Changes in regulating and maintenance ecosystem services (e.g. water purification, waste remediation). Changes in weather patterns that may affect the availability of water for crops and production processes. Decrease in the supply of natural inputs (timber, cotton) for materials production. Changes in the quality of natural inputs for materials production, e.g. climate change can negatively affect cotton fibre length.[10] Increase in the amount of microplastics in the waterways and oceans due to the regular washing of synthetic or blended fabrics. Genetic modification technologies, while potentially able to deliver efficiency and productivity gains, carry risks to biodiversity if not appropriately managed. Depleted aquifers (underground water reserves) caused by intensive groundwater pumping for irrigation pose a threat to biodiversity and to the availability of water supply to grow essential crops (e.g. cotton).[11] Decreases in water quality if runoff includes fertilisers, pesticides and livestock effluents that pollute waterways and groundwater.	Increased capital expenditure on adaptation (e.g. mechanical or hand pollination). Reduction in revenue due to interruptions of operations/supply chain. Restoration costs.

10 Dai, Y. et al. (2017) Simulative global warming negatively affects cotton fiber length through shortening fiber rapid elongation duration.

11 Textile Exchange (2023) Biodiversity landscape analysis.

Risk type		Illustrative risk in the apparel, accessories and footwear sector	Magnitude indicator
Physical, transition or systemic-type risk	**Risk category**		
Transition risk	Policy and legal	Changes to legislation/regulation aimed at achieving nature-positive outcomes (trade restrictions, taxes), leading to more stringent nature-related reporting obligations. Regulatory risks from potential changes to water costs, access rights or social license to operate.[12]	Increased costs of operations, inputs, personnel and monitoring of activities required. Increased compliance costs. Clean up costs.
Transition risk	Market	Shifting customer/investor values or preferences to fashion products and/or services that help avoid and reduce negative impacts on nature and contribute to nature-positive outcomes. Changes to costs of materials. Decline in brand and value proposition due to nature performance being perceived as worse than competitors.	Reduction in revenue due to lower demand for products and services. Loss of market share and investor goodwill. Costs related to substituting existing products and services.
Transition risk	Reputational	Reputational risks from adverse coverage of a brand's water impacts.[13] Reputational risks due to declines in water availability, as crops such as cotton are seen as competing with food crops for land. Reputational risks due to soil degradation caused by conventional cotton cultivation.	Reduction in revenue due to brand's issues causing lower demand for products and services.

12 Planet Tracker (2024) Ripple effects – quantifying water risks in the apparel supply chain.

13 Planet Tracker (2024) Ripple effects – quantifying water risks in the apparel supply chain.

Opportunities

Table 9: Illustrative nature-related opportunities for the apparel, accessories and footwear sector

Opportunity type	Illustrative opportunity in the apparel, accessories and footwear sector	Magnitude indicator
Ecosystem restoration, protection and regeneration	Implementation of nature-based solutions. Regenerative production practices used on depleted land have the potential to improve the condition of ecosystems and sequester carbon. Investment in natural flood management activities upstream of quarries, extraction areas or roads to prevent flooding of the organisation's assets. Direct and indirect restoration and conservation of ecosystems, habitats and species. Integrated multi stakeholder action at land and jurisdictional scale. Protection, conservation and sustainable use and management of threatened species.	Restoration of areas of degraded land. Improvement in ecosystem extent and condition and species abundance and extinction risk. Transmission mechanisms to business performance benefits through reputational capital leading to increased capital flow and financing.

Opportunity type	Illustrative opportunity in the apparel, accessories and footwear sector	Magnitude indicator
Resource efficiency	Transition to processes with increased positive impacts on nature, including those with increased efficiency and reduced resource extraction (water, timber, plants). Transition to efficient and circular production systems and value chains. Circular design approaches include: • During use – durability/longevity, reusability, repairability; and • End of use – disassembly, design for remanufacture/refurbishment, recyclability, compostability.[14] Diversification of use of nature-related resources. The need for virgin resources is minimised by increasing the use of existing products and materials. Transition to next-generation materials containing agricultural residue, pre and post-consumer waste or other innovative sources (e.g. fungi, bacteria, CO_2).	Reduced exposure to raw material and natural resource price volatility. Increased market valuation through resilience planning. Tax benefits for certifications. Increased resilience to reduction in availability of natural resources.

14 EMF (2022) Circulytics indicators, see Circulytics indicator 6d, p30.

Opportunity type	Illustrative opportunity in the apparel, accessories and footwear sector	Magnitude indicator
Products and services	Use of owned or managed environmental assets to create or enhance ecosystem services that may be monetised (e.g. natural flood risk management). Resource efficient products, circular production systems, nature-based solutions and business models that benefit nature (e.g. sustainable wild plant collection, regenerative agriculture). The creation of new clothing rental models such as subscription models or personal shopper experiences taking changing customer needs into consideration – examples include short-term use, practical requirements or fast evolving fashion preferences. The transition to innovative resale models and partnerships to make resale attractive to a wide range of customers and capture the value of the increasing average quality and durability of clothing on the market. Indeed, resale has grown 21 times faster than retail over the past five years and 56 million women bought second-hand products in 2018, up from 44 million in 2017.[15] The introduction of more clothing care services, such as garment restyling or consulting; advice on upgrades, customisation and at home mending; repair and other services in-store; and the formation of partnerships with repair and restyle providers based in local communities.	Increased resilience due to business diversification. Reduced costs of raw materials and production inputs. Increased market valuation through resilience planning.

15 EMF (2019) Fashion and the circular economy – deep dive.

Opportunity type	Illustrative opportunity in the apparel, accessories and footwear sector	Magnitude indicator
	The introduction of new sales models such as order by demand or just in time manufacturing to reduce stocks. The potential for using ocean waste as raw material; as well as alternative natural resources (such as algae) for clothing and accessories production. Utilising materials from the oceans can represent a blue business opportunity, acknowledging the fact that the blue economy can facilitate value creation through sustainable practices that benefit both businesses and the environment.	
Reputational capital	Collaborative engagement with stakeholders at local, national and international levels, including Indigenous Peoples and Local Communities. Actions that create positive changes in sentiment towards the organisation/ brand due to positive impacts on environmental assets and ecosystem services that have impacts on society and local economic capabilities.	Increase in revenue due to improved reputation. Increase in brand value. Reduced costs due to engagement of suppliers and stakeholders.
Sustainable use of natural resources	Reuse and recycling of natural resources, including opportunities for the increase in recycled fibres for apparel manufacture. Certification for projects, products and services.	Reduced resource extraction, pollution and waste. Through redesign, materials or substances that would become waste are eliminated, become feedstock for another production process, or are safely returned to the biosphere. Transmission mechanisms to business performance benefits through reputational capital leading to increased capital flow and financing.

A2

A2: Adjustment of existing risk mitigation and risk and opportunity management

Guiding questions:

What existing risk and opportunity management processes and elements are we already applying?

