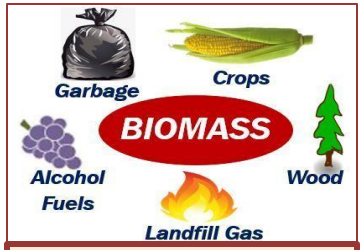
Renewable Resources

Solar Energy

Wind Energy



Biomass Energy

Thermal Energy

COMSATS UNIVERSITY ISLAMABAD

ARCHITECTURE DEPARTMENT
CUI Lahore

ENVIRONMENT IMPACT ANALYSIS (ARC-555)

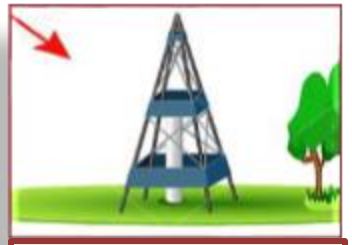
CLIMATE CHANGE/POLLUTANTS

Presented by:
Dr. Bilal Ahmad Zafar Amin

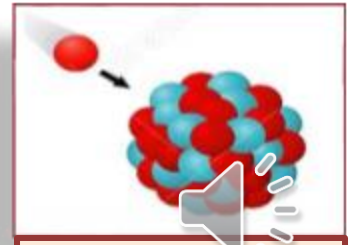
Non-Renewable Resources

Oil

Coal



Natural Gas



Nuclear

Lecture Outlines:

Environmental perspective of fossil fuel burning and climate change

- Composition of Greenhouse gases (GHGs)
- GHGs functions and emissions
- Human impact on atmospheric concentration of CO_2
- Greenhouse effect, Enhanced Greenhouse effect
- Concept of global warming and climate change
- Natural balance of source and sink relationship
- Global CO_2 emissions from fossil fuel combustion
- Adverse effects of climate change

Climate Change

Weather: Defines the tendency of the atmospheric changes over short periods of time

- Temperature
- Rainfall
- Precipitation
- Wind speed and direction

Climate: Defines the tendency of the weather over long periods of time

"Climate is what you expect
Weather is what you get"

Climate Change

Climate is:

- Long term
- Large area
- Can change slowly
- Easy to predict

Weather is :

- Short term
- Limited area
- Can change rapidly
- Difficult to predict

CLIMATE CHANGE/GLOBAL WARMING

The Green House Effect:

Some gases naturally exist in the atmosphere, the so called Greenhouse Gases (GHGs) that form a blanket surrounding the earth and keeps the earth warmer. This is called Greenhouse Effect.

The Enhanced Greenhouse Effect:

Human activities (fossil fuel burning, depletion of sinks like forests etc.) has been increasing the concentration of GHGs in the atmosphere and is leading to rise in temperatures. This is called Enhanced Greenhouse Effect.

Global Warming/Climate Change:

Rise in temperatures of earth and other associated climatic changes as caused by the Enhanced Green House Effect is called “Global Warming” and in broader term “Climate Change”.

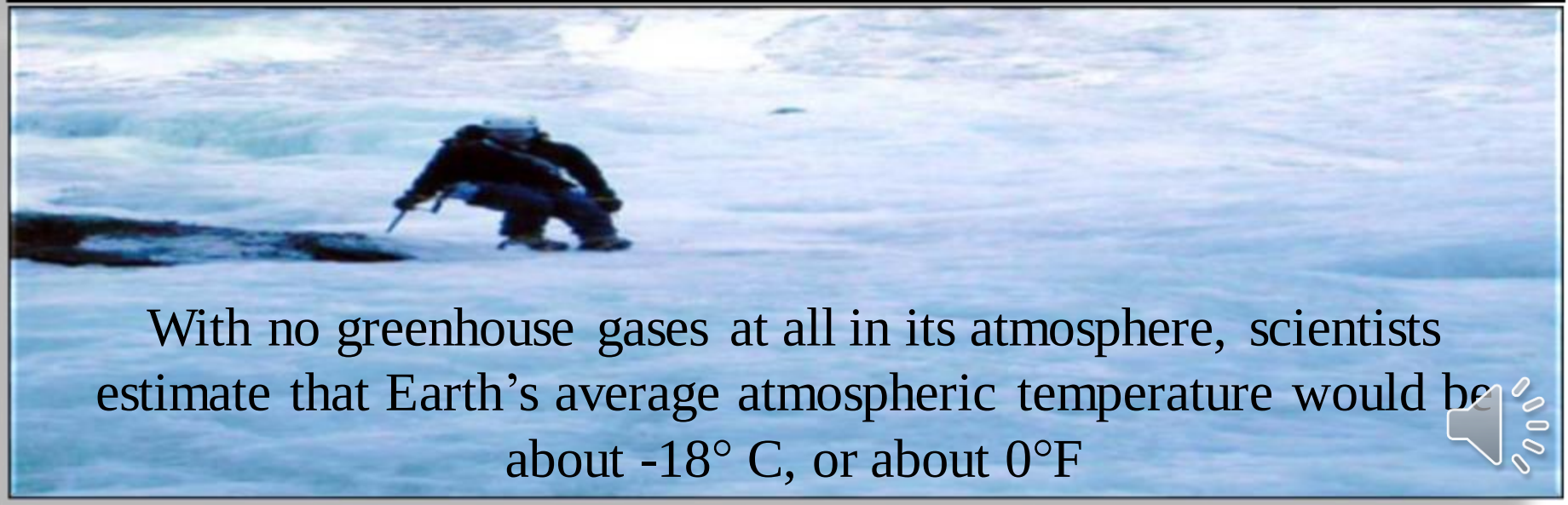
Climate Change

"the greatest challenge facing the world at the beginning of the century."

World Economic Forum
Davos, Switzerland 2000
(www.weforum.org/)

"the most important long-term issue which we face as a global community".

Jack Straw,
British Foreign Secretary
(Daily NEWS 15 May 2004)



With no greenhouse gases at all in its atmosphere, scientists estimate that Earth's average atmospheric temperature would be about -18° C, or about 0°F

Climate Change and Green house gases

Planets with very little greenhouse effect are either very cold…

Pluto's average temperature is –370° F

…or they have huge temperature swings from day to night.

