Climate Change and Sustainability: A Global Challenge

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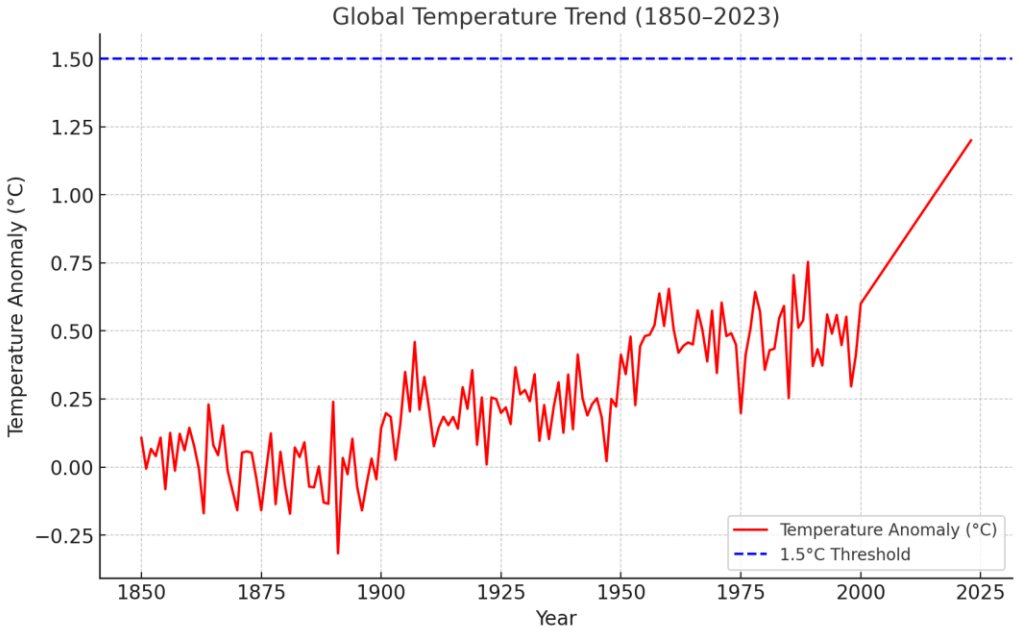
Capturing Climate Change Indicators

Global Temperature Rise:

- The global average temperature **has increased by 1.2°C** above pre-industrial levels (as of 2023).
- The Intergovernmental Panel on Climate Change (IPCC) predicts **crossing the 1.5°C threshold by the early 2030s** if current trends persist.



CO_2 Concentration:

- **CO_2 levels reached 420 parts per million (ppm)** in 2023, the highest in over 800,000 years.

Sea Level Rise:

- Sea levels have risen by **~20 cm since 1880**, accelerating in the last three decades.
- **By 2100**, levels are **projected to rise by 26–98 cm**, threatening coastal areas and island nations.

Analysing Climate Change Impact

Global Temperature Rise:

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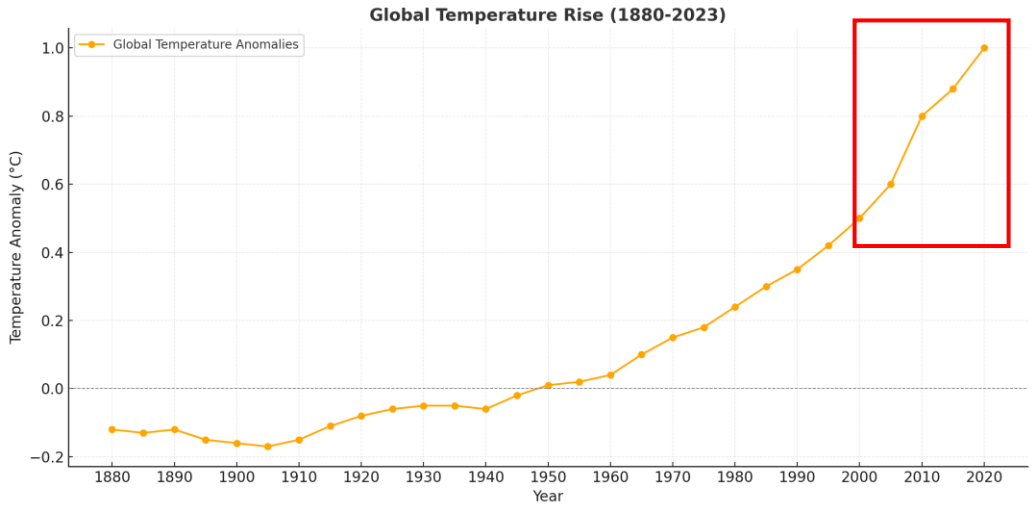
Here's a graph of global temperature anomalies (1880–2023), showing:

- Minor fluctuations until 1940.
- Accelerated warming post-1940, sharpest since the 1970s.
- Significant 21st-century rise linked to industrialization and fossil fuel use.
- **A noticeable surge in temperature is observed after the 2000s, directly linked to rising pollution levels.**



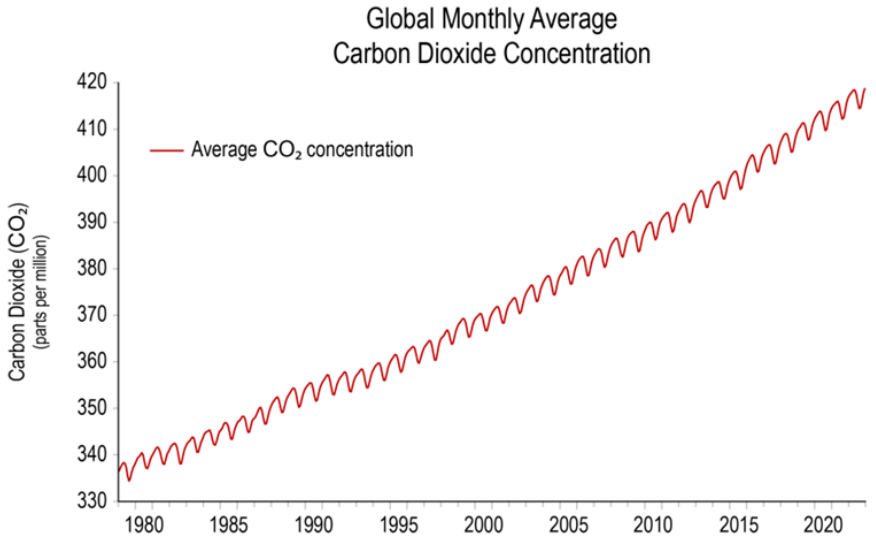
Recording Green Gas Changing Landscape

CO_2 Concentration:

The CO_2 concentration in Earth's atmosphere is a crucial indicator of climate change. Over the last 800,000 years, CO_2 levels fluctuated between 180–280 ppm, driven by natural processes such as ice ages and interglacial periods.

Key Milestones:

- **1950s:** CO_2 levels surpassed 300 ppm for the first time.
- **1980s-2000s:** The rise accelerated, with levels reaching around 350 ppm by 1980 and 380 ppm by the early 2000s.
- **2010s**: CO_2 concentrations crossed 400 ppm, marking a new threshold in the climate crisis.
- **2023:** CO_2 levels reached 420 ppm, the highest they've been in over 800,000 years, signaling a critical tipping point in climate change.



Implications: Higher CO_2 levels are directly linked to global warming, ocean acidification, and more extreme weather patterns. The increase in atmospheric CO_2 is a key driver of climate change, influencing temperature rise and contributing to the melting of polar ice caps.

Summarizing Impact and Hazards

Sea Level Rise:

1. **Historical Rise:** Global sea levels have risen by 20 cm since 1880 due to thermal expansion and melting ice.
2. **Recent Acceleration:** The rise has accelerated in recent decades, now increasing by about 3.3 mm per year.
3. **Future Projections:** By 2100, sea levels could rise by 26–98 cm (10–39 inches), depending on emissions and ice melt rates.

Implications:

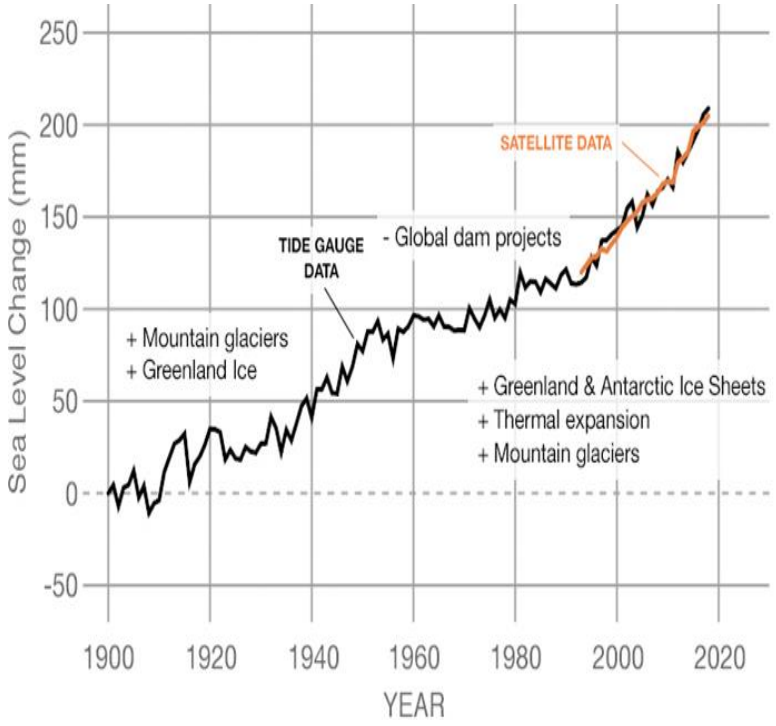
- Coastal Erosion and flooding will affect low-lying regions.
- Saltwater intrusion will impact freshwater resources.
- More frequent and severe storm surges will cause widespread damage.

Immediate Impact on Islands & Coastal Nations:

- Island nations- **Maldives, Kiribati & Tuvalu at high risk of submergence.**
- Coastal cities- **Miami and Jakarta** facing regular flooding

Gravity / Seriousness: Socio-Economic Impact in Trillions

- **Permanent land loss and climate refugees** are major risks.



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Rippling Impact on Biodiversity

❖ **Impact on Biodiversity:**

Over **1 million species are at risk of extinction** due to climate change (UN report).

❖ **Human Health:**

Climate change contributes to **250,000 additional deaths annually between** 2030 and 2050 from heat stress, malnutrition, and disease.

❖ **Economic Threat:**

Climate change could **reduce global GDP by 11-14% by 2050**, equating to losses of $23 trillion annually.

❖ **Need of the Hour:**

Immediate action on **climate mitigation and adaptation is critical** to avoid severe impact and irreversible consequences on humanity.

Ushering Global Response & Initiatives

Paris Agreement (2015):

- **Aim: Limit global temperature rise to below 2°C, ideally 1.5°C.**
- **Signed by 195 countries**;
- binding commitments for Nationally Determined Contributions (NDCs).

Net Zero Commitments:

- **140+ countries pledged net-zero emissions**, covering 90% of global GDP.
- Major economies like the **US, EU, China, and India have set timelines**
- e.g., India: Net Zero by 2070.

Global Financial Commitments:

- Developed countries committed **$100 billion annually for climate financing** to assist developing nations (yet to be fully realized).

Figuring India's Global Contribution in Emission

3rd largest emitter of CO_2 globally after China and the USA.

Global CO_2 Emissions Share:

India: ~**7%** of global CO_2 emissions.
Global CO_2 Total (2022): ~**40 billion tons**.
India's Contribution: ~**2.9 billion tons** of CO_2.