How can risk and opportunity management processes and associated elements (e.g. risk taxonomy, risk inventory and risk tolerance criteria) be adapted?

As for all components, refer to the Guidance on the identification and assessment of nature-related issues: The LEAP approach.

A3

A3: Risk and opportunity measurement and prioritisation

Guiding question:

Which risks and opportunities should be prioritised?

Organisations should consider the following dependencies that may create material nature-related risks and opportunities for this sector as examples:

- Soil degradation in connection with cotton;
- Water availability in countries with high water stress, for both crops (where irrigated) and processing, in connection with availability, cost increases, and reputational risks and opportunities; and
- Any other material nature-related risks or opportunities arising from the organisation's impacts and dependencies on nature.

A4

A4: Risk and opportunity materiality assessment

Guiding question:

Which risks and opportunities are material and therefore should be disclosed in line with the TNFD recommended disclosures?

As for all components, refer to the Guidance on the identification and assessment of nature-related issues: The LEAP approach.

2.5. Prepare to respond and report

This section provides additional considerations to help apparel, accessories and footwear sector organisations with the Prepare phase of the LEAP approach.

The Kunming-Montreal Global Biodiversity Framework (GBF) aims to "halt and reverse biodiversity loss" by 2030, envisioning "a world living in harmony with nature" by 2050. Achieving this implies a transition which will require significant business changes across sectors. The Taskforce on Nature-related Financial Disclosures (TNFD) has published a draft guidance to help organisations develop and disclose nature transition plans. These plans provide a structured way to manage responses and contributions to this transition, starting with key priorities and expanding over time as understanding improves, such as through a LEAP assessment. The LEAP Prepare phase provides initial guidance for addressing dependencies, impacts, risks, and opportunities, laying the groundwork for a nature transition plan.

P1 P1: Strategy and resource allocation plans

Guiding question:

What risk management, strategy and resource allocation decisions should be made as a result of this analysis?

Table 10 maps a non-exhaustive list of actions in the apparel, accessories and footwear sector based on TNFD's interpretation of the Science Based Targets Network's AR3T framework (and pending alignment with future development of SBTN's Step 4 guidance), which covers mitigation hierarchy principles when determining responses to identified nature-related issues.

Figure 5: SBTN's AR3T framework

Table 10: Illustrative priority and transformative actions for the apparel, accessories and footwear sector mapped to the AR3T framework

Impact driver	Example of response actions	Global framework alignment	SBTN action framework (AR3T)				
			Avoid	Reduce	Regenerate	Restore	Transform
Climate change	Refer to the SBTi Forest, land and agriculture (FLAG) science-based target setting Guidance.	SBTi FLAG Guidance					
Land-use change	For new developments, avoid all protected areas, internationally recognised areas, critical habitat (including but not limited to Natura 2000 sites or geography-specific equivalent network or standard) and areas with the potential to become protected by countries under updated National Biodiversity Strategies and Action Plans (NBSAPs).						
	Implement policies and commitments to reduce or eliminate agricultural-driven natural ecosystem conversion with specified targets and cut-off dates for the organisation's own production, sourcing of animal feed and products sourced for aggregation, processing or trade. For example, set zero deforestation targets for no later than 2020 in accordance with the Accountability Framework Initiative, or for leather, abide by the Deforestation-Free Call to Action for Leather and commit to sourcing bovine leather from deforestation/ conversion-free supply chains by 2030 or earlier.	GRI 13, (2022); SBTN targets for Land; SBTi FLAG Guidance; TNFD additional sector guidance for food and agriculture; Deforestation-Free Call to Action for Leather.					

Impact driver	Example of response actions	Global framework alignment	SBTN action framework (AR3T)				
			Avoid	Reduce	Regenerate	Restore	Transform
Land-use change	Create a soil management plan that identifies the main threats to soil health, describes soil management practices used and outlines an approach to input optimisation, including the use of fertilisers.	GRI 13 (2022); TNFD additional sector guidance for food and agriculture.					
	Establish a plan with time-bound targets to reduce excess fertiliser use intensity per fertiliser nutrient type (N, P2O5, K2O) with an open methodology for the specific production system.	FAO (2021); related to GBF target 7; TNFD additional sector guidance for food and agriculture.					
	Invest in precision technologies to increase nutrient use efficiency and decrease runoff and eutrophication, as well as technologies for nutrient recycling and organic fertilisers.	TNFD additional sector guidance for food and agriculture.					

Impact driver	Example of response actions	Global framework alignment	SBTN action framework (AR3T)				
			Avoid	Reduce	Regenerate	Restore	Transform
Land-use change	Invest in pesticide efficiency technologies and environmentally friendly pest control.	FAO (2021); TNFD additional sector guidance for food and agriculture.					
	Develop and adhere to an Integrated Pest Management Plan, in line with best practices from the International Code of Conduct on Pesticide Management, to prevent, mitigate and remediate negative impacts associated with the use of hazardous pesticides and excess pesticide use. Phase out pesticides listed on the Pesticide Action Network's List of Highly Hazardous Pesticides (HPP).	FAO (2021); TNFD additional sector guidance for food and agriculture.					
	Support developments of nature-based solutions for water quality and flood risk management in river catchments containing the organisation's operations. Support other nature restoration projects in the organisation's areas of influence.	Business for Nature (2023) Fashion and apparel: Priority actions towards a nature-positive future.					

Impact driver	Example of response actions	Global framework alignment	SBTN action framework (AR3T)				
			Avoid	Reduce	Regenerate	Restore	Transform
Land-use change	Invest in rewilding/regeneration initiatives, such as natural vegetation in cropped landscapes, rewilding, flower strips and tree cover on crop land.	TNFD additional sector guidance for food and agriculture.					
	Increase fibre value by branding its geographic origin and its regenerative landscape management practices, similar to food and its ingredients.	Textile Exchange (2023) Regenerative Agriculture Outcome Framework.					
	Implement strategies to manage the use of genetically modified organisms (GMOs).	SASB Standards (2018) Agricultural Products.					
Resource use/ replenishment: water use	Illustrative examples of quantifiable, actionable and time-bound targets: • Substantially increase water-use efficiency across processes, with specified targets and cut-off dates. • Reduce water use in high water impact parts of the value chain with specified targets and cut-off dates. • Increase water reuse by treating and recycling wastewater generated during production processes for non-potable purposes such as cleaning or irrigation, or by implementing rainwater harvesting systems.	SBTN (2024) Freshwater technical guidance; Business for Nature (2023) Fashion and apparel: Priority actions towards a nature-positive future.					