On Mars, there is about a 300 degree F difference between high and low temperatures

Planets with abundant greenhouse gases are very hot

The average temperature on Venus is about 855° F!

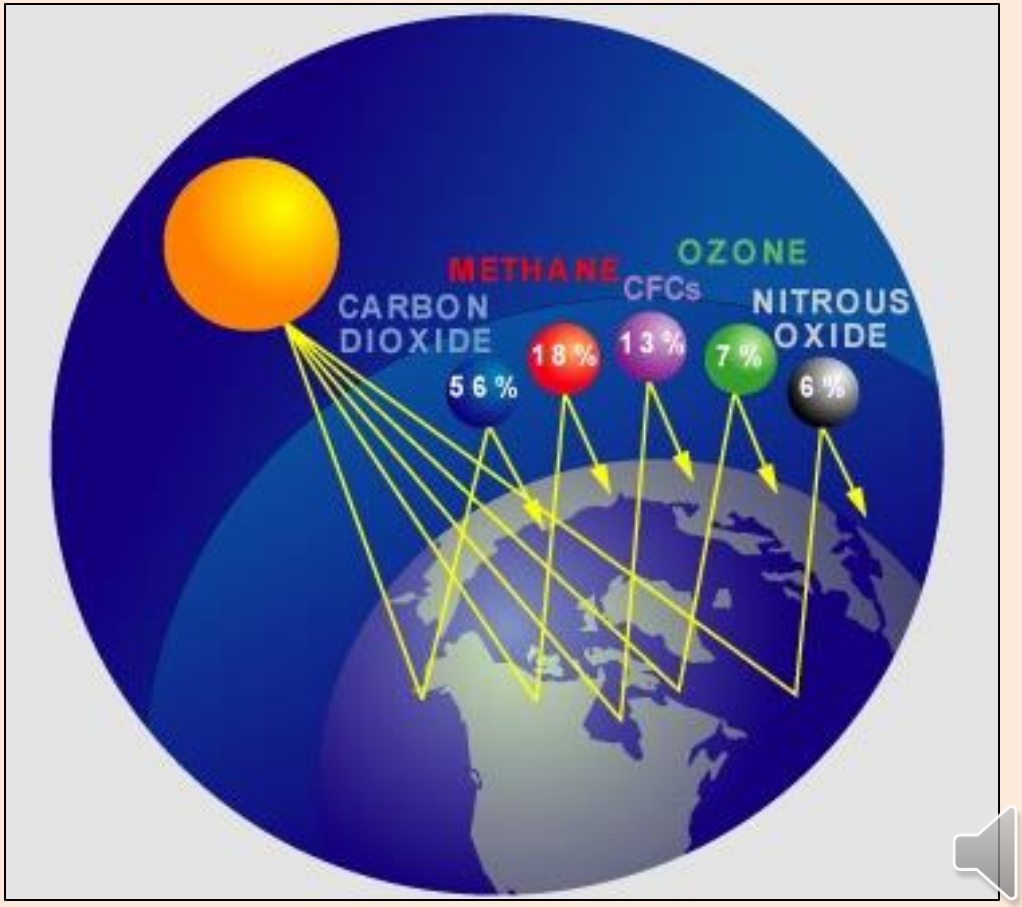
…and then there's Earth….

Which is just right…for the moment, anyway.

