

# Sustainable Tourism Future

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The content of this course was developed by faculty from the following institutions:





## Mitigating Climate Change

### Mitigating Climate Change Module

Photo: Jose M. Peral <https://www.flickr.com/photos/jose-pepo/>

**Focus:** International tourism's CO<sub>2</sub> emissions and overall environmental impact are substantial. Yet, despite the impact of tourism on climate change, the industry continues to grow, driven by ever-increasing demand. This module will focus on tourism's contribution to climate change, and our new challenge of reimagining the tourism industry in order to mitigate those impacts for a more sustainable future.

## Learning Outcomes

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- Use the contemporary tourism and hospitality landscape to assess its future economic, cultural, and environmental vulnerabilities from the perspective of the tourist, industry, and host stakeholders.
- Apply critical thinking skills to anticipate future challenges facing tourism and hospitality stakeholders.
- Apply design thinking to create sustainable, innovative, and resilient tourism and hospitality solutions that will help manage current and future challenges.

Using Bloom's taxonomy, this module is based on assessing future vulnerabilities, applying critical thinking skills, and applying design thinking.

Once students have completed this module, they will have a broader understanding of the issues and concepts pertaining to climate change, and how tourism stakeholders can mitigate the negative impacts.



How can we ensure that tourism initiatives relying on the natural environment, mitigate their impact on it?

The goal of this module is to start thinking about how those who benefit from the natural environment (tourism operators, hotels, tourists, hosts), can work towards mitigating their environmental impacts, such that the natural environment can be conserved and preserved.

Photo credit: Patrick Tehnan, LA Times.

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# Module Objectives

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**Upon successful completion of this module you will be able to:**

1. Understand the greenhouse effect, greenhouse gases, and evidence for climate change.
2. Examine the Intergovernmental Panel on Climate Change (IPCC)'s current state of knowledge on climate change potential impacts, adaptation, and vulnerability.
3. Determine the amount of CO<sub>2</sub> that you are responsible for emitting into the atmosphere through your daily activities, and solutions for offsetting carbon emissions.
4. Describe some sustainable (alternative) solutions that the tourism industry can employ to help mitigate the industry's impact on the climate.

Using Bloom's taxonomy, this module is based on understanding, examining, determining, and describing the key concepts and strategies involved with trying to mitigate the impacts from tourism on the natural environment and climate.

Once students have completed this module, they will have a broader understanding of the issues and concepts associated with tourism's impact on climate change.

## Pre-Module Readings

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In preparation for this module, students should read the following information from the accompanying course notes booklet.

- UNWTO. (2021): [\*Tourism in the 2030 Agenda\*](#)
- Sustainable Travel. (2021): [\*Carbon Offsets\*](#)

In preparation for this module, students should read the following information from the accompanying course notes booklet. Reading this information before they start the module will help set the context for what they are about to cover.





Image credit: Travel Weekly: <https://www.travelweekly.com.au/article/heres-why-top-destinations-are-banning-selfie-sticks/>

Tourists posing for selfies in front of the Leaning Tower of Pisa.

Climate change refers to a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer.

~ Intergovernmental Panel on Climate Change (IPCC)

## Definition of Climate Change

IPCC Definition of Climate Change



# Intro to Climate Change

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- The long-term changes in the climate that occur over time.
- Caused by rapidly increasing greenhouse gases in the Earth's atmosphere due primarily to burning fossil fuels (e.g., coal, oil, and natural gas).
- Heat-trapping gases are warming the Earth and the Oceans
- Rising sea levels, changes in storm patterns, altered ocean currents, changes in rainfall, melting snow and ice, extreme heat events, fires, and drought.
- Impacts are projected to continue and intensify, affecting human health, infrastructure, forests, agriculture, freshwater supplies, coastlines, and marine systems.

Climate change refers to the long-term changes in the climate that occur over decades, centuries or longer. It is caused by rapidly increasing greenhouse gases in the Earth's atmosphere due primarily to burning fossil fuels (e.g., coal, oil, and natural gas).

These heat-trapping gases are warming the Earth and the Oceans resulting in rising sea levels, changes in storm patterns, altered ocean currents, changes in rainfall, melting snow and ice, more extreme heat events, fires, and drought. These impacts are projected to continue and in some cases, intensify, affecting human health, infrastructure, forests, agriculture, freshwater supplies, coastlines, and marine systems.

