

# Sustainability Course 2

Environment Module 2\_Topic\_3 and 4



# Environment



Select the START button to continue.

**START**



# Other environmental topics

Select the NEXT button to continue.



## Topic learning objectives

By the end of this topic, you will be able to:



Explain the concept of circular economy



Identify the principles of circular economy



Identify sources and consequences of different types of pollution



Recognize the risks and opportunities for an organization associated with these environmental issues



Describe the standards and frameworks applicable to the biodiversity and natural capital



## Waste and pollution

### Definition

Circular economy is a way of doing business in which waste is minimized by continually reusing, repairing, refurbishing, remanufacturing, repurposing or recycling products and materials as much as possible (Government of Canada).



The circular economy is a systems solution framework that addresses global challenges including climate change, loss of biodiversity, and waste and pollution.

The concept of circular economy is not new, and has been practiced by Indigenous peoples of North America since time immemorial (World Circular Economy Forum, 2021).



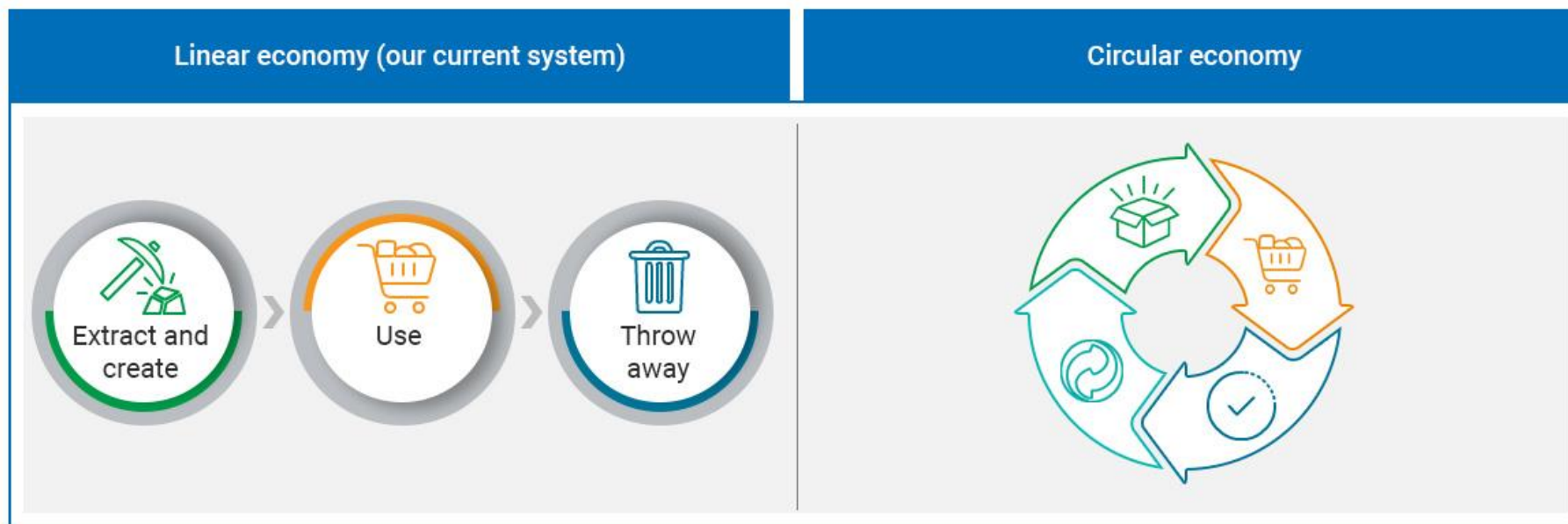
**Source:** Government of Canada



# Linear economy vs circular economy

Circular economy is unlike our current economy which is linear, meaning that after materials are used for their defined purpose they are often considered waste.

Select the tabs to learn more about the life cycle of a product in each type of economy.



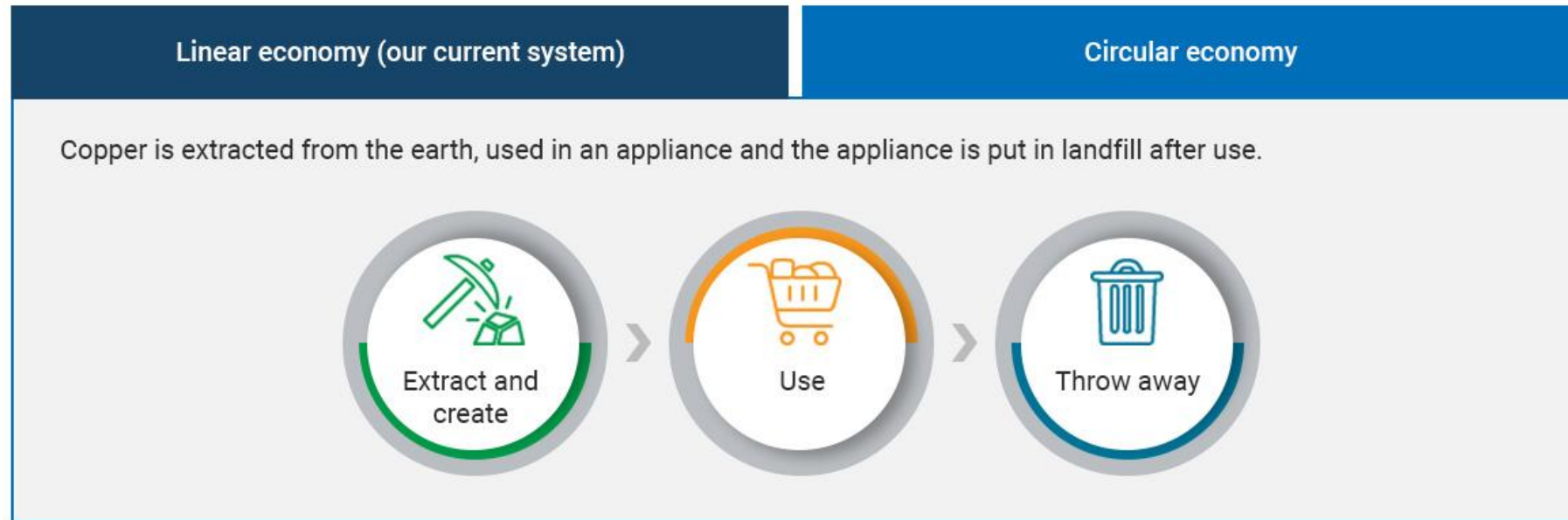
Source: World Circular Economy Forum



# Linear economy vs circular economy

Circular economy is unlike our current economy which is linear, meaning that after materials are used for their defined purpose they are often considered waste.

Select the tabs to learn more about the life cycle of a product in each type of economy.




Source: World Circular Economy Forum



# Linear economy vs circular economy

Circular economy is unlike our current economy which is linear, meaning that after materials are used for their defined purpose they are often considered waste.

Select the tabs to learn more about the life cycle of a product in each type of economy.

Linear economy (our current system)	Circular economy
<p>Copper is extracted from the Earth, used in an appliance, and after this use is complete, the appliance is transported back to the factory, where the copper is extracted and repurposed into another appliance.</p> <p>Ideally, the other materials in the appliance are reused in some form as well.</p>	 <p>The diagram illustrates a circular economy cycle with four stages: 'Products' (represented by a box icon), 'Use' (represented by a shopping cart icon), 'End of use' (represented by a checkmark icon), and 'Remanufacture, repurpose, repair, recycle' (represented by a circular arrow icon). The cycle is depicted as a continuous loop of arrows.</p>



Source: World Circular Economy Forum





## Three principles of circular economy



### Elimination of waste and pollution

By reusing, repurposing and remanufacturing already existing products, waste is reduced and so is the release of GHGs, hazardous substances and pollution.



### Keep products and materials in use

This preserves the value of labour, materials and energy. Products and materials need to be designed to last, reused, remanufactured and/or recycled.



### Regeneration of the natural environment

This actively improves the environment by reducing the consumption of natural resources and supporting the use of renewable energy as opposed to fossil fuels.

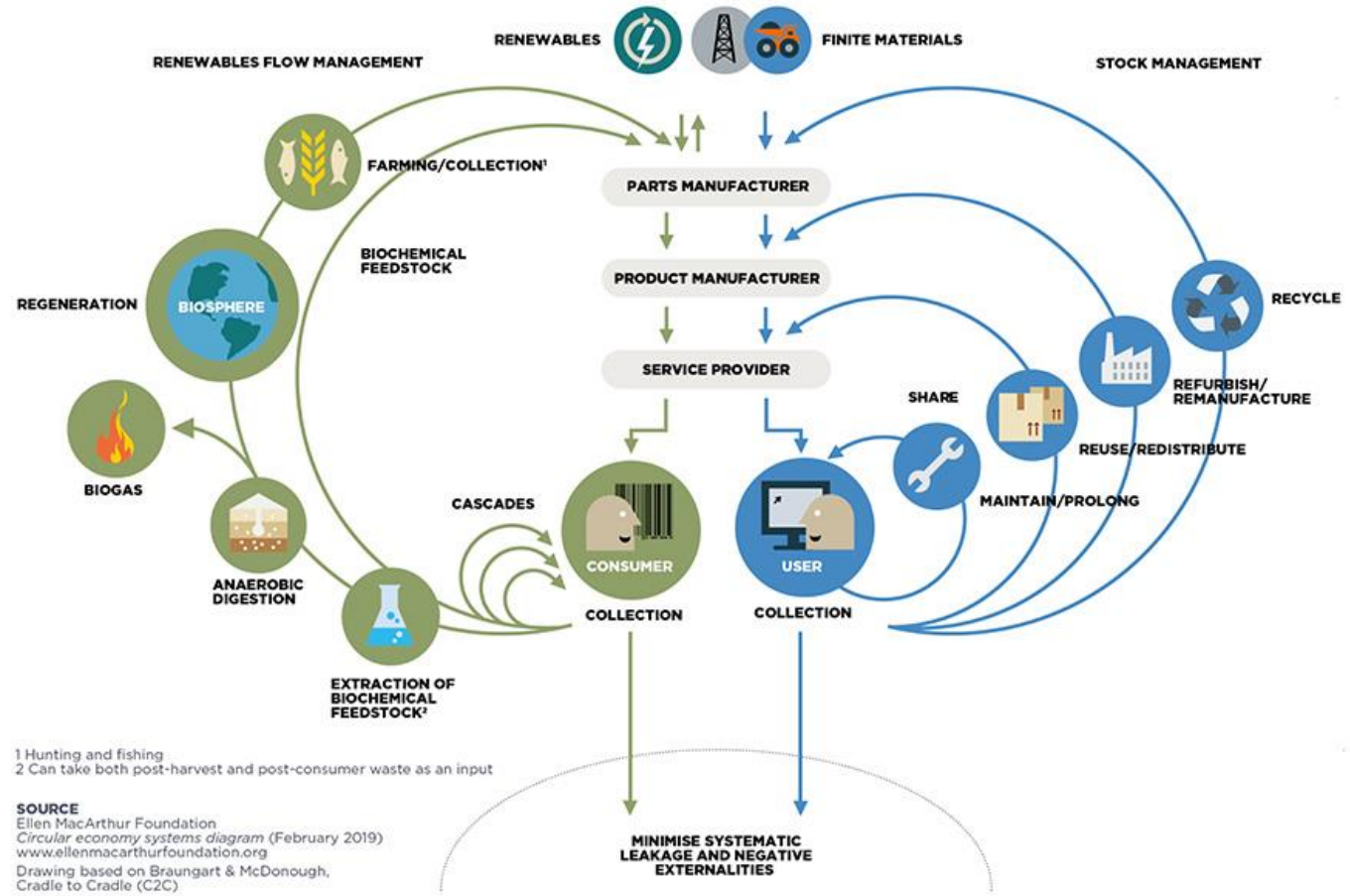


**Source:** Ellen Macarthur Foundation



# Circular economy flow

The diagram displayed on this screen aims to depict all aspects of a circular economy and capture the flow of materials, nutrients, components and products.

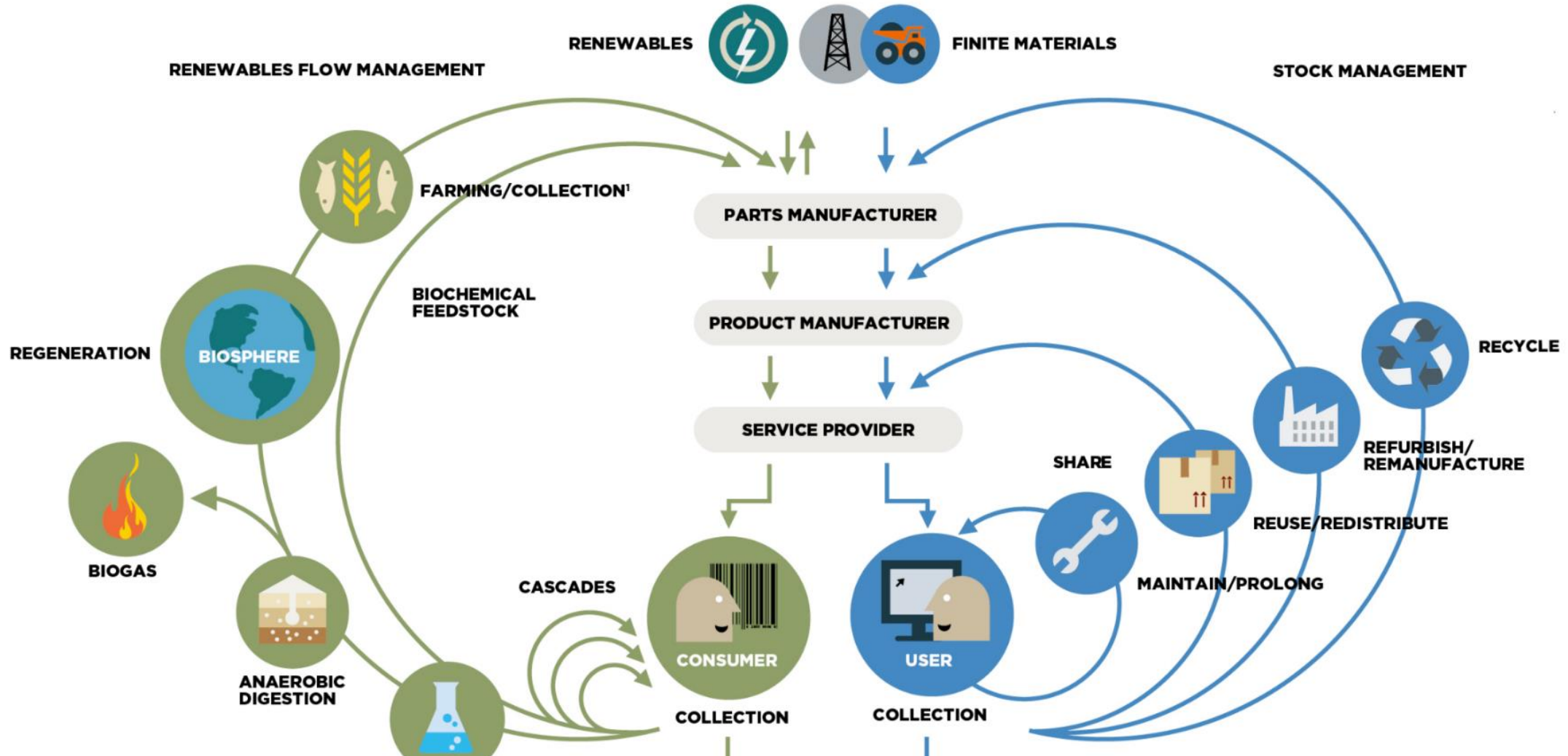


Select the Zoom button to enlarge the diagram.



Select the NEXT button to continue.





## Risks and opportunities related to circular economy

Circular economies create opportunities to add business value.

Considering the circular economy as part of your business model can transform your organization and its role in the entire sustainability value chain. You go from considering cost savings from energy usage to a full circular product, which will reduce costs, environmental impact, and create long-term sustainability for businesses. The circular economy is an opportunity area for companies as they shift toward more sustainable practices.

Circular economy reduces waste and pollution, which has financial and environmental advantages. Waste and pollution will be discussed further in the next section.



# Pollution

## Definition

Pollution is the introduction of harmful substances into the environment that cause adverse effects on the natural environment and can be harmful to humans, animals and plant life.



# Types of pollution

There are many types of pollution and many ways to classify it. The UN Environment Program (UNEP) identifies six main forms of pollution:



Source: UN Environment Program



# Sources of pollution

Select the tabs to learn more about the common sources of each type of pollution.

Type of pollution	Sources
Air	
Freshwater	
Land and soil	
Marine and coastal	
Chemical	
Waste	



**Note:** This is not an exhaustive list.

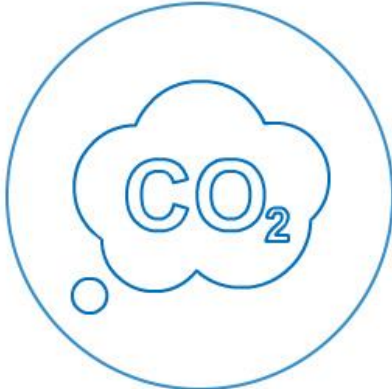


**Source:** (UNEP)



# Sources of pollution

Select the tabs to learn more about the common sources of each type of pollution.

Type of pollution	Sources	
Air	Burning of fossil fuels, wildfires, sand and dust storms	
Freshwater		
Land and soil		
Marine and coastal		
Chemical		
Waste		



**Note:** This is not an exhaustive list.



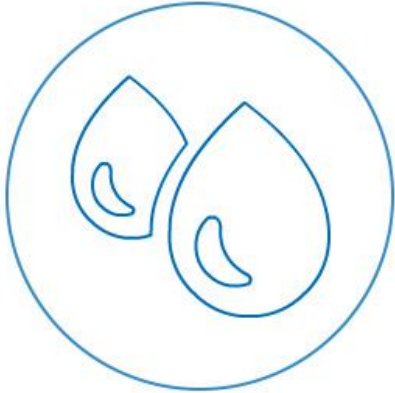
**Source:** (UNEP)





# Sources of pollution

Select the tabs to learn more about the common sources of each type of pollution.

Type of pollution	Sources	
Air	Municipal and industrial waste, nutrient runoff	
<b>Freshwater</b>		
Land and soil		
Marine and coastal		
Chemical		
Waste		



**Note:** This is not an exhaustive list.



**Source:** (UNEP)



# Sources of pollution

Select the tabs to learn more about the common sources of each type of pollution.

Type of pollution	Sources	
Air	Industrial accidents, impacts of extractive industries	
Freshwater		
Land and soil		
Marine and coastal		
Chemical		
Waste		



**Note:** This is not an exhaustive list.




**Source:** (UNEP)



# Sources of pollution

Select the tabs to learn more about the common sources of each type of pollution.

Type of pollution	Sources	
Air	Trash entering the ocean, discarded fishing gear	
Freshwater		
Land and soil		
<b>Marine and coastal</b>		
Chemical		
Waste		



**Note:** This is not an exhaustive list.




**Source:** (UNEP)



# Sources of pollution

Select the tabs to learn more about the common sources of each type of pollution.

Type of pollution	Sources	
Air	<p>Human-made chemicals such as persistent organic pollutants, naturally occurring elements such as lead, mercury and cadmium that can be toxic</p>	
Freshwater		
Land and soil		
Marine and coastal		
<b>Chemical</b>		
Waste		



**Note:** This is not an exhaustive list.



**Source:** (UNEP)



# Sources of pollution

Select the tabs to learn more about the common sources of each type of pollution.

Type of pollution	Sources	
Air	Human-made food waste, and hazardous and industrial waste	
Freshwater		
Land and soil		
Marine and coastal		
Chemical		
<b>Waste</b>		



**Note:** This is not an exhaustive list.



**Source:** (UNEP)



# Consequences of pollution



Select each button to learn more about the consequences of each pollution type.



Air



Freshwater



Land and soil



Marine and coastal



Chemical



Waste

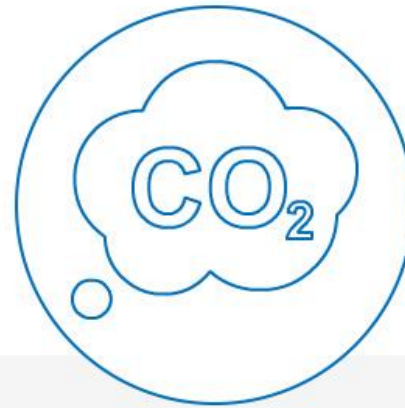


# Consequences of pollution

Select each button to learn more about the consequences of each pollution type

## Air

Air pollution kills more than 7 million people every year and is the biggest environmental health risk of our time (UNEP).<sup>1</sup>



Source: 1. UNEP

Air

Waste



# Consequences of pollution

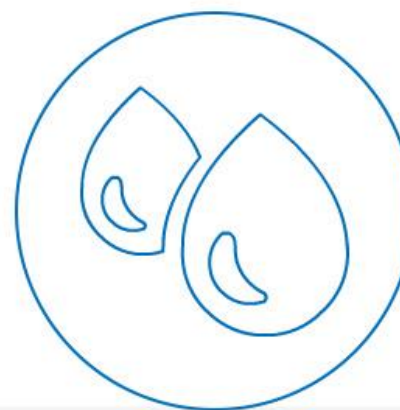
Select each button to



## Freshwater

Freshwater pollution threatens the health of aquatic life and humans. For example, nutrient runoff can lead to toxic algal blooms that harm aquatic life as well as humans (Government of Canada).<sup>2</sup>

Globally, many people rely on freshwater sources for direct drinking water (with no water treatment system). Annually, approximately 4,000 children die from polluted freshwater drinking sources (UNEP).<sup>3</sup>



**Source:** 2. Government of Canada 3. UNEP





# Consequences of pollution

Select each button to learn more about the consequences of each pollution type

## Land and soil

Soil can no longer regulate water flow, filter pollutants, cycle nutrients and support health ecosystems (UNEP).<sup>4</sup>



Source: 4. UNEP



# Consequences of pollution

Select each button to learn more about the consequences of each pollution type

## Marine and coastal

Approximately 8 million tonnes of plastic waste enter the world's oceans annually, impacting marine life and threatening biodiversity (UNEP).<sup>5</sup>



Source: 5. UNEP



# Consequences of pollution

Select each button to learn more about the consequences of each pollution type

## Chemical

Exposure to chemicals Exposure to chemicals can result in significant impacts on human health, causing acute poisoning, cancers, birth defects, neurological disorders and hormone disruption (UNEP).<sup>6</sup>



Source: 6. UNEP



# Consequences of pollution

Select each button to learn more about the consequences of each pollution type

## Waste

Food waste in landfills leads to methane emissions and the burning of waste can create persistent organic pollutants that threaten human and environmental health (UNEP).<sup>7</sup>



Source: 7. UNEP



# Consequences of pollution



Select each button to learn more about the consequences of each pollution type.



Air



Freshwater



Land and soil



Marine and coastal



Chemical



Waste

Pollution and waste threaten the integrity and resilience of natural ecosystems that humans and all other life on earth are reliant on. In the next section, we will discuss natural capital and biodiversity, and their importance to humans and nature.



## Knowledge check

**Q** Which of the following is not a principle of circular economies?

Choose the correct option and select **SUBMIT**.

- Keep products and materials in use
- Recycle all materials
- Elimination of waste and pollution
- Regeneration of the natural environment



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## Knowledge check

Q Which of the following is not a principle of circular economies?

Choose the correct option and select SUBMIT

- Keep products and materials in use
- Recycle all materials
- Elimination of waste and pollution
- Regeneration of the natural environment



### Feedback

Not quite, but close. Please try again.

TRY AGAIN



## Knowledge check

Q Which of the following is not a principle of circular economies?

Choose the correct option and select

- Keep products and materials in u
- Recycle all materials
- Elimination of waste and pollutio
- Regeneration of the natural enviro



### Feedback

That's incorrect.

"Recycle all materials" is not a principle of circular economies.

CONTINUE





## Knowledge check

Q Which of the following is not a principle of circular economies?

Choose the correct option and select

- Keep products and materials in use
- Recycle all materials
- Elimination of waste and pollution
- Regeneration of the natural environment



### Feedback

Well done!

“Recycle all materials” is not a principle of circular economies.

CONTINUE



## Natural capital and biodiversity definitions

### Natural capital

Natural capital can be defined as the world's stocks of natural assets, which include geology, soil, air, water and all living things. It is from this natural capital that humans derive a wide range of services, often called ecosystem services, which make human life possible.



### Biodiversity

Biodiversity is the “variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and ecosystems” (Convention on Biological Diversity)<sup>1</sup>.

Biodiverse ecosystems are more resilient to adverse conditions such as pests, pathogens and the impacts of climate change (IPBES, 2019)<sup>2</sup>. Biodiversity represents the living component of natural capital, but it can be difficult to appraise. Resources like the Biodiversity Guidance that accompanies the Natural Capital Protocol are designed to help businesses incorporate value from biodiversity when completing natural capital assessments (Capitals Coalition)<sup>3</sup>.



**Sources:** 1. Convention on Biological Diversity 2. IPBES 3. Capitals Coalition



## Why is biodiversity important?

There are numerous ways in which humans benefit from biodiversity (IPBES, 2019). Increased biodiversity has direct and positive effects on the following ecosystem services:



Pollination of plants, flowers and crops



Regulation of air quality and climate



Regulation of detrimental organisms (e.g., mosquitoes)



Formation, protection and decontamination of soils



Regulation of freshwater and coastal water quality



Source: IPBES



## Environmental and financial impacts of biodiversity

According to the World Economic Forum (2020)<sup>1</sup>, \$44 trillion of economic value creation is moderately or highly dependent on nature and its services. Biodiversity is essential to human life as it provides basic life support, material goods and spiritual value (IPBES, 2019)<sup>2</sup>. Biodiversity provides monetary benefits as well as societal and environmental benefits. This is a prime example of GRI's concept of double materiality: when evaluating the impact an organization has on biodiversity, there are environmental and financial impacts to consider.

Select the button for an example of double materiality.

Example



Sources: 1. World Economic Forum (2020), 2. IPBES, 2019



Select the NEXT button to continue.



# Environmental and financial impacts

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## Example of double materiality

For example, soy farming in South America is a significant contributor to deforestation in the Amazon (Global Forest Watch)<sup>3</sup>. Although this financially benefits the companies and farmers involved, there are significant non-financial drawbacks. Biodiversity, global climate, water cycling and Indigenous peoples who live in these areas are negatively impacted by deforestation (World Wildlife Fund)<sup>4</sup>. It is important to consider the costs that these other costs have when evaluating opportunities and risk. Under a double materiality lens, soy from South America may have more costs than benefits.



**Sources:** 3. Global Forest Watch, 4. World Wildlife Fund



**Sources:** 1. World Economic Forum (2020), 2. IPBES, 2019



## Biodiversity loss

According to the Global Assessment Report on Biodiversity and Ecosystem Service, around 1 million animal and plant species are threatened with extinction, many within decades (IPBES, 2019).

The most important drivers of biodiversity loss are (in order of largest impact) (IPBES, 2019):



Land use change



Direct exploitation  
of organisms



Climate change



Pollution



Invasion of alien  
species



Source: IPBES, 2019



## Risks and opportunities related to waste, pollution and natural capital

Risks and opportunities related to waste, pollution and natural capital are important to consider for any organization. Waste and pollution threaten the integrity and sustainability of natural capital.

All organizations are dependent on natural capital in some way, for example:



Select the **NEXT** button to continue.



# Risks and opportunities related to biodiversity

## Risk

As we just learned, biodiversity is the living component of natural capital. The World Economic Forum's Biodiversity and Business Risk Report (2010) defines biodiversity risks as "business risks related to biodiversity in the broadest sense. This includes risks as a result of direct impacts or dependencies on biodiversity and ecosystem services, as well as regulatory, financing, reputational and supply chain risks that arise due to business's relationships with biodiversity and ecosystems" (PDF p. 4).



## Opportunities

Opportunities related to natural capital and biodiversity include areas where an organization can have a positive impact on biodiversity and nature. This can lead to an increase in stakeholder trust, positive reputational impacts and positive financial impacts. For example, a forest management company practicing sustainable forest management may return nutrients to the soil by mulching the area of its plantation. This can increase yields, help the soil to support more life and improve the quality of its product.



**Source:** World Economic Forum's Biodiversity and Business Risk Report (2010)





## Standards applicable to biodiversity and natural capital: TNFD

TNFD—the Task Force on Nature-related Financial Disclosures, similar to TCFD, is a framework established in 2021 to help integrate nature-related risks and opportunities into financial reporting to inform decision making.

The mission of TNFD is “to develop and deliver a risk management and disclosure framework for organizations to report and act on evolving nature-related risks, with the ultimate aim of supporting a shift in global financial flows away from nature-negative outcomes and toward nature-positive outcomes” (TNFD).

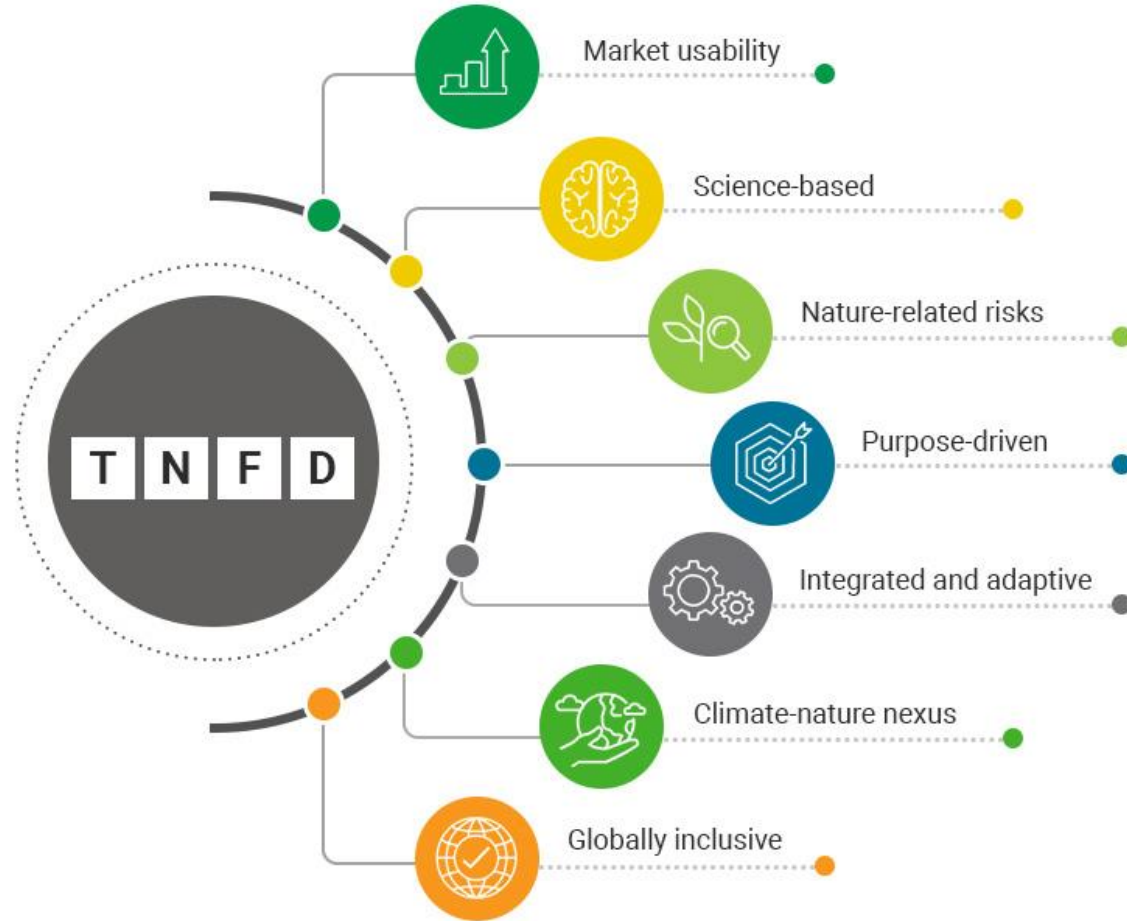


Source: TNFD



# TNFD principles

TNFD has seven main principles.



TNFD is a framework that CPAs may use to disclose nature-related data in annual sustainability reports, and to help guide the assessment of risks and opportunities related to nature.



## Knowledge check

**Q** Which of the following are considered the main drivers of biodiversity loss?

Choose all that apply and select **SUBMIT**.

- Pollution
- Crop cultivation
- Irrigation
- Land use change
- Climate change




## Knowledge check

Q Which of the following are considered the main drivers of biodiversity loss?

Choose all that apply and select **SUBMIT**

- Pollution
- Crop cultivation
- Irrigation
- Land use change
- Climate change





### Feedback

Not quite, but close. Please try again.

[TRY AGAIN](#)



## Knowledge check

Q Which of the following are the most important drivers of biodiversity loss?

Choose all that apply and select Submit

- Pollution
- Crop cultivation
- Irrigation
- Land use change
- Climate change



### Feedback

That's incorrect.

The most important drivers of biodiversity loss are:

- Pollution
- Land use change
- Climate change

CONTINUE



## Knowledge check

Q Which of the following are drivers of biodiversity loss?

Choose all that apply and select Submit

- Pollution
- Crop cultivation
- Irrigation
- Land use change
- Climate change



### Feedback

Well done!

The most important drivers of biodiversity loss are:

- Pollution
- Land use change
- Climate change

CONTINUE



## Summary

This section explored environmental topics: circular economy, pollution and natural capital. It is becoming increasingly clear that environmental topics are important for organizations to consider when analyzing their impact, risks and opportunities and implement the standards and frameworks recognized to mitigate their adverse impact on the organization and society.





You have now completed Module 2, Topic 3 - Other environmental topics.

Select the EXIT button.

EXIT





# Other useful standards and frameworks

Select the NEXT button to continue.



## Topic learning objectives

By the end of this topic, you will be able to:



Recognize some relevant internationally recognized and industry specific standards and frameworks



Understand their use in evaluating performance related to the issues covered in the earlier topics of this module



# ISO

ISO is the International Organization for Standardization. It develops and publishes International Standards (ISO). Entities can become ISO certified for a specific standard if they are deemed to meet the requirements by an ISO certified auditor.

Select the arrows to learn more about different ISO standard for environmental management.

## ISO 14000

The International Organization for Standardization (ISO) has developed a family of standards (ISO 14000) related to environmental systems and management.



Source: ISO 14000



# ISO

ISO is the International Organization for Standardization. It develops and publishes International Standards (ISO). Entities can become ISO certified for a specific standard if they are deemed to meet the requirements by an ISO certified auditor.

Select the arrows to learn more about different ISO standard for environmental management.

## ISO 14001

ISO 14001 is a standard for environmental management systems. More than 300,000 certifications for ISO 14001 have been given in 171 countries around the world (ISO).

ISO 14001 specifies the environmental management system (EMS) that an organization can implement to improve environmental due diligence and performance.

This standard helps organizations achieve intended environmental management outcomes, providing value for the environment, the organization and stakeholders.



Source: ISO 14001



# ISO

ISO is the International Organization for Standardization. It develops and publishes International Standards (ISO).

Entities can become ISO certified for a specific standard if they are deemed to meet the requirements by an ISO certified auditor.

Select the arrows to learn more about different ISO standard for environmental management.

## ISO 14001 (Contd.)

Intended outcomes of the (EMS) include:

- Enhancement of environmental performance
- Fulfilment of compliance obligations
- Achievement of environmental objectives

ISO 14001 "is applicable to any organization, regardless of size, type and nature, and applies to the environmental aspects of its activities, products and services that the organization determines it can either control or influence considering a life cycle perspective." (ISO)



Source: ISO 14001



## Industry specific standards



Numerous standards exist that establish sustainability reporting standards for specific industries. For example:

**SASB (Sustainability Accounting Standards Board)**



Sets out reporting metrics and standards for every major industry

**TSM (Towards Sustainable Mining)**



Establishes standards specific to the mining industry

**RGMP (Responsible Gold Mining Principles)**



Establishes a framework for sustainable gold mining



Note: Some industry specific standards will be discussed in more detail in Course 3 - Reporting, Disclosure and Assurance.



Source: SASB



## Knowledge check

**Q** The intended outcomes of the environmental management system (EMS) include all but which of the following:

Choose the correct option and select **SUBMIT**.

- Enhancement of environmental performance
- Fulfilment of compliance obligations
- Enforcement of environmental goals
- Achievement of environmental objectives



## Knowledge check

Q The intended outcomes of the environmental management system (EMS) include all but which of the following:

Choose the correct option and select SUBMIT

- Enhancement of environmental performance
- Fulfilment of compliance obligations
- Enforcement of environmental goals
- Achievement of environmental objectives



### Feedback

Not quite, but close. Please try again.

TRY AGAIN





## Knowledge check



The intended outcomes of the environmental management system (EMS) include all but which of the following?

Choose the correct option and select

- Enhancement of environmental performance
- Fulfilment of compliance obligations
- Enforcement of environmental goals
- Achievement of environmental objectives



### Feedback

That's incorrect.

Enforcement of environmental goals is not one of the intended outcomes of the environmental management system (EMS).

CONTINUE



## Knowledge check



The intended outcomes of the environmental management system (EMS) include all but which of the following?

Choose the correct option and select

- Enhancement of environmental performance
- Fulfilment of compliance obligations
- Enforcement of environmental goals
- Achievement of environmental objectives



### Feedback

Well done!

Enforcement of environmental goals is not one of the intended outcomes of the environmental management system (EMS).

CONTINUE



## Knowledge check

**Q** ISO 14001 is applicable to any organization, regardless of size, type and nature.

Choose the correct option and select **SUBMIT**.

- True
- False



## Knowledge check

Q ISO 14001 is applicable to any organization, regardless of size, type and nature.

Choose the correct option and select

- True
- False



### Feedback

That's incorrect.

The statement "ISO 14001 is applicable to any organization, regardless of size, type and nature" is true.

CONTINUE



## Knowledge check

Q ISO 14001 is applicable to any organization, regardless of size, type and nature.

Choose the correct option and select

- True
- False



### Feedback

Well done!

The statement "ISO 14001 is applicable to any organization, regardless of size, type and nature" is true.

CONTINUE



## Summary

This topic reviewed a few additional frameworks and standards that an organization may reference when considering its environmental impacts, commitments, risks and opportunities. It is important to be aware of the relevant frameworks and their potential applications.





You have now completed Module 2, Topic 4 - Other useful standards and frameworks.

Select the EXIT button.

EXIT