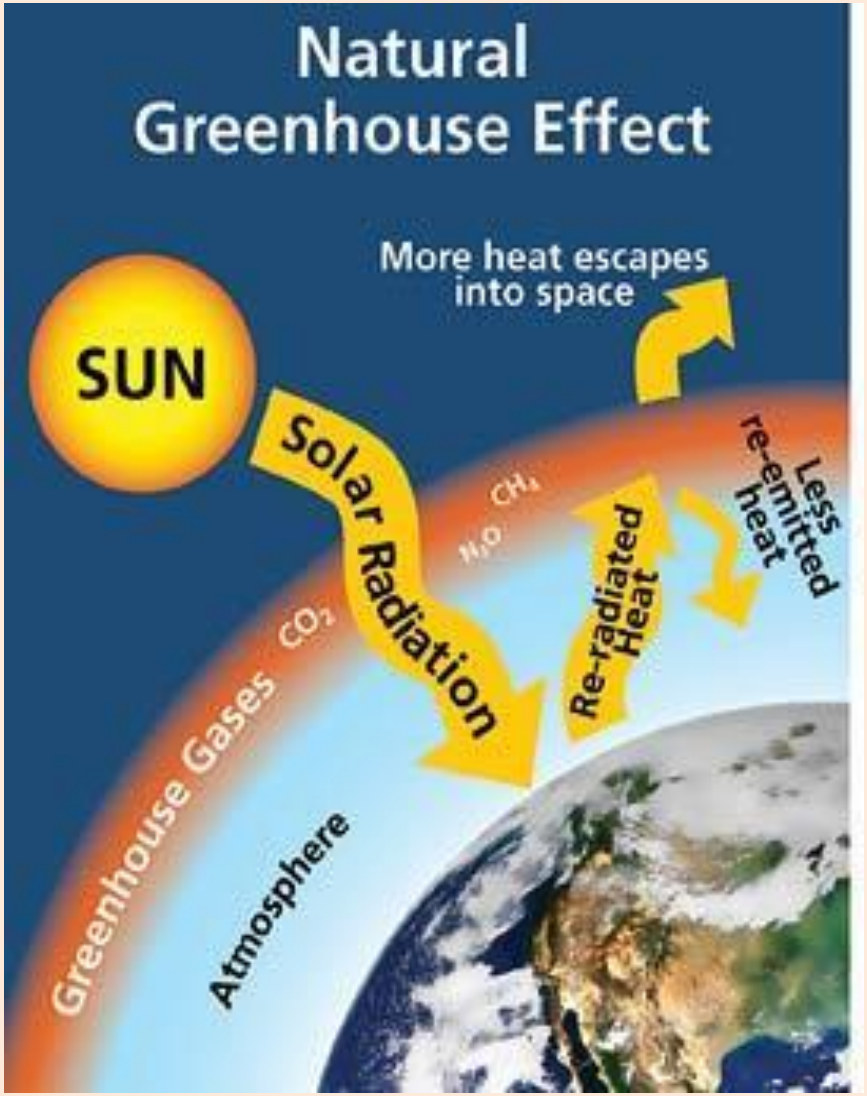
COMPOSITION OF GREENHOUSE GASES

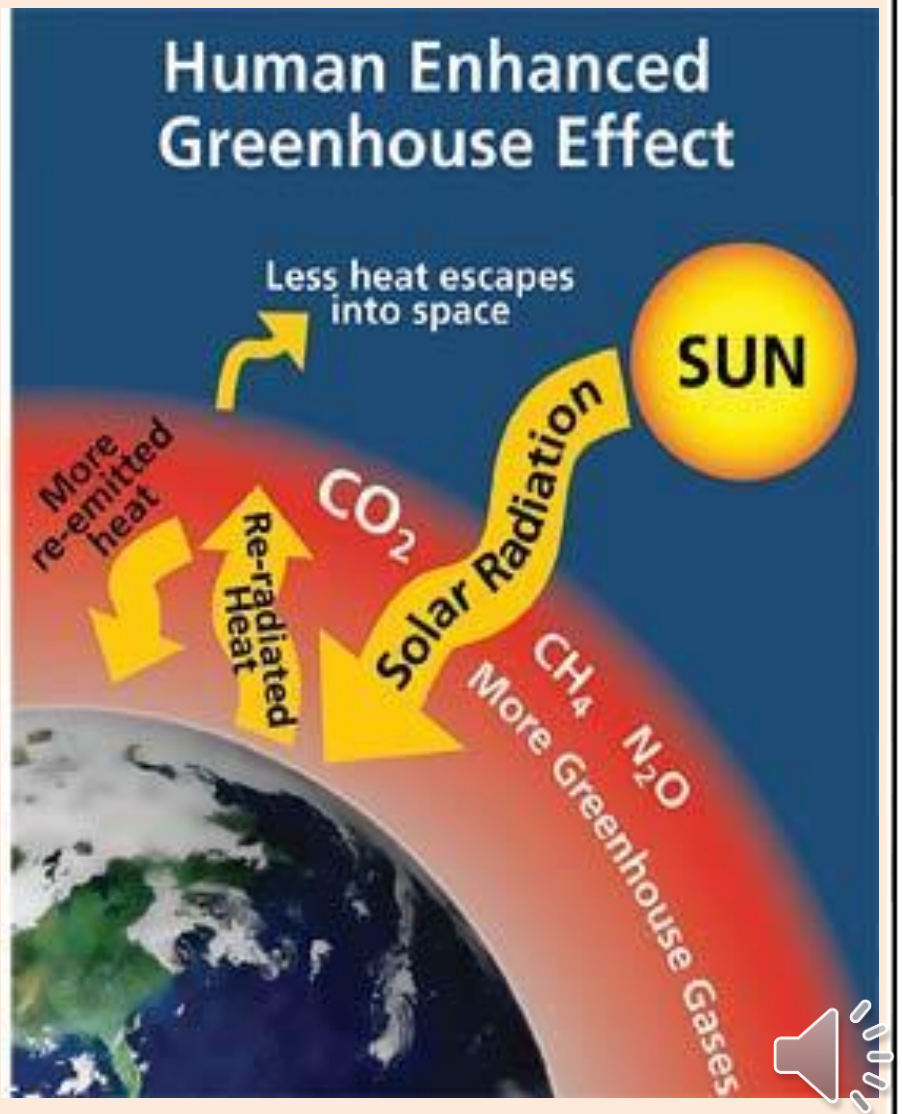
Gases in our atmosphere which absorb IR waves and radiate some of the heat back toward the earth.

- Methane
- Nitrous oxide
- Chlorofluorocarbons
- Carbon dioxide (CO_2)

