



# Climate Change and Bhutan

---



*Tenzin Wangmo*  
*Climate Change Division*  
*National Environment Commission*  
*Royal Government of Bhutan*



# Outline

- ❖ Overview of climate change
- ❖ Bhutan's vulnerability
- ❖ Response to climate change
  - ❖ Global response
  - ❖ National response
- ❖ Way forward



# Definitions

**Climate**, sometimes understood as the "average weather," is **defined** as the measurement of the mean and variability of certain variables (such as temperature, precipitation or wind) over a period of time, ranging from months to thousands or millions of years.

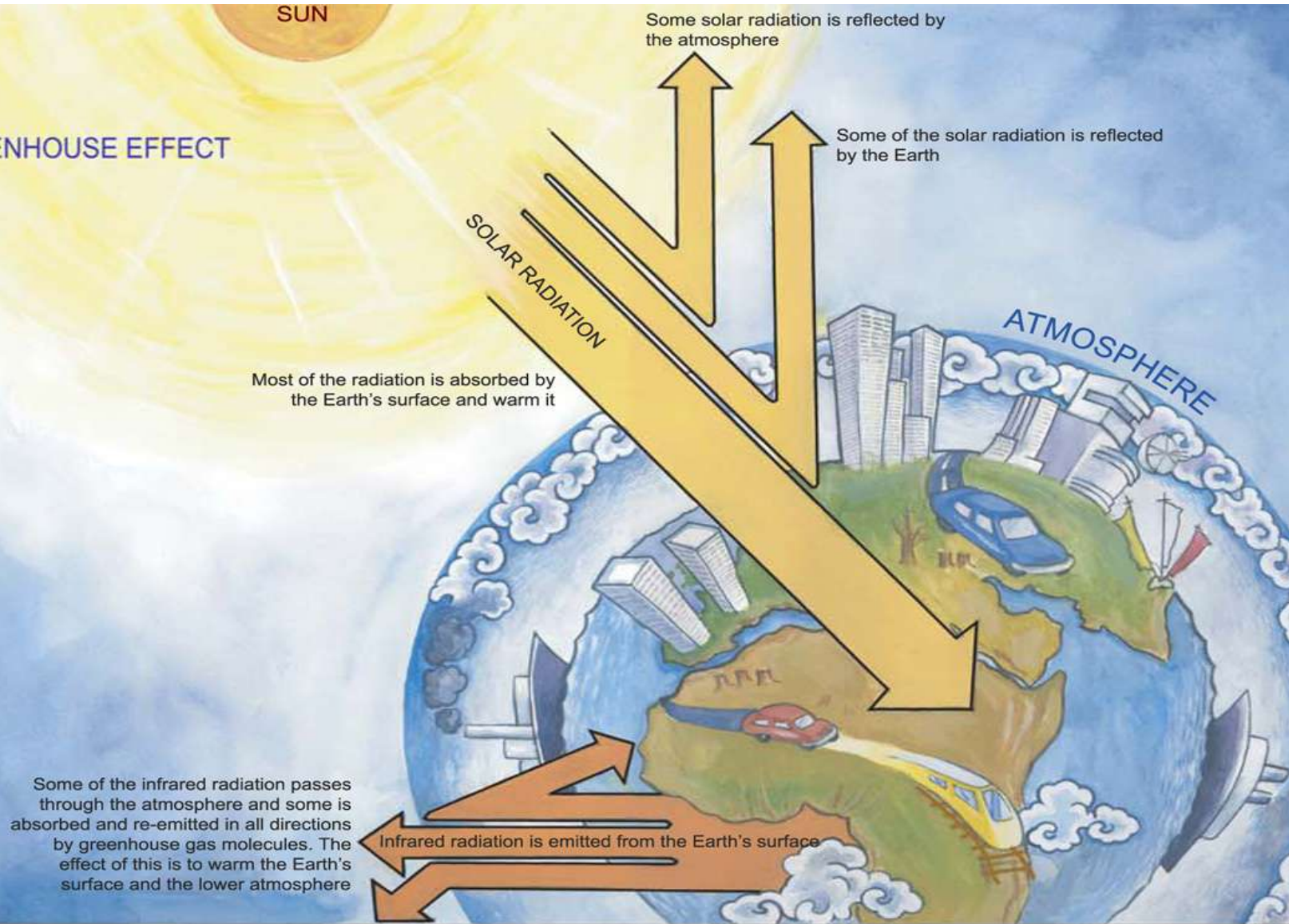
**Climate Change** refers to "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods."

