

# The Climate Crisis and its Impacts on a Global Scale

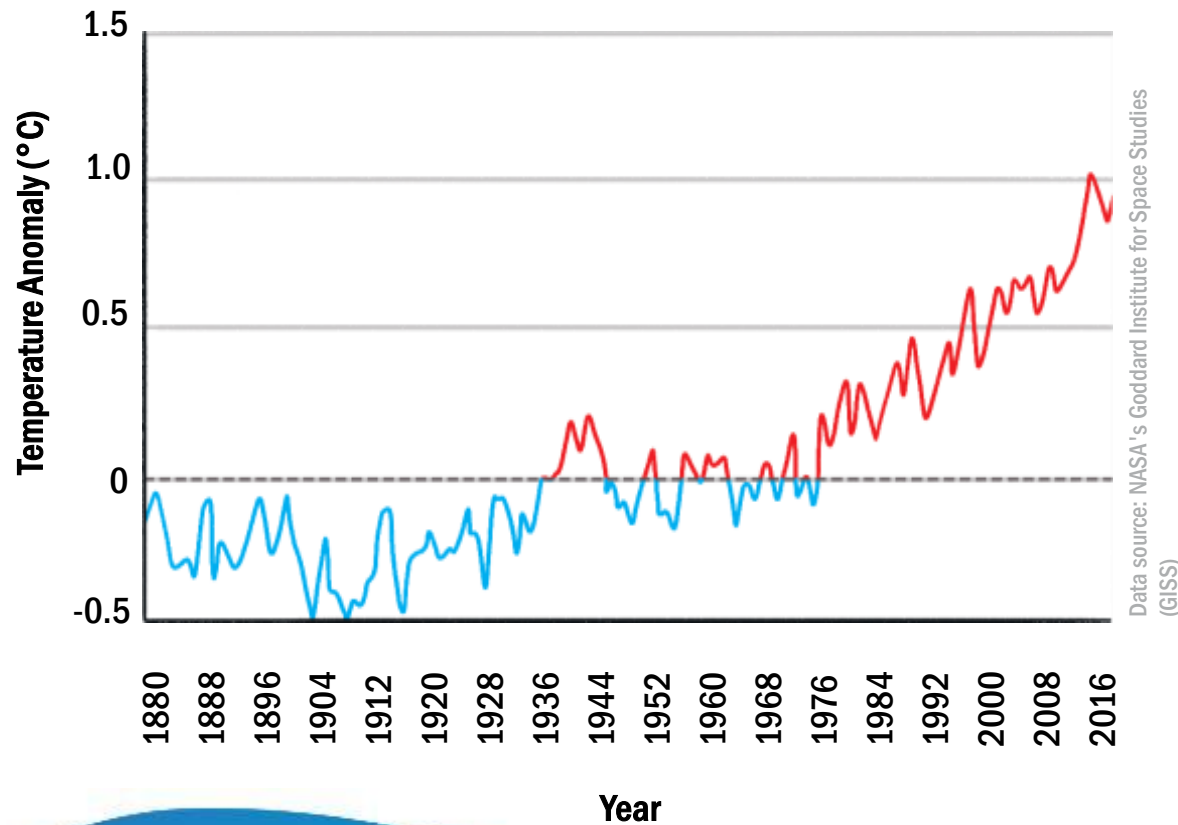
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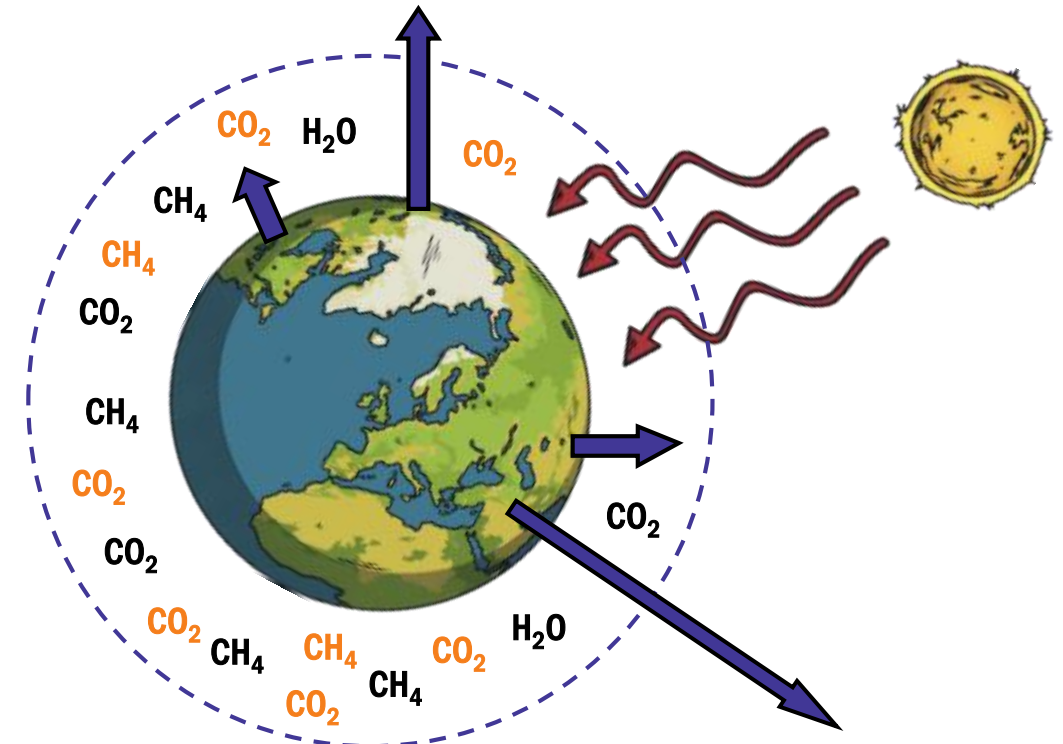


