



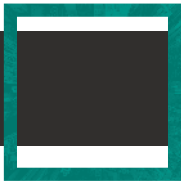
Additional sector guidance **Beverages**

January 2025
Version 1.0

SICS® industries:

Alcoholic Beverages (FB-AB)

Non-Alcoholic Beverages (FB-NB)



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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 beverage 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 beverage 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 Table 1 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 beverage 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

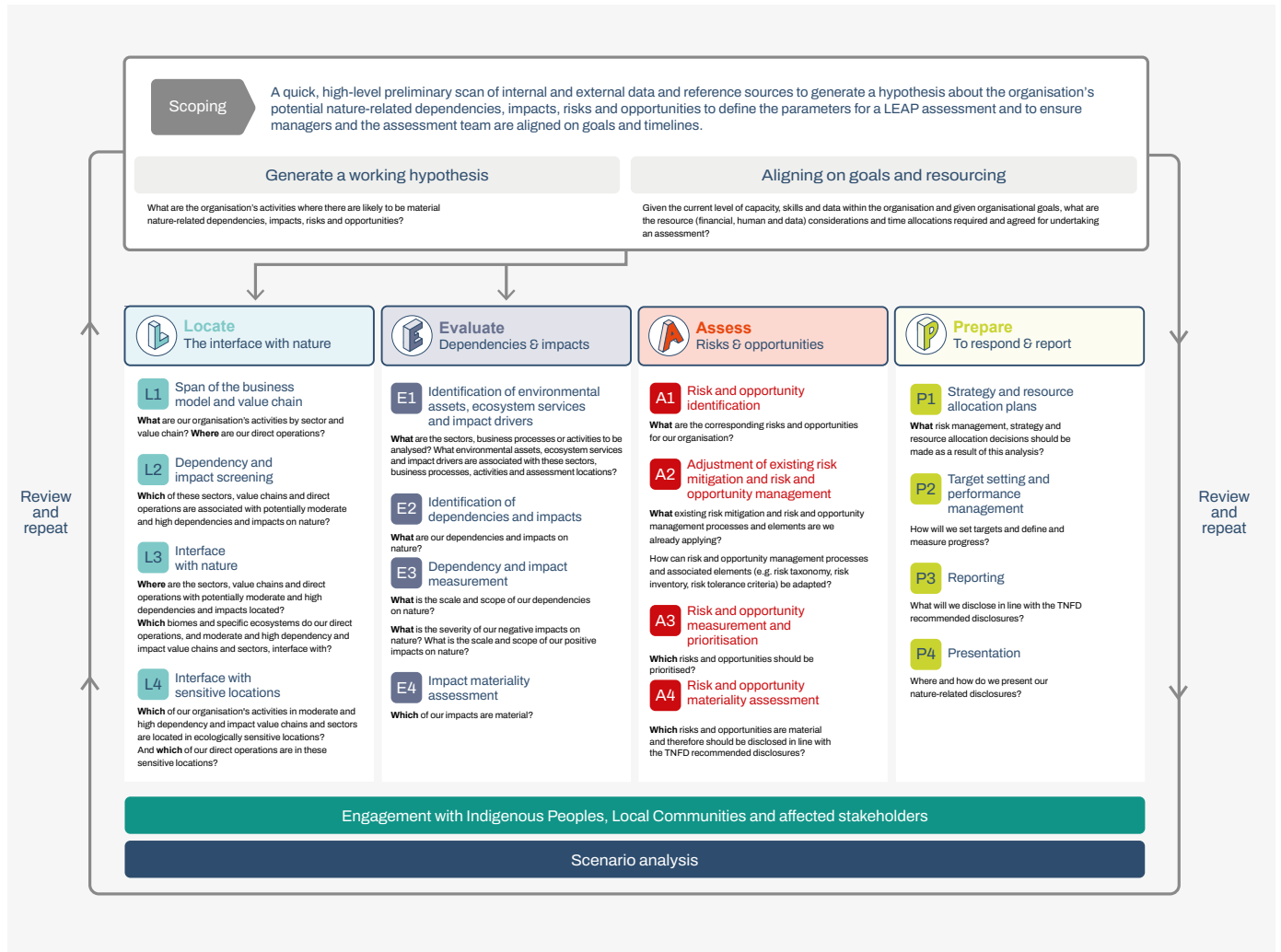
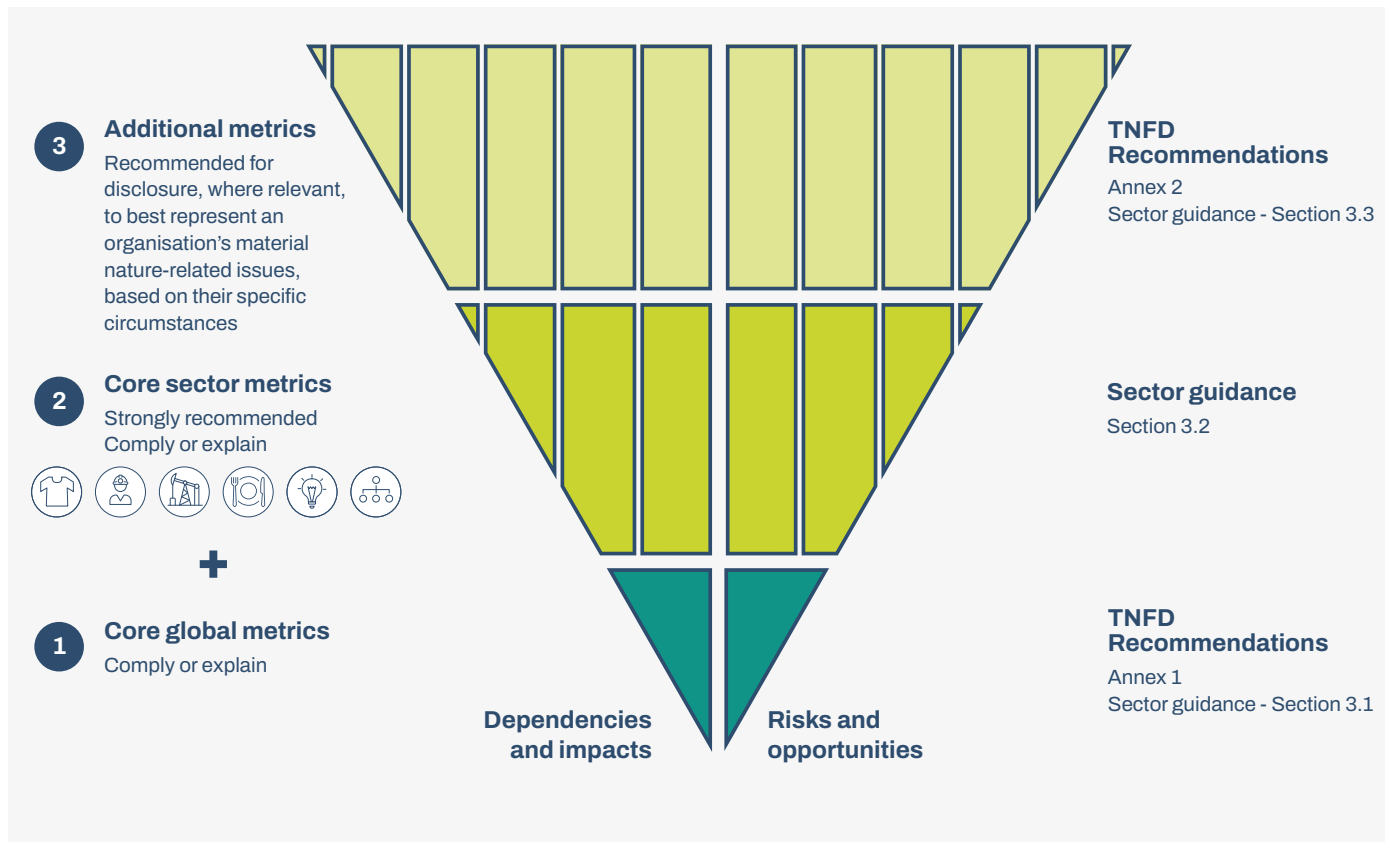


Figure 2: TNFD disclosure metrics architecture signposted to metrics lists



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 by leveraging current data collection and reporting practices to minimise additional assessment and reporting costs.