Impact driver	Example of response actions	Global framework alignment	SBTN action framework (AR3T)				
			Avoid	Reduce	Regenerate	Restore	Transform
Resource use/ replenishment	Improve transparency on substances used in production processes to increase accountability for the materials used to make products, demonstrate the health of supply chains and reduce reputational risk. Examples of validation include, but are not limited to: • The Global Recycled Standard (GRS); and • The Recycled Claim Standard (RCS).	Ellen MacArthur Foundation (2023) The Jeans Redesign Insights Report 2021 – 2023.					
	Adopt responsible sourcing practices for man-made cellulosic fibres (MMCFs) by emphasising the importance of sustainable forest management.	FSC (2023) Forest friendly fashion: are MMCFs sustainable?; FSC (2020) FSC in Fashion; PEFC (2023) Enhancing Sustainability through Forest-Positive MMCF Sourcing: A Guide for Fashion Brands and Retailers.					

Impact driver	Example of response actions	Global framework alignment	SBTN action framework (AR3T)				
			Avoid	Reduce	Regenerate	Restore	Transform
Resource use/ replenishment	Organisations can follow the Ellen MacArthur Foundation's principles on the **waste hierarchy**, where keeping products in use through rental, repair, reuse and remaking activities, should be prioritised over recycling.[16] When designing products, follow c**ircular economy principles**,[17] such as: **In the use phase:** Designed for **maintenance, longevity and durability** in such a way that encourages longer use than the industry standard in practice and at scale (e.g. marketing repair rather than replacement, timeless design with durable material choices) and in such a way that does not compromise circular treatment at the end of functional life; Designed for **reusability** in such a way that ensures actual reuse in practice and at scale (e.g. secondary markets, packaging reuse systems, standardised design); and Designed for **repairability** in such a way that uses existing systems for repair in practice and at scale (e.g. network of repair shops or own repair service).	OECD Circular economy – waste and materials; Business for Nature (2023) Fashion and apparel: Priority actions towards a nature-positive future; Ellen MacArthur Foundation (2020) Vision for a circular economy for Fashion;					

16 The waste hierarchy is illustrated by the OECD Circular economy – waste and materials and EMF (2021) The butterfly diagram: visualising the circular economy.

17 EMF (2022) Circulytics indicators, Circulytics indicator 6d p30.

Impact driver	Example of response actions	Global framework alignment	SBTN action framework (AR3T)				
			Avoid	Reduce	Regenerate	Restore	Transform
Resource use/ replenishment	Examples of design choices include modular design; built in predictive maintenance sensors, repair diagnostics; designs with right to repair by third parties; designs for remanufacturing; using standardised components across a sector. **At the end of functional life:** Designed for **disassembly** (e.g. product-component passports, modular design, reversible connections); Designed for **remanufacturing/refurbishment** (e.g. modular design); Designed for **recycling** (e.g. low materials complexity, low toxicity, ease of separating materials), in such a way that uses existing recycling systems that operate in practice and at scale; and Designed for **nutrient recirculation** that meets the qualifying conditions[18] (e.g. composting and anaerobic digestion) in such a way that uses systems in practice and at scale.	Ellen MacArthur Foundation (2022) Circulytics indicators; Ellen MacArthur Foundation (2023) The Jeans Redesign Insights Report 2021 – 2023.					

18 See Circulytics indicator 6d p.31 for the qualifying conditions. EMF (2022) Circulytics indicators

Impact driver	Example of response actions	Global framework alignment	SBTN action framework (AR3T)				
			Avoid	Reduce	Regenerate	Restore	Transform
Resource use/ replenishment	Make business models that keep products in use at their highest value – like rental and recommerce – the norm across the industry, decoupling its economic development from resource consumption. Adopt business models and partnerships such as short-term clothing rental models, resale models and clothing care models. Examples include garment restyling or consulting; advice on upgrades, customisation and at home mending; repair and other services in-store; and the formation of partnerships with repair and restyle providers based in local communities.	Ellen MacArthur Foundation (2020) Vision for a circular economy for Fashion; Business for Nature (2023) Fashion and apparel: Priority actions towards a nature-positive future.					
	Ensure all products that are made are used – excess inventory should be minimised and never destroyed.	Ellen MacArthur Foundation (2020) Vision for a circular economy for Fashion; Business for Nature (2023) Fashion and apparel: Priority actions towards a nature-positive future.					

Impact driver	Example of response actions	Global framework alignment	SBTN action framework (AR3T)				
			Avoid	Reduce	Regenerate	Restore	Transform
Resource use/ replenishment	Empower users and customers with the necessary knowledge, tools and services to maintain the physical and emotional appeal of their products.	Ellen MacArthur Foundation (2020) Vision for a circular economy for fashion; Business for Nature (2023) Fashion and apparel: Priority actions towards a nature-positive future.					

Impact driver	Example of response actions	Global framework alignment	SBTN action framework (AR3T)				
			Avoid	Reduce	Regenerate	Restore	Transform
Resource use/ replenishment	Contribute to the support of infrastructure to ensure the organisation's products are collected and reused, remade or recycled in practice. Invest in shared infrastructure that allows for the recirculation of materials after maximum use. For example, invest in reverse logistics infrastructure and long-term sourcing agreements with recyclers.	Ellen MacArthur Foundation (2020) Vision for a circular economy for fashion; Ellen MacArthur Foundation (2024) Pushing the boundaries of EPR policy for textiles; Business for Nature (2023) Fashion and apparel: Priority actions towards a nature-positive future.					

Impact driver	Example of response actions	Global framework alignment	SBTN action framework (AR3T)				
			Avoid	Reduce	Regenerate	Restore	Transform
Resource use/ replenishment	Invest in shared infrastructure that allows for the recirculation of materials after maximum use. For example, investment in reverse logistics infrastructure and long-term sourcing agreements with recyclers.	Ellen MacArthur Foundation (2024) Pushing the boundaries of EPR policy for textiles.					
	Review best practices with regards to water stewardship for industries other than your own organisation. This encourages cross industry learning and collaboration.	Ceres (2023) Valuing Water Finance Initiative benchmark.					
	Illustrative examples of quantifiable, actionable and time-bound targets: • Set specified targets and cut-off dates to reduce extinction threat to species; • Avoid sourcing from areas of high species extinction risk; • Support these species' restoration.	TNFD; SBTN (2023) Step 3: Land technical guidance (Version 0.3).					

Impact driver	Example of response actions	Global framework alignment	SBTN action framework (AR3T)				
			Avoid	Reduce	Regenerate	Restore	Transform
Pollution removal: Soil and water pollutants	Adopt collaborative industry-led practices such as ZDHC's Roadmap to Zero to eliminate harmful chemicals from fashion's global value chain, that include: The ZDHC Man-Made Cellulosic Fibres (MMCF) Guidelines, which support the MMCF supply chain in implementing industry best practices in sustainable chemical management, wastewater and air emissions, detailing performance criteria to monitor progress and track continuous improvement; The ZDHC Manufacturing Restricted Substance List (MRSL), which provides a continually updated list of harmful substances. This restricts the intentional use of harmful substances and enables the manufacturing processes in the apparel, textile, leather and footwear industries to switch to safer, more sustainable alternatives, using the ZDHC Gateway.	EMF (2017) A new textiles economy: redesigning fashion's future; ZDHC Wastewater Guidelines; AFRIM Restricted Substances List.					