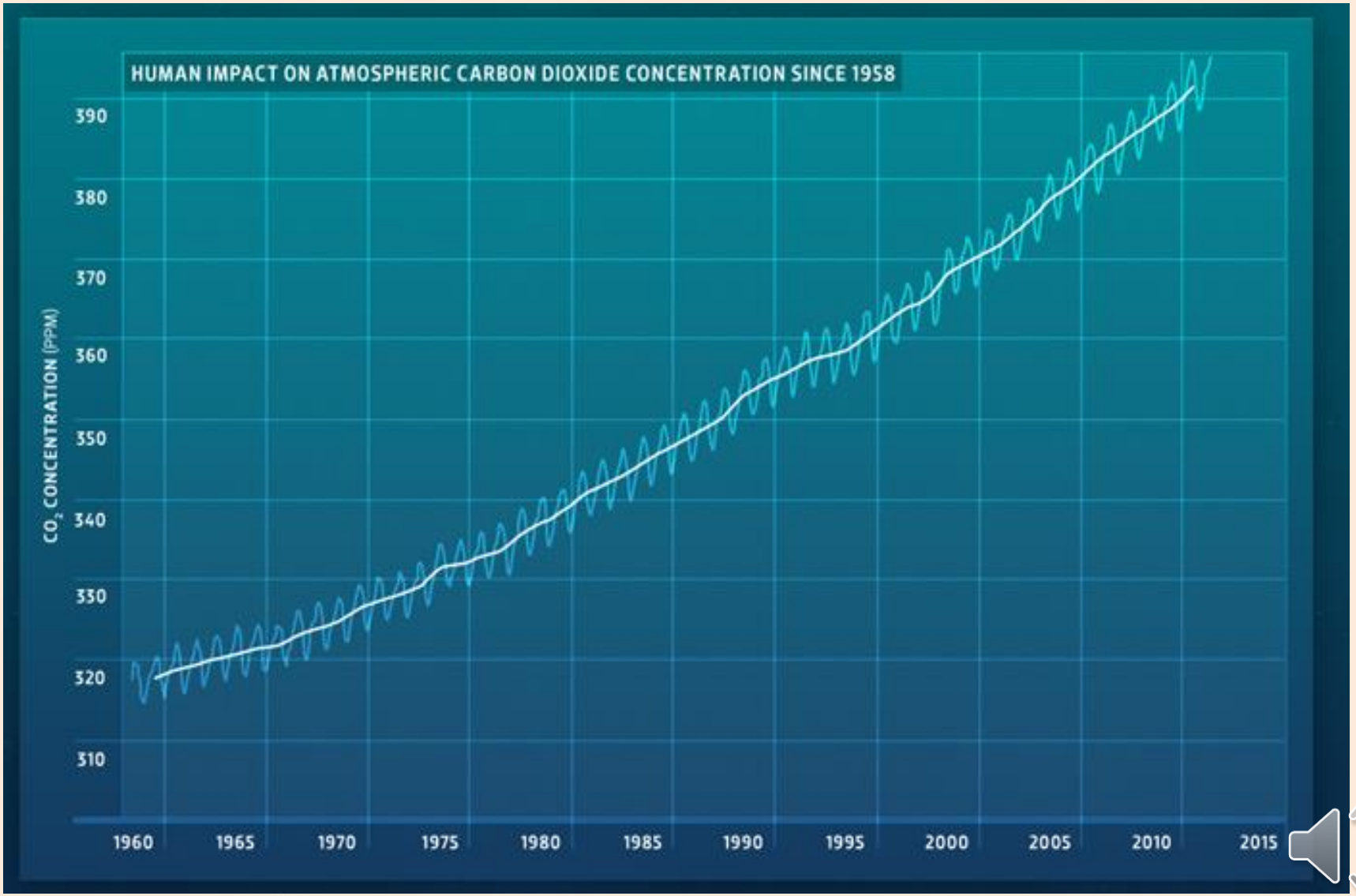


Natural & Human enhanced greenhouse effect

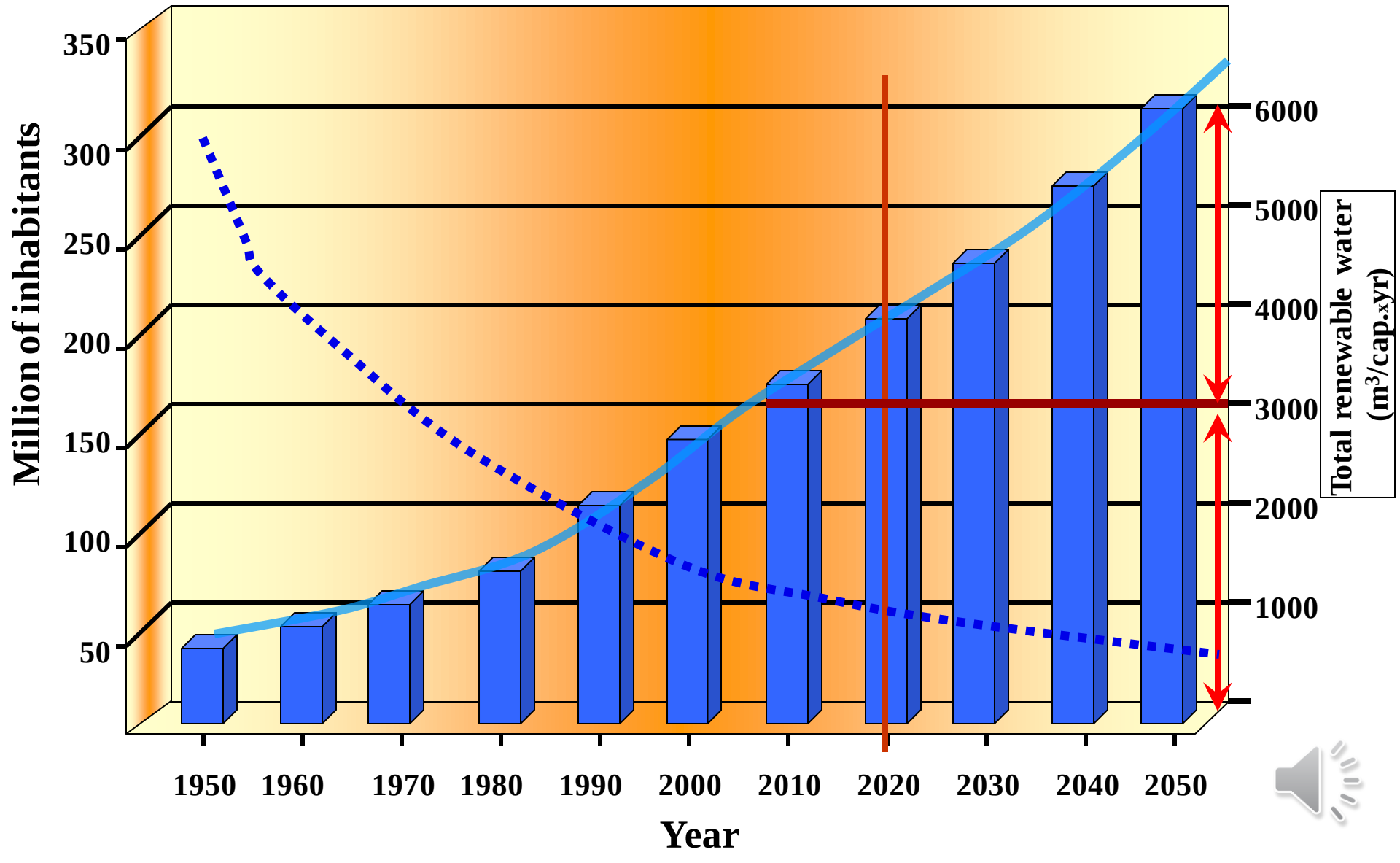




Human impact on atmospheric CO_2 concentration



Population Development in Pakistan



Urbanisation

The Development in Pakistan

Nature works on ecofriendly concept

Balance of Source & Sink relationship

SOURCE

CO2

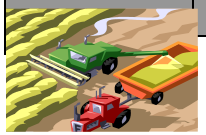
SINK

Forests

Natural balance

- Soil respiration & decomposition
- Ocean atmospheric exchange
- Plant and animal respiration
- Volcanic eruptions

