

## Lesson Plan: Climate Change Impacts in Brazil

As a **High School** or **Undergraduate Earth Sciences, Environmental Sciences, or Geography** teacher, you can use this lesson plan to teach your students about climate change and global warming and specifically the impacts of climate change in Brazil.

This lesson plan provides an introduction to climate change, causes and impacts of climate change globally, **climate change risk profile for Brazil** that includes climate impacts on major sectors of the country such as agriculture, water resources, human health, ecosystems, energy, infrastructure, and disasters. This lesson plan also includes the current and future health risks in Brazil due to climate change.

Thus, the use of this lesson plan allows you to teach Climate Science and Climate Change in your **Earth Sciences, Environmental Sciences, and Geography** classrooms.

Use this lesson plan to help your students find answers to:

- What is climate change? What are the causes of global warming?
- What are the global impacts of climate change?
- What are the impacts of climate change in Brazil?
- How will increased temperatures impact Brazil?
- How will changing weather patterns including changes in precipitation, storms, droughts impact Brazil in the future?
- What are the current and future health risks due to climate change in Brazil?

[About the Lesson Plan](#)

**Grade Level:** High school, Undergraduate

**Discipline:** Earth Sciences, Environmental Sciences, Geography

**Topic(s) in Discipline:** Climate Change, Global Warming, Climate Change Risk Profile of Brazil, Health Impacts of Climate Change

**Climate Topic:** Introduction to Climate Change, Climate Variability Record, Climate and Health, Climate Change and Food Security, Climate and Agriculture

**Location:** South America, Brazil

**Access:** Online

**Language(s):** English

**Approximate Time Required:** 60 – 75 min

# 1 Contents

## 1. Reading (15 min) and Video Micro-Lectures (5-15 min)

A reading from the NASA Global Climate Change website that includes contains information about what is the scientific evidence for climate change, causes and impacts of climate change.

This can be accessed at:

<https://climate.nasa.gov/causes/>

**Optional:** A set of 7 of short video micro-lectures (2-5 minutes in length) on climate change and global warming developed by the National Research Council, The National Academies of Sciences, Engineering, and Medicine.

This can be accessed at:

[https://www.youtube.com/playlist?annotation\\_id=annotation\\_709415&feature=iv&list=PL38EB9C0BC54A9EE2&src\\_vid=qEPVyrSWfQE](https://www.youtube.com/playlist?annotation_id=annotation_709415&feature=iv&list=PL38EB9C0BC54A9EE2&src_vid=qEPVyrSWfQE)

## 2. Readings (30 min)

A set of two readings to explain climate change and impacts in Brazil.

Reading 1 by Climatelinks: A Global Knowledge Portal for Climate and Development Practitioners USAID

This can be accessed at:

[https://www.climatelinks.org/sites/default/files/asset/document/2018-April-30\\_USAID\\_CadmusCISF\\_Climate-Risk-Profile-Brazil.pdf](https://www.climatelinks.org/sites/default/files/asset/document/2018-April-30_USAID_CadmusCISF_Climate-Risk-Profile-Brazil.pdf)

Reading 2 by the Climate Change Knowledge Portal of the World Bank

This can be accessed at:

<https://climateknowledgeportal.worldbank.org/country/brazil>

### **3. Reading (15 min)**

A reading by the World Health Organization on how climate change can impact human health in Brazil.

This can be accessed at:

[https://apps.who.int/iris/bitstream/handle/10665/208857/WHO\\_FWC\\_PHE\\_EPE\\_15.03\\_eng.pdf?sequence=1](https://apps.who.int/iris/bitstream/handle/10665/208857/WHO_FWC_PHE_EPE_15.03_eng.pdf?sequence=1)

### **4. Suggested questions/assignments for learning evaluation**

- What is climate change? What are the causes of global warming?
- What are the global impacts of climate change?
- What are the impacts of climate change in Brazil?
- How will increased temperatures impact Brazil?
- How will changing weather patterns including changes in precipitation, storms, droughts impact Brazil in the future?
- What are the current and future health risks due to climate change in Brazil?

## 2 Step-by-step User Guide

Here is a step-by-step guide to using this lesson plan in the classroom/laboratory. We have suggested these steps as a possible plan of action. You may customize the lesson plan according to your preferences and requirements.

### 1. Introduction to Climate Change

Introduce to your students what is climate change and global warming using a reading from the NASA Global Climate Change website. This resource contains information about what is the scientific evidence for climate change, causes and impacts of climate change.

This resource can be accessed at:

<https://climate.nasa.gov/causes/>

**Optional:** You may choose to provide your students with further information about global climate change using a set of video micro-lectures. This set of 7 of short video micro-lectures (2-5 minutes in length) have been developed by the National Research Council, The National Academies of Sciences, Engineering, and Medicine.

They include:

- What is Climate? Climate Change, Lines of Evidence Chapter 1
- Is Earth Warming? Climate Change, Lines of Evidence Chapter 2
- Greenhouse Gases. Climate Change, Lines of Evidence Chapter 3
- Increased Emissions. Climate Change, Lines of Evidence Chapter 4
- How Much Warming? Climate Change, Lines of Evidence Chapter 5
- Solar Influence. Climate Change, Lines of Evidence Chapter 6
- Natural Cycles. Climate Change, Lines of Evidence Chapter 7

This video playlist can be accessed at:

[https://www.youtube.com/playlist?annotation\\_id=annotation\\_709415&feature=iv&list=PL38EB9C0BC54A9EE2&src\\_vid=qEPVyrSWfQE](https://www.youtube.com/playlist?annotation_id=annotation_709415&feature=iv&list=PL38EB9C0BC54A9EE2&src_vid=qEPVyrSWfQE)

## 2. Readings; Climate Change in Brazil

Use the following readings to explain climate change and climate risks in Brazil to your students.