Impact driver	Example of response actions	Global framework alignment	SBTN action framework (AR3T)				
			Avoid	Reduce	Regenerate	Restore	Transform
Pollution removal: Soil and water pollutants	The ZDHC Wastewater Guidelines, which set a single, globally unified expectation across the apparel, textile, leather and footwear industry supply chain for industrial wastewater and sludge. They define the guidelines for wastewater discharge, sludge quality and disposal pathways. The ZDHC Chemical Management System (CMS) Framework, which provides the apparel, textile, leather and footwear industry with a set of best practices and requirements for sustainable chemical management within the supply chain. The Apparel and Footwear International RSL Management (AFIRM) Group additionally lists restricted substances found in finished products – AFRIM Restricted Substances List. Larger brands often have their own Restricted Substance List (RSL), but harmonisation and the adoption of a common RSL and MRSL could more rapidly eliminate the most hazardous substances by simplifying the requests placed on manufacturers.	Business for Nature (2023) Fashion and apparel: Priority actions towards a nature-positive future.					

Impact driver	Example of response actions	Global framework alignment	SBTN action framework (AR3T)				
			Avoid	Reduce	Regenerate	Restore	Transform
Pollution removal: Soil and water pollutants	Improve transparency on chemicals used across the supply chain to help phase out the most polluting substances.	EMF (2017) A new textiles economy: redesigning fashion's future; Business for Nature (2023) Fashion and apparel: Priority actions towards a nature-positive future.					
	Raw material production practices and supply chains should optimise the use of water, energy, chemicals and materials.	TNFD additional sector guidance for food and agriculture.					

Impact driver	Example of response actions	Global framework alignment	SBTN action framework (AR3T)				
			Avoid	Reduce	Regenerate	Restore	Transform
Pollution removal: Soil and water pollutants	Production (including inputs used during manufacturing and processing) should be decoupled from the use of finite resources. Preferentially source and use non-virgin material and, where not possible, renewable and regeneratively sourced virgin materials.	Ellen MacArthur Foundation (2020) Vision for a circular economy for Fashion; Business for Nature (2023) Fashion and apparel: Priority actions towards a nature-positive future.					
Pollution removal: Plastic pollution	Engage with and adopt tools developed by the Microfibre Consortium.	The Microfibre Consortium.					

Impact driver	Example of response actions	Global framework alignment	SBTN action framework (AR3T)				
			Avoid	Reduce	Regenerate	Restore	Transform
Pollution removal: Plastic pollution	Research and investigate the release of microfibres in waterways during the use phase of products and explore and implement mitigation actions and/or alternative materials accordingly. Eliminate the use of hazardous materials in products and production practices, and prevent microfibres from being released in the environment either by design or collection.	TNFD; Ellen MacArthur Foundation (2020). Our vision of a circular economy for fashion.					
	Align with the Ellen MacArthur Foundation's Global Commitment on plastics with any of the following measurable targets: • Set specified targets and cut-off dates to decrease the use of virgin plastic in packaging (weight of undertakings' virgin plastic packaging in million metric tonnes (MMT)). • Set specified targets and cut-off dates for ensuring 100% of the organisation's plastic packaging is reusable, recyclable or compostable. • Set specified targets and cut-off dates to increase the share of post-consumer recycled content across all packaging used. • Set specified targets and cut-off dates to eliminate all problematic or unnecessary plastic packaging.	Ellen MacArthur Foundation's Global Commitment on plastics.					

Impact driver	Example of response actions	Global framework alignment	SBTN action framework (AR3T)				
			Avoid	Reduce	Regenerate	Restore	Transform
Pollution removal: soil pollutants	Drive collective innovation efforts to develop and scale safe material products and production processes, free from unrecommended chemicals.						
	Design innovative business models to improve end-of-life prospects of apparel, textiles and accessories, such as in-store repair offers, recycling models and waste management strategies.	Ellen MacArthur Foundation (2020) Vision for a circular economy for Fashion.					
	Encourage a move towards sustainable agriculture across the value chain: create a soil management plan that identifies main threats to soil health, describes soil management practices used and outlines an approach to input optimisation, including the use of fertilisers.	TNFD additional sector guidance for food and agriculture					
	Establish a plan with time-bound targets to reduce excess fertiliser use intensity per fertiliser nutrient type (N, P_2O_5, K_2O) with an open methodology for the specific production system.	TNFD additional sector guidance for food and agriculture					
	Invest in precision technologies to increase nutrient use efficiency and decrease runoff and eutrophication, as well as technologies for nutrient recycling and organic fertilisers.	TNFD additional sector guidance for food and agriculture					

Box 2: The circular economy

The Ellen MacArthur Foundation describes the three principles of a circular economy:[19]

1. **Eliminate waste and pollution**
   Substances that are of concern to health or the environment are designed out and no pollutants such as plastic microfibres are inadvertently released into the environment and ocean. With a focus on design, the concept of waste can be eliminated. Many products could be circulated by being maintained, shared, reused, repaired, refurbished, remanufactured, and, as a last resort, recycled. This also means adopting reusable packaging or using less packaging
2. **Circulate products and materials at their highest value**
   This means keeping materials in use, either as a product or, when the product can no longer be used, as components or raw materials, which eliminates the production of waste and retains the intrinsic value of products and materials.
   Circular business models require accelerating necessary systems-level action and infrastructure to keep products in use. It could include business models based on sharing, so users get access to a product rather than owning it and more people get to use it over time. It could involve reuse through resale. It could mean cycles of maintenance, repair and refurbishment.
3. **Regenerate nature**
   By shifting the economy from linear to circular, the focus is shifted from extraction to regeneration. Instead of continuously degrading nature, natural capital should be built up. The aim is to adopt farming practices that allow nature to rebuild soils, increase biodiversity and return biological materials to the earth.

P2

P2: Target setting and performance management

Guiding question:

How will we set targets and define and measure progress?

As for all components, refer to the Guidance on the identification and assessment of nature-related issues: The LEAP approach, which includes additional guidance on target setting in this component P2.

Organisations may wish to refer to the target setting methods developed by the SBTN and the summary guidance on SBTN's methods for setting science-based targets for nature, which the TNFD has co-developed.

19 Ellen MacArthur Foundation (n.d.) Circular economy principles.

Apparel, accessories and footwear sector organisations wishing to set targets may find it useful to consider:

- World Economic Forum's five priority transformative actions that fashion companies can implement to effectively reduce their dependencies and impacts on nature.
- Setting freshwater targets aligned to the SBTN Freshwater science-based targets.
  - Water quantity (focused on water withdrawals)
  - Water quality (focused on nutrient loading)
- Setting land science-based targets aligned to the SBTN Land science-based targets:
  - No conversion of natural ecosystems;
  - Land footprint reduction; and
  - Landscape engagement.
- Setting targets to reduce negative and increase positive impacts on biodiversity. Companies can use SBTN's Biodiversity short paper to address biodiversity within science-based targets for nature. The document introduces a forthcoming detailed analysis of biodiversity coverage in the first release of science-based targets for nature, which will inform the development of further SBTN methods.