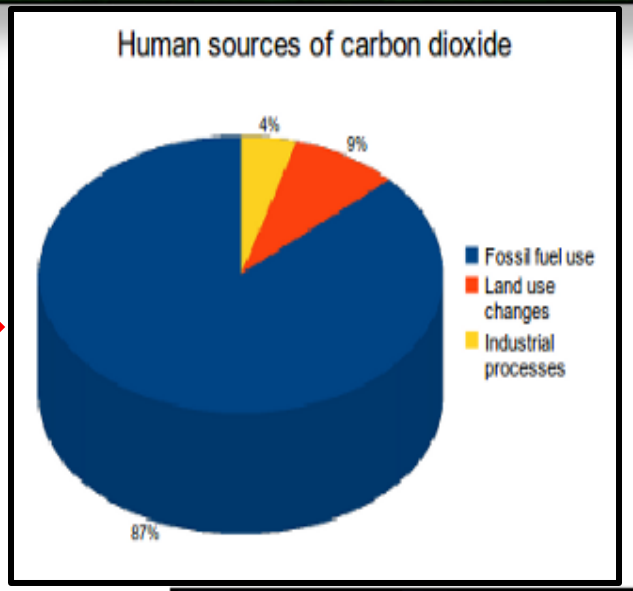
- Photosynthesis
- Energy production
- Oxygen production
- Temperature maintenance



Anthropogenic activities

- Spiraling Population
- High pace of Industrialization
- Increasing use of Fossil Fuels in Industry & Transport
- Deforestation for Agriculture and Urbanization

Urbanization

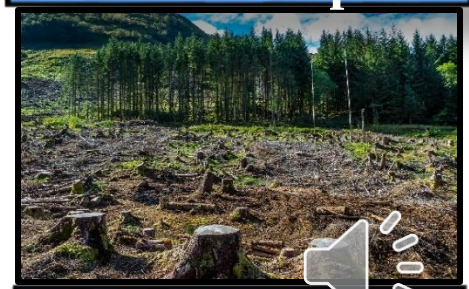


Sources
CO2 production

Industrialization

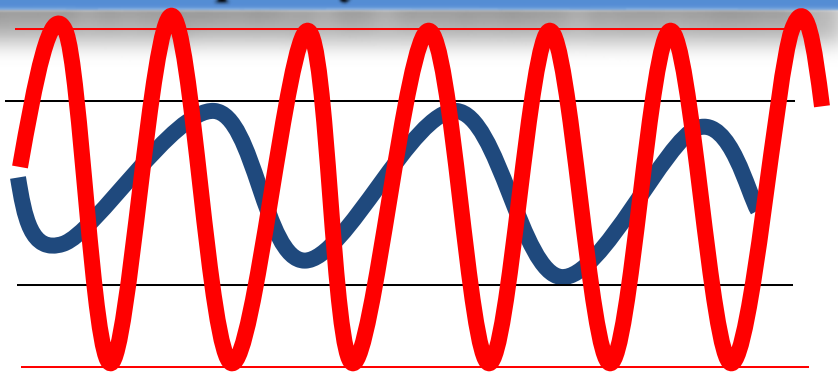
Fossil fuel burning

Sink
CO2 consumption



Deforestation

Increased frequency of weather extremes:



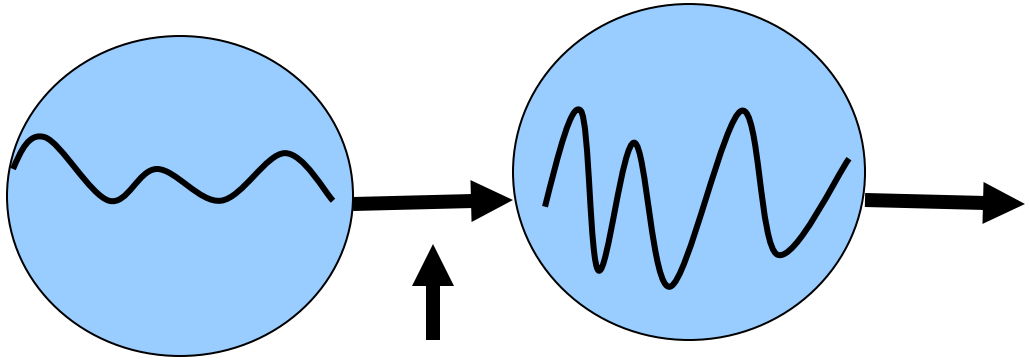
- Global Warming
- Increased Precipitation & its uneven Distribution
- Increase in Frequency & Intensity of Extreme Weather Events
- Melting of Glaciers & Snow
- Sea level Rise

Higher water demand due to higher temperatures

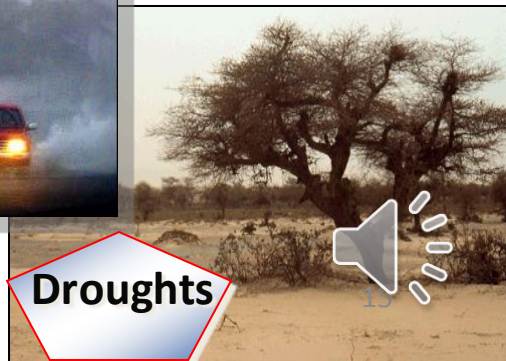
Sea level rise: Loss of fertile land, seawater intrusion