- *UNFCCC*

# The Greenhouse Effect



## The GREENHOUSE EFFECT

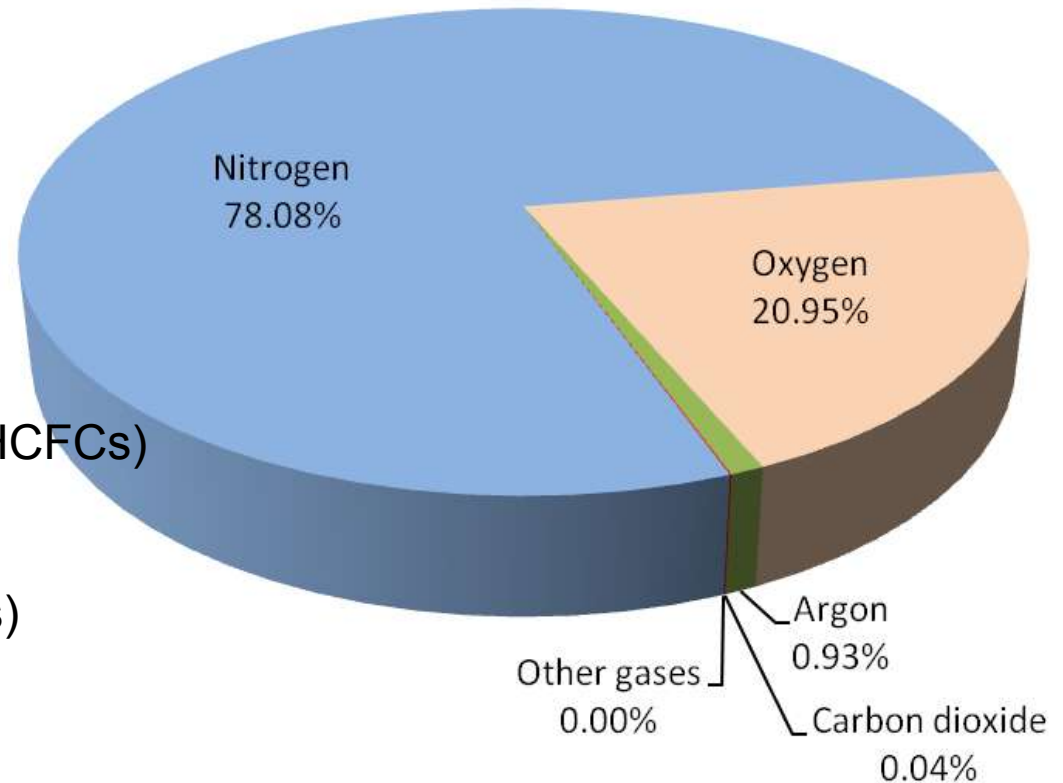


# Greenhouse gases & Atmosphere

## Greenhouse gases:

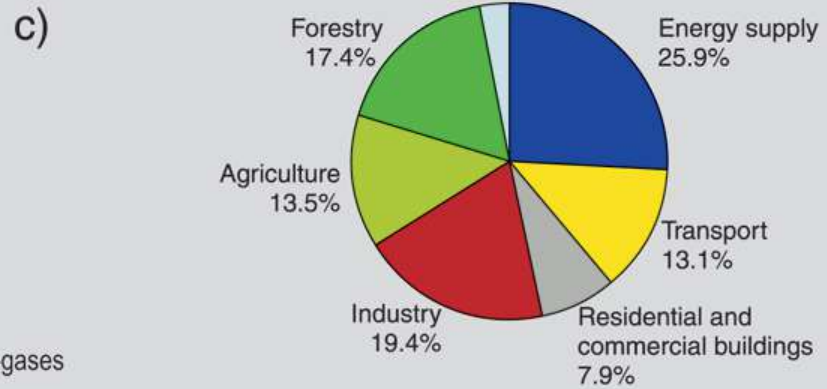
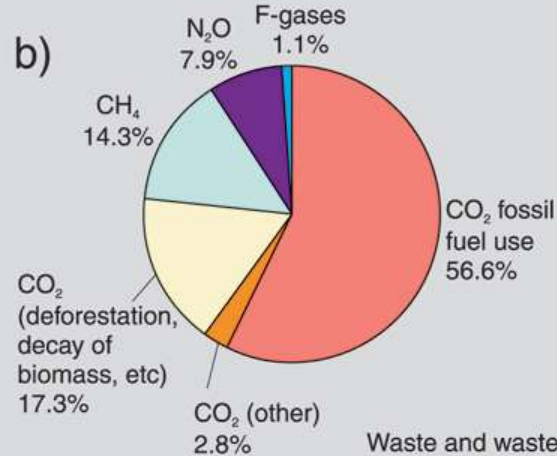
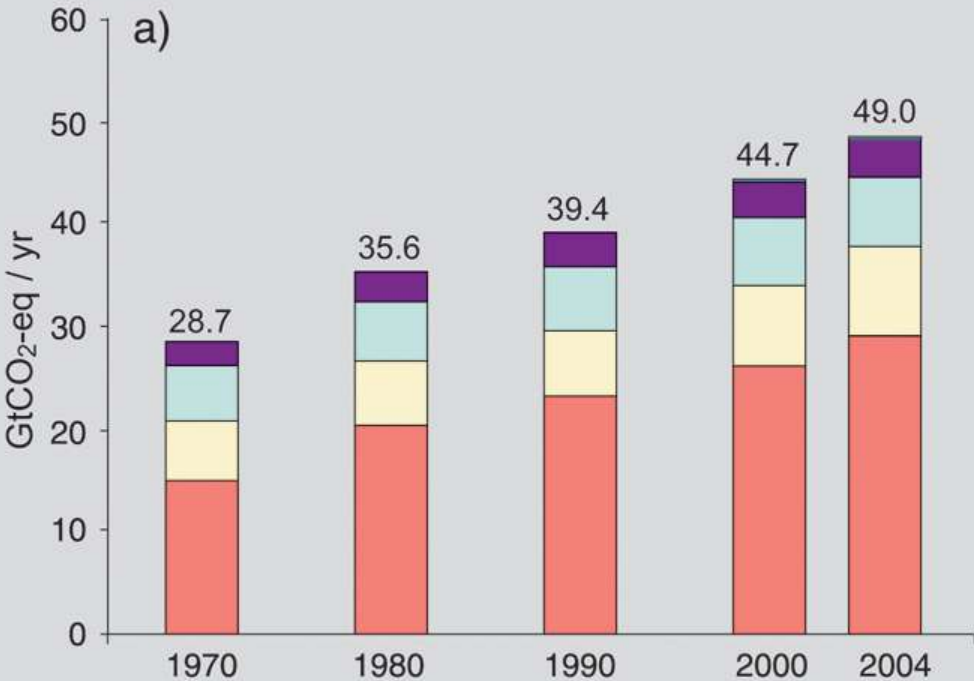
1. water vapor ( $H_2O$ )
2. carbon dioxide ( $CO_2$ )
3. methane ( $CH_4$ )
4. nitrous oxide ( $N_2O$ )
5. halogenated fluorocarbons (HCFCs)
6. Ozone ( $O_3$ )
7. perfluorinated carbons (PFCs)
8. Hydro-fluorocarbons (HFCs)

## Composition of Atmosphere





# Sources of anthropogenic GHGs



Source: IPCC, FAR, Summary for Policy Makers 2007

*Global atmospheric concentration of CO<sub>2</sub>, methane and nitrous oxide have increased markedly as result of human activities since 1750 and far exceed pre-industrial levels*



# Global Warming & Climate Change

## Global warming

An average increase in the Earth's temperature, which in turn causes **changes in climate**.



# Potential areas of impacts of climate change



## Human Health

Rising Temperatures may cause the spread of tropical diseases and heat stress into higher altitudes.



## Natural Disasters

Rapidly retreating alpine glaciers is increasing the risk of 'glacial lake outburst floods' endangering life and property downstream. Increasing flash floods may also be caused by intensifying



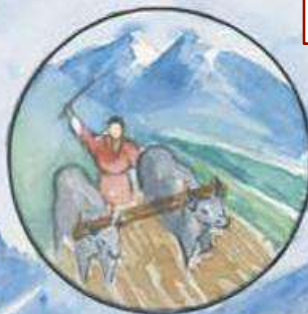
## Forests & Biodiversity

Increasing temperatures may cause species and ecosystems to shift and species at higher elevations and other species unable to migrate to become extinct.