P3 P3: Reporting

Guiding question:

What will we disclose in line with the TNFD recommended disclosures?

As for all components, refer to the Guidance on the identification and assessment of nature-related issues: The LEAP approach.

Additionally, when considering international interoperability throughout their disclosure process, organisations may find it helpful to refer to the following documents:

- TNFD – European Financial Reporting Advisory Group (EFRAG) Correspondence Mapping; and
- TNFD – Global Reporting Initiative (GRI) Standards Interoperability Mapping.

P4 P4: Presentation

Guiding question:

Where and how do we present our nature-related disclosures?

As for all components, refer to the Guidance on the identification and assessment of nature-related issues: The LEAP approach.

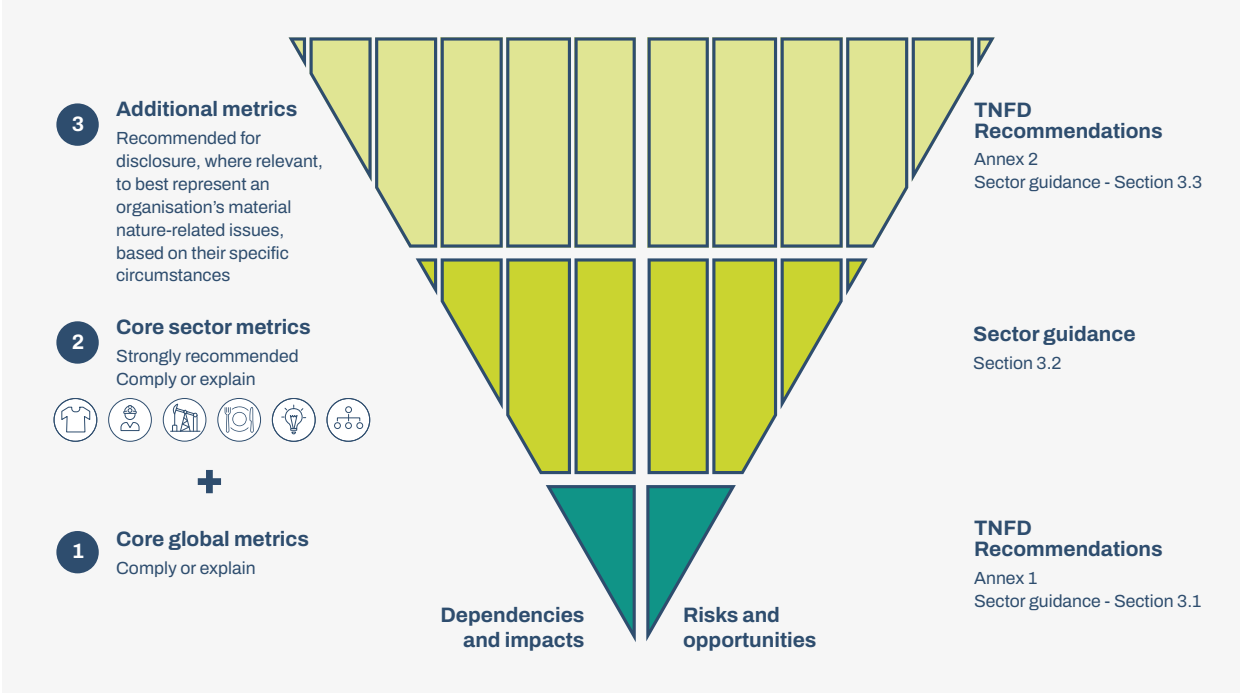
3. Sector-specific disclosure metrics and related guidance – apparel, accessories and footwear

Sector-specific metrics form an important part of the TNFD's measurement architecture (see Figure 6). This reflects the diversity of business models across value chains and their interface with nature across and within sectors. Sector-specific metrics help financial institutions to compare organisations within the same sector, which often face similar nature-related issues.

This section provides the TNFD sector-specific metrics for the apparel, accessories and footwear sector. It includes:

- Guidance on the application of the core global disclosure indicators and metrics to the apparel, accessories and footwear sector (Section 3.1); and
- Core and additional disclosure indicators and metrics for the apparel, accessories and footwear sector (Sections 3.2 and 3.3).

Figure 6: TNFD disclosure measurement architecture



Where available, the TNFD's recommended metrics for disclosure draw from a range of existing standards and frameworks including the IFRS Sustainability Disclosure Standards, Sustainability Accounting Standards Board (SASB) Standards (now the responsibility of the International Sustainability Standards Board (ISSB)), GRI Standards, the CDP disclosure platform, the Kunming-Montreal Global Biodiversity Framework and other relevant UN frameworks, ESRS and others. A number of organisations, including standard-setting organisations, continue to work on identifying relevant sector-level assessment and reporting metrics. The Taskforce recommends that report preparers stay engaged with year-on-year progress on these developments and implement the latest definitions within their risk management processes and disclosures. The TNFD is working closely with standard-setting organisations and others and will periodically update this guidance on recommended sector metrics for disclosure in line with these ongoing initiatives.

Organisations in the apparel, accessories and footwear sector should refer to Annex 1 of the TNFD recommendations for further information on the core global disclosure metrics. As outlined in the TNFD recommendations, core global disclosure metrics should be reported on a comply or explain basis, with the exception of the placeholder metrics.

Where organisations are unable to report against any of the core global metrics, they should provide a short explanatory statement as to why they have not reported those metrics. An organisation should report on the core global disclosure metrics unless:

- It has not been identified as relevant and material to the organisation, e.g. not relevant to business activities or the location the organisation is operating in, or not found to be a material issue for the organisation; or
- It has been identified as relevant and material, but the organisation is unable to measure it due to limitations with methodologies, access to data or because the information is commercially sensitive. In this case, organisations should explain how they plan to address this in future reporting periods.

Companies should report on the same basis for the core sector disclosure metrics outlined in Section 3.2.

Organisations are also encouraged to draw on the TNFD additional sector disclosure indicators and metrics outlined in Section 3.3 and any other relevant metrics to represent most accurately the organisation's nature-related dependencies, impacts, risks and opportunities.

3.1. Guidance on the application of the core global disclosure metrics

This section provides guidance, where relevant, on how to apply the TNFD core global disclosure metrics in the apparel, accessories and footwear sector. If no further sector specific guidance is provided, organisations should refer to the core global disclosure metrics.

As outlined above, core global disclosure metrics should be reported on a comply or explain basis following the guidance for the apparel, accessories and footwear sector where provided.

For the placeholder indicators on invasive alien species and the state of nature, the TNFD encourages organisations to consider and report against these indicators where possible, but these are not expected on a comply or explain basis. There are not yet widely accepted metrics for these indicators, but the Taskforce recognises their importance and will continue to work with knowledge partners to develop further guidance on these metrics.