Natural Climate Variability

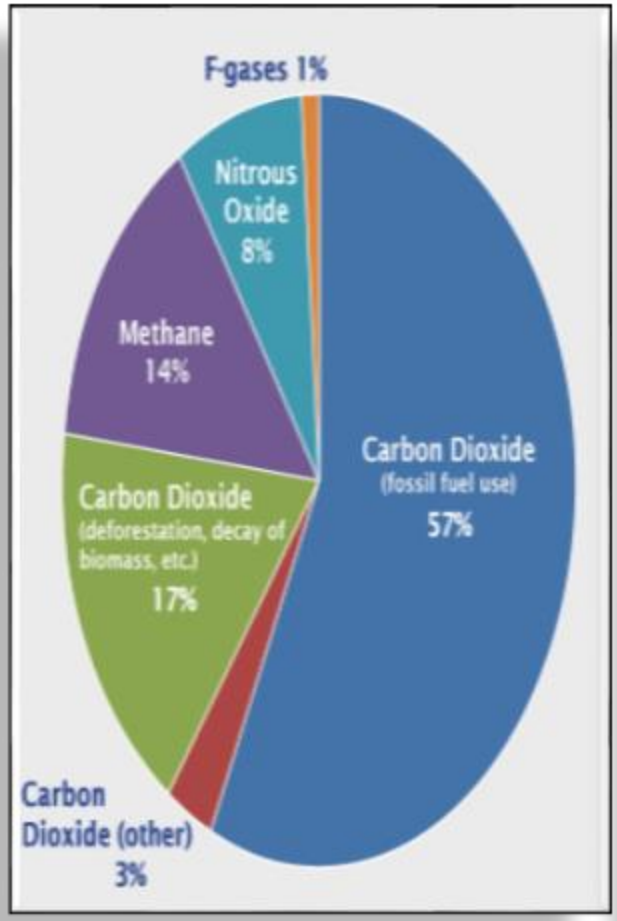
Climate Change
Natural + Anthropogenic



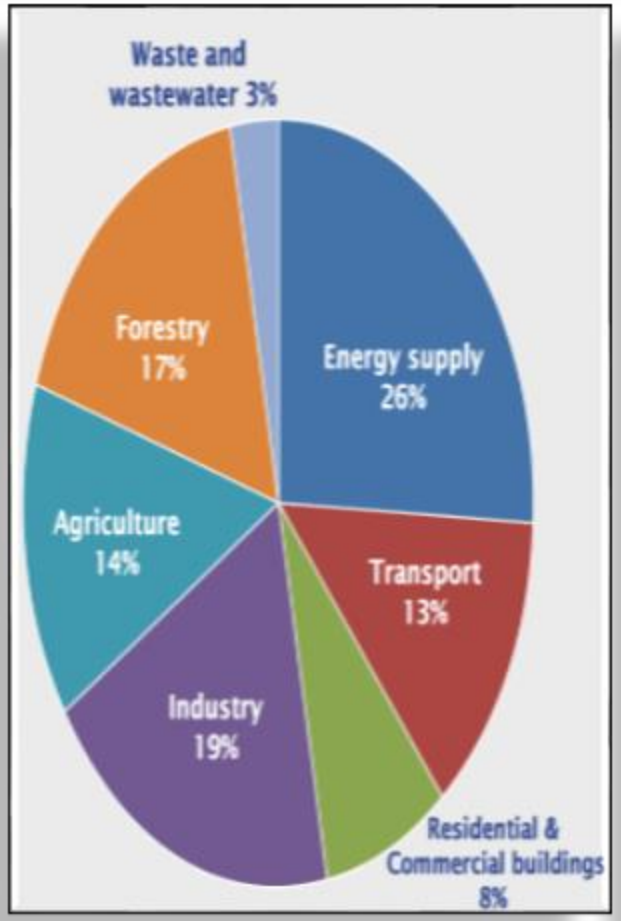
Anthropogenic Influences since the Industrial revolution



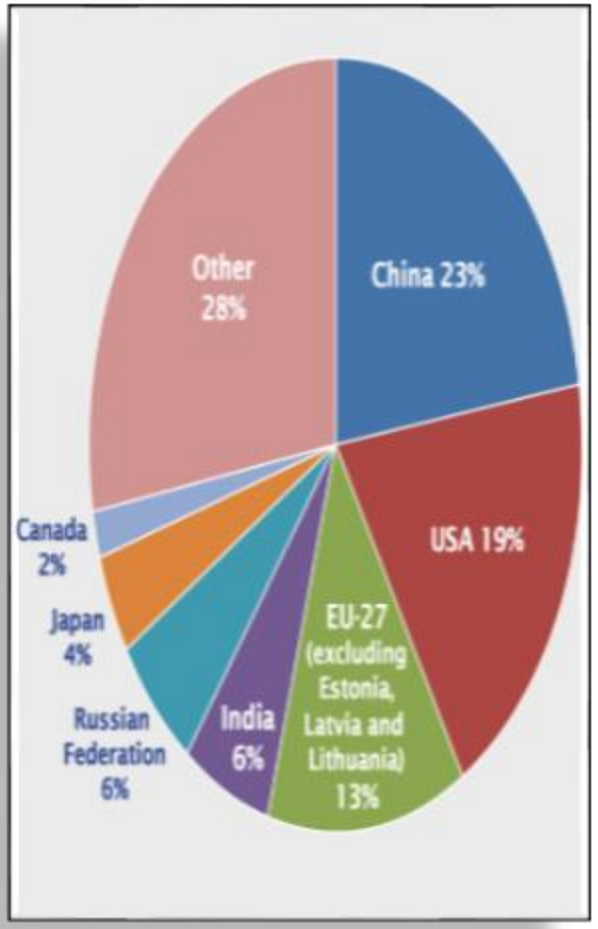
Global CO_2 Emissions from Fossil Fuel Combustion