1.2. Audience for this guidance

This guidance covers organisations with business models or value chains in the beverage sector (Box 1). For simplicity, all organisations in these industries are referred to as ‘beverage sector organisations’ in this guidance. Under the Sustainable Industry Classification System (SICS®), beverages fall under the Food & Beverage thematic sector.¹ The main focus of this sector guidance is the alcoholic and non-alcoholic beverages sector industries, which provides additional details to the [TNFD food and agriculture sector guidance](#).

1 SASB Standards (2023) [Sustainable Industry Classification System \(SICS®\)](#).



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

- Food & Beverage – Alcoholic Beverages (FB-AB)
- Food & Beverage – Non-Alcoholic Beverages (FB-NB)
- Food & Beverage – Food Retailers & Distributors (FB-FR): content covered by [TNFD food and agriculture guidance](#)
- Food & Beverage – Agricultural Products (FB-AG): content covered by [TNFD food and agriculture guidance](#) – indication of some additional sources for beverages in this guidance when relevant.
- Food & Beverage – Restaurants (FB-RN): content covered by [TNFD food and agriculture guidance](#) – indication of some additional sources for beverages in this guidance when relevant.

Food & beverage – Alcoholic beverages

The alcoholic beverages industry includes organisations that brew, distil and manufacture various alcoholic beverages, including beer, wine and liquor. Organisations in this industry transform agricultural products, such as sugar, barley and corn, into finished alcoholic beverages. The largest organisations have global operations, with portfolios of numerous branded products. Levels of vertical integration within the industry vary due to regulation in different markets. Breweries generally have multiple manufacturing facilities to provide access to different markets, while vintners and distillers are typically located where they have a history of production.²

Food & beverage – Non-alcoholic beverages

The non-alcoholic beverages industry produces a broad range of beverage products, such as various carbonated soft drinks, syrup concentrates, juices, energy and sport drinks, and water products, some of which may contain tea or coffee ingredients. The industry is dominated by large, international entities. Entities conduct syrup manufacturing, marketing, bottling operations and distribution, with larger entities typically being more vertically integrated into operations that bottle, sell and distribute the finished products.³

Some references to the agricultural products, food retailers and distributors, and restaurants sub-sectors have been included in this guidance to provide a comprehensive view of topics relevant for the beverage sector. Content related to these sub-sectors is comprehensively covered in the [TNFD food and agriculture guidance](#), which covers:

- **Agricultural products industry:** Engaged in processing, trading and distributing vegetables and fruits, and producing and milling agricultural commodities such as grains, sugar, consumable oils, maize, soya beans and animal feed;⁴

² SASB Standards (2023) [Sustainable Industry Classification System \(SICS®\)](#).

³ SASB Standards (2023) [Sustainable Industry Classification System \(SICS®\)](#).

⁴ SASB Standards (2023) [Agricultural Products](#).



- **Meat, poultry and dairy industry:** Produces raw and processed animal products, including meats, eggs and dairy products, for human and animal consumption. Key activities include animal raising, slaughtering, processing and packaging;⁵
- **Processed foods industry:** Includes organisations that process and package foods such as bread, frozen foods, snack foods, pet foods and condiments for retail consumer consumption;⁶
- **Food retailers and distributors industry:** Consists of organisations engaged in wholesale and retail sales of food, beverage and agricultural products. Store formats include retail supermarkets, convenience stores, warehouse supermarkets, liquor stores, bakeries, natural food stores, specialty food stores, seafood stores and distribution centres;⁷ and
- **Restaurants industry:** Organisations in the restaurants industry prepare meals, snacks and beverages to customers’ orders for immediate on- and off-premises consumption.⁸

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 beverages 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 beverages 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 beverages sector

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

5 SASB Standards (2023) [Meat, Poultry & Dairy](#). Aquaculture is covered in separate [TNFD sector guidance](#).
6 SASB Standards (2023) [Processed Foods](#).
7 SASB Standards (2023) [Food Retailers & Distributors](#).
8 SASB Standards (2023) [Restaurants](#).

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 material nature-related dependencies, impacts, risks and opportunities?

Goals and resourcing alignment:

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

For the beverage sector, nature-related dependencies, impacts, risks and opportunities vary for specific companies but typically derive from the following:

Upstream

The **sourcing of beverage ingredients** involves agricultural activities that can be resource intensive and potentially harmful to ecosystems. For some beverage organisations, many of the dependencies and impacts lie upstream, making a thorough upstream assessment critical. The [TNFD food and agriculture sector guidance](#) and [forestry, pulp and paper sector guidance](#) cover these impacts on nature in more detail, including:

- Conversion of various biomes, including forests, grasslands, savannahs and wetlands;
- Use of water for crops such as rice and sugar cane, leading to depletion of local water sources; and
- Pollution, for example with pesticides and excess fertilisers, which can lead to water and soil pollution.

The **production of packaging materials** like glass, aluminium, plastic and polyethylene terephthalate (PET) also has impacts on nature. The extraction of raw materials can lead to ecosystem use change and habitat destruction. The processes involved in producing packaging materials can generate significant waste and pollution, including contributions to greenhouse gas emissions. Plastic pollution has particular negative impacts on ocean ecosystems.



The **production of aluminium** involves the mining of bauxite, which can lead to significant land degradation and deforestation. This process also involves substantial water usage and can result in water pollution from the runoff of processing sites, which may contain heavy metals and other toxic substances. Lastly, the refining process of bauxite to produce alumina, and finally metallic aluminium, is energy intensive and releases significant amounts of carbon dioxide and other greenhouse gases into the atmosphere.

Direct operations

The process of blending ingredients and processing and packaging beverages is resource intensive, often requiring significant amounts of energy and water, which can lead to carbon emissions and wastewater production. Efficient use of resources and proper treatment of emissions and effluents are necessary to minimise these environmental impacts.

The beverages industry often faces criticism for its high water usage, particularly in regions experiencing water scarcity. The withdrawal of large volumes of water can affect local ecosystems, alter water tables and reduce water availability for other users, including local communities and agriculture. Moreover, the discharge of wastewater from beverage production can contaminate local water bodies if not properly treated.

Downstream

The amount of packaging and post-consumer waste management are additional areas of concern for the industry, as improper disposal and inadequate recycling systems can lead to significant environmental pollution. Beverage containers are among the most common forms of litter found in marine environments, contributing to habitat destruction, wildlife harm and water pollution, according to a study published in [Nature](#) in 2021.



2.2. Locate the organisation’s interface with nature

This section provides additional guidance to help beverage sector organisations with the Locate phase of the LEAP approach.