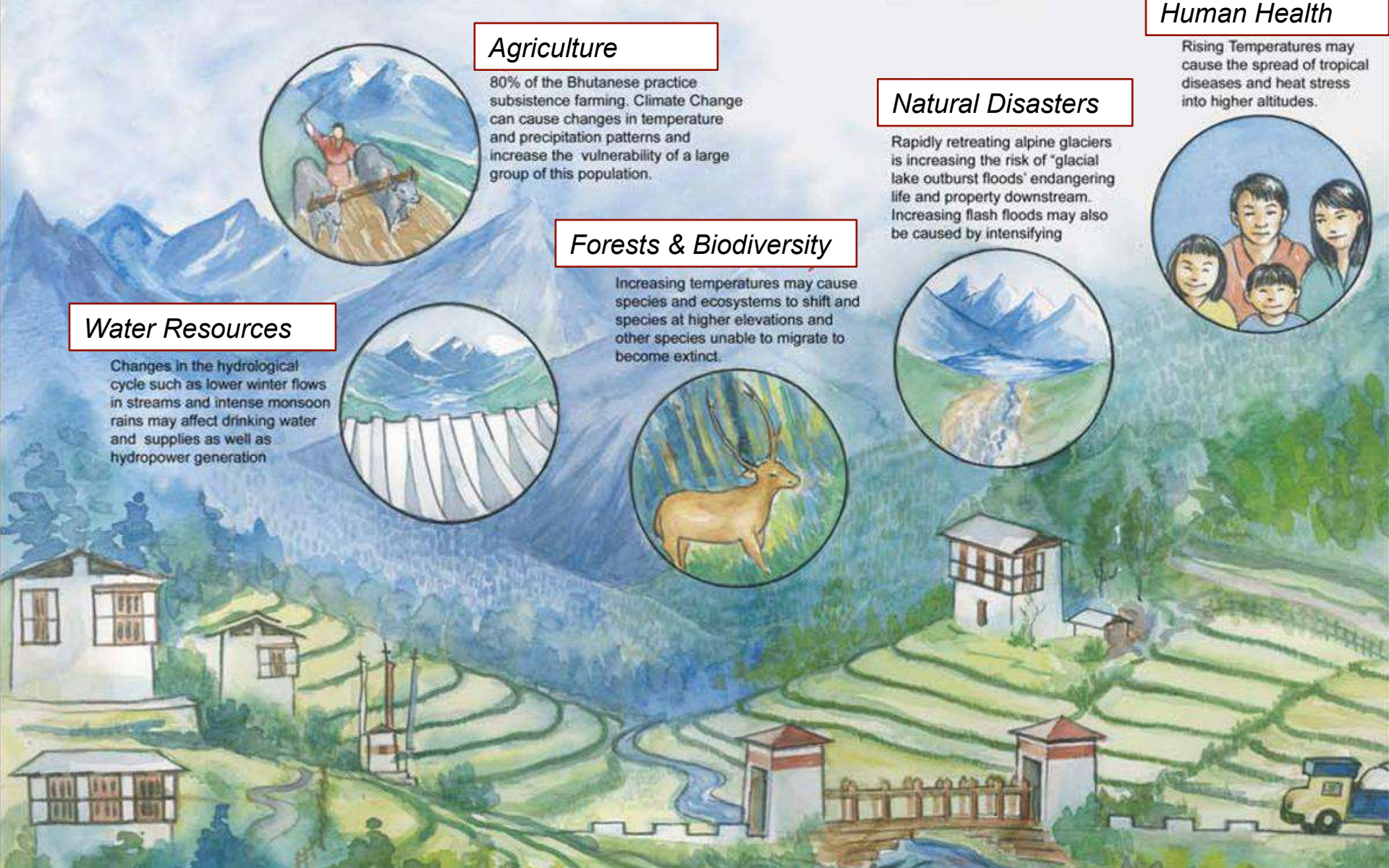
## Agriculture

80% of the Bhutanese practice subsistence farming. Climate Change can cause changes in temperature and precipitation patterns and increase the vulnerability of a large group of this population.



## Water Resources

Changes in the hydrological cycle such as lower winter flows in streams and intense monsoon rains may affect drinking water and supplies as well as hydropower generation







# Global response to climate change

- UN Framework Convention on Climate Change (UNFCCC), 1992
  - “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”
  - 192 Parties
- Kyoto Protocol, 1997
- Paris Agreement, 2015
  - Global agreement to contain global temperature rise below 2°C





# Bhutan's Response to Combating Climate Change

- Ratified UN Framework Convention on Climate Change, Kyoto Protocol and Paris Agreement
- Article 6 of the Constitution of the Kingdom of Bhutan
  - A minimum of 60% of total land **shall** be maintained under forest cover for all times to come.
- Bhutan's declaration to remain Carbon Neutral
  - Declared at 15<sup>th</sup> Conference of Parties to UNFCCC (2009)
  - Reiterated to remain carbon neutral in 2015 - NDC
  - Call for support of international community
- “National Strategy and Action Plan for Low Carbon Development, 2012” to remain carbon neutral



# Bhutan's Response to Combating Climate Change

- ❖ Developed sectoral low emission development strategies
- ❖ Economic Development Policy emphasizes “green growth”
- ❖ National Adaptation Program of Action
  - NAPA I – GLOF, early warning system, lowering of thorthomi lake
  - NAPA II – addressing risk of climate induced disaster through enhanced national and local capacity for effective action
  - NAPA III - Enhancing Sustainability and Climate Resilience of Forest and Agriculture Landscape" und Community Livelihoods in Bhutan,'
- ❖ Proposal on National Adaption Plan – accessing preparatory grant from GCF
- ❖ Draft Climate Change Policy, 2018



# Way Forward

- Awareness and education on climate change
- Institutional capacity building including private sector
- Strengthening Coordination among relevant stakeholders
- Climate change law- recommendation from draft climate change policy





**THANK YOU  
&  
TASHI DELEK !**