Global Greenhouse Gas Emissions by Gas



Global Greenhouse Gas Emissions by source



Global Greenhouse Gas Emissions by country

Glaciers are melting away worldwide

Agassiz Glacier, Montana, in 1913…

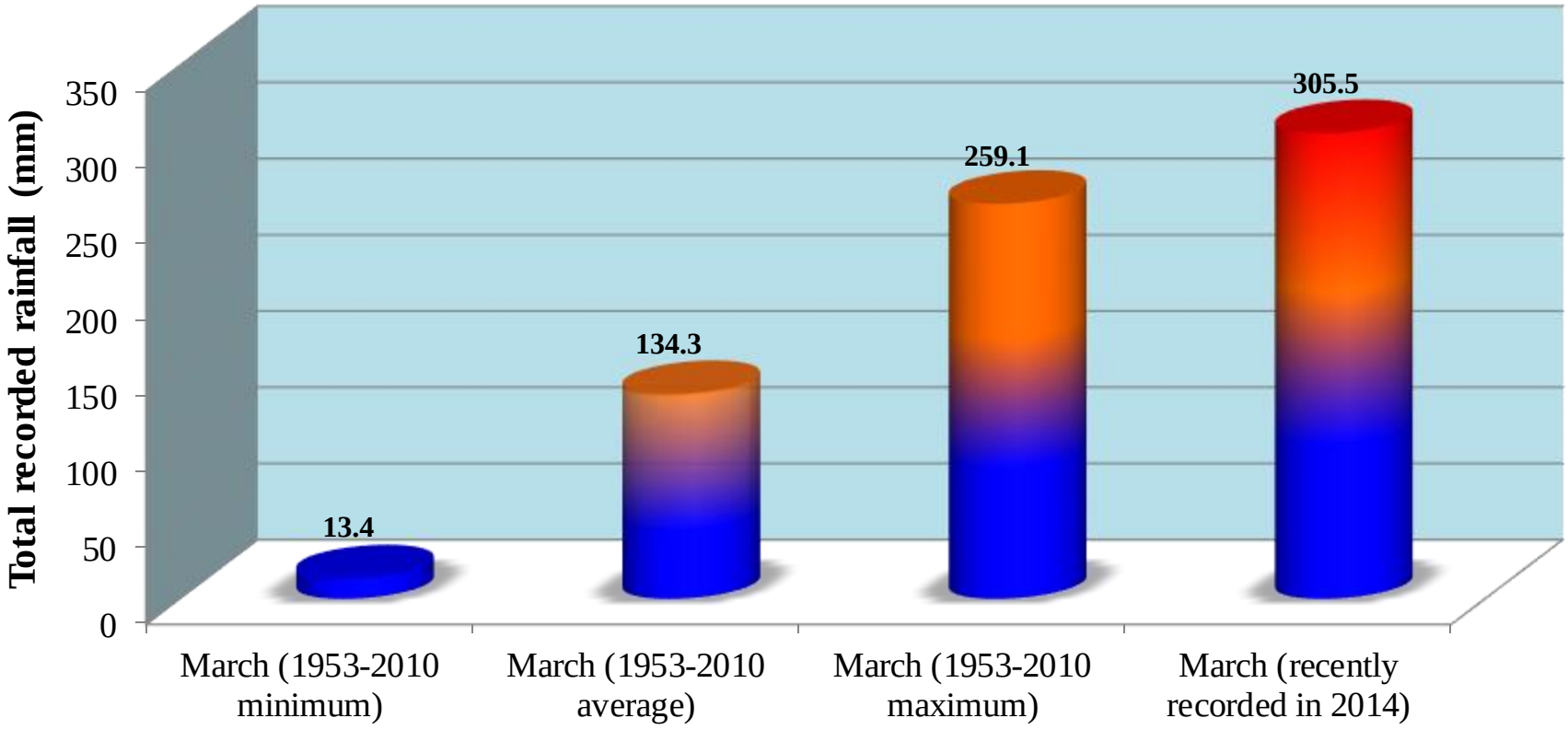
…and in 2005

Pasterze Glacier, Austria, in 1875…

…and in 2004

Changing Climate in Abbottabad Scenario

Total recorded rainfall for the month of March at Abbottabad:
1953 to 2010 (recorded at Kakul weather station)
2014 (recorded at COMSATS weather station)



Total rainfall for the month of March 2014 at Abbottabad was higher than in last 60 years from 1953-2013.

Impacts of Changing Rainfall Regime…

Increased frequency of floods and droughts affect

What must be our goal???

WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by:

- **conserving the world's biological diversity.**
- **promoting the reduction of pollution and wasteful consumption.**
- **ensuring that the use of renewable natural resources is sustainable.**

WWF Network Meta-Goals

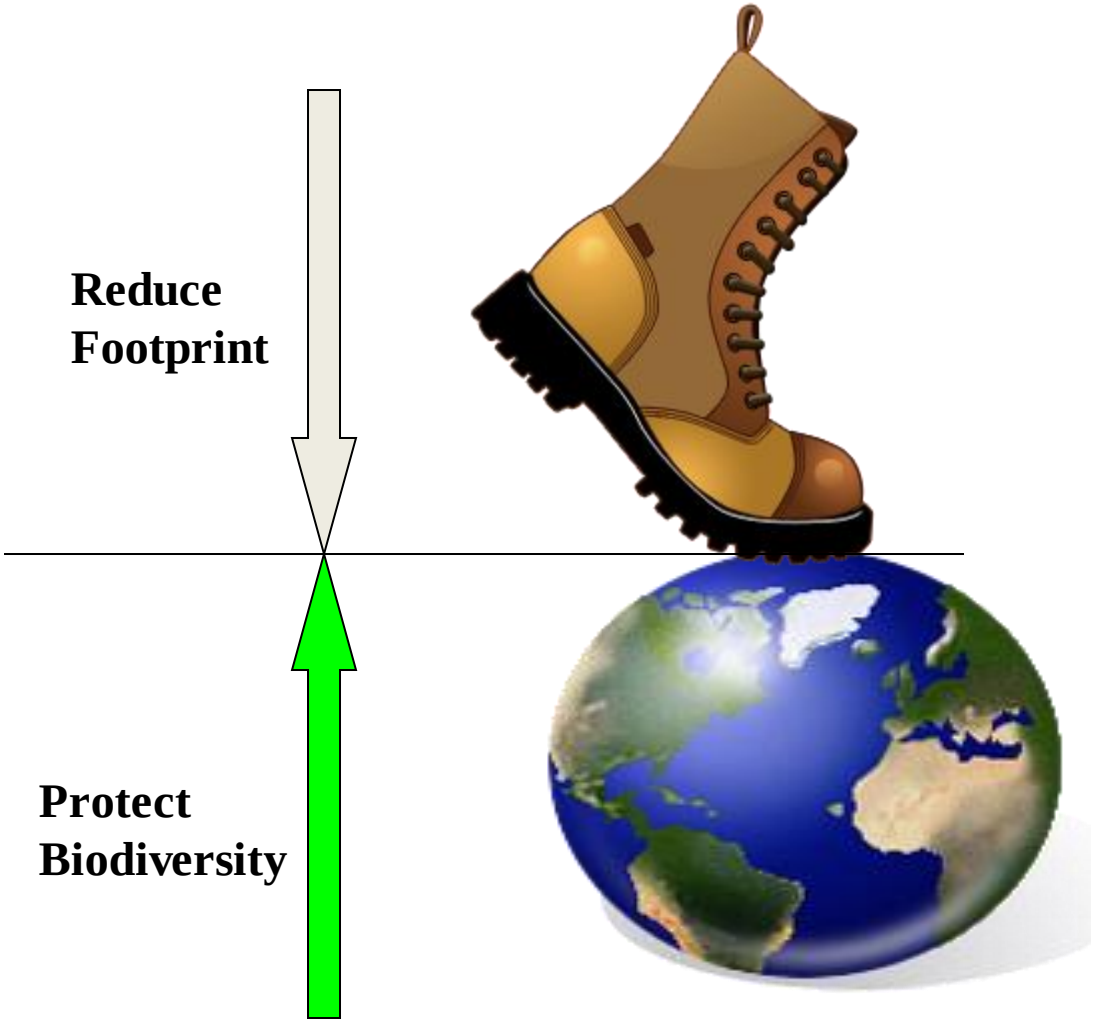
How we do it?