L1: Span of the business model and value chain

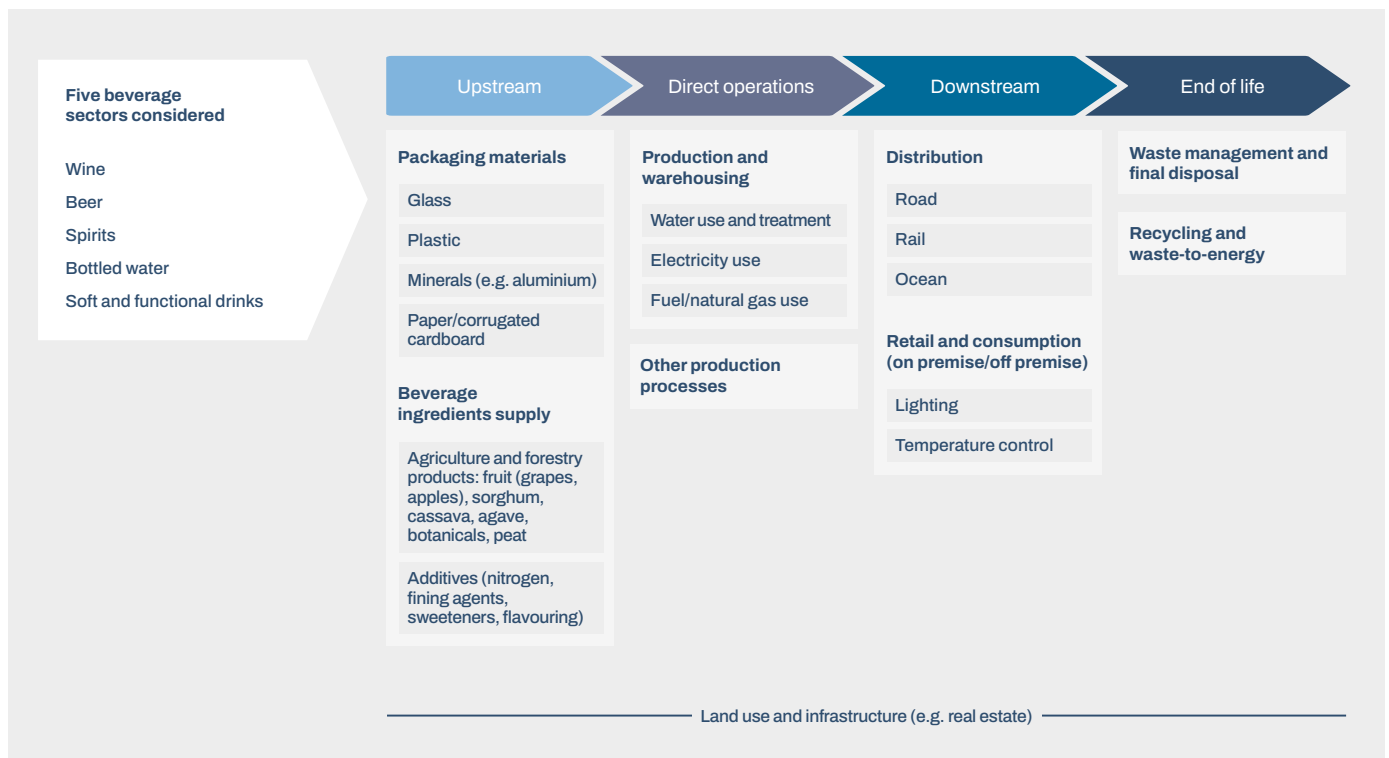
Guiding questions:

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

Figure 3 provides an illustrative representation of typical beverage sector value chains. Each company is encouraged to build and assess its specific value chain activities to capture its own specificities.

The value chain diagram aims to cover different beverage products i.e. wine, beer, spirits, bottled water, soft and functional drinks. Food retail and distribution are covered in more depth in the [TNFD food and agriculture sector guidance](#).

Figure 3: Illustrative beverage value chain





L2: Dependency and impact screening

Guiding questions:

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

Table 2 and Table 3 show the primary impact drivers of beverage sector organisations and the ecosystem services on which they most depend, based on [ENCORE](#) and [Science Based Target Network \(SBTN\)](#) materiality data.

An organisation using the ENCORE ratings to inform prioritization should consider their applicability to their context, bearing in mind that ENCORE ratings refer to global sector averages.

Table 2: Materiality ratings of ecosystem services the beverage sector typically depends on

Ecosystem services		Growing of cereals (except rice), leguminous crops and oil seeds	Growing of sugar cane	Other land transport	Distilling, rectifying and blending of spirits	Manufacture of malt liquors and malt	Manufacture of wines	Manufacture of soft drinks; production of mineral waters and other bottled waters	Beverage serving activities
Provisioning services	Water supply	High	High	Very low	High	High	High	High	Medium
	Genetic material	Very high	Very high	N/A	Very high	Very high	Very high	ND	ND
	Biomass provisioning	Very high	Very high	N/A	N/A	N/A	N/A	N/A	N/A
	Other provisioning services – Animal-based energy	Medium	Medium	Medium	N/A	N/A	N/A	N/A	N/A
Regulating and maintenance services	Solid waste remediation	Medium	Medium	ND	Medium	Medium	Medium	Medium	ND
	Soil and sediment retention	Very high	Very high	Low	Low	Low	Low	Low	Low
	Water purification	Very high	Very high	ND	High	High	High	High	Very high
	Soil quality regulation	Very high	Very high	N/A	N/A	N/A	N/A	N/A	N/A
	Other regulating and maintenance service – Dilution by atmosphere and ecosystems	Medium	Medium	Very low	Low	Low	Low	Low	ND
	Biological control	High	High	ND	ND	ND	ND	Very low	Very low

Ecosystem services		Growing of cereals (except rice), leguminous crops and oil seeds	Growing of sugar cane	Other land transport	Distilling, rectifying and blending of spirits	Manufacture of malt liquors and malt	Manufacture of wines	Manufacture of soft drinks; production of mineral waters and other bottled waters	Beverage serving activities
Regulating and maintenance services	Air filtration	Medium	Medium	Very low	N/A	N/A	N/A	Very low	Very low
	Flood control	High	Medium	Medium	Medium	Medium	Medium	Medium	Very low
	Global climate regulation	Very high	Very high	Medium	Very low	Very low	Very low	Very low	Medium
	Nursery population and habitat maintenance	Very low	Very low	N/A	N/A	N/A	N/A	N/A	N/A
	Noise attenuation	N/A	N/A	Very low	N/A	N/A	N/A	N/A	ND
	Local (micro and meso) climate regulation	Very high	Very high	Low	Low	Low	Low	Low	Low
	Pollination	High	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Storm mitigation	High	Medium	Medium	Medium	Medium	Medium	Medium	Low
	Water flow regulation	High	High	Low	High	High	High	High	Low
	Rainfall pattern regulation	Very high	Very high	Medium	N/A	N/A	N/A	Medium	Very low

Ecosystem services		Growing of cereals (except rice), leguminous crops and oil seeds	Growing of sugar cane	Other land transport	Distilling, rectifying and blending of spirits	Manufacture of malt liquors and malt	Manufacture of wines	Manufacture of soft drinks; production of mineral waters and other bottled waters	Beverage serving activities
Cultural services	Recreation related services	N/A	N/A	N/A	N/A	N/A	N/A	ND	Very high
	Visual amenity services	N/A	N/A	Very high	N/A	N/A	N/A	ND	Very high
	Education, scientific and research services	N/A	N/A	N/A	ND	ND	N/A	ND	ND
	Spiritual, artistic and symbolic services	N/A	N/A	N/A	ND	ND	N/A	ND	Very high