## Projections

- Atmospheric temperatures: 2-4°C increase by 2100, mostly due to human activity
- Sea level rise: ~1 m rise by 2100 due to thermal expansion and glacial melting. Note: the contribution of the Greenland and West Antarctic ice sheet could increase the extent of sea-level rise
- Changes in storm patterns - warming may cause tropical storms globally to be more intense on average (with intensity increases of 2-11% by 2100)

Source: <https://reefresilience.org/management-strategies/community-based-climate-adaptation/climate-change-introduction/>

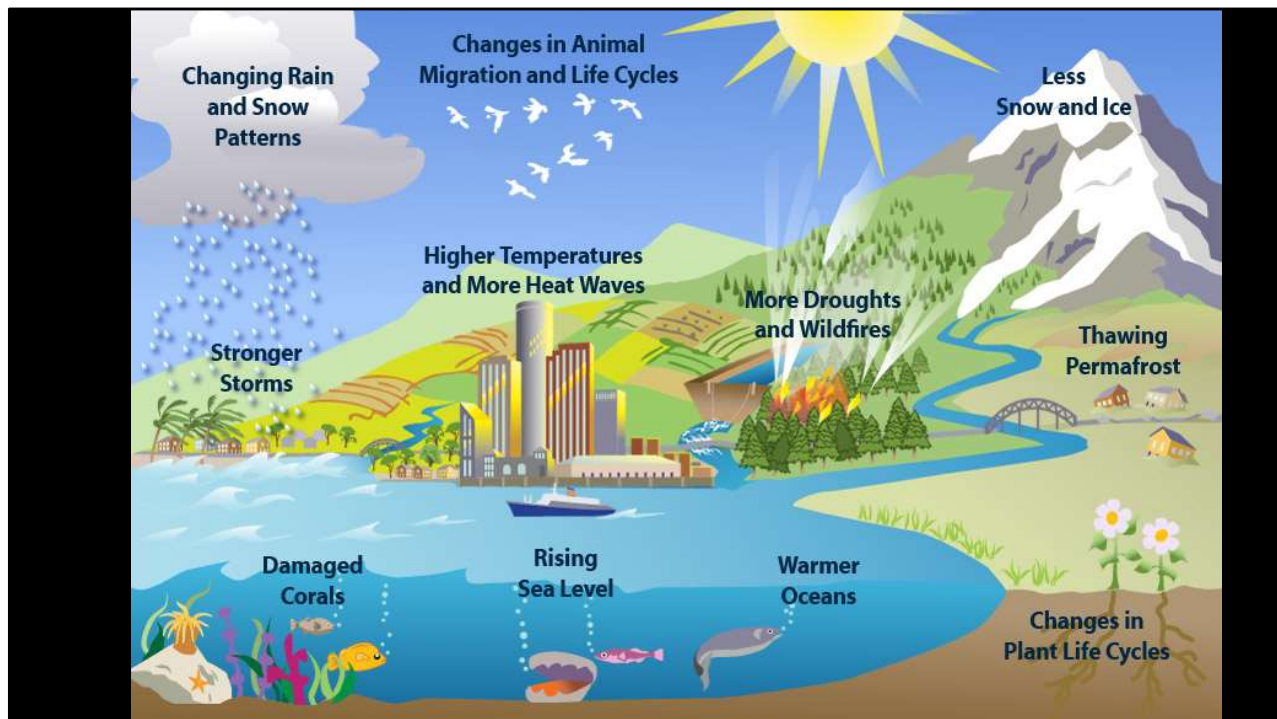
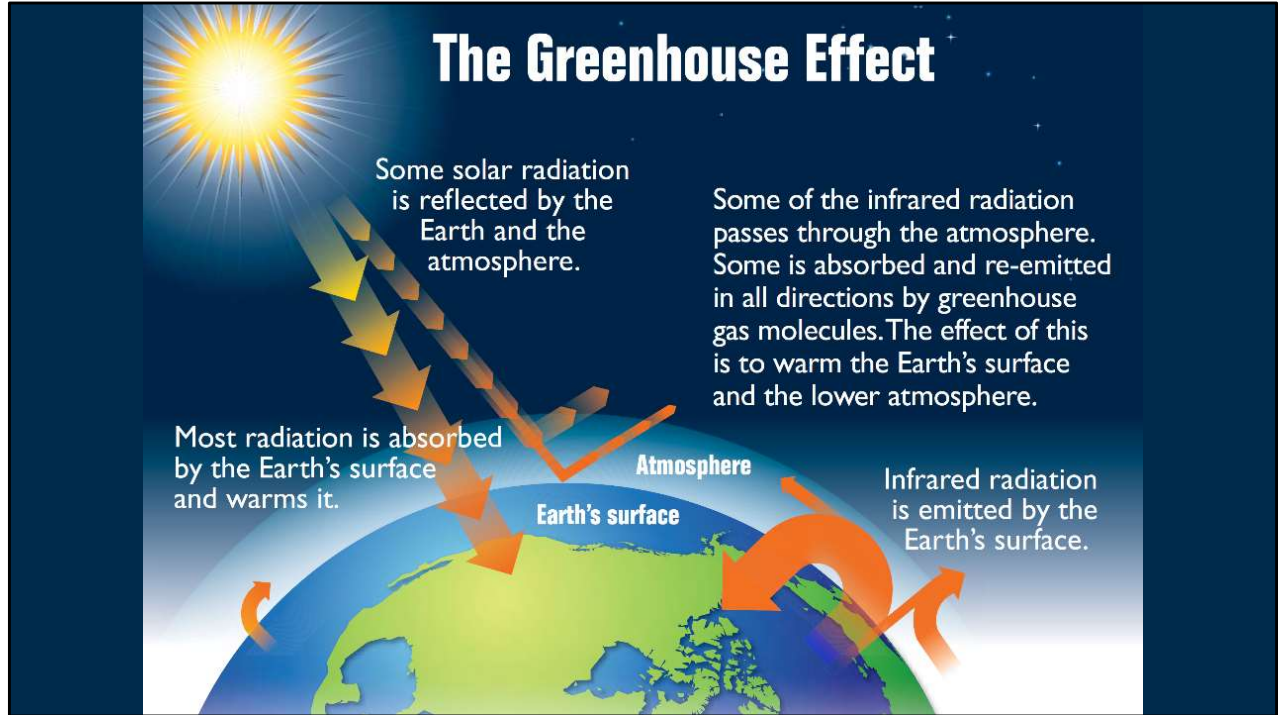