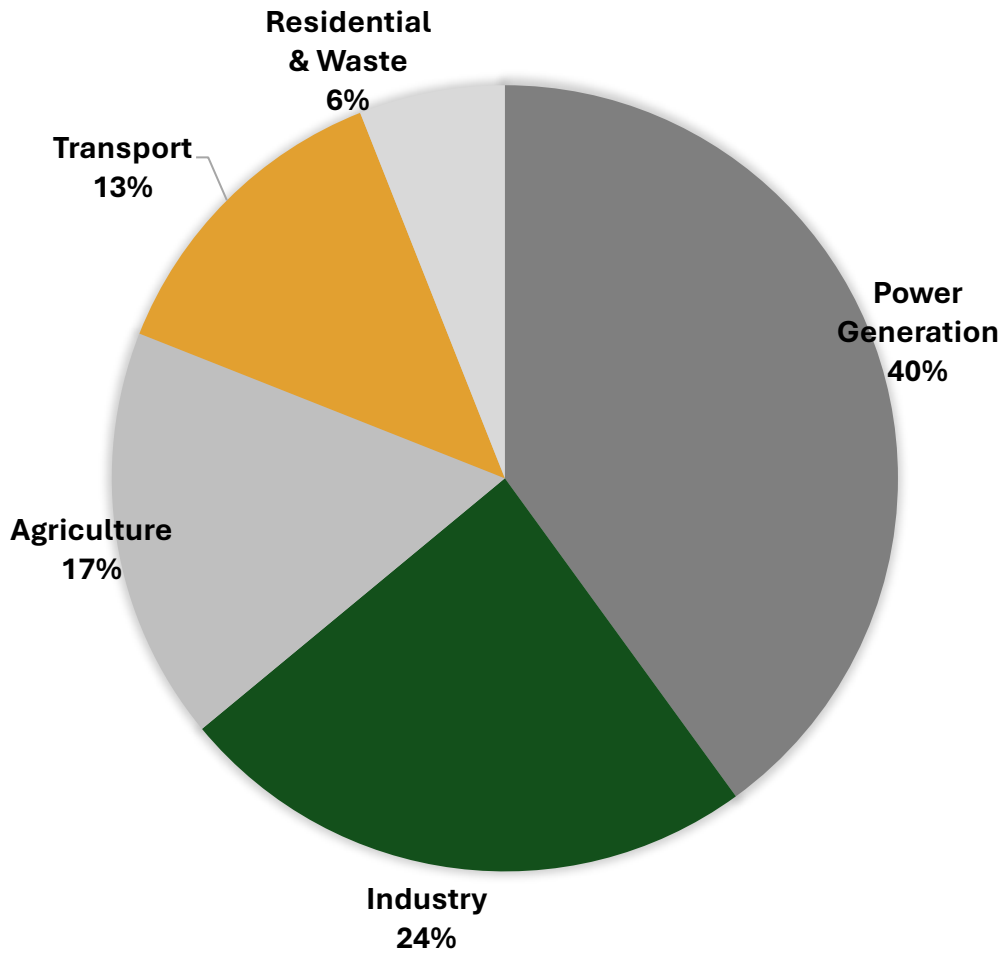
Per Capita CO_2 Emissions:

India: ~**2.0 tons** per person (2022).
Global Average: ~**4.5 tons** per person.
USA: ~14-15 tons per person.
China: ~8.5 tons per person.

Decoding India’s Carbon Emission Sector-wise

- **Significant Contributor:** The transport sector is India's third-largest GHG-emitting sector.
- **Percentage of Emissions**: It accounts for approximately 13% of India’s energy-related CO_2 emissions.
- **Historical Increase**: Emissions from Transport sector have more than tripled since 1990.
- **Future Growth:** With India’s urban population expected to double by 2050, emissions from the transport sector are likely to rise further, emphasizing the need for sustainable mobility solutions.

India CO2 emissions by sector (2022)



Triggering Global Commitments on Emission Control

- **Paris Agreement & Net Zero Target**: Committed to **reaching net-zero emissions by 2070** and **reducing emissions** intensity by **45% by 2030** (from 2005 levels).

- **COP26 Commitments**: Announced goals to **increase non-fossil fuel energy share to 50%** and **reduce carbon emissions by 1 billion tons by 2030.**

- **National Green Initiatives:** Programs like **NAPCC** and the **Green Growth Strategy** reinforce India's sustainability commitments.

