

## Biodiversity and Water Reporting Templates

The reporting template diagram, along with the reporting template examples below, illustrates how to disclose biodiversity and/or water sustainability-related risks and opportunities in the mainstream report<sup>1</sup> to investors, lenders, and other creditors (users) in a connected way, including possible locations within the mainstream report. Understanding that environmental information cannot be separated from wider social information, it is important preparers retain a holistic and interconnected approach when reporting on sustainability matters, ensuring investors receive a complete picture of the connectivity of material sustainability-related information on risks and opportunities from biodiversity, water, social and climate, for example. The examples demonstrate how companies operating in specific sectors could meet relevant elements of CDSB’s disclosure requirements, including reference to the relevant checklist points.

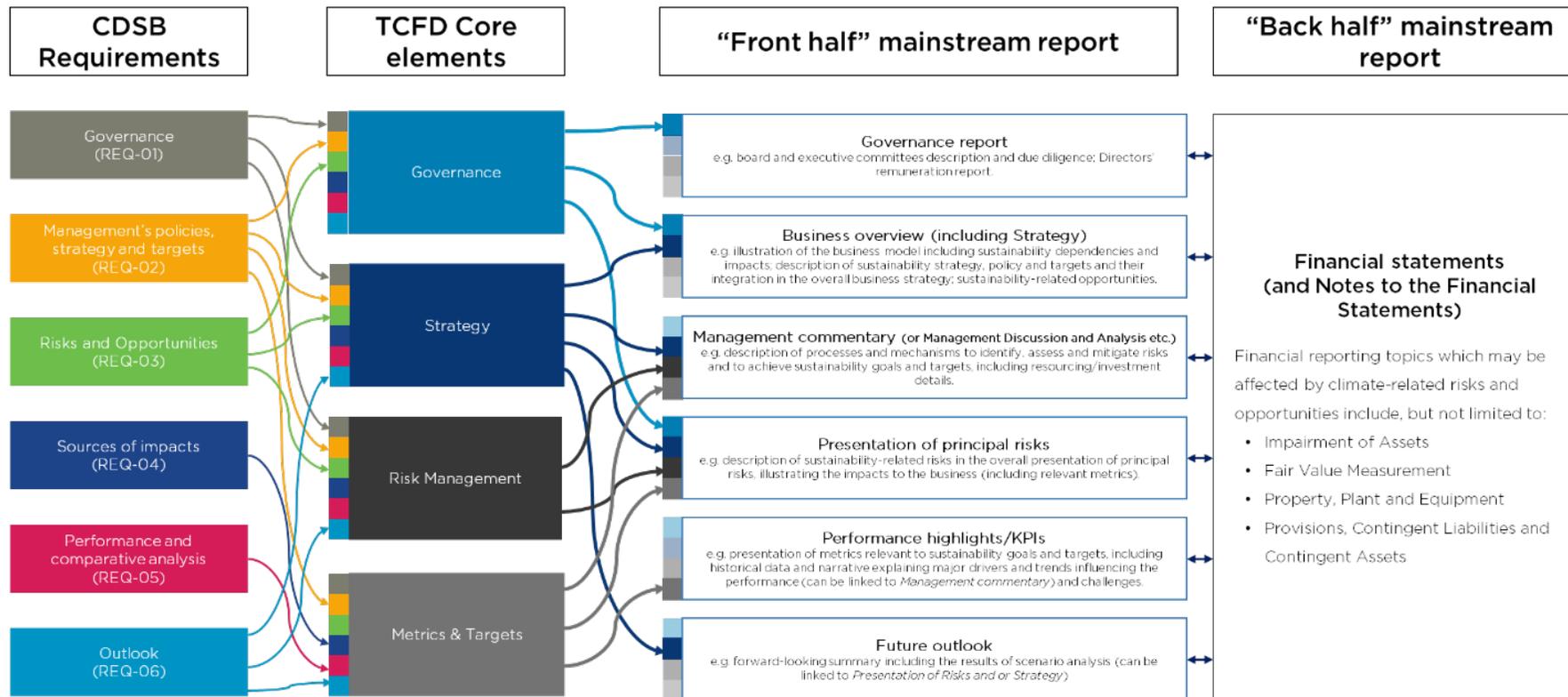


Figure 1. Connecting CDSB Requires and TCFD Core elements to the mainstream report.

<sup>1</sup> The mainstream report is defined as the annual reporting packages in which companies are required to deliver their audited financial results under the corporate, compliance or securities laws of the country in which they operate.

## Template 1 – Coffee production

### Biodiversity

An international coffee producer sources, processes, and supplies coffee worldwide. Coffee beans are produced in Mexico, Colombia, Costa Rica, Ethiopia, Uganda, and Indonesia and processed in different plants located in Italy, Germany, US and India. The company depends and impacts on biodiversity along its entire value chain from coffee farming to transportation and coffee roasting, and to the final use and packaging disposal by the final consumers.

Coffee is often grown in areas with high biodiversity,<sup>2, 3</sup> creating a risk of having **significant impacts** on biodiversity. The company's long-term **relationship with external stakeholders**, such as coffee farmers, local communities and NGOs, is crucial to maintain sustainable high quality of its products in the long term. In particular, collaboration with farmers towards the minimisation of impacts on and the conservation of natural ecosystems and their biodiversity plays a key role in guaranteeing a sustainable coffee supply in the long term.

*The below disclosures demonstrate how the company could meet relevant elements of CDSB's disclosure requirements, including reference to the relevant checklist points completed and possible locations to report in the mainstream report (i.e. the annual reporting packages in which companies are required to deliver their audited financial results under the corporate, compliance or securities laws of the country in which they operate).*

#### 1. Description of the business and its interactions with biodiversity

Coffee beans are produced in Mexico, Colombia, Costa Rica, Ethiopia, Uganda, and Indonesia and then processed in different plants located in Italy, Germany, US and India. The company depends and impacts on biodiversity along its entire value chain from coffee farming to the final use and packaging disposal by final consumers. Both business dependencies and impacts create risks and opportunities for the company, with subsequent financial implications.

Significant **dependencies** are located within the organisation's direct operations, particularly the coffee farming process which relies on forest-based pollination to maintain production levels due to stronger resistance to diseases through pollen deposition and maintenance of final coffee berry weights and yields.<sup>4</sup>

Significant business **impacts** on biodiversity and nature include (1) reduction in population numbers of species such as migratory birds and forest ants, as well as trees, due to replacing native trees with semi-shade polyculture or not shade monoculture; (2) reduction in population numbers of insect and bird species due to the use of herbicides to eliminate natural pests from coffee plants; (3) degradation of soil quality and consequent loss of species due to the use of fertilisers; and (4) reduced water quality due to increased Nitrogen and Phosphate content from fertiliser use. Business **drivers** for the impacts are (1) changes in land-cover aimed at the creation and expansion of coffee plantations (e.g. through deforestation); and (2) polluting emissions into water and soil due to the use of pesticides and other agrochemical use and wastewater from processing of coffee beans. Business impacts have the potential to reduce access to resources the company is dependent on.