- A. First, use the factsheet Climate Change Risk Profile: Brazil from climatelinks: A Global Knowledge Portal for Climate and Development Practitioners USAID. This factsheet (7 pages) includes the climate summary, historical and future climate, impacts on major sectors such as agriculture, water resources, human health, ecosystems, energy, infrastructure, and disasters, for Brazil.

This resource can be accessed at:

[https://www.climatelinks.org/sites/default/files/asset/document/2018-April-30\\_USAID\\_CadmusCISF\\_Climate-Risk-Profile-Brazil.pdf](https://www.climatelinks.org/sites/default/files/asset/document/2018-April-30_USAID_CadmusCISF_Climate-Risk-Profile-Brazil.pdf)

- B. You may wish to have your students explore climate change and its risks in Brazil in more detail through a resource from the Climate Change Knowledge Portal of the World Bank.

This resource can be accessed at:

<https://climateknowledgeportal.worldbank.org/country/brazil>

This resource contains the information specific to Brazil and includes the following sections:

1. Overview
2. Climate Data -Historical and Future Projections
3. Climate by Sector – Agriculture, Energy, Water, Health
4. Vulnerability
5. Climate Impacts – Agriculture, Water, Sea Level Rise

## 6. Adaptation

Each section contains relevant climate change information including data, projections, and visualizations. The data is visualized through interactive graphs and users can select different indices, model projections, timescales, and sectors to better understand the impacts of climate change in Brazil.

### 3. Reading: Climate Change and Human Health Impacts in Brazil

Use a reading by the World Health Organization (WHO) to stress to your students how climate change can impact human health in Brazil. This factsheet (8 pages) titled Climate Change and Health: Country Profile: Brazil includes information on climate hazard projections for Brazil and current and future health risks of climate change in Brazil. You could use this factsheet to help your students better understand what risks does climate change pose to human health in Brazil with respect to infectious disease, malaria, and undernutrition.

This resource can be accessed at:

[https://apps.who.int/iris/bitstream/handle/10665/208857/WHO\\_FWC\\_PHE\\_EPE\\_15.03\\_eng.pdf?sequence=1](https://apps.who.int/iris/bitstream/handle/10665/208857/WHO_FWC_PHE_EPE_15.03_eng.pdf?sequence=1)

### 4. Questions/Assignments

Use the tools and the concepts learned so far to discuss and determine answers to the following questions:

- What is climate change? What are the causes of global warming?
- What are the global impacts of climate change?
- What are the impacts of climate change in Brazil?
- How will increased temperatures impact Brazil?
- How will changing weather patterns including changes in precipitation, storms, droughts impact Brazil in the future?
- What are the current and future health risks due to climate change in Brazil?

## 3 Learning Outcomes

The tools in this lesson plan will enable students to:

- learn about climate change and global warming
- understand the impacts of climate change in Brazil
- discuss how changing weather patterns due to climate change could affect Brazil's future
- describe the current and future health risks in Brazil due to climate change

## 4 Additional Resources

If you or your students would like to explore the topic further, these additional resources will be useful.

### 1. [Webpage; 'Brazil' on Climatelinks](#)

Climate Change in Brazil specific factsheets, case studies compiled by Climatelinks, USAID.

This can be accessed at:

<https://www.climatelinks.org/countries/brazil#climate-info>



## **2. Reading; 'Brazil's Intended Nationally Determined Contribution (INDC)'**

Document submitted to the United Nations Framework Convention on Climate Change (UNFCCC).

This can be accessed at:

<https://www4.unfccc.int/sites/submissions/INDC/Published%20Documents/Brazil/1/BRAZIL%20iNDC%20english%20FINAL.pdf>

## **3. Webpage; 'INDCs as communicated by Parties\*' on UNFCCC**

UNFCCC webpage for accessing the INDCs for various nations.

This can be accessed at:

<https://www4.unfccc.int/sites/submissions/indc/Submission%20Pages/submissions.aspx>

## **4. Teaching Modules; 'Climate Change and Human Health Lesson Plans'**

Educational material by the National Institute of Environmental Health Sciences (NIEHS).

This can be accessed at:

<https://www.niehs.nih.gov/health/scied/teachers/cchh/index.cfm>

## 5 Credits/Copyrights

All the teaching tools in our collated list are owned by the corresponding creators/authors/organizations as listed on their websites. Please view the individual copyright and ownership details for each tool by following the individual links provided. We have selected and analyzed the tools that align with the overall objective of our project and have provided the corresponding links. We do not claim ownership of or responsibility/liability for any of the listed tools.

### 1. Reading, “The Causes of Climate Change”

By [NASA’s Global Climate Change website](#).

### 2. A set of videos; “Climate Change: Lines of Evidence”

Presented by National Research Council, [The National Academies of Sciences, Engineering, and Medicine](#).

### 3. Readings; “Climate Change Risk Profile- Southern Africa’ and ‘Climate Change Information Fact Sheet- Brazil’

By [Climatelinks](#): A Global Knowledge Portal for Climate and Development Practitioners, USAID.

### 4. Reading; “Climate and Health Country Profile- 2015: Brazil”

By [World Health Organization \(WHO\)](#).

### 5. Additional Resources

[Climatelinks, USAID](#)

[UNFCCC](#)

[NIEHS](#)