We're here to stop the degradation of our planet's natural environment, and build a future where people live in harmony with nature.

We do this by

Reducing our footprint on the natural world by challenging wasteful consumption and pollution and promoting sustainability.

Protecting biodiversity the magnificent array of living things that inhabit our planet, and the places they live.



Climate Change

International Law and Global Governance

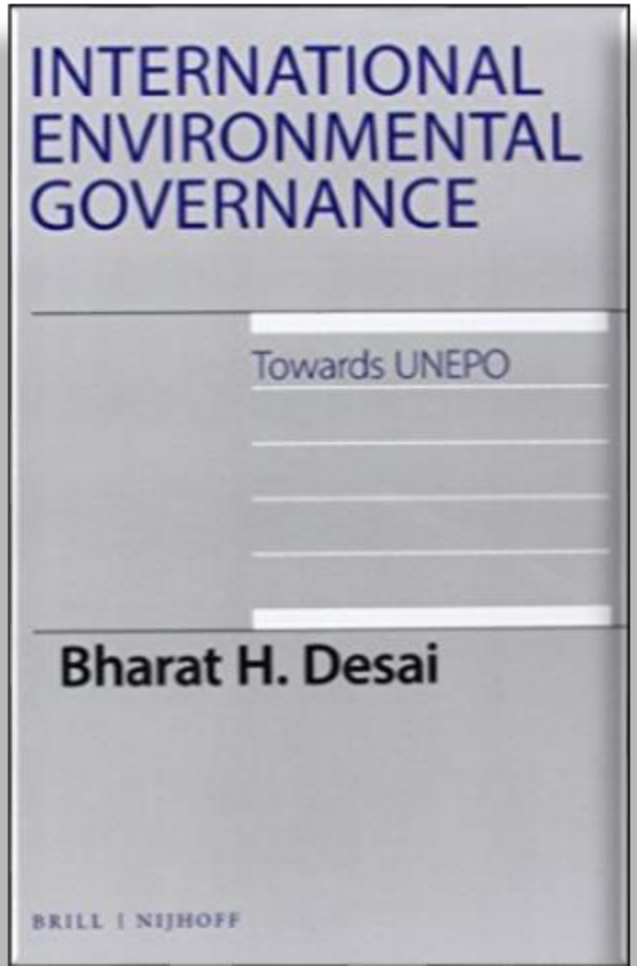
Climate Change: International Law and Global Governance
Volume I: Legal Responses and Global Responsibility
Edited by Prof. Dr. Oliver C. Ruppel, Prof. Dr. Christian Roschmann and Dr. Katharina Ruppel-Schlichting
With a foreword by Prof. Dr. Hans-Gert Poettering

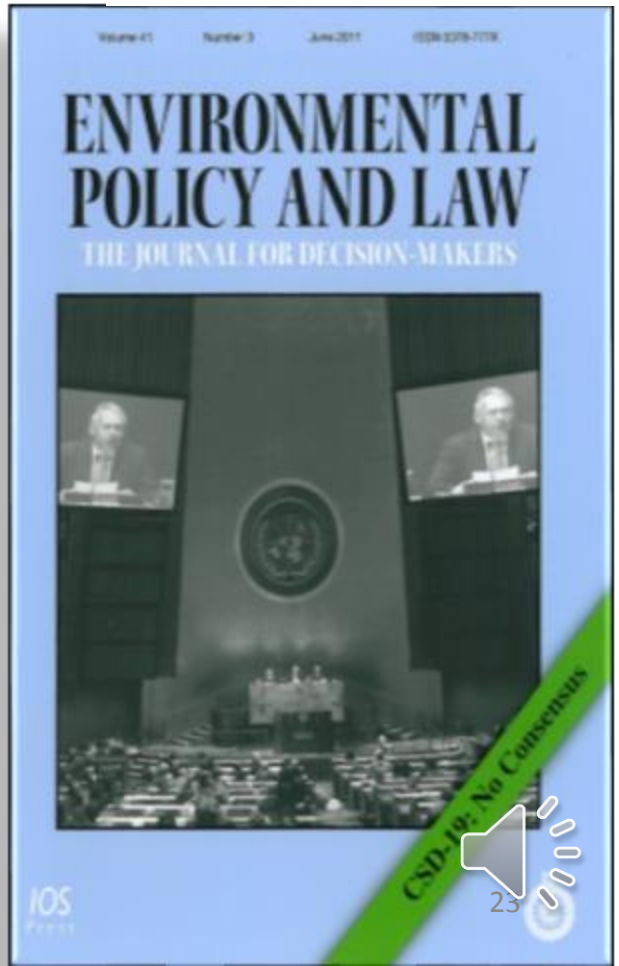
Climate Change: International Law and Global Governance
Volume II: Policy, Diplomacy and Governance in a Changing Environment
Edited by Prof. Dr. Oliver C. Ruppel, Prof. Dr. Christian Roschmann and Dr. Katharina Ruppel-Schlichting

Volume I:
assesses the most pressing impacts of climate change on various international law regimes ■ climate change, the law of the sea and sea level rise ■ judicial review and international climate change litigation

Volume II:
reflects on the United Nations Framework Convention on Climate Change (UNFCCC) and the most pressing impacts of climate change on ■ international diplomacy and ■ global governance.

Some other authentic books……..





Thanks for your Attention