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 beverage sector

Drivers of nature change	Impact drivers	Growing of cereals (except rice), leguminous crops and oil seeds	Other land transport	Distilling, rectifying and blending of spirits	Manufacture of malt liquors and malt	Manufacture of wines	Manufacture of soft drinks; production of mineral waters and other bottled waters	Beverage serving activities
Land, freshwater and ocean use change	Land ecosystem use	High	Medium	Low	Low	Low	Low	Low
	Freshwater ecosystem use	Medium	N/A	N/A	N/A	N/A	N/A	Low
	Area of seabed use	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Climate change	Greenhouse gas (GHG) emissions	Medium	Medium	Low	Low	Low	Low	Low
Pollution/ pollution removal	Non-GHG air pollutants	High	Low	Low	Low	Low	Low	Low
	Toxic soil and water pollutants	High	Low	Very low	Very low	Very low	Medium	Low
	Nutrient soil and water pollutants	Very high	Medium	Medium	Medium	Medium	High	Low
	Solid waste	High	Very low	Medium	Medium	Medium	Medium	Medium
	Disturbances (e.g noise, light)	Medium	Medium	ND	Medium	Medium	Medium	Low

Drivers of nature change	Impact drivers	Growing of cereals (except rice), leguminous crops and oil seeds	Other land transport	Distilling, rectifying and blending of spirits	Manufacture of malt liquors and malt	Manufacture of wines	Manufacture of soft drinks; production of mineral waters and other bottled waters	Beverage serving activities
Resource use/ replenishment	Water use	Very high	Low	Medium	Medium	Medium	Medium	Low
	Other biotic resource use (e.g. fish, timber)	ND	N/A	N/A	N/A	N/A	N/A	N/A
	Other abiotic resource use	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Introduction of invasive alien species		Very high	Low	ND	ND	ND	ND	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>.



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, moderate and high dependency and impact value chains and sectors, interface with?

The beverage sector typically interfaces with the following biomes:

Land:

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

Freshwater:

- Rivers and streams (F1);
- Lakes (F2); and
- Subterranean freshwaters (SF1).

Ocean:

- Marine shelf (M1).

This list should be considered as a reference, since the relevant biomes may vary from company to company, based on their specific sites and locations. Indeed, organisations are encouraged to assess and review all applicable biomes connected to their specific interfaces across their value chains and related activities where significant dependencies and impacts on those biomes exist.

For further guidance, organisations may also refer to the [TNFD guidance on biomes](#) when assessing their interfaces with these biomes and the potential resulting nature-related issues.

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? Which of our direct operations are in sensitive locations?

Physical water risks are one of the criteria for sensitive locations. The following tools may be useful to map water stressed areas.



List of datasets and tools for identifying areas of high physical water risks

Some examples of tools to identify sensitive locations based on physical water risks include:

- WRI Aqueduct [Water Risk Atlas](#);
- WWF [Water Risk Filter](#); and
- [Waterplan](#).

Other tools mentioned in the [CDP water questionnaire](#) may also be useful to consider, such as:

- [Collect Earth](#);
- [Ecolab Smart Water Navigator](#);
- [GEMI Local Water Tool](#);
- [SIWI Water Tool](#); and
- [Water Footprint Network Assessment tool](#).

This list is not exhaustive. Further examples of tools to be considered can be found in the [Guidance on the identification and assessment of nature-related issues: The LEAP approach](#), in the [TNFD Tools Catalogue](#), and [SBTN's Step 1 Toolbox](#). Appropriate tools and datasets will vary depending on different factors, such as location and activities under assessment. Companies are encouraged to consider all tools and databases relevant for the assessment in scope.



2.3. Evaluate dependencies and impacts on nature

This section provides additional guidance to help beverage 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 sectors, business processes or activities to be analysed?

What environmental assets, ecosystem services and impact drivers are associated with these sectors, business process, 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?

Table 4 and Table 5 provide examples of dependency and impact pathways for the beverage sector. Beverage sector organisations should refer to the [TNFD food and agriculture guidance](#) for further guidance on the identification of dependencies and impacts on nature for beverage ingredients. Partial guidance is provided here, with additional sources provided where information might prove useful to beverage sector organisations.

Table 4: Examples of dependency pathways for the beverage sector

Value chain stage	Activity	Ecosystem services	Environmental assets	Dependencies description
Upstream	Beverage ingredients supply (forestry and agricultural products) ⁹	Ground water supply	Freshwater ecosystems	Agricultural production accounts for 70% of water withdrawals worldwide. ¹⁰ Sites located in high water-stress areas can face significant production volatility. This will be particularly significant for water-intensive crops such as rice, sugar cane and wheat (in order of decreasing intensity). ¹¹
		Surface water supply	Subterranean freshwater ecosystems	
		Water flow regulation		
		Water purification		
		Biological control	Land	Crops with high pathogen and pest sensitivity will be most dependent on this ecosystem service, e.g. maize, rice, soya beans, grapes and chia trees.
		Pollination	Terrestrial (land based) ecosystems	Agricultural ingredients are highly dependent on pollination, with fruit crops among the most dependent. Some varieties could face up to 90% yield reduction in case of missing pollination. ¹²

⁹ For additional guidance refer to the [TNFD food and agriculture guidance](#).

¹⁰ FAO (2017) [Water for Sustainable Food and Agriculture](#).

¹¹ See also Our World in Data (2022) [Environmental impacts of food production](#).

¹² Our World in Data (2021) [How much of the world's food production is dependent on pollinators?](#); IPBES (2016) [Assessment report on pollinators, pollination and food production](#).

Value chain stage	Activity	Ecosystem services	Environmental assets	Dependencies description
Upstream	Beverage ingredients supply (forestry and agricultural products)	Global climate regulation Flood mitigation	Land Atmospheric systems	Crop growth is optimised in stable conditions. Shocks such as flooding and other extreme weather events will affect growth, depending on the individual specimen's growth stage. Crop-specific vulnerability curves can be found in scientific literature. Notably: <ul style="list-style-type: none"> • Agave is known for its resilience to drought conditions (i.e. ability to store water in leaves, roots and stems); and • Sorghum and millet, typically used as beer gluten-free alternatives and traditional African and Asian drinks, are also drought resistant.¹³
		Soil and sediment retention Soil quality regulation Surface water supply Water flow regulation Water purification	Terrestrial (land based) ecosystems Subterranean terrestrial ecosystems	Crop growth depends on high quality soil and access to clean water in the appropriate quantity at the appropriate time.

¹³ Monteleone, B. et al. (2023) [Quantifying crop vulnerability to weather-related extreme events and climate change through vulnerability curves](#);
FAO (2024) [FAO vegetation indicators](#).

Value chain stage	Activity	Ecosystem services	Environmental assets	Dependencies description
Direct operations	Production and warehousing	<p>Water supply (ground water and surface water)</p> <p>Water flow regulation</p> <p>Water purification</p>	<p>Water resources</p> <p>Freshwater ecosystems</p> <p>Subterranean freshwater ecosystem</p>	<p>The beverage industry is fundamentally dependent on water, not only as a primary ingredient in its products but also throughout various stages of the production process. Water is essential for mixing beverages, diluting concentrates and maintaining product consistency.</p> <p>Additionally, substantial amounts of water are required for operational purposes. Cooling systems use water to regulate temperatures during production; cleaning processes, crucial for maintaining hygiene and ensuring product safety, involve rinsing equipment and containers; and steam production, often necessary for heating and processing ingredients, relies on water.</p>
Downstream	Distribution	<p>Global and local climate regulation</p> <p>Soil and sediment retention</p> <p>Flood mitigation</p> <p>Storm mitigation</p>	<p>Land</p> <p>Atmospheric systems</p>	<p>Climate and ecosystem changes can significantly disrupt distribution channels in several ways, impacting the transportation, supply chain management and overall operational efficiency of industries.</p> <p>Supply chain, transportation routes and distribution centres (including ports) are highly dependent on global climate regulation services, and the protection offered by nature, in order to avoid damage from extreme weather events to the infrastructure and distribution nodes and channel.</p>