<sup>2</sup>Coffee Futures: A Source Book of Some Critical Issues Confronting the Coffee Industry, (pp.94-103)Chapter: Coffee and biodiversity; a producer-country perspectivePublisher: Commodities PressEditors: P.S.Baker

<sup>3</sup>Andini, R., et al (2021). Making biodiversity work for coffee production. A case study of Gayo Arabica coffee in Indonesia. Available at: <https://medcraveonline.com/MQJES/making-biodiversity-work-for-coffee-production-a-case-study-of-gayo-arabica-coffee-in-indonesia.html>

<sup>4</sup>Ngo, H.T., et al (2011). Coffee plant - pollinator interactions: A review. Available at: [https://www.researchgate.net/publication/237973812\\_Coffee\\_plant\\_-\\_pollinator\\_interactions\\_A\\_review](https://www.researchgate.net/publication/237973812_Coffee_plant_-_pollinator_interactions_A_review)

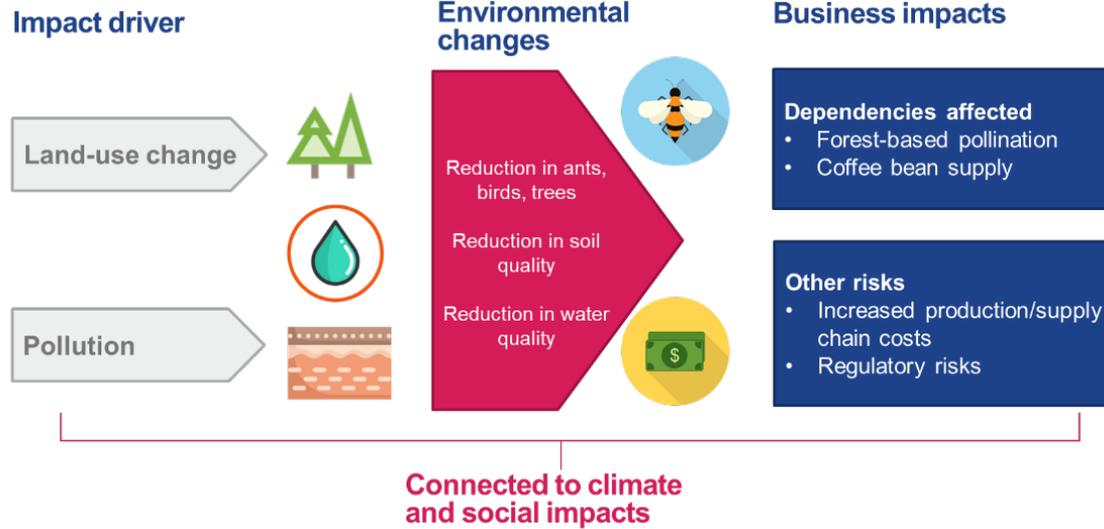


Figure 2. Illustration of connection between biodiversity impact drivers, environmental changes and business impacts.

**Potential location(s) in mainstream reports:** Business overview or Business model description

**Checklist item completed:**

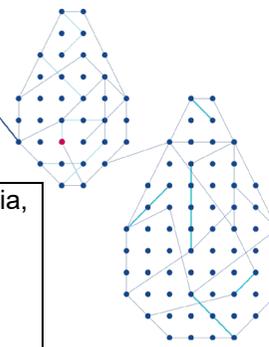
✓ Provide context by explaining the biodiversity-related dependencies and impacts of the organisation with additional consideration of links to natural capital (REQ-02)

## 2. Biodiversity-related risks and opportunities

The company has identified and assessed **biodiversity-related risks and opportunities specific** to its business and the related financial implications, considering both physical (including biological, chemical etc.,) risks and risks that are linked to the transition to a **nature-positive economy**, and adopting a **value-chain approach**. The results are summarised in the following tables.

Sources of biodiversity-related business risks	Financial risks for the business	Priority risk locations
Decline in pollinator populations due to habitat loss, presence of toxic substances (e.g. linked to the use of pesticides in agriculture), and diseases <sup>5</sup> .	• Supply chain disruption due to reduction in productivity of coffee beans and consequent increase in costs of raw materials.	Colombia, Indonesia Uganda,

<sup>5</sup> The Sustainability Consortium. (2019). Coffee Sustainability Snapshot .Available from: <https://sustainabilityconsortium.org/wp-content/uploads/2021/07/fba-coffee-snapshot.pdf>



Reliance on few coffee varieties, which are vulnerable to diseases and are likely to be affected by future global warming. <sup>6</sup> For example, an increased frequency of droughts and increased temperature caused by climate change and exacerbated by forest loss affects productivity and resilience of major coffee varieties, in particular the variety C. Arabica, which is characterized by a low heat resistance. <sup>7</sup>	<ul style="list-style-type: none"> <li>• Supply chain disruption and consequent impacts on production;</li> <li>• Higher raw material prices;</li> <li>• Costs due to the need for rehabilitation and replantation of coffee plantations. In particular, the need to relocate coffee plantations to upper latitudes.</li> </ul>	Mexico, Uganda	Indonesia,
Tighter legislation on protection of highly biodiverse areas, on wastewater treatments and on corporate reporting on impacts on biodiversity and natural ecosystems.	<ul style="list-style-type: none"> <li>• Legal costs and fines;</li> <li>• Costs associated with the loss of licence to operate;</li> <li>• Costs of hiring personnel with biodiversity expertise.</li> </ul>	Europe, India, US, global	
Increased demand from consumers and investors to have a net-positive biodiversity outcome	<ul style="list-style-type: none"> <li>• Reduction in sales due to changing consumer preference.</li> <li>• Reduced access to affordable finance.</li> </ul>	Global	

Table 1. Reporting template 1 biodiversity-related risks

Sources of biodiversity-related business opportunities	Financial opportunities for the business
Increase in the variety of coffee beans used as raw materials (e.g. varieties that are resistant to higher temperatures and water scarcity).	<ul style="list-style-type: none"> <li>• Improved business resilience (e.g. to diseases);</li> <li>• Reduced exposure to raw materials/natural resources price volatility;</li> <li>• New revenue streams.</li> </ul>
Research and implementation of coffee agroecosystems with higher biodiversity (e.g. agroforestry under native forest canopy) <sup>8</sup> and lower use of agrochemicals.	<ul style="list-style-type: none"> <li>• Improve business resilience (e.g. to diseases);</li> <li>• Increased access to funds and loans;</li> <li>• New revenue streams.</li> </ul>

Table 2. Reporting template 2 biodiversity-related opportunities

**Potential location(s) in mainstream reports:** Business overview, strategy description, management commentary or presentation of principle risks

**Checklist items completed:**

- ✓ Identify significant biodiversity-related risks and opportunities (including those arising from the loss of related final ecosystem services) by adopting a value-chain approach and considering different types of risk (REQ-03)
- ✓ Explain the implications of significant biodiversity-related risks and opportunities on business, value chain and products/services, specifying the geographical locations and time horizons in which they will materialise (REQ-03)

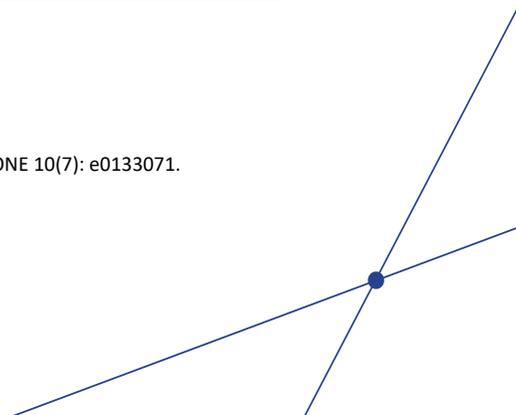
<sup>6</sup> Vernon, T. and Kevan, P. (2012). Insect pollination: commodity values, trade and policy considerations using coffee as an example. Available from:

[https://www.researchgate.net/publication/285913968\\_Insect\\_pollination\\_commodity\\_values\\_trade\\_and\\_policy\\_considerations\\_using\\_coffee\\_as\\_an\\_example](https://www.researchgate.net/publication/285913968_Insect_pollination_commodity_values_trade_and_policy_considerations_using_coffee_as_an_example)

<sup>7</sup> Citation: Magrach A, Ghazoul J (2015) Climate and Pest-Driven Geographic Shifts in Global Coffee Production: Implications for Forest Cover, Biodiversity and Carbon Storage. PLoS ONE 10(7): e0133071. Doi:10.1371/journal.pone.0133071