# What is Climate Change?

Climate change is a change in the energy balance of the Earth, causing average temperatures to rise and changing cycles of weather over a long period of time.



- The Earth's atmosphere traps greenhouse gases, which absorb some of the energy from the sun.
- An increase in the concentration of greenhouse gases in the atmosphere leads to an increase in energy being trapped.
- In turn, this leads to global warming.



# What are the Causes of Climate Change?

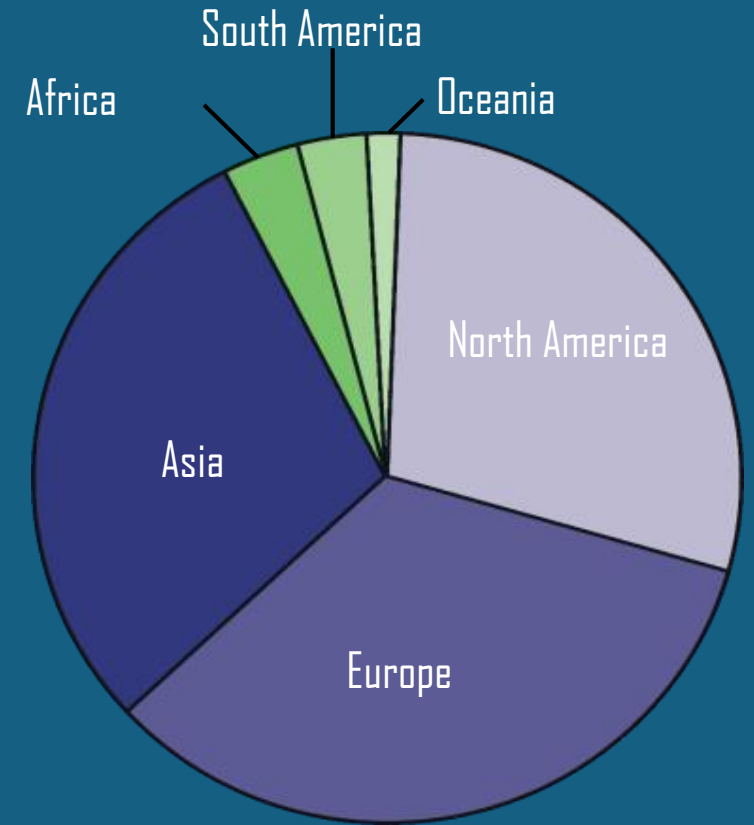
## Greenhouse gas emissions from:



## And loss of carbon sinks:

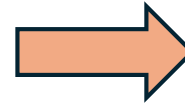
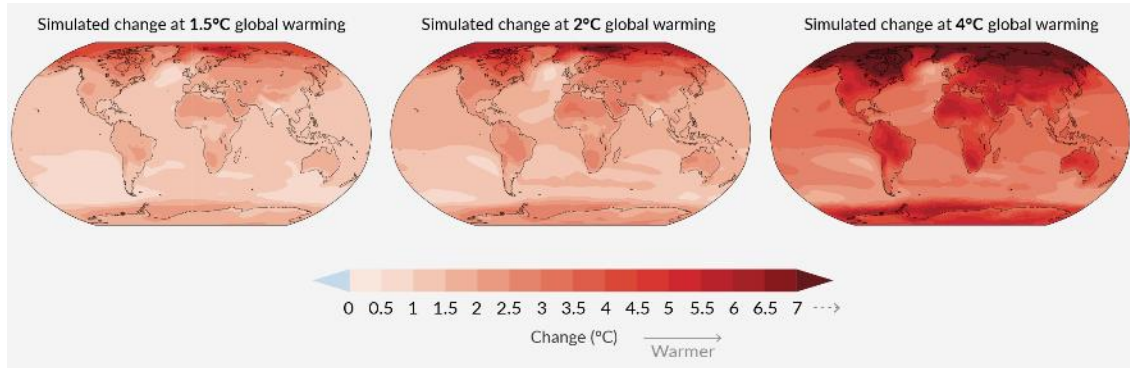


## Who contributes most to greenhouse gas emissions?

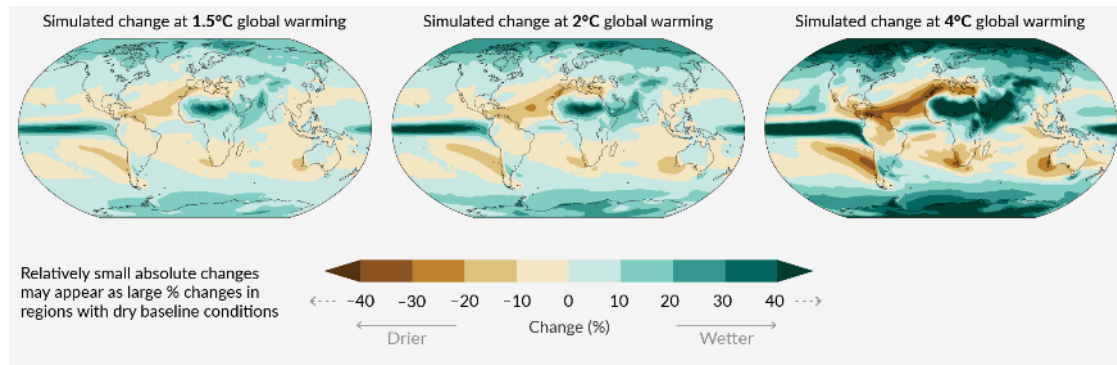


# Climate Change Alters the Hydrological Cycle

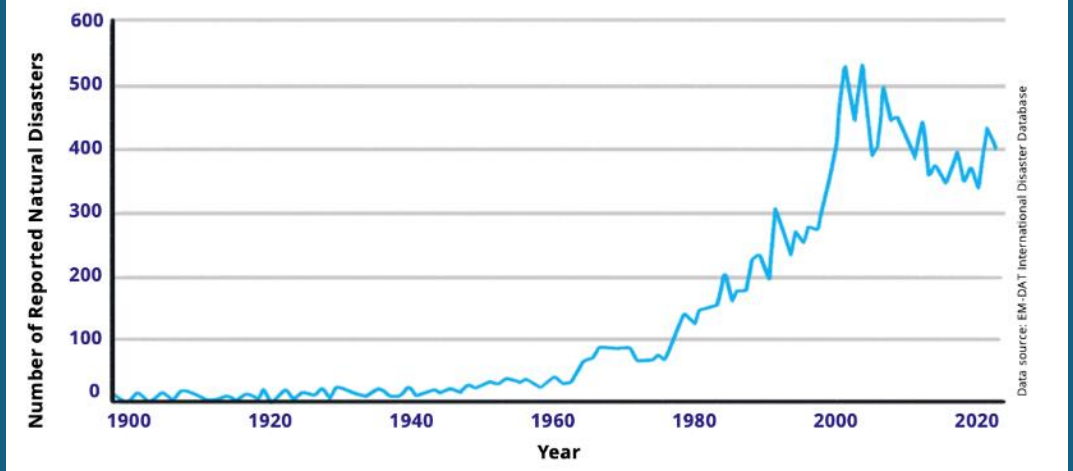
## Changes in annual mean temperatures compared to 1850-1900:



## Changes in annual mean precipitation compared to 1850-1900:



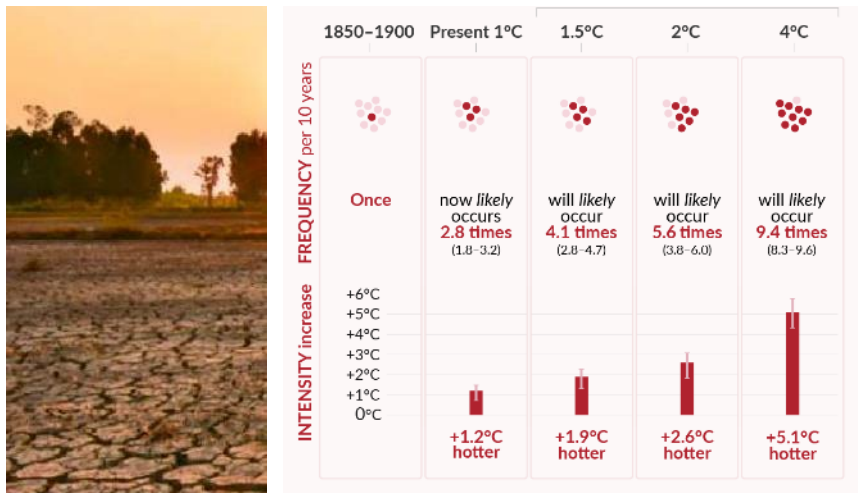
## More frequent and severe extreme weather events



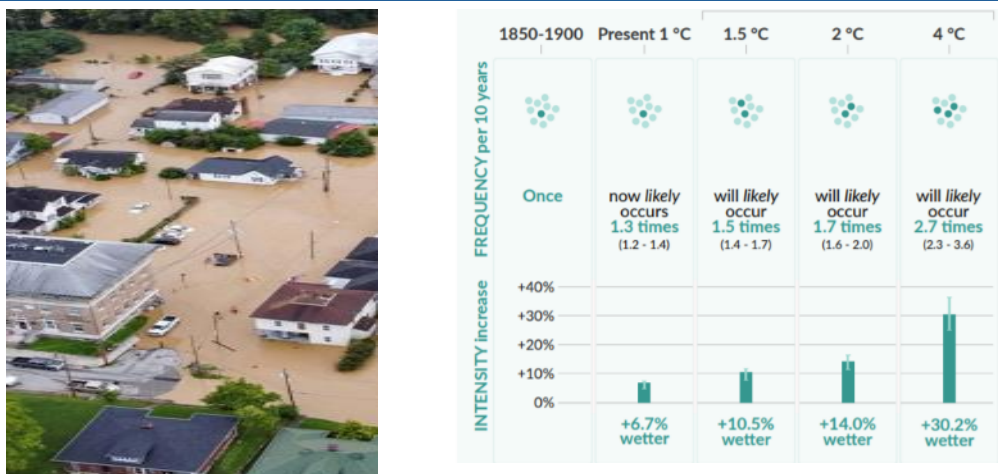
# How Do We Experience Climate Change?



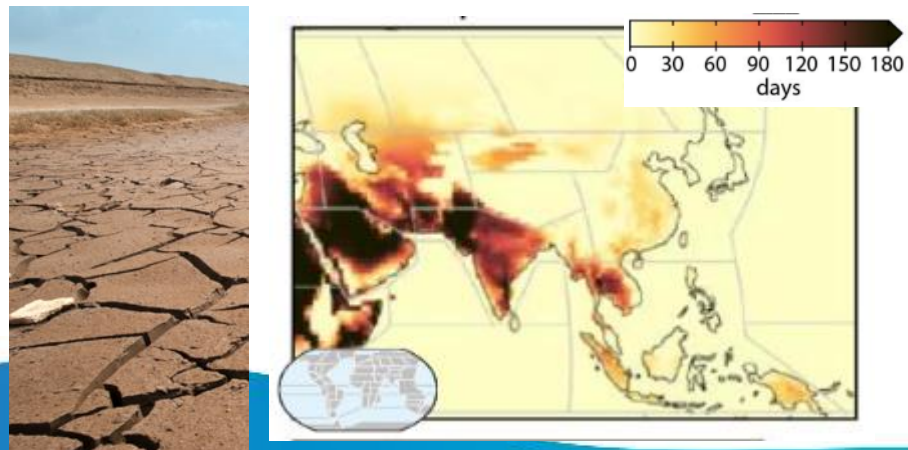
## More frequent and intense heat waves



## More frequent and intense flooding events



## More frequent and intense droughts



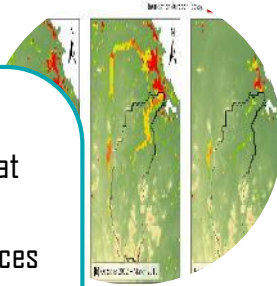
## More frequent and long-lasting forest fires



# Implications Across Sectors

## Water Security

- **4 billion people** experience water scarcity for at least a month each year
- **2 billion** lacked access to safely managed services for drinking water, **and 3.6 billion** for sanitation in 2020
- By 2050, global demand for water is projected to increase by **50%** compared to 2000 levels



## Food security

- **1.2 billion people** live in areas with issues of severe water shortages or scarcity in agriculture
- Climate change is projected to put **8 to 80 million people** at risk of hunger in mid-century, concentrated in Sub-Saharan Africa, South Asia and Central America



## Resilient cities

- Urban areas face multiple climate-related risks, including heatwaves, storms, sea-level rise, and flooding
- **1 in 4 cities worldwide** experience water insecurity
- Global South cities face compounding challenges like poverty and lack of infrastructure
- Urban water demand is projected to increase by **50-70% by 2050**

## Energy production and resilience

- Climate change directly affects every segment of the electricity system, impacting generation potential, efficiency, and the physical resilience of transmission and distribution networks
- Hydropower generation is projected to decrease by **2.2% to 5.4% by 2050** due to changes in river flow and reservoir storage (Osman et al., 2023)

## Ecosystems Services

- According to the FAO, our ecosystems are **at a breaking point**
- Changes in temperature and precipitation disrupt ecosystems, affecting **pollination, water purification, and soil fertility**
- The **melting of tropical glaciers** exacerbates water scarcity and affects local