Table 5: Examples of impact pathways for the beverage sector

Value chain stage	Activity	Impact driver	Impact description
Upstream	Beverage ingredients supply (forestry and agricultural products) ¹⁴	Land, freshwater and ocean use change Land ecosystem use: Agriculture ingredient production (e.g. rice, barley, sugar cane, coffee, tea, herbs and fruit) may be associated with habitat modification and conversion of natural habitats to croplands. This will vary by commodity. ¹⁵	Reduction in extent and connectivity of habitats, leading to increased species extinction risks. This may have knock-on impacts on ecosystem services, such as flood protection and pollination, as habitats supporting these services decline and pollinator numbers decline.
		Pollution/pollution removal Soil and water pollutants: Pesticide use for arable crops leads to substantial environmental pollution, particularly of nearby water bodies (surface and ground water) and soil. Fertiliser use: For example, maize, wheat and rice represent high nitrogen and phosphorous intensive crops. ¹⁶	Poorly targeted use of pesticides and fertiliser can contaminate and acidify the soil and lead to the contamination and eutrophication of local water bodies. This can in turn affect wildlife populations such as freshwater insects and fish.
		Resource use/replenishment Water use: Beverage ingredients such as fruit, rice and sugar are among the most water-intensive crops. ¹⁷	Supply and treatment of water can create significant water stress in areas with groundwater and surface water scarcity.
		Invasive alien species introduction/removal Reducing the forest footprint to facilitate agricultural expansion can lead to the introduction of invasive alien species.	Introduction of non-native species alters the balance of different species in ecosystems though resource competition and disease.

¹⁴ For additional guidance refer to the [TNFD food and agriculture guidance](#).

¹⁵ EU Commission (2023) [Deforestation risk commodities](#); Our World in Data (2022) [Environmental impacts of food production](#).

¹⁶ IFA (2022) [Fertilizer Use by Crop and Country for the 2017-2018 period](#).

¹⁷ WWF (2013) [Thirsty Crops: Our food and clothes: eating up nature and wearing out the environment?](#)

Value chain stage	Activity	Impact driver	Impact description
Upstream	Packaging production	<p>Land, freshwater and ocean use change</p> <p>Land ecosystem use: Mining operations to source raw minerals (e.g. aluminium) can be associated with land use change and pollution.¹⁸ Paper packaging, if not produced sustainably, can be associated with deforestation.¹⁹</p>	Reduction in extent and connectivity of habitats, leading to increased species extinction risks. This may have knock-on impacts on ecosystem services, such as flood protection and pollination, as habitats supporting these services decline and pollinator numbers decline.
		<p>Resource use/replenishment</p> <p>Water use: Production, use and disposal of PET, aluminium and glass all use water. It takes more than three times as much water to produce a bottle of water than the contents of the container itself. Paper production for boxed water and cartons uses large volumes of water to soak pulp before it can be turned into paper:²⁰</p>	Extraction and use of this water can disrupt the local water cycle and increase risks of water stress through reduced supply of water and increased drought severity.

¹⁸ More details in the [TNFD Metals and mining guidance](#).

¹⁹ WWF (n.d.) [Pulp and Paper](#). More details in the [TNFD Forestry, pulp and paper guidance](#).

²⁰ WWF (2021) [Packaging unwrapped: Exploring the environmental impacts of global material flows relating to the UK's packaging consumption](#).

Value chain stage	Activity	Impact driver	Impact description
Direct operations	Production and warehousing	<p>Pollution/pollution removal</p> <p>Non-GHG air pollutants: From the use and disposal of chemical additives in carbonisation processes of soft drinks.</p> <p>Solid waste: Process waste as production residue, packaging material and by-products.²¹</p>	Mismanagement of these pollutants can lead to ecosystem contamination. This in turn may cause a deterioration of the quality of environmental assets such as the air and water bodies that others depend on. It can similarly affect species populations.
	Production and warehousing	<p>Resource use/replenishment</p> <p>Water use: Water is used for cooling purposes in production lines and in the warehouse. Recycling is possible for cooling but limited for production.</p>	Beverage manufacturing is heavily water intense and can pose stress on the ecosystem. Water extracted for use in production facilities may affect habitats and ecosystems if abstraction levels exceed a sustainable threshold. ²² This can disrupt the water cycle and cause changes to hydrological and hydraulic ecosystems, affecting the availability of water to others and contributing to water stress.
Downstream	Distribution	<p>Pollution/pollution removal</p> <p>Disturbances: Noise/light pollution occurs from vehicles (terrestrial, marine and airborne), which are significant sources of road, marine and aerial noise, respectively.</p>	Noise and light pollution can disturb local species, affecting their migratory, feeding and breeding routes.
	Retail and consumption	<p>Resource use/replenishment</p> <p>Water use: Water use associated with cooling systems, both centralised and decentralised for consumers.</p>	Water extracted may affect habitats and ecosystems if abstraction levels exceed a sustainable threshold. ²³ This can disrupt the water cycle and cause changes to hydrological and hydraulic ecosystems, affecting water availability for others and contributing to water stress.

21 Ceres (2022) [Global assessment for private sector impacts on water](#).

22 Global Canopy, UNEP-FI, and UNEP-WCMC (2024) [ENCORE: Exploring Natural Capital Opportunities, Risks and Exposure](#).

23 Global Canopy, UNEP-FI, and UNEP-WCMC (2024) [ENCORE: Exploring Natural Capital Opportunities, Risks and Exposure](#).

Value chain stage	Activity	Impact driver	Impact description
Downstream	Distribution	<p>Invasive alien species introduction/removal</p> <p>The introduction of distribution channels and nodes can lead to invasive alien species introduction.</p>	Introduction of non-native species alters the balance of different species in ecosystems through resource competition and disease.
	Retail and consumption: Packaging materials	<p>Pollution/pollution removal</p> <p>Solid waste: Improper disposal of packaging materials can affect production locations, immediate surroundings and consumption sites, polluting the environment with microplastics. Billions of plastic bottles produced by beverage companies end up in the sea every year.</p> <p>Even where packaging is sent to landfill, it may not degrade quickly, if at all. Plastic may take tens to hundreds of years, aluminium cans hundreds of years and glass bottles thousands of years. Chemicals from the packaging materials, including inks and dyes from labelling, can also leach into groundwater and soil.</p> <p>In general, solid waste from packaging can take several years before decomposing in landfill sites: e.g. plastic might take tens to hundreds of years, aluminium cans up to hundreds of years and glass bottles thousands of years.²⁴</p>	The pollution of the soil and aquatic ecosystems by the disposal of packaging can affect the health of a variety of species – e.g. through the accumulation of microplastics in the body – as well as causing direct hazards, such as choking.

²⁴ Oceana (2020) [Soft drink industry can stop billions of plastic bottles from polluting the ocean by switching from single-use, throwaway bottles to refillables](#); WWF (2021) [Packaging unwrapped, exploring the environmental impacts of global material flows relating to the UK's packaging consumption](#); Sustainable Columbia (n.d.) [What is the most sustainable way to consume water?](#)



E3 E3: Dependency and impact measurement

Guiding question:

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?

For quantification of negative and positive impacts, beverages organisations should refer to the metrics provided in Section 3 of this guidance and refer to the [TNFD food and agriculture sector guidance](#) for metrics and guidance relevant to beverage ingredients.

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](#).



2.4. Assess risks and opportunities

This section provides additional guidance to help beverage sector organisations with the Assess phase of the LEAP approach.

A1: Risk and opportunity identification

Guiding question:

What are the corresponding risks and opportunities for your organisation?