<sup>8</sup>Dunn, C., et al (2014). A bitter cup: climate change profile of global production of Arabica and Robusta coffee. Available from:

[https://www.researchgate.net/publication/269419801\\_A\\_bitter\\_cup\\_climate\\_change\\_profile\\_of\\_global\\_production\\_of\\_Arabica\\_and\\_Robusta\\_coffee](https://www.researchgate.net/publication/269419801_A_bitter_cup_climate_change_profile_of_global_production_of_Arabica_and_Robusta_coffee)



### 3. Strategy, Policies, targets

Given its dependencies and impacts on biodiversity, and the related risks and opportunities, the company has introduced a biodiversity strategy to define and structure its approach to nature protection and conservation in order to achieve a **net positive impact by 2030**. The strategy has three main policies: (1) halt the loss of biodiversity in the areas where coffee plantations are located with a focus on *forest ecosystems*, *pollinators*, and *wastewater*; (2) re-build ecosystems through *regenerative agriculture* in coffee plantations, and (3) increase the *agrobiodiversity* of its coffee supply whilst engaging with coffee farmers and customers.

- As part of its strategy, the company has defined the following biodiversity-related targets: Reduce the use of pesticides and other agrochemicals in all its coffee plantations by 90% by 2030;
- Improve the efficiency of wastewater treatments up to 95% in all its production plants located in Europe, India and US by 2030;
- 40% of coffee beans supply to be produced with regenerative agriculture techniques by 2030; and
- Introduce 5 varieties of coffee beans and lower the fraction of C. Arabica on total coffee beans produced below 50% by 2030.

**Potential location(s) in mainstream reports:** Business overview, strategy description or management commentary

**Checklist items completed:**

- ✓ Summarise the biodiversity policies and strategies, including definitions and how they support or link to the organisation's risks and opportunities and overall strategy (REQ-02)
- ✓ Set out targets (which, where possible, should be contextual, science-based and time bound), timelines, and indicators for delivery of biodiversity policy and strategy with methods and baselines, including progress towards targets (REQ-02)

### 4. Governance

The company has set up a **biodiversity committee**, including the CEO, that is responsible for forming biodiversity-related policies, strategies and targets. The committee meets every six weeks to discuss biodiversity-related issues together with internal and external professionals and experts. The delivery of policies, strategies and management responses are delegated to appropriate teams and progress towards biodiversity-related goals and KPIs are presented to the committee to monitor progress. In the regions where coffee beans are cultivated, **biodiversity managers** have been introduced. These roles are responsible for delivering the biodiversity-related goals and targets defined for the region and for supervising engagement with farmers and other stakeholders. The company currently does not have an **incentivisation system** linked to remuneration in place but plans to implement one by 2023.

**Potential location(s) in mainstream reports:** Governance report or Business overview

**Checklist items completed:**

- Identify the person(s) or committee responsible for biodiversity-related policies, strategy and information (REQ-01)
- Explain how biodiversity-related policies, strategy and management responses are delegated to management (REQ-01)
- Explain whether there are specific roles or mechanisms in place in priority geographical areas and for priority products/services to tackle compliance with the biodiversity-related regulatory landscape, implementation of biodiversity management responses and engagement with stakeholders (REQ-01)
- Describe any systems for accountability and incentivisation of biodiversity management (REQ-01)

## 5. Management and Performance

To *mitigate* biodiversity-related risks and achieve its biodiversity-related goals, the company is applying **mitigation hierarchy** principles and structuring its activities around the four prioritised response categories: avoidance, reduction, restoration/regeneration and offsetting. The main management responses and results achieved are:

Management responses	Outcomes
Collaboration with universities located in regions where coffee plantations and production plants are located to (1) explore new varieties of coffee and (2) reduce the negative impacts from water and soil emissions.	<ul style="list-style-type: none"> <li>• Identification of 2 new commercial and 1 wild coffee varieties suitable to customers' preferences and more resistant to climate change;</li> <li>• Identification of wastewater treatments (including nature-based solutions) for operations in Europe, Mexico, US and India;</li> <li>• Identifications of nature-based fertilisers and pest control solutions to be used in the coffee plantations.</li> </ul>
Installation of more efficient wastewater treatments (including nature-based filters) in operations in Italy and Germany.	<ul style="list-style-type: none"> <li>• After 2 months from the installation, emissions reduced between 2% and 5% compared to the previous year.</li> </ul>
Collaboration with NGOs to restore freshwater ecosystems nearby the operations in Europe.	<ul style="list-style-type: none"> <li>• Identification of (1) areas to restore and of (2) potential restoration projects.</li> </ul>
Collaboration with agencies to organise training with coffee farmers and other employees on the interactions between biodiversity and nature and the business, and on practical advice to reduce environmental impacts in their daily job.	<ul style="list-style-type: none"> <li>• 80% of farmers involved in biodiversity-related training;</li> <li>• 90% of employees responsible for emissions and effluents in operations in Europe, US, and India have been trained on wastewater impacts;</li> </ul>
Introduction of new coffee varieties and plantations following traditional techniques (agroforestry systems including several plant species, where coffee grows under the shade of other trees) including also wild varieties of coffee beans, which are more resistant to climate change.	<ul style="list-style-type: none"> <li>• Acquisition of 50 ha of coffee plantations to introduce 2 new coffee varieties;</li> <li>• Acquisition of 80 ha of degraded areas to implement coffee plantations based on agroforestry.</li> </ul>

**Table 3. Reporting template 2 biodiversity-related management responses and outcomes**

**Potential location(s) in mainstream reports:** Management commentary or performance overview

**Checklist items completed:**

- When applicable, explain whether and how biodiversity strategies, policies, and management are established through stakeholder engagement and connect with relevant external societal agreements, policies and targets **(REQ-02)**
- Explain the major trends with reference to drivers of change under and/or outside the control of the organisation **(REQ-05)**

## 6. Outlook

The company has assessed its risks and opportunities related to biodiversity and identified the following **future priority areas** of interventions: (1) reduce the use of *agrochemicals* to minimise the impacts on pollinators and natural ecosystems and improve genetic diversity in coffee plantations, and (2) improve the management of *wastewater* due to coffee processing. Nevertheless, given the increasing pressure from regulators and consumers on biodiversity-related issues, there may be a need of review goals and targets to minimise the impacts on the company financial performance.

In order to better understand future biodiversity risks and opportunities for its business, the company has started a collaboration with a University and an NGO to develop **scenario analysis**. In particular, the University is developing a mathematical model that includes different scenarios, from climate to socio-economic, and the NGO is exploring the implications of such scenarios on biodiversity starting from the regions where coffee beans are produced and considering time horizons of 10, 20 and 30 years.