Companies applying the SBTN methods to set SBTs for Nature will be required to use mostly the same indicators as recommended by TNFD. In some instances, additional data may be required or recommended by SBTN to set and implement targets.

Table 11: Guidance on the application of the core global disclosure metrics

Driver of nature change:	Metric no.	Core global indicator	Core global metric	Guidance for the sector	Source
Climate change		GHG emissions	Refer to IFRS S2 Climate-related Disclosures.	No further guidance.	IFRS
Land/ freshwater/ ocean-use change	C1.0	Total spatial footprint	Total spatial footprint (km^2) (sum of): • Total surface area controlled/ managed by the organisation, where the organisation has control (km^2); • Total disturbed area (km^2); and • Total rehabilitated/restored area (km^2).	In reporting the total surface area controlled/managed (km^2), an organisation should include areas sourced from (km^2).	TNFD

Driver of nature change:	Metric no.	Core global indicator	Core global metric	Guidance for the sector	Source
Land/ freshwater/ ocean-use change	C1.1	Extent of land/ freshwater/ ocean-use change	Extent of land/freshwater/ocean-use change (km^2) by: • Type of ecosystem;[20] and • Type of business activity.	In reporting this core global disclosure metric, an organisation should include: • Agriculture-driven terrestrial natural ecosystem conversion, including, at least, conversion of primary forests, other naturally regenerating (second-growth) forests, savannahs, grasslands and freshwater natural ecosystems, linked to land owned, leased, operated, financed or sourced from; and • Natural ecosystem conversion driven by other activities for fibre production e.g. oil extraction, including, at least, conversion of primary forests, other naturally regenerating (second-growth) forests and freshwater natural ecosystems, linked to land owned, leased, operated, financed or sourced from. An organisation should refer to the TNFD Glossary for definitions of forest, conversion, deforestation and plantation forests. An organisation may provide information additional to the IUCN Global Ecosystem Typology (GET) to define the type of ecosystem they refer to, such as regional or local classifications.	TNFD Food and agriculture metrics

20 When disclosing on ecosystem types, refer to the International Union for Conservation of Nature Global Ecosystem Typology.

Driver of nature change:	Metric no.	Core global indicator	Core global metric	Guidance for the sector	Source
Land/ freshwater/ ocean-use change	C1.1	Extent of land/ freshwater/ ocean-use change	Extent of land/freshwater/ocean ecosystem conserved or restored (km^2), split into: • Voluntary; and • Required by status or regulators.	In reporting this core global disclosure metric, an organisation should include area of forest, wetland, savannah and grassland conserved and/or restored/reforested/rewetted in direct operations or in the supply chain of the organisation, noting if it is in a way that is likely beneficial to wildlife (e.g. with native plantations). An organisation should report area conserved and restored separately, if data is available.	TNFD Food and agriculture metrics
			Extent of land/freshwater/ocean ecosystem that is sustainably managed (km^2) by: Type of ecosystem;[21] and Type of business activity.	In reporting this core global disclosure metric, an organisation should include: • The area covered by landscape-level initiatives that the company contributes to, including the financial contribution of the company; and • The area managed or sourced from that deploys practices with measurable regenerative outcomes, including the definition of regenerative used for disclosure. Regenerative practices may be considered to have started when a baseline has been undertaken for the organisation to track regeneration of environmental assets.	TNFD Food and agriculture metrics

21 When disclosing on ecosystem types, refer to the International Union for Conservation of Nature Global Ecosystem Typology.

Driver of nature change:	Metric no.	Core global indicator	Core global metric	Guidance for the sector	Source

Pollution/ pollution removal	C2.0	Pollutants released to soil split by type	Pollutants released to soil (tonnes) by type, referring to sector specific guidance on types of pollutants.	In reporting this core global disclosure metric in direct operations and upstream, an organisation should include the following pollutants:
				• Pesticides used by toxicity hazard level (either extremely hazardous, highly hazardous, moderately hazardous, slightly hazardous, or unlikely to present an acute hazard) against baseline.
				• Nitrogen balance:[22]
				• Nitrogen input from livestock manure and fertilisers; and
				• Nitrogen output;
				• Phosphorus balance:
				  • Phosphorus input;
				  • Phosphorus output;
				• If relevant, balances for potassium and other nutrients (e.g. micronutrients).
				• Hydrocarbons (including oil and grease).
					TNFD Food and agriculture metrics

22 It is recognised that nitrogen and phosphorus are nutrients and only become pollutants when applied in excess. See TNFD Food and agriculture guidance.

Driver of nature change:	Metric no.	Core global indicator	Core global metric	Guidance for the sector	Source
Pollution/ pollution removal	C2.1	Wastewater discharged	Volume of water discharged (m^3), split into: • Total • Freshwater; and • Other.[23] Including: • Concentrations of key pollutants in the wastewater discharged, by type of pollutant, referring to sector specific guidance for types of pollutants; and Temperature of water discharged, where relevant.	In reporting this core global disclosure metric, an organisation should include the pollutants in its direct operations and upstream that are listed on the Zero Discharge of Hazardous Chemicals (ZDHC) programme's Manufacturing Restricted Substance List (MRSL),[24] such as: • Allergenic Disperse Dyes; • Anti-microbials and Biocides; • Total heavy metals; • Organotin Compounds; • Perfluorinated and Polyfluorinated Chemicals (PFAS); • Bisphenol A (BPA); • Phenols; and • Phthalates – including all other esters of ortho-phthalic acid.	Adapted from TNFD Food and agriculture metrics; FAIRR Index; FAO (2017); Zero Discharge of Hazardous Chemicals (ZDHC) programme's Manufacturing Restricted Substance List (MRSL); adapted from SASB CG-AA-250a.1

23 Freshwater: (≤1,000 mg/L Total Dissolved Solids). Other: (>1,000 mg/L Total Dissolved Solids). Reference: GRI (2018) GRI 303-4 Water discharge.

24 Organisations can refer to the 4S CHEM protocol to check the compliance level of the chemicals used in their production process with ZDHC.

Driver of nature change:	Metric no.	Core global indicator	Core global metric	Guidance for the sector	Source
Pollution/ pollution removal	C2.1	Wastewater discharged		In reporting this core global metric, an organisation should also report the following pollutants in its direct operations and upstream: • Microfibres; • Hydrocarbons (including oil and grease); • Nutrients (nitrogen and phosphorus);[25] • Pesticides; • Organic loading (including crop and livestock excreta); • Pathogens; • Other and emerging pollutants (including antimicrobials and other veterinary medicines).	

25 Agricultural water pollutants in wastewater should only include pollutant concentrations measured in cleaning and operations wastewater discharged from farms, livestock cleaning operations, processing plants, factories etc., and should not include agricultural runoff concentrations.