Table 6 and Table 7 provide a list of illustrative nature-related physical and transition risks and opportunities for the beverage sector.

Table 6: Illustrative nature-related risks for the beverage sector

Risk category	Risk type	Illustrative examples of risks
Physical risks	Acute	<p>Increase in capital expenditure on infrastructure repair due to damage by natural disasters in the area of company operations, e.g. floods causing damages to facilities or inability of staff to reach workplace.</p> <p>Increase in production and sourcing costs due to agricultural product volatility, e.g. tropical storms in the Caribbean affecting sugar cane crops, creating shortages or price increases for the rum industry; heatwaves creating CO₂ shortages affecting the carbonation process for soft drinks producers.</p>
	Chronic	<p>Increased costs/production interruption due to contamination of water sources or restrictions caused by droughts.</p> <p>Increased cooling/refrigerant costs due to heat waves and increased temperatures.</p> <p>Changes in the biodiversity of a given region causing a reduction of yields, e.g. an alteration in pollination services leading to shortages/price spikes of beverage ingredients and supply chain disruptions.</p>



Risk category	Risk type	Illustrative examples of risks
Transition risks	Regulatory	<p>Increased operational costs/taxation from stricter environmental regulations, for example, on water, GHG emissions and waste management, and extended producer responsibility regulation on packaging.</p> <p>Costs of relocating production and/or sourcing areas due to expansion of protected areas.</p>
	Liability	<p>Fines/penalties due to inability to respond to mandatory regulations on nature-related topics, e.g. Corporate Sustainability Reporting Directive (CSRD), the European Union Deforestation-free Regulation (EUDR), minimum post-consumer recycled content requirements, the European Union Corporate Sustainability Due Diligence Directive (CSDDD).</p>
	Technological	<p>Failure of nature-friendly technological innovation and loss of market share, e.g. reduced water use/reuse, chemical usage, sustainable packaging, renewable energy.</p>
	Market	<p>Loss of market share due to shifting of customers' preferences to products and services that have positive impacts on nature, mitigate negative impacts or have lower nature dependencies (e.g. packaging).</p> <p>Volatility of ingredient prices, such as increased water prices due to water scarcity or increased agricultural product prices due to ecosystem disruption.</p>
	Reputational	<p>Loss in revenue due to reputational damage caused by, for example, business contamination of ground water, plastic pollution and/or emissions.</p> <p>Revocation of operating licenses and reputational expenses following environmental damages caused by high water withdrawal volumes in water-scarce regions already facing social challenges (e.g. limiting water access for communities).</p> <p>Missed investment opportunities, poor ratings and negative brand perception due to failure to adhere to sustainability standards, including mandatory frameworks.</p>



Table 7: Illustrative nature-related opportunities for the beverage sector

Opportunity category	Opportunity type	Illustrative examples of opportunities
Business performance	Resource efficiency	<p>Reduce use of water by installing water-saving and water recycling technology, working towards a fully circular approach with zero effluent and full reuse.</p> <p>Optimise distribution networks to minimise transportation distances and use fuel-efficient or electric vehicles.</p> <p>Reduce packaging materials, using recycled and recyclable materials, reusable/returnable/refillable systems, or deposit systems for empty bottles (e.g. from on-premise consumption).</p>
	Products and services	<p>Increase R&D investment into new materials, processes and technologies, e.g.:</p> <ul style="list-style-type: none"> • Plant-based packaging; • Concentrated products diluted at home by consumers with reduced shipping volumes; • Upcycled ingredients (e.g. spent grains to produce fibres/animal feed); and • Use of seasonal ingredients.
	Markets	<p>Access to new markets and license to operate, e.g. by focusing on markets with strong regulations, collaborating with eco-friendly brands and entering into large public and private procurement contracts with high standards.</p>
	Capital flow	<p>Green/plastic bonds, green grants and subsidies, venture capital, KPI-linked finance linked, for example, to efficiency gains in water.</p>
	Reputational capital	<p>Increase of revenue and brand value due to strong reputation on nature performance.</p> <p>Improve engagement and collaboration to build local capacity; work with NGOs, government bodies and other companies on collective actions.</p>



Opportunity category	Opportunity type	Illustrative examples of opportunities
Sustainability performance	Sustainable use of natural resources	Use agricultural ingredients from regenerative/sustainable agriculture and farming practices (e.g. barley, tea, coffee). Grow more resilient varieties of agricultural ingredients (e.g. hops, barley).
	Ecosystem protection, restoration regeneration	Invest in initiatives to conserve and restore high biodiversity areas, which are key to maintaining a stable operating environment and improving water provisioning ecosystem services. Develop green infrastructure projects/nature-based solutions aimed at restoring water basins. Engage in watershed protection and water replenishment activities to support sustainable water usage.

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

Guiding questions:

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

How can risk and opportunity management processes and associated elements (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: Risk and opportunity measurement and prioritisation

Guiding question:

Which risks and opportunities should be prioritised?

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

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 guidance to help beverage 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 that will require significant business changes across sectors. The Taskforce on Nature-related Financial Disclosures (TNFD) has published 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: 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 8 presents illustrative priority and transformative actions that beverages sector organisations may want to consider based on the risks identified in the Assess phase. All actions have been categorised by the corresponding impact driver, based on TNFD’s interpretation of [SBTN’s AR3T framework](#) (Figure 4), pending alignment with future development of SBTN’s Step 4 guidance: avoid and reduce negative impacts; restore and regenerate; transformation of business models, products, services, markets and investments; and contributing to needed systemic change inside and outside value chains.

Figure 4: SBTN’s AR3T framework

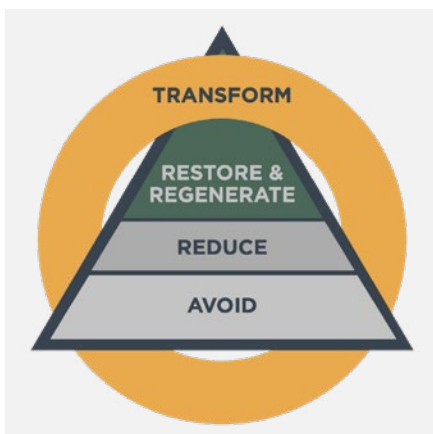


Table 8: Illustrative priority and transformative actions for the beverage sector mapped to the AR3T Framework

Driver of nature change/ dependency	Value chain step	Activity	Priority action	Avoid	Reduce	Regenerate	Restore	Transform
Land, freshwater and ocean use change	Upstream	Beverage ingredients (forestry and agricultural products, water supply)	Supplier water stewardship programmes: Collaborate with suppliers to improve their water management practices, e.g. shared best practices, capacity building and trainings, encouraging certifications, joint research.					
			Supplier land protection and deforestation-free programmes: Regularly assess the land usage and management practices (e.g. regenerative agriculture) of suppliers and encourage them to set and meet specific deforestation-free targets/ask for certifications.					
	Downstream		Community, NGO and government projects/educational programmes: Engage in or support local projects aimed at preserving or restoring water sources, particularly in water-scarce regions, and guaranteeing water access (e.g. nature-based solutions, peat restoration projects). Work with local communities, schools and non-profits to promote water conservation education and awareness.					
			Watershed and water replenishment programmes: Prioritise water use efficiency across the high-stress sites identified, set goals and implement watershed management process (e.g. yearly water stress assessment/ measurement).					