**Potential location(s) in mainstream reports:** Management commentary or performance overview

**Checklist items completed:**

- Explain the likely effect of future biodiversity-related impacts, risks and opportunities, as well as of biodiversity strategy on organisation performance and resilience, taking account of regulatory and market trends and environmental changes? **(REQ-06)**
- Identify and explain the time horizons used for reporting on corporate outlook? **(REQ-06)**
- Explain any techniques, such as scenario analysis, used to inform the outlook including the methods, scenarios and assumptions used, and any shortcomings and uncertainties? **(REQ-06)**

## Template 2 – Mining

### Biodiversity and water – direct operations

A multinational mining company operates in Australia, United States, Chile, Indonesia, and Brazil. The company has varying projects in different stages of the mining life cycle. These include initial site survey and mineral deposit assessments, mine planning and related construction, ore extraction, extraction-related management, and the removal of equipment and infrastructure for projects at the end of the mining life cycle. Projects in different life cycle stages have different **dependencies** and **impacts** on biodiversity.<sup>9</sup>

The company's core activities of exploration, site construction and ore extraction involve exploration drilling, site access road construction, land clearance for infrastructure construction, mining installation, pipeline and power transmission lines, extraction storage, rock crushing, chemical processing and disposal, transportation of hazardous materials, extensive water use and waste disposal.<sup>10</sup>

*The below disclosures demonstrate how the company could meet relevant elements of CDSB's disclosure requirements, including reference to the relevant checklist points completed and possible locations to report in the mainstream report (i.e. the annual reporting packages in which companies are required to deliver their audited financial results under the corporate, compliance or securities laws of the country in which they operate).*

#### 1. Description of the business and its interactions with biodiversity and water

Mining impacts on biodiversity and water are *interconnected*. **Impacts on biodiversity** can cause widespread biodiversity loss, due to habitat degradation, ecosystem fragmentation, exposure to toxins. Reptiles, amphibians and small mammals are at particular risk from mining activities and bird mortalities may occur due to collisions with transmission lines and infrastructure. **Impacts on water** include (1) contamination of water sources contributing to further biodiversity loss, such as loss of fish stocks, (2) increased sedimentation in surface water sources resulting in decreased light availability in aquatic environments and (3) raised pH, salinity, and trace element concentrations in downstream water-sources, contributing to large declines in bacterial, algal, macroinvertebrates and fish communities.<sup>11</sup> Environmental impacts are also connected to **social issues**, for example, reduced access to clean water, reduction in fish stocks available, reduction in grazing grounds and reduction in fruit sources/medicinal plants.

<sup>9</sup> ICMM. (2006). Good Practice Guidance for Mining and Biodiversity (Page 17- Fig 1.2). Available at: <https://www.cbd.int/development/doc/Minining-and-Biodiversity.pdf>

<sup>10</sup> ICMM (2006). Good Practice Guidance for Mining and Biodiversity (Page 24- Fig 2.2). Available at: <https://www.cbd.int/development/doc/Minining-and-Biodiversity.pdf>

<sup>11</sup> Simonin, M. et al (2021). Consistent declines in aquatic biodiversity across diverse domains of life in rivers impacted by surface coal mining. Available at: <https://esajournals.onlinelibrary.wiley.com/doi/full/10.1002/eap.2389?af=R>

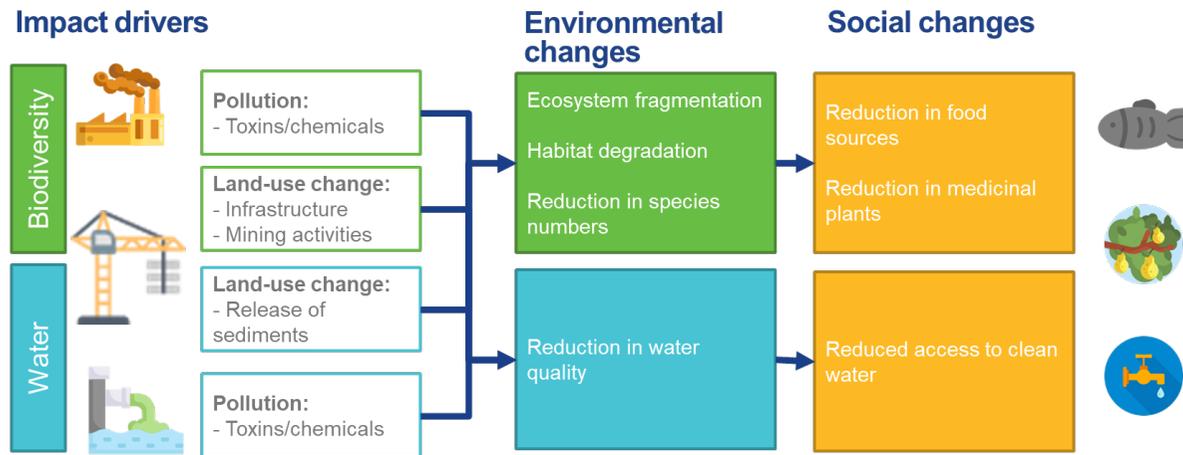


Figure 3. Illustration of connection between biodiversity impact drivers, environmental changes and social changes.

The company is significantly **dependent on water** which plays a vital role in the mining and extractive processes, being used for the transportation of ores or wastes, mineral processing and separation, dust management, and the cooling and cleaning of mining equipment. The consumption of water is also vital for local mining communities. The supply of water is *supported* and *underpinned* by biodiversity and healthy ecosystems. The company’s operations are also dependent on other **ecosystem services** including natural climate regulation, flood protection and erosion control.

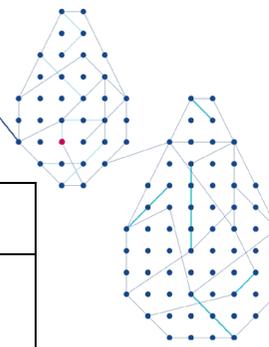
**Potential location(s) in mainstream reports:** Business overview or Business model description

**Checklist item completed:**

- Provide context by explaining the biodiversity-related dependencies and impacts of the organisation with additional consideration of links to natural capital (REQ-02)
- Explain the material water-related dependencies and impacts of the organisation with additional consideration of links to natural capital? (REQ-02)

## 2. Biodiversity and water-related risks and opportunities

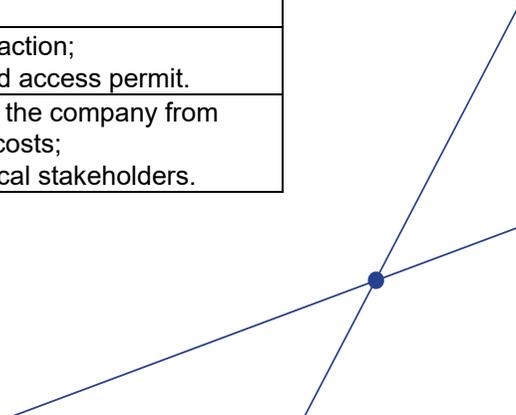
The company has identified and assessed **biodiversity and water-related risks and opportunities** specific to its business and the related financial implications, considering both **physical** (including biological, chemical etc) risks and risks that are linked to the **transition** to a nature-positive economy. Risks and opportunities related to the **ecosystem services** underpinned by biodiversity have also been considered. Risks have been identified and assessed in line with existing risks management systems, as well as following the **best practice guidelines** of Environmental Impact Assessment (EIA) and framework of International Union for Conservation of Nature (IUCN). Risks have been categorised into priority categories of “*high*”, “*medium*” and “*low*”, based on their likelihood, severity and potential timeframe of arising (in the absence of mitigation measures).