Driver of nature change:	Metric no.	Core global indicator	Core global metric	Guidance for the sector	Source
Pollution/ pollution removal	C2.2	Waste generation and disposal	Weight of hazardous and non-hazardous waste generated by type (tonnes), referring to sector specific guidance for types of waste. Weight of hazardous and non-hazardous waste (tonnes) disposed of, split into: • Waste incinerated (with and without energy recovery); • Waste sent to landfill; and • Other disposal methods. Weight of hazardous and non-hazardous waste (tonnes) diverted from landfill, split into waste: • Reused; • Recycled; and • Other recovery operations.	In reporting this core global disclosure metric, an organisation should if applicable refer to the Cascale's Higg Facility Environmental Module (FEM) for types of production hazardous waste (e.g. empty chemical drums and containers, expired/used/ unused chemicals). In reporting the weight of hazardous and non-hazardous waste (tonnes) diverted from landfill, an organisation should disclose in line with the waste hierarchy: • The weight (tonnes) and proportion (%) of unsold apparel products and fabric waste by type in the company's direct operations that are diverted from landfill in line with the waste hierarchy;[26] • The weight (tonnes) and proportion (%) of apparel products by type in the company's direct operations that are kept in use through rental, repair, reuse, and remaking activities in line with the waste hierarchy; • The weight (tonnes) and proportion (%) of unsold apparel products in all selling points that are recycled or donated for reuse; and • The weight (tonnes) and proportion (%) of apparel products and fabric waste by type in the company's direct operations that have been diverted due to design choices (i.e. waste designed out).	Cascale, previously known as Sustainable Apparel Coalition (2022); OECD Waste Hierarchy; TNFD

26 The Waste Hierarchy ranks waste prevention as the most preferred option, and then states that keeping products in use through rental, repair, reuse, refurbishment, re-manufacturing, and remaking activities, should be prioritised over recycling. The waste hierarchy is illustrated by the OECD (OECD: Circular economy – waste and materials) and Ellen MacArthur Foundation (Ellen MacArthur Foundation: the butterfly diagram: visualising the circular economy).

Driver of nature change:	Metric no.	Core global indicator	Core global metric	Guidance for the sector	Source
Pollution/ pollution removal	C2.3	Plastic pollution	Plastic footprint as measured by total weight (tonnes) of plastics (polymers, durable goods and packaging) used or sold broken down into raw material content.[27] For plastic packaging, percentage of plastics that is: • Reusable; • Compostable; • Technically recyclable; and • Recyclable in practice and at scale.[28]	In reporting this core global disclosure metric, an organisation should report: • Weight (tonnes) of plastic material (primary, secondary and tertiary) used for textile products; and • Weight (tonnes) of plastics used in packaging and products commonly classified as problematic (PS, PVC, EPC, multilayer plastic packaging, undetectable carbon black). For plastic packaging, an organisation should report: • Weight (tonnes) and proportion (%) of plastic packaging containing virgin plastics; • Weight (tonnes) and proportion (%) of plastic packaging containing post-consumer recycled content; and • Proportion (%) of plastic packaging that is reusable, compostable, technically recyclable, and recyclable in practice and at scale.	TNFD, Ellen MacArthur Foundation Global Commitment; Plastic Footprint Network

27 Raw material content: % of virgin fossil-fuel feedstock; % of post-consumer recycled feedstock; % of post-industrial recycled feedstock; % of virgin renewable feedstock.

28 These should be disclosed separately.

Driver of nature change:	Metric no.	Core global indicator	Core global metric	Guidance for the sector	Source
Pollution/ pollution removal	C2.4	Non-GHG air pollutants	Non-GHG air pollutants (tonnes) by type: • Particulate matter $PM_{2.5}$ and/or PM_{10}); • Nitrogen oxides (NO_2, NO and NO_3); • Volatile organic compounds (VOC or NMVOC); • Sulphur oxides (SO_2, SO, SO_3, SO_x); and • Ammonia (NH_3).	In determining additional pollutants to report under this core global disclosure metric, an organisation should, if applicable, refer to the Cascale's Higg Facility Environmental Module (FEM)'s Air Emissions 2022.	SASB and Cascale, previously known as Sustainable Apparel Coalition (2022)
Resource use/ replenishment	C3.0	Water withdrawal and consumption from areas of water scarcity	Water withdrawal and consumption[29] (m^3) from areas of water scarcity, including identification of water source.[30]	No further sector specific guidance; refer to the core global disclosure metric.	TNFD Valuing Water Finance Initiative – benchmark methodology

29 Water consumption is equal to water withdrawal less water discharge. Reference: GRI (2018) GRI 303-5.

30 Surface water; groundwater; seawater; produced water; third-party water. Reference: GRI (2018) GRI 303-3.

Driver of nature change:	Metric no.	Core global indicator	Core global metric	Guidance for the sector	Source
Resource use/ replenishment	C3.1	Quantity of high-risk natural commodities sourced from land/ocean/ freshwater	Quantity of high-risk natural commodities[31] (tonnes) sourced from land/ocean/freshwater, split into types, including proportion of total natural commodities.	In reporting this core global disclosure metric, an organisation should include: • Natural fibre or raw material products on the SBTN High Impact Commodity List (i.e. cotton, leather, wool). An organisation should note that for wood products, types refers to biomass, pulp or wood and that it can refer to FAO's classification and definitions of forest products; and • Wild species, indicating what proportion of these represent threatened species listed as vulnerable, endangered and critically endangered on the IUCN red list and species listed by the Convention on International Trade in Endangered Species of Wild Fauna and Flora, known as CITES.	SBTN High Impact Commodity List; IUCN Red List of Threatened Species, CITES, TNFD

31 Users should refer to the Science Based Targets Network (SBTN) High Impact Commodity List (HICL), species listed as vulnerable, endangered or critically endangered on the IUCN red list, and species listed in appendices I, II and III to CITES.

Driver of nature change:	Metric no.	Core global indicator	Core global metric	Guidance for the sector	Source
Resource use/ replenishment	C3.1	Quantity of high-risk natural commodities sourced from land ocean/ freshwater	Quantity of high-risk natural commodities[32] (tonnes) sourced under a sustainable management plan or certification programme, including proportion of total high-risk natural commodities.	In reporting this core global disclosure metric, an organisation should include: • Natural fibre or raw material products on the SBTN High Impact Commodity List (i.e. cotton, leather, wool) certified to a relevant third-party environmental, social, and/or animal welfare standard such as Global Organic Textile Standard (GOTS), Regenagri, Textile Exchange's Responsible Wool Standard (RWS), and Organic Content Standard (OCS). • For forestry and pulp products, an organisation should report on planted forests and native forests respectively. An organisation should provide information on the forest management conditions for the wood or fibre, such as whether these are certified by a broadly recognised third-party certification system with a global presence, such as the Forest Stewardship Council (FSC), Programme for the Endorsement of Forest Certification (PEFC) and Sustainable Forestry Initiative (SFI). 'Controlled Wood', 'Controlled Sources' or 'SFI Fiber Sourcing' are excluded. Organisations should refer to the UN FAO definition of 'Sustainable Forest Management' (see TNFD glossary). The organisation should specify which certification applies and the percentages of certified fibres or raw materials by category. These lists are not exhaustive.	SBTN High Impact Commodity List, adapted from SASB Standards (2023) Apparel, Accessories & Footwear TNFD

32 Users should refer to the Science Based Targets Network (SBTN) High Impact Commodity List (HICL), species listed as vulnerable, endangered or critically endangered on the IUCN red list, and species listed in appendices I, II and III to CITES.