Driver of nature change/ dependency	Value chain step	Activity	Priority action	Avoid	Reduce	Regenerate	Restore	Transform
Pollution	Upstream/ Direct operations/ End of life	Packaging materials	<p>Waste management improvements (organic waste, water, materials): Implement systems for reducing, reusing and recycling waste materials generated from production processes. This includes organic waste, water and traditional packaging materials, for example:</p> <ul style="list-style-type: none"> • Returnable and refillable plastic systems, recycling and recycled content; • Waste water treatment and reuse (e.g. irrigation, share with third parties). 					
Resource use/ replenishment	Upstream	Beverage ingredients (forestry and agricultural products) ²⁵	<p>Sustainable/regenerative agriculture practices: Encourage and support farmers in adopting water-efficient irrigation techniques, such as drip irrigation or rainwater harvesting, especially for key ingredients like sugarcane, fruits and grains. This could include leveraging sustainable agriculture platforms to assess suppliers' sustainability levels and training on regenerative agriculture practices, such as crop rotations and increased biodiversity across crops.</p>					

²⁵ For additional guidance refer to the [TNFD food and agriculture guidance](#).

Driver of nature change/ dependency	Value chain step	Activity	Priority action	Avoid	Reduce	Regenerate	Restore	Transform
Resource use/ replenishment	Direct operations	Beverage production	Water recycling and reuse: Implement systems to treat and reuse wastewater within the production processes.					
			Upgrade equipment: Replace old machinery and pipelines with more water-efficient models.					
			Advanced water metering and monitoring: Use smart water management systems to monitor and control water usage, identifying areas for improvement and reducing wastage.					
			Developing water-neutral products and water replenishment: Innovate to create products that require less water in their production and explore compensating for the water used through replenishment projects.					
			Portfolio adjustment: Evaluate the water footprint of different products and prioritise or promote those with lower water impacts.					
			Water reporting: Regularly report on water usage, management practices and conservation efforts.					
			Set public targets: Publicly set and commit to specific water reduction targets to demonstrate leadership and accountability in water stewardship (e.g. water use per beverage produced; deforestation targets and commitment for primary crops).					

Driver of nature change/ dependency	Value chain step	Activity	Priority action	Avoid	Reduce	Regenerate	Restore	Transform
Resource use/ replenishment	Downstream	Packaging	Introduce new circular business models: Implement new business models to facilitate reduction and reuse of packaging.					

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 [Science Based Targets Network \(SBTN\)](#) and the [summary guidance on SBTN’s methods for setting science-based targets for nature](#), which the TNFD has co-developed.

In particular, beverage sector organisations wishing to set targets may find it useful to consider SBTN Freshwater technical guidance and targets,²⁶ with a focus on quantity and quality, wherever these issue areas are material for the organisation’s activities:

- Reduction of water withdrawals (from surface or groundwater); and
- Reduction of nutrient loading (nutrient and phosphorus) to freshwater bodies.

Organisations may also find it useful to refer to the SBTN Land technical guidance²⁶, with a particular focus on no conversion of natural ecosystems and (agricultural) land footprint reduction, and an additional landscape engagement target with a flexible focus on any land-related issue, and the Ceres [Corporate Expectations for Valuing Water](#).

²⁶ SBTN (2023) [Freshwater technical guidance](#) and [Land technical guidance](#).



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](#)
- TNFD – Global Reporting Initiative (GRI) Standards [Interoperability Mapping](#)

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](#).

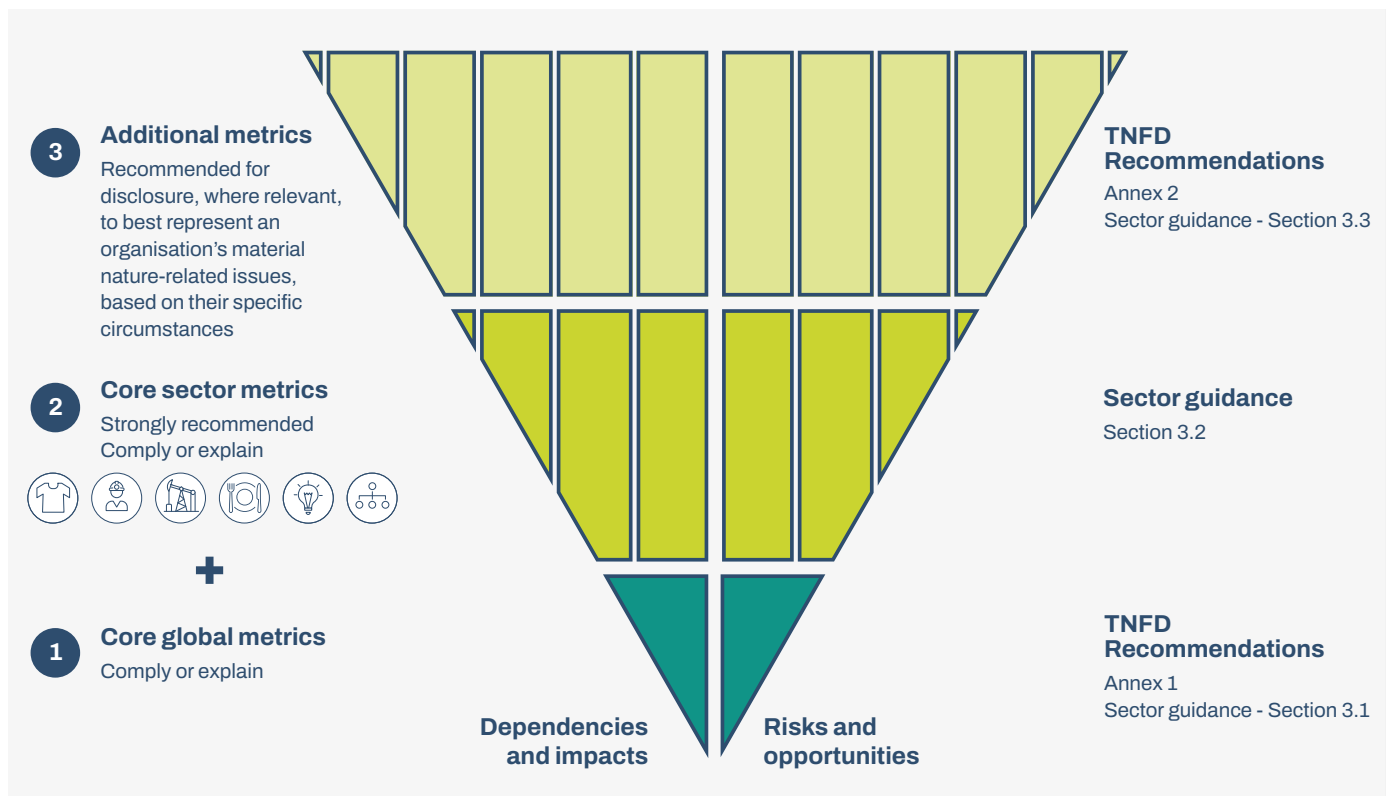
3. Sector-specific disclosure metrics – Beverages

Sector-specific metrics form an important part of the TNFD's measurement architecture (see Figure 5). 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 beverages sector. It includes:

1. Guidance on the application of the core global disclosure indicators and metrics to the beverages sector (Section 3.1); and
2. Core and additional disclosure indicators and metrics for the beverages sector (Sections 3.2 and 3.3).

Figure 5: 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 beverages 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 beverages 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 beverages 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, although these are not expected to comply or explain bases. 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 9: 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 Disclosure Standard.	No further sector specific guidance; refer to the core global disclosure metric.	
Land/freshwater/ocean-use change	C1.0	Total spatial footprint	Total spatial footprint (km ²) (sum of): <ul style="list-style-type: none"> • Total surface area controlled/managed by the organisation, where the organisation has control (km²); • Total distributed area (km²); and • Total rehabilitated/restored area (km²). 	No further sector specific guidance; refer to the core global disclosure metric.	
	C1.1	Extent of land/freshwater/ocean-use change	Extent of land/freshwater/ocean-use change (km ²) by: <ul style="list-style-type: none"> • Type of ecosystem²⁷, and • Type of business activity. 	No further sector specific guidance; refer to the core global disclosure metric.	

²⁷ 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: <ul style="list-style-type: none"> • Voluntary; and • Required by status or regulators. 	An organisation should report area conserved and restored separately, if data is available.	TNFD
			Extent of land/freshwater/ocean ecosystem that is sustainably managed (km ²) by: <ul style="list-style-type: none"> • Type of ecosystem²⁸, and • Type of business activity. 	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
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.	No further sector specific guidance; refer to the core global disclosure metric.	

²⁸ 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	C2.1	Wastewater discharged	<p>Volume of water discharged (m³), split into:</p> <ul style="list-style-type: none"> • Total • Freshwater; and • Other.²⁹ <p>Including:</p> <ul style="list-style-type: none"> • 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. 	<p>In reporting this core global disclosure metric, an organisation should include:</p> <ul style="list-style-type: none"> • Total volume (megalitres/year) of effluents, used water and unused water released to surface water, groundwater, seawater or a third party, for which the organisation has no further use; and • Total water discharge (megalitres/year) by level of treatment (primary, secondary, tertiary). <p>In reporting this core global disclosure metric, an organisation should include the following pollutants:</p> <ul style="list-style-type: none"> • Inorganic pollutants; • Nitrates; • Phosphates; • Pesticides; • Pathogens; • Microplastics; and • Priority substances listed under the EU Water Framework Directive. 	GRI 303-4; CDP water questionnaire; Adaptation from SDG goal 6 (Clean water and sanitation)

²⁹ Freshwater: (≤1,000 mg/L Total Dissolved Solids). Other: (>1,000 mg/L Total Dissolved Solids). Reference: GRI (2018) [GRI 303-4 Water discharge](#).

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	<p>Weight of hazardous and non-hazardous waste generated by type (tonnes), referring to sector-specific guidance for types of waste.</p> <p>Weight of hazardous and non-hazardous waste (tonnes) disposed of, split into:</p> <ul style="list-style-type: none"> • Waste incinerated (with and without energy recovery); • Waste sent to landfill; and • Other disposal methods. <p>Weight of hazardous and non-hazardous waste (tonnes) diverted from landfill, split into waste:</p> <ul style="list-style-type: none"> • Reused; • Recycled; and • Other recovery operations. 	<p>In reporting this core global disclosure metric, the organisation should include:</p> <ul style="list-style-type: none"> • Total weight of packaging; • Proportion (%) made from recycled (ISO 14021) or renewables materials; and • Proportion (%) that is recyclable, reusable or compostable. 	SASB (FB-NB-410a.1.); SASB (FB-AB-410a.1.)

Driver of nature change	Metric no.	Core global indicator	Core global metric	Guidance for the sector	Source
Pollution/pollution removal	C2.3	Plastic pollution	<p>Plastic footprint as measured by total weight (tonnes) of plastics (polymers, durable goods and packaging) used or sold broken down into raw material content.³⁰</p> <p>For plastic packaging, percentage of plastics that is:</p> <ul style="list-style-type: none"> • Reusable; • Compostable; • Technically recyclable; and • Recyclable in practice and at scale. 	No further sector specific guidance; refer to the core global disclosure metric.	
	C2.4	Non-GHG air pollutants	<p>Non-GHG air pollutants (tonnes) by type:</p> <ul style="list-style-type: none"> • Particulate matter PM_{2.5} and/or PM₁₀); • Nitrogen oxides (NO₂, NO and NO₃); • Volatile organic compounds (VOC or NMVOC); • Sulphur oxides (SO₂, SO, SO₃, SO_x); and • Ammonia (NH₃). 	No further sector specific guidance; refer to the core global disclosure metric.	

³⁰ Raw material content: % of virgin fossil-fuel feedstock; % of post-consumer recycled feedstock; % of post-industrial recycled feedstock; % of virgin renewable feedstock.

Driver of nature change	Metric no.	Core global indicator	Core global metric	Guidance for the sector	Source
Resource use/ replenishment	C3.0	Water withdrawal and consumption from areas of water scarcity	Water withdrawal and consumption ³¹ (m ³) from areas of water scarcity, including identification of water source. ³²	<p>In reporting this core global disclosure metric, an organisation should include:</p> <p>Water withdrawal Determine breakdown of the water withdrawn from each source (surface, groundwater, seawater, third party water) as:</p> <ul style="list-style-type: none"> • Ratio of total annual water withdrawal to total available annual renewable water supply. <p>Water consumption Determine total water consumption (water withdrawal minus water discharge) for all facilities, with separate indication of those located in areas of water stress as:</p> <ul style="list-style-type: none"> • Ratio of water consumption-to-availability. <p>Water recycled, reused</p> <ul style="list-style-type: none"> • Ratio of water recycled/reused in production process. <p>Watershed replenishment</p> <ul style="list-style-type: none"> • Seasonal timing and ratio/amount of water restored equivalent to withdrawn or consumed. 	GRI 303-3; GRI 303-5; SASB (FB-AB-140a.1.); SASB (FB-NB-140a.1.); CDP water questionnaire; Adaptation from SDG goal 6 (Clean water and sanitation); WRI

31 Water consumption is equal to water withdrawal less water discharge. Reference: GRI (2018) [GRI 303-5](#).

32 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 ³³ (tonnes) sourced from land/ocean/freshwater, split into types, including proportion of total natural commodities.	No further sector specific guidance; refer to the core global disclosure metric.	
			Quantity of high-risk natural commodities ³⁴ (tonnes) sourced under a sustainable management plan or certification programme, including proportion of total high-risk natural commodities.	No further sector specific guidance; refer to the core global disclosure metric.	
Invasive alien species and other	C4.0	Placeholder indicator: Measures against unintentional introduction of invasive alien species (IAS) ³⁵	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.	

33 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 [appendix I, II and III of CITES](#).

34 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 [appendix I, II and III of CITES](#).

35 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 conditions	<p>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:</p> <ul style="list-style-type: none"> • Level of ecosystem condition by type of ecosystem and business activity; • Impacts on means species extinction risk. <p>There are a number of different measurement options for these indicators.</p> <p>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.</p> <p>The TNFD will continue to work with knowledge partners to increase alignment.</p> <p>No further sector specific guidance; refer to the core global disclosure metric.</p>	No further sector specific guidance; refer to the core global disclosure metric.	
		Placeholder indicator: Species extinction risks			



3.2. Core sector disclosure indicators and metrics

The TNFD core sector disclosure metrics for the beverages 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 10: Core sector disclosure indicators and metrics

Metric subcategory	Metric no.	Indicator	Core sector metrics	Source
Land/ freshwater/ ocean use change	B.C1.0	Deforestation- free products	Proportion (%) of sourced products by weight determined to be deforestation- and conversion-free (DCF), by product.	TNFD food and agriculture sector guidance
Resource use/ replenishment	B.C3.0	Water replenishment	Volume (m ³) of water restored/replenished in basins where water is withdrawn.	CDP water questionnaire; SASB- FB (AB/NB); GRI 303; WRI
Resource use/ replenishment	B.C3.1	Water use	Volume of water consumed (m ³), split by source, including water from third parties.	CDP water questionnaire; SASB- FB (AB/NB); GRI 303; WRI

3.3. Additional sector disclosure indicators and metrics

There are no suggested TNFD additional sector disclosure indicators and metrics for the beverage sector.

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