Image Source: <https://www3.epa.gov/climatechange/kids/images/scientists-clues-print.jpg>

This image depicts how a changing climate impacts a variety of different natural habitats and living organisms.

# The Greenhouse Effect



## What is the IPCC ?

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- The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change.
- The IPCC provides regular assessments of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation.

Created in 1988 by the [World Meteorological Organization](#) (WMO) and the [United Nations Environment Programme](#) (UNEP), the objective of the IPCC is to provide governments at all levels with scientific information that they can use to develop climate policies. IPCC reports are also a key input into international climate change negotiations. The IPCC is an organization of governments that are members of the United Nations or WMO.

The IPCC currently has 195 members. Thousands of people from all over the world contribute to the work of the IPCC. For the assessment reports, experts volunteer their time as IPCC authors to assess the thousands of scientific papers published each year to provide a comprehensive summary of what is known about the drivers of climate change, its impacts and future risks, and how adaptation and mitigation can reduce those risks.

An open and transparent review by experts and governments around the world is an essential part of the IPCC process, to ensure an objective and complete assessment and to reflect a diverse range of views and expertise. Through its assessments, the IPCC identifies the strength of scientific agreement in different areas and indicates where further research is needed. The IPCC does not conduct its own research.

Source: <https://www.ipcc.ch/about/>



## IPCC Future Projections

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- Atmospheric temperatures: 2-4°C increase by 2100, mostly due to human activity.
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The IPCC projects:

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Source: IPCC -- The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1-30.



Image credit: <https://www.worldfootprints.com/bali-battles-a-plastic-ocean-while-eagerly-awaiting-economic-respite/>

As if Bali hasn't been suffering enough with the economic blow of COVID-19, locals are also battling a catastrophic environmental disaster as an abnormal amount of plastic washes up along popular tourist beaches. In the first week of 2021, thousands of locals and expats, including local government officials, have taken on a colossal clean-up mission to remove the tonnes of plastic waste washing ashore.