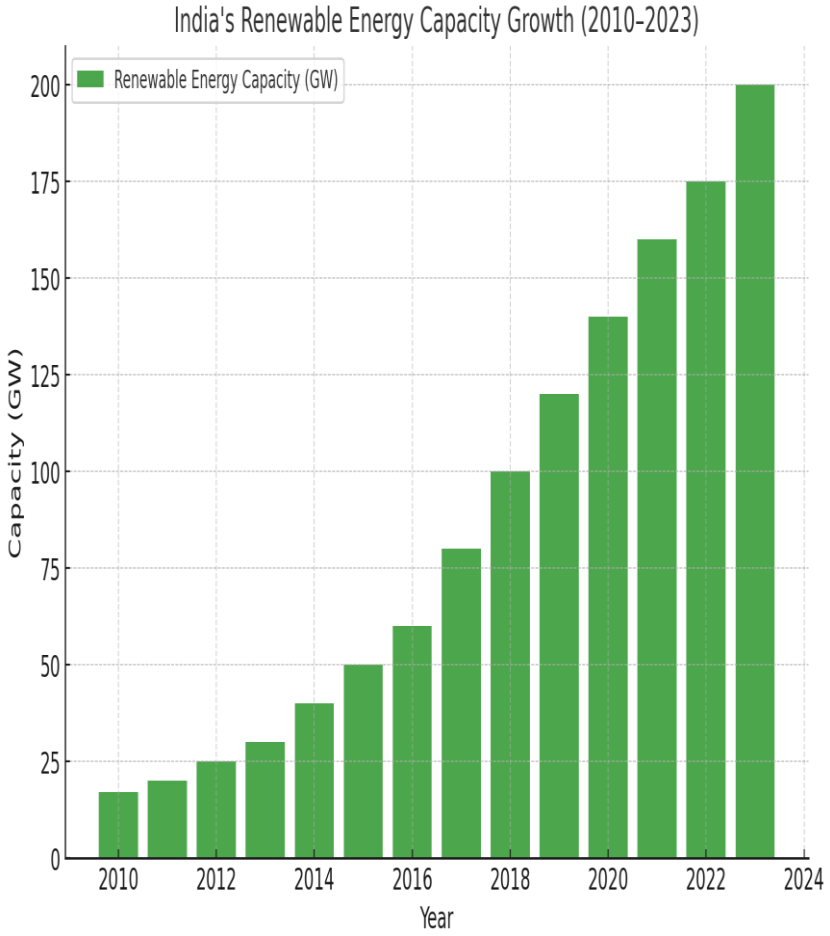
Delivering National Commitments

1. India’s National Commitments:

- **Net Zero by 2070** (announced at COP26 in 2021).
- **Reduce carbon intensity of GDP by 45% by 2030** (from 2005 levels).
- **Increase** the share of **non-fossil fuel** energy capacity to **50% by 2030.**

2. Renewable Energy Progress:

- **Installed 175 GW of renewable energy** capacity as of 2022.
- **Targeting 500 GW of non-fossil fuel** energy capacity by 2030.
- Largest solar energy expansion: **India ranks 4th globally in solar capacity.**



Delivering National Commitments… *continue*

3. Afforestation and Carbon Sink:

- India has increased its **forest cover by 1,540 sq km** over the last five years.
- Goal: Create an additional **2.5–3 billion tons** of carbon sink by 2030.

4. Major Initiatives:

- **International Solar Alliance (ISA):** Leading a global coalition of **121 countries** for solar energy adoption.
- **National Hydrogen Mission:** Targeting **5 million tons of green hydrogen production annually** by 2030.
- **Ujjwala Yojana:** Providing **clean cooking gas** to **90 million households**, reducing indoor air pollution.

Pinning down India's Future Commitments

Upcoming Targets:

- India aims to become a **$1 trillion green economy** by 2030.
- Commitment to transition **30% of vehicles to EVs by 2030.**

Climate Finance:

- India has mobilized **$20 billion annually** for climate-related projects domestically.
- Collaboration with global funds like GCF (Green Climate Fund) and private investments in ESG.

Offering Great Opportunity

Global Green Economy Growth:

- **Green jobs**: Expected to create **24 million jobs globally** by 2030.
- **ESG investments:** Reached **$50 trillion in assets globally** by 2023.

Join India's Green Mission:

- Opportunities in **renewable energy, electric mobility, green hydrogen, carbon markets, and climate tech startups.**
- Policy advocacy, innovation, and partnerships to drive sustainable development.

Defining Actionable for Targets

- **Collaboration:** Foster Public-Private Partnerships **(PPP) and Global Cooperation** for green solutions and climate action.
- **Policy Advocacy:** Advocate for **carbon pricing**, **green finance**, and **sector-specific** emission reduction targets.
- **Thought Leadership:** Influence global policies, **provide research and insights**, and raise public awareness.
- **Innovation:** Support **green technologies** and smart monitoring for emissions tracking.
- **Decarbonizing Sectors:** Promote renewable **energy, EVs, energy efficiency, and sustainable practices** in key sectors.

Focusing Infrastructure for Action

- **Growing Urbanization:** Rapid urbanization in India is **driving demand for infrastructure** that is both functional and environmentally sustainable.

- **Challenges:** Traditional infrastructure harms the environment; **India needs tailored, sustainable solutions.**

- **Key Emission Contributor:** Infrastructure development, particularly in **energy and transport, accounts for about 60% of global carbon emissions**. In India, past priorities on speed and cost over environmental impact are shifting to sustainability.

Today, we stand at a critical juncture of a long journey—where the choices we make in shaping our infrastructure will define not only our economic future but also our commitment to the "Green and Greener planet"

Hence, this initiative *-Green Infrathink Foundation* (GIF)

"To drive an impactful change in the infrastructure sector, helping the world transition towards green and sustainable solutions for a better and more equitable tomorrow"

Thanks for Visiting Us
Hope you find this informative

Do Drop your suggestions at- contact@greeninfrathink.org

Your views matter to us.