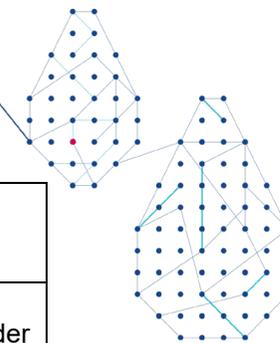


Sources of biodiversity and water-related business risks	Financial risks for the business	Risk category
Increased scarcity of water resulting from ecosystem degradation, as well as changing precipitation patterns linked to climate change.	<ul style="list-style-type: none"> <li>Reduction in revenue due to operation disruption;</li> <li>Rise in water use costs.</li> </ul>	High
Loss of natural flood protection and unpredicted heavy rainfall can cause flooding in underground mines.	<ul style="list-style-type: none"> <li>Increased costs in natural hazard protection;</li> <li>Additional property development and infrastructure costs due to damages.</li> </ul>	Medium
Infrastructure damage induced by soil erosion in mining areas due to surface mining techniques and related seismic activities.	<ul style="list-style-type: none"> <li>Increased cost of soil management;</li> <li>Capital expenditure on infrastructure rebuilding due to sudden retirement of existing assets.</li> </ul>	High
Regulatory, shareholder and consumer pressure to improve biodiversity and water management and increase reporting comprehensiveness.	<ul style="list-style-type: none"> <li>Reduction in access to capital;</li> <li>Loss of investor confidence;</li> <li>Costs of hiring experts for monitoring, and reporting of biodiversity and water-related performance.</li> </ul>	Medium
Performance track record and report of future mitigation plans required as a prerequisite to access new mining land.	<ul style="list-style-type: none"> <li>Costs of obtaining a social licence;</li> <li>Costs of stakeholder identification, inclusion and management;</li> <li>Costs of obtaining permit to access land and water shared with local communities.</li> </ul>	High
Changes in existing legislation and/or incorporation of tougher legislation on management of mining areas.	<ul style="list-style-type: none"> <li>Higher disposal costs;</li> <li>Fines, penalties and in extreme cases project shutdowns for natural capital mismanagement;</li> <li>Mine site rehabilitation costs related to native restoration.</li> </ul>	Medium
Damage to brand and reputation due to biodiversity mismanagement.	<ul style="list-style-type: none"> <li>Reduction in profit due to decreased demand from mineral buyers;</li> <li>Permit denials or delays by regulators as a consequence of reputational loss.</li> </ul>	Medium

Table 4. Reporting template 2 biodiversity-related risks

Sources of biodiversity and water-related business opportunities	Financial opportunities for the business
Integration of biodiversity management standards to initial project plan to reduce project approval waiting period.	<ul style="list-style-type: none"> <li>Early commencement of exploration and extraction;</li> <li>Lower project initiation costs due to quick land access permit.</li> </ul>
Investment in habitat restoration and ecological offsetting in areas impact by company activities.	<ul style="list-style-type: none"> <li>Earlier impact mitigation adaptation can save the company from regulatory fines and other legislation related costs;</li> <li>Improved reputation and relationships with local stakeholders.</li> </ul>





Development of technologies that reduce energy and water consumption, limit waste production, and recycle natural resources to reduce impacts on biodiversity and ecosystems.	<ul style="list-style-type: none"> <li>• Scaling down dependency on natural inputs;</li> <li>• Reduced risk of natural-input supply disruption;</li> <li>• Protection from effects of natural-input price volatility.</li> </ul>
Movement towards sustainable mining which is compatible with social norms, stakeholders' interest, and environmental integrity.	<ul style="list-style-type: none"> <li>• Reduced social and environmental risks;</li> <li>• Improved understanding of evolving expectations of the stakeholder groups;</li> <li>• Improved safety of mining sites and stability in mining operations;</li> <li>• Greater competitiveness due positive feedback of stakeholders to permit authorities.</li> </ul>

Table 5. Reporting template 2 biodiversity-related opportunities

**Potential location(s) in mainstream reports:** Business overview, strategy description, management commentary or presentation of principle risks

**Checklist items completed:**

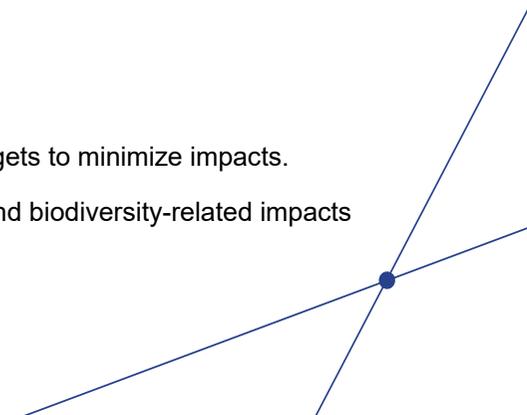
- Identify significant biodiversity-related risks and opportunities (including those arising from the loss of related final ecosystem services) by adopting a value-chain approach and considering different types of risk **(REQ-03)**
- Explain the implications of significant biodiversity-related risks and opportunities on business, value chain and products/services, specifying the geographical locations and time horizons in which they will materialise **(REQ-03)**
- Describe the systems and processes used for assessing, identifying, and monitoring biodiversity-related risks and opportunities, including whether they are integrated with existing risk management systems and processes and are stakeholder inclusive **(REQ-03)**
- Identify material water-related risks and opportunities by adopting a basin-scale and value chain approach, and by considering different types of risks **(REQ-03)**
- Explain the implications of material water-related risks and opportunities on business and value chains, specifying geographic locations and time horizons in which the risks will materialise **(REQ-03)**
- Describe the systems and processes used for assessing, identifying, and monitoring water-related risks and opportunities, including whether they are integrated with existing risk management systems and processes **(REQ-03)**

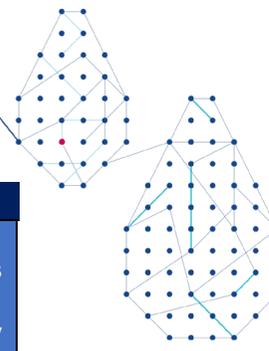
### 3. Strategy, Policies, targets (REQ-02)

The company has committed to having a net-positive impact on nature by 2030 and to create a full risk management plan in 2022. As a starting point, the following **targets** have been set:

- 10% water use reduction target by 2030 against a 2020 baseline;
- 4% sewage waste reduction target by 2025 against a 2019 baseline year;
- 30% of coal mines to use only recycled water by 2030;
- 45% percent treatment rate of subsided land by 2025; and
- Achieve a full assessment of the company's impacts on biodiversity and water resources by 2022, including setting local targets to minimize impacts.

In addition, the company commits to **restore ecosystems** have been degrading in mining areas and to assess and mitigate water and biodiversity-related impacts on **local stakeholders** that result from mining activities.





**Potential location(s) in mainstream reports:** Business overview, strategy description or **management** commentary

**Checklist items completed:**

- Summarise the biodiversity policies and strategies, including definitions and how they support or link to the organisation’s risks and opportunities and overall strategy **(REQ-02)**
- Set out targets (which, where possible, should be contextual, science-based and time bound), timelines, and indicators for delivery of biodiversity policy and strategy with methods and baselines, including progress towards targets **(REQ-02)**
- Summarise the water policies and strategies and how they support or link to the organisation’s risks and opportunities and overall strategy **(REQ-02)**
- Set out the contextual, science-based and time bound targets, timelines, and indicators for delivery of water policy and strategy with methods and baselines, as well as explain progress and/or the development of policies **(REQ-02)**

**4. Governance (REQ-02)**

In 2018, the company formed an **Environment and Biodiversity Sustainability Committee** (including a water focused sub-committee) which is chaired by the Company CEO. In the fourth meeting of sustainability committee, held in October 2021, the committee reviewed the administrative progress on environmental and biodiversity governance. Managers from all mining projects were present and progress reports were presented to the committee chairman.

**Potential location(s) in mainstream reports:** Governance report or Business overview

**Checklist items completed:**

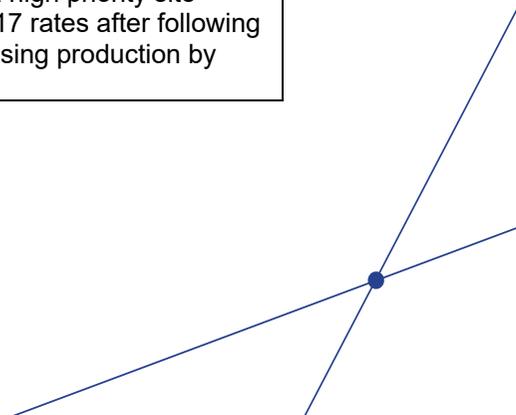
- Identify the person(s) or committee responsible for biodiversity-related policies, strategy and information? **(REQ-01)**
- Identify the person(s) or committee responsible for water policies, strategy and information? **(REQ-01)**

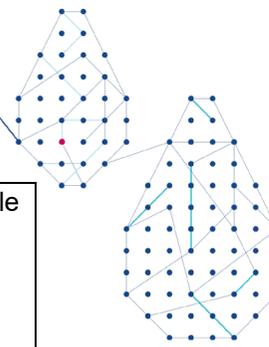
**5. Management Responses and Performance<sup>12</sup>**

The company’s current biodiversity and water performance is outlined below.

Responses	Outcomes
<p>Some of company’s projects are situated near to high water baseline stress and share water sources with local communities. With the collaboration of researchers, experts and international NGOs the company has introduced a ‘Water Consumption Reduction Techniques on Mining Operation’ guideline.</p>	<ul style="list-style-type: none"> <li>• The total water use of the company has reduced from withdrawing 1,027 million m<sup>3</sup> of various types of water in 2019 to 917 million m<sup>3</sup> in 2020 (a 110 million m<sup>3</sup> reduction);</li> <li>• A zinc mine in Peru that had been identified as a high priority site reduced its consumption by nearly 20% from 2017 rates after following the water guidance, whilst simultaneously increasing production by 7.5%.</li> </ul>

<sup>12</sup> Inspiration for the examples used were taken from **Glencore Sustainability Report’s 2020**, available at: [https://www.glencore.com/dam/jcr:fa2343a3-831b-42d0-93b3-26457e111c22/Glencore\\_SR%202020\\_Interactive\\_Final\\_%20optimised.pdf](https://www.glencore.com/dam/jcr:fa2343a3-831b-42d0-93b3-26457e111c22/Glencore_SR%202020_Interactive_Final_%20optimised.pdf)





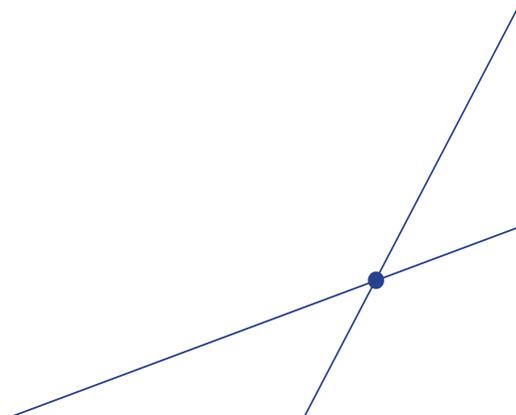
<p>In 2019, the company formed a water sub-committee containing internal experts with the aim of improving water management and governance. To assess ongoing water usage (using 2020 as a baseline), the committee was tasked with developing a year-end water use balance sheet for 2020.</p>	<ul style="list-style-type: none"> <li>• The committee prepared a project-based on water input, reuse, recycle and net consumption report;</li> <li>• In 2020 water reused/recycled on-site was 524 million m<sup>3</sup>, which was 7% more than the previous year;</li> <li>• In 2020, 30% of company projects uses reclaimed water for power generation to minimize ground water exploitation.</li> </ul>
<p>The company owns, leases or manages 1.9 million hectares of land, for which it has a land stewardship management system and progressive land rehabilitation targets due to its commitment to reduce potential impacts on natural capital and to achieve no net loss of biodiversity.</p>	<ul style="list-style-type: none"> <li>• Mining activities have degraded 7% of the company's total land. During 2018 and 2019, of the total land degraded, the company has restored 34,000 hectares;</li> <li>• By 2023 company expects to rehabilitate 55,000 hectares, and by the end of 2025 company expects to rehabilitate 50% of total disturbed land.</li> </ul>
<p>The Company manages a mining project in Western Australia that is in close proximity to an identified key biodiversity area that is partially degraded. The company conducted research and a detailed survey on biodiversity management and possible restoration with NGOs like Earthwatch Institute, BirdLife International and Fauna &amp; Flora International.</p>	<ul style="list-style-type: none"> <li>• The Company initiated a pilot project to test a rehabilitation plan to protect habitats close to mining project neighbourhoods. The Company purchased 650 hectares of land and vegetated that areas with native floras;</li> <li>• After 2 years of this trial, experts found similar enrichment of flora and fauna in the project area compared to nearby non-degraded areas. This enabled the company to achieve access permit for further extraction from local authorities.</li> </ul>

**Table 6. Reporting template 2 biodiversity-related management responses and outcomes**

**Potential location(s) in mainstream reports:** Management commentary or performance overview

**Checklist items completed:**

- Explain the major trends with reference to drivers of change under and/or outside the control of the organisation **(REQ-05)**
- Contextualise performance with baselines/reference states, targets and other criteria used to assess progress **(REQ-05)**
- Provide metrics and indicators for sources of material water impacts (at least withdrawals, consumption, discharge) using both absolute and normalised metrics **(REQ-04)**



## Template 3 – Energy

### Biodiversity and water – direct operations

A multinational energy corporation is headquartered in London and has active business operations in more than 170 countries worldwide. As an integrated energy company, it is involved in all stages of oil and natural gas operations. The company operations can be categorised into three different classes:

1. **Upstream operations** including exploration, appraisal, site development and production of subsurface deposits of hydrocarbons.
2. **Midstream operations** which include storage, processing, and transportation of produced hydrocarbon via tankers and pipelines to the refineries for further processing.
3. **Downstream activities** related to the refining and marketing of petroleum products.

*The below disclosures demonstrate how the company could meet relevant elements of CDSB's disclosure requirements, including reference to the relevant checklist points completed and possible locations to report in the mainstream report (i.e. the annual reporting packages in which companies are required to deliver their audited financial results under the corporate, compliance or securities laws of the country in which they operate).*

#### 1. Description of the business and its interactions with biodiversity and water

The significant **dependencies** of the company on biodiversity and ecosystem services have been identified as follows:

- **Water** is vital to produce oil and gas, for example, being used as a lubricant during drilling, for cooling the drilling equipment and cleaning the mud, sand and rock debris from drilling equipment. During hydraulic fracturing, water is pumped at high pressure into tight formations to open fractures in the rock, which increases the quantity of extractable oil and gas.<sup>13</sup> During the production process, water is used in wells for dust control, equipment washing and for drinking and sanitation needs within the manufacturing facility.
- The construction of roads, pipelines, dams, energy transmission lines and related operational structures that are necessary to facilitate oil and gas extraction depend on **natural erosion control**,<sup>14</sup> including the protection provided by vegetation and ecosystems against floods and storms.
- The management of waste disposals and spillages depends on **ecosystem adaptability and resilience**, for example, ecosystems that are less resilient will require increased costs to restore them to their natural state. With foreseeable increased water scarcity and recurring extreme weather events, these dependencies are to be amplified in future.

During extraction, processing, transportation and project decommissioning, there is potential for significant **negative biodiversity impacts**, including ecosystems, species and related ecosystem services, such as water and air quality. For example:

- **Toxic additives** used for temperature and friction control during drilling can contaminate water sources and reduce numbers of fish populations and degrade their habitats.

<sup>13</sup> World Bank Group. (2016). The importance of water for oil and gas extraction. Available at: <https://openknowledge.worldbank.org/bitstream/handle/10986/23635/Thirsty0energy0I0and0gas0extraction.pdf?sequence=1>

<sup>14</sup> Convention on Biological Diversity. (2017). Mainstreaming of biodiversity into the energy and mining sectors. Available at: <https://www.cbd.int/doc/c/d9d0/7a53/95df6ca3ac3515b5ad812b04/sbstta-21-inf-09-en.pdf>

- **Hydraulic fracturing** requires 3 to 5 million gallons of water per well and between 600 and 1,000 tanker trucks to transport water. Water withdrawals can cause drying and/or warming of rivers and streams, which alter mussel, fish and macroinvertebrate habitats.<sup>15</sup>
- **Noise** generated from drilling, construction and transportation disturbs wildlife, for example, nesting sage grouse and prairie chickens.<sup>16</sup>
- **Infrastructure** used during extraction causes fragmentation of habitats and may interfere with animals' seasonal dwellings and migration routes.
- **Marine activities** such as vessel mobilisation and movement, vessel emissions and discharges, seismic operation, use of chemical and fuel handling can reduce abundance and richness of fish populations, sea birds and marine mammals through impacts to their feeding patterns, migratory behaviour and degradation of their habitats. In an event of an oil spill, thousands of fish, sea birds, sea otters, sea turtles, marine mammals, invertebrates and marine and onshore plants like seagrasses, mangroves and wetland vegetation can be affected.<sup>17</sup>

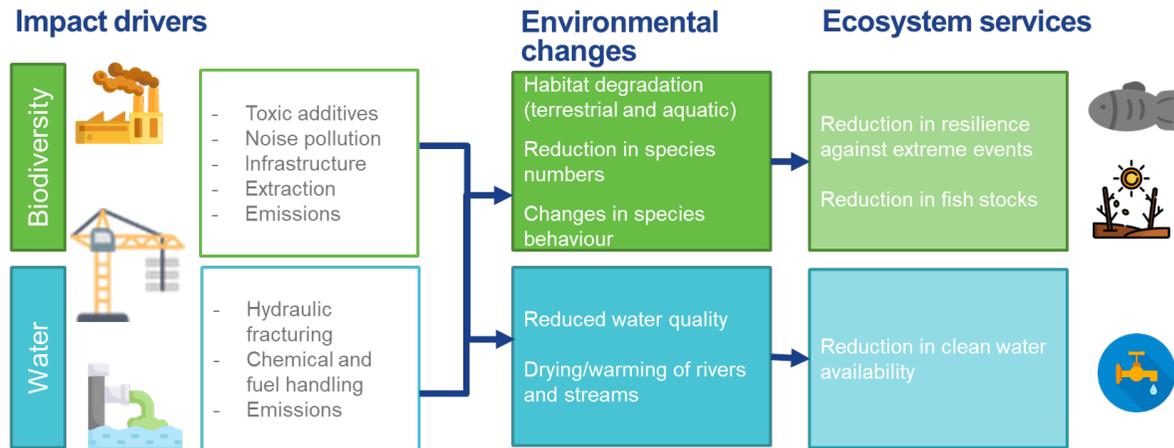


Figure 4. Illustration of connection between biodiversity impact drivers, environmental changes and impacts to ecosystem services

These impacts also have connections to climate and social issues, for example, emissions will contribute to climate change and local communities may experience reduced access to water or be disturbed by noise pollution.

**Potential location(s) in mainstream reports:** Business overview or Business model description

**Checklist item completed:**

- Provide context by explaining the biodiversity-related dependencies and impacts of the organisation with additional consideration of links to natural capital (REQ-02)

<sup>15</sup> U.S. Fish and Wildlife Service. (2020). Energy Technologies and Impacts. Available at: <https://www.fws.gov/ecological-services/energy-development/oil-gas.html>

<sup>16</sup> Gregory. A.J. (2018). Environmental Impacts of Energy Development on Prairie-Grouse and Sage-Grouse in the Continental United States. Available at: <https://www.siftdesk.org/article-details/Environmental-Impacts-of-Energy-Development-on-Prairie-Grouse-and-Sage-Grouse-in-the-Continental-United-States/310>

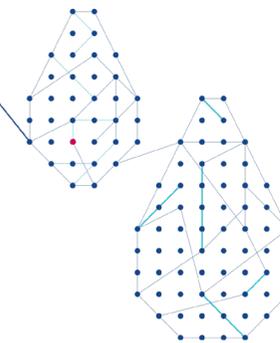
<sup>17</sup> NOAA. (2021). How Oil Harms Animals and Plants in Marine Environments. Available at: <https://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/how-oil-harms-animals-and-plants-marine-environments.html>

- Explain the material water-related dependencies and impacts of the organisation with additional consideration of links to natural capital? (REQ-02)

## 2. Biodiversity and water-related risks and opportunities

The biodiversity and water-related dependencies and impacts generate **business-related risk and opportunities**. With growing concern for greener products and environmental issues among consumers, investors and related stakeholders, environmental mismanagement can ultimately lead to impacts on costs, revenues, and the overall value of the company.

Sources of biodiversity-related business risks	Financial risks for the business	Timescale for risk to materialise
With increased water scarcity, there is a risk of reduced access to water which is considered as highly critical direct input by the company.	<ul style="list-style-type: none"> <li>• Higher cost of water per unit.</li> <li>• Increased expenditure on water recycling.</li> <li>• Higher costs of water transportation.</li> </ul>	Medium-term
Increased natural hazards induced by soil erosion and loss of vegetation (such as mangroves) and other sources of natural disaster protections.	<ul style="list-style-type: none"> <li>• Increased hazard protection costs.</li> <li>• Increased infrastructure repair costs due to damages from floods, storms, and fires.</li> </ul>	Long-term
Changes to regulatory conditions including permit delays or extra conditions required to receive licence to operate.	<ul style="list-style-type: none"> <li>• Increased compliance costs.</li> <li>• Higher production costs to maintain compliance whilst fulfilling extraction needs.</li> <li>• Risk of losing investment if entry to new sites is denied.</li> <li>• Revenue loss due to production delays.</li> <li>• Fines, compensation and legal costs.</li> </ul>	Short-term
Market demand from investors to de-risk their investments from exposure to environmental and biodiversity risks and to minimise impacts on nature.	<ul style="list-style-type: none"> <li>• Increased cost of hiring experts to assess company's environmental impacts.</li> <li>• Increased reporting costs to ensure transparent communication of environmental performance to investors.</li> <li>• Reduced access to capital.</li> <li>• Reduction in number of areas the company is able to operate in, creating loss of revenue.</li> </ul>	Short-term



Concerns from stakeholders (e.g. internal employees, indigenous people, local communities, local government and NGOs) on company's impacts on biodiversity and ecosystem services.	<ul style="list-style-type: none"> <li>• Increased costs of considering community concerns as a key part of risk management.</li> <li>• Increased employee salaries, frequent recruitment and retention costs.</li> <li>• Revenue loss due to restrictions on access to new resources, and project delays if company fails to operate harmoniously with stakeholders.</li> <li>• Increased employee salaries, frequent recruitment and retention costs.</li> </ul>	Short-term
Need to integrate advanced technologies that minimise environmental impacts.	<ul style="list-style-type: none"> <li>• Higher R&amp;D costs.</li> <li>• Increased capital costs.</li> <li>• Cost of training employees to operate new equipment.</li> </ul>	Medium-term

**Table 7. Reporting template 3 biodiversity-related risks**

Sources of biodiversity-related business opportunities	Financial opportunities for the business
Improved perception of the company from permit authorities achieved by mandating and designing plans to restore lands to their natural state once oil and gas extraction is completed.	<ul style="list-style-type: none"> <li>• Greater likelihood of project approval.</li> <li>• Decrease in project delays.</li> </ul>
Improved corporate governance that demonstrates the company's commitment to mitigate biodiversity loss and improve environmental performance.	<ul style="list-style-type: none"> <li>• Ability to move with the market trend of creating long-term shareholder value.</li> <li>• Gaining access to investor funds awarded to greener projects.</li> </ul>
Management of stakeholder relations by improving shared understanding and mutual trust throughout all project stages.	<ul style="list-style-type: none"> <li>• Lowered compliance costs and risk of litigation.</li> <li>• Enhanced reputation.</li> <li>• Increased access to resources.</li> </ul>
Inventing technologies and methods to reduce freshwater usage and to increase amount of water recycling.	<ul style="list-style-type: none"> <li>• Improved water security for the project use.</li> <li>• Reduced chance of water-related conflicts with local communities.</li> <li>• Lower expenditure on water access permits.</li> </ul>
Transformation of company into a pioneering investor in the rapidly growing renewable energy sector.	<ul style="list-style-type: none"> <li>• Diversification of market and related risks.</li> <li>• Scope of gaining large market share of renewables market.</li> </ul>

**Table 8. Reporting template 3 biodiversity-related risks**

**Potential location(s) in mainstream reports:** Business overview, strategy description, management commentary or presentation of principle risks

**Checklist items completed:**

- Identify significant biodiversity-related risks and opportunities (including those arising from the loss of related final ecosystem services) by adopting a value-chain approach and considering different types of risk **(REQ-03)**
- Explain the implications of significant biodiversity-related risks and opportunities on business, value chain and products/services, specifying the geographical locations and time horizons in which they will materialise **(REQ-03)**



- Identify material water-related risks and opportunities by adopting a basin-scale and value chain approach, and by considering different types of risks **(REQ-03)**
- Explain the implications of material water-related risks and opportunities on business and value chains, specifying geographic locations and time horizons in which the risks will materialise **(REQ-03)**

### 3. Strategy, Policies, targets<sup>18</sup>

To mitigate risks and opportunities, the company has set a strategy to *mitigate biodiversity loss and improve overall environmental performance*. To enable this, the company has set science-based **water consumption** and **biodiversity restoration targets**:

- Reduce freshwater consumption by 10% by 2025 from 2021 levels.
- To invest \$25 million annually in nature-based solutions, starting with those that capture carbon from the atmosphere and restore nature.

In addition, the company commits to (1) ceasing operations and exploration in International Union for Conservation of Nature (IUCN) Category I-IV protected areas, areas of high biodiversity value and World Heritage sites, (2) reducing its dependency on water, particularly in areas where water resources are shared with local communities and (3) to thoroughly review and improve its spill prevention programme.

To support global sustainable development goals, by 2030 the company commits:

- To improve filtration and eliminate contamination through improved water treatment solutions.
- To have 60% of operations related to renewable energy production, such as biofuel. The company is currently developing a project in France which will be capable of producing 8,000 barrels of biofuel per day by 2026.

The company is currently developing standardised biodiversity and water metrics that will be used to track performance from 2022.

**Potential location(s) in mainstream reports:** Business overview, strategy description or **management** commentary

**Checklist items completed:**

- Summarise the biodiversity policies and strategies, including definitions and how they support or link to the organisation's risks and opportunities and overall strategy **(REQ-02)**
- Set out targets (which, where possible, should be contextual, science-based and time bound), timelines, and indicators for delivery of biodiversity policy and strategy with methods and baselines, including progress towards targets **(REQ-02)**
- Summarise the water policies and strategies and how they support or link to the organisation's risks and opportunities and overall strategy **(REQ-02)**
- Set out the contextual, science-based and time bound targets, timelines, and indicators for delivery of water policy and strategy with methods and baselines, as well as explain progress and/or the development of policies **(REQ-02)**

<sup>18</sup> Inspiration for the examples used were taken from **Shell's 2021 Biodiversity report**, available at: <https://www.shell.com/sustainability/environment/biodiversity.html>

#### 4. Governance

The company has formed a **technical working committee** of approximately 50 members (30 internal Members and 20 external, including representatives from NGOs, investors, policymakers, academics and other experts) that is responsible for water and biodiversity goal setting, strategic plans and performance monitoring, as well as delegating responsibilities to the appropriate teams and identifying priority geographical areas that require enhanced management responses. The committee is chaired by the CEO. Monthly meetings were held during the year 2020 – 2021, during which the committee set Biodiversity Performance Goals with proposals, inputs and recommendations.

**Potential location(s) in mainstream reports:** Governance report or Business overview

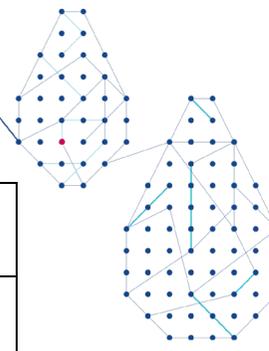
##### Checklist items completed:

- Identify the person(s) or committee responsible for biodiversity-related policies, strategy and information? **(REQ-01)**
- Identify the person(s) or committee responsible for water policies, strategy and information? **(REQ-01)**
- Explain how biodiversity-related policies, strategy and management responses are delegated to management? **(REQ-01)**
- Explain how water policies, strategy and information are delegated to management, and if there are specific roles or mechanisms in place in hotspot areas to tackle compliance with water-related regulatory landscape and engagement with stakeholders **(REQ-01)**

#### 5. Management Responses and Performance<sup>19</sup>

Response	Outcome
30% of company operating sites lie in areas with potential of future water scarcity. To manage this risk, the company initiated site-specific management strategies. For example, improving water conservation technology, increasing wastewater recycling, and use of alternative water sources like collection of rainwater etc.	In 2020, the net freshwater consumption totaled 300 million cubic meters, a decrease of 20 million cubic meters from 2019 consumption of 320 million cubic meters. Simultaneously, the amount of oil and gas extraction increased by 8 percent.
The company committed to reduce its dependency on water sources which are shared with local communities.	In 2020, the company launched a project in Scotland with collaboration of local government to utilise lower quality water while preserving high-quality freshwater resources in the project neighborhoods. This project will help to divert 1.3 million cubic meters of high-quality freshwater into a reservoir for conservation and human consumption.
The company committed to research and utilise the use of nature-based solutions to reduce carbon emissions, such as restoring forests, grasslands and wetlands.	In an abandoned project area in Ireland the company planted more than 500,000 trees of many varieties, including Caledonian pine, which will help to regenerate habitats and benefit animals such as pine martens, ospreys, black grouse and red squirrels.
The company is improving its spill prevention programme by strengthening company-wide inspections, increasing equipment maintenance checks and reviewing operator training. Through	In 2020, reported spills of hydrocarbons was 10,900 barrels. The reported spills in 2021 was decreased to 8,000 barrels, which is 2,900 barrels less than the previous year.

<sup>19</sup>Inspiration for the examples used were taken from Exxon's sustainability report, available at: <https://corporate.exxonmobil.com/Sustainability/Sustainability-Report/Environment>



<p>conducting frequent practice drills, the company is capable of initiating a quick response in order to minimise impacts on biodiversity and environment.</p>	
<p>The company aims to minimise effects on vegetation, wildlife and their habitats by adjusting engineering plans, construction and operation methods based on the advice of external experts</p>	<p>The company collaborated with the Wildlife Habitat Council to manage 21 sites around the world, including forests, wetlands and grasslands.</p>

**Table 9. Reporting template 2 biodiversity-related management responses and outcomes**

**Potential location(s) in mainstream reports:** Management commentary or performance overview

**Checklist items completed:**

- Explain the major trends with reference to drivers of change under and/or outside the control of the organisation **(REQ-05)**
- Contextualise performance with baselines/reference states, targets and other criteria used to assess progress **(REQ-05)**
- Provide metrics and indicators for sources of material water impacts (at least withdrawals, consumption, discharge) using both absolute and normalised metrics **(REQ-04)**



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## Contact

On 31st January 2022, the Climate Disclosure Standards Board (CDSB) was consolidated into the IFRS Foundation to support the work of the newly established International Sustainability Standards Board (ISSB). While this site and its resources remain relevant for preparers looking to improve sustainability disclosure until such time as the ISSB issues its IFRS Sustainability Disclosure Standards on such topics, no further work or guidance will be produced or published by CDSB. For further information please visit the IFRS website.