Driver of nature change:	Metric no.	Core global indicator	Core global metric	Guidance for the sector	Source
Invasive alien species and other	C4.0	Placeholder indicator: Measures against unintentional introduction of invasive alien species (IAS)[33]	Proportion of high-risk activities operated under appropriate measures to prevent unintentional introduction of IAS, or low-risk designed activities.	No further sector specific guidance; refer to the core global disclosure metric.	TNFD

33 Due to the measurement of levels of invasive species for organisations being a developing area, the chosen indicator focuses on whether an appropriate management response is in place for the organisation. The additional sets of metrics contain measurement of the level of invasive species within an area. The TNFD intends to do further work with experts to define 'high-risk activities' and 'low-risk designed activities'.

Driver of nature change:	Metric no.	Core global indicator	Core global metric	Guidance for the sector	Source
State of nature	C5.0	Placeholder indicator: Ecosystem condition	For those organisations that choose to report on state of nature metrics, the TNFD encourages them to report the following indicators and to refer to the TNFD additional guidance on measurement of the state of nature in Annex 2 of the LEAP approach: • Level of ecosystem condition by type of ecosystem and business activity; • Impacts on mean species extinction risk. There are a number of different measurement options for these indicators. The TNFD does not currently specify one metric as there is no single metric that will capture all relevant dimensions of changes to the state of nature and a consensus is still developing. The TNFD will continue to work with knowledge partners to increase alignment.	No further sector specific guidance; refer to the core global disclosure metric.	TNFD
		Placeholder indicator: Species extinction risk		No further sector specific guidance; refer to the core global disclosure metric.	TNFD

3.2. Core sector disclosure indicators and metrics

The TNFD core sector disclosure metrics for the apparel, accessories and footwear sector are outlined below. These metrics are recommended by the TNFD to be disclosed by all report preparers in the sector on a comply or explain basis.

Table 12: Core sector disclosure indicators and metrics

Metric category	Metric subcategory	Metric No.	Indicator	Core sector metrics	Source
Response	Dependency, impact, risk and opportunity management: Changes to nature (dependency and impact): mitigation hierarchy steps	AT.C23.0	Percentage of land managed or sourced from that deploys practices with measurable regenerative outcomes	Proportion (%) of land managed or sourced from (for agriculture, grazing and/or forestry) that employs practices with measurable regenerative outcomes, referencing the definition of regenerative agriculture used for disclosure (e.g. from OP2B or Textile Exchange).[34]	TNFD Food and agriculture metrics, related to GBF target 10
Impact driver	Resource use/replenishment	AT.C3.0	Priority materials from recycled sources	Total weight (tonnes) of fibre and materials from recycled sources, by material.	Textile Exchange Materials Benchmark
Pollution/ pollution removal	Plastic pollution	AT.C2.0	Microfibre release	Weight (tonnes) of synthetic textiles washed and quantity (number) of washings during production. Average mass loss (g/kg) of the original sample weight, using The Microfibre Consortium Test Method for the quantification of fibre release from fabrics during simulated domestic laundering.	Plastic Footprint Network module on microplastics from textile fibres; The Microfibre Consortium

34 The measures start when a baseline has been undertaken for the corporation to track regeneration of environmental assets against, as disclosure data for the metric.

3.3. Additional sector disclosure indicators and metrics

The TNFD additional sector disclosure metrics for the apparel, accessories and footwear sector are outlined below. The TNFD encourages all report preparers in the sector to draw on these and any other relevant metrics where relevant to best represent an organisation's material nature-related dependencies, impacts, risks and opportunities.

Table 13: Additional sector disclosure indicators and metrics

Metric category	Metric subcategory	Metric No.	Indicator	Additional sector metrics	Source
Impact driver	Land/freshwater/ocean-use change	AT.A1.0	Deforestation and conversion-free products	Percentage of production volume from land owned, leased, managed or sourced from that is determined to be deforestation- and conversion-free (DCF), by product.	TNFD Food and agriculture metrics
Response	Dependency, impact, risk and opportunity management: Changes to nature (dependency and impact): mitigation hierarchy steps	AT.A23.0	Circular sourcing	Weight (tonnes) and proportion (%) of physical products that are: • Non-virgin products and materials (e.g. using reused and recycled products and materials); • Sourced from by-products/waste streams (e.g. offcuts of a material that has not previously been in a product); • Virgin but renewable and regeneratively produced;[35] • Virgin but renewable and sustainably produced; • None of the above (virgin and not sustainably or regeneratively produced).	Indicator 6a p.28 EMF (2022) Circulytics indicators

35 Refer to Indicator 6a p.28 EMF (2022) Circulytics indicators for a definition of regenerative production for this metric.

Metric category	Metric subcategory	Metric No.	Indicator	Additional sector metrics	Source
Response	Dependency, impact, risk and opportunity management: Changes to nature (dependency and impact): mitigation hierarchy steps	AT.A23.1	Circularity: use phase	Weight (tonnes) and proportion (%) of physical products designed following use phase circular economy principles.[36]	Indicator 6d p.30-31 EMF (2022) Circulytics indicators
Response	Dependency, impact, risk and opportunity management: Value chain	AT.23.3	Circularity: value chain	Weight (tonnes) and proportion (%) of products that enable longevity further down the value chain e.g. products with care instructions for washing and drying.	Indicator 6d p.30-31 EMF (2022) Circulytics indicators
Response	Dependency, impact, risk and opportunity management: Changes to nature (dependency and impact): mitigation hierarchy steps	AT.A23.2	Circularity: end of functional life	Weight (tonnes) and proportion (%) of physical products designed following end of life circular economy principles.[37]	Indicator 6d p.30-31 EMF (2022) Circulytics indicators
State of nature	Ecosystem extent and condition	AT.A5.0	Concentration of pollutants around key water basins	Concentration of key pollutants around key water basins[38] in which the company is operating: nutrients (nitrogen and phosphorus levels), pesticides, organic loading (including crop and livestock excreta), pathogens, metals, other and emerging pollutants (including antibiotics and other veterinary medicines).	Adapted from FAIRR (2022), FAO (2017)

36 Refer to the TNFD Glossary for a definition of use phase circular economy principles. Based on Indicator 6d p.30-31 EMF (2022) Circulytics indicators.

37 Refer to the TNFD Glossary for a definition of end of life circular economy principles. Based on Indicator 6d p.30-31 EMF (2022) Circulytics indicators.

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