The cause of the disaster is linked to mismanagement of waste as inland flooding, brought about by the monsoon rains, causes a large percentage of the island's garbage to end up in rivers and waterways. It is common for these washes to occur during the monsoon season; however, according to Bali-based ocean conservationist [Emma Sparrow](#), "this year is particularly bad."

There has historically been an argument as to who is responsible for Bali's [constant battle with plastic waste](#). Critics point the finger at an unsustainable tourism industry known for heavy reliance on single-use plastic. Others blame lack of education, illegal dumping, and poor waste management. No matter where the blame belongs,

circumstances have not improved despite a regulation implemented by the Bali provincial government in December 2019 calling for a ban on the use of plastic bags, straws and styrofoam.

However, the nature of this year's monsoon, and the amount of waste that has washed ashore in spite of border closures, gives an indication that tourists may be the tip of the iceberg when it comes to Indonesia's problem with waste.

Since 2010, Indonesia has ranked 2nd in a list of the world's worst ocean polluters, followed by China. According to the [Global Plastic Action Partnership](#), Indonesia produces about 6.8 million tonnes of plastic waste annually, with an estimated 9% of that waste ending up in the ocean — the equivalent of roughly 620,000 tonnes of plastic waste entering the ocean each year.

Source: <https://www.worldfootprints.com/bali-battles-a-plastic-ocean-while-eagerly-awaiting-economic-respite/>

## How 'trashy' tourism threatens world-famous destinations

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Source: [https://www.youtube.com/watch?v=9aW\\_Dlq0lnk](https://www.youtube.com/watch?v=9aW_Dlq0lnk)

# Learning Activity #1

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## ENVIRONMENTAL IMPACTS FROM TOURISM

- |      |       |
|------|-------|
| 1. . | 6. .  |
| 2. . | 7. .  |
| 3. . | 8. .  |
| 4. . | 9. .  |
| 5. . | 10. . |

For this learning activity, students should make a list of 10 environmental impacts created by tourism.

These impacts could be negative (eg. carbon emitted from the airplane) or positive (eg. tourist's park fees contribute to park warden's wages)

## Strategies for the Future

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- Produce more fuel-efficient vehicles/airplanes
- Reduce vehicle usage
- Improve energy-efficiency in buildings (LEED Design)
- Develop carbon capture and storage processes
- Increase wind power
- Increase solar power
- Decrease deforestation / soil erosion
- Improve soil carbon management strategies
- Carbon off-setting

The Covid19 pandemic and its effects on the economy, especially in the tourism sector, have led to a crisis without precedent. Some of the strategies that have been applied so far are no longer valid and must be reinvented to face a new scenario in which to take advantage of promoting more sustainable and environmentally friendly activities. Educating tourists in their behavior when traveling will be key to definitively promote these sustainability policies. On the other hand, the tourist has also become more demanding when it comes to requesting products and services with the guarantee of sustainability and environmental respect.

Sustainable tourism initiatives must take into account environmental impacts, and learn to rethink strategies for mitigating those environmental and climate impacts.

The future of tourism will not be an extension of the past, but will be very different from how we have known it. Despite the fact that it will continue to be a main activity in the economic sector of tourist destinations and in the contributions to GDP, it will be necessary to join efforts and network to structure new proposals. Increasing awareness and respect for ecosystems will be essential. Encouraging new methods of transportation – with a lower carbon output – will be essential. Creating new ways to measure the carbon footprint of each activity carried out in order to involve the

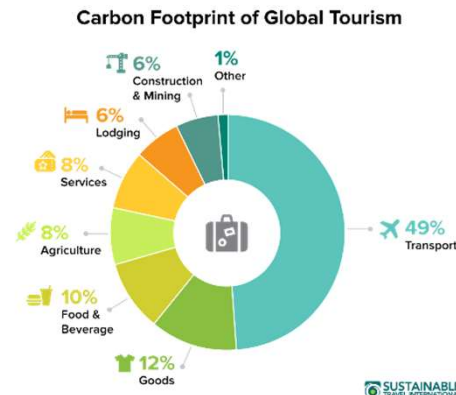


tourist in the mitigation processes will be key.

Source: <https://www.avantgrup.com/en/the-future-of-tourism-sustainable-and-respectful-with-the-environment/>

# Carbon Emissions from Tourism

- Tourism is responsible for approx. 8% of the world's carbon emissions.
- Eg. airplane flights, boat rides, souvenirs, lodging, etc.
- The majority of this footprint is emitted by visitors from high-income countries.
- As the number of people who can afford to travel grows, so will tourism's environmental footprint.



Tourism is responsible for roughly 8% of the world's carbon emissions. From plane flights and boat rides to souvenirs and lodging, various activities contribute to tourism's carbon footprint. The majority of this footprint is emitted by visitors from high-income countries, with U.S. travelers at the top of the list. As the number of people who can afford to travel grows, so will tourism's environmental footprint.

Source: <https://sustainabletravel.org/issues/carbon-footprint-tourism/>

## What is Carbon Offsetting?

- Offsetting one tonne of carbon means there will be one less tonne of carbon dioxide in the atmosphere.
- To offset your emissions you must purchase the equivalent volume of carbon credits to compensate for them.
- The payments you make to purchase carbon credits is what makes the emissions reductions projects financially viable and sustainable.
- Emissions reductions projects are certified by third parties to prove they are real, measurable, and permanent.

In simple terms, offsetting one tonne of carbon means there will be one less tonne of carbon dioxide in the atmosphere than there would otherwise have been. To offset your emissions you must purchase the equivalent volume of carbon credits (independently verified emissions reductions) to compensate for them. The payments you make to purchase these [carbon credits](#) (carbon finance) is what makes the emissions reductions projects which created them, financially viable and sustainable.

These projects can then continue to reduce global carbon emissions by improving technologies, changing awareness and behaviours in a community. Every carbon credit represents one tonne of emissions reductions that has been delivered by a project, and is independently audited to internationally agreed standards.

They are all certified by third parties and go through a rigorous system of checks and balances to prove they are real, measurable, permanent, additional, independently verified and unique.

<https://www.climatecare.org/calculator/carbon-offsetting/>

## Learning Activity #2

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- Determine your closest international airport.
- Choose a destination that you would like to fly to.
- Click on the [Climate Care Carbon Calculator](#)
- Calculate how many tonnes of CO2 you will be emitting
- From the weblink, select a carbon reduction project that you would like to donate to
- How much does it cost to off-set your carbon emissions?
- Is this more/less than you would have anticipated?
- Does this new knowledge of your emission total, or the added cost, make your reconsider whether you will travel or not?

• Help your students walk through the process of offsetting their carbon emissions. Have them use the Climatecare Carbon Calculator to calculate the carbon emission amount, and the cost of offsetting their emission.

- Determine your closest international airport.
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## Case Study: Fogo Island Inn

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### Case Study: Fogo Island Inn:

From its inception, Fogo Island Inn has adopted a responsible, systems-based approach to design and implementation in order to conduct itself in a way that demonstrates and upholds a higher fidelity relationship with the natural world. The Inn has a concrete and accredited environmental strategy, ethical suppliers, and tactics in place to protect the environment. Their ultimate goal is to develop a place-based solution for carbon offset which would directly benefit Fogo Island.

This would be an important step towards achieving carbon neutrality on Fogo Island. Fogo Island Inn has partnered with [Carbonzero](#), so their guests can opt in to achieve carbon neutrality for their stay.

<https://fogoislandinn.ca/contact-us/a-gentle-footprint/>



## Discussion Question #1

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- COVID-19 has had an unprecedented impact on international tourism. Although this has had a negative impact on tourism profits, in which ways has the pandemic helped mitigate the negative environmental impacts on the planet?
- How can these positive impacts be sustained once tourism numbers start to increase again?

Use this question to generate discussion and dialogue amongst the students. Encourage the students to use examples from their pre-class readings, as well as their own personal observations, as they formulate their responses.

## Discussion Question #2

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- List some practical strategies that you might suggest as a means of reducing your environmental impact, and thereby reducing the effects of climate change.

Use this question to generate discussion and dialogue amongst the students. Encourage the students to use examples from their pre-class readings, as well as their own personal observations, as they formulate their responses.

## Key Takeaways:

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- There are a variety of positive and negative environmental impacts created by tourism.
- Tourism emissions are a key contributor to climate change.
- Tourism stakeholders must work towards mitigating environmental impacts; both for the sake of the natural environment, and the sustainability of their tourism enterprises.
- Carbon off-setting is a unique way of mitigating our environmental impacts.

Key takeaways from this module



Image credit: Debbie Lane <http://www.cleanenergyco.com.au/>

A closing image of windmills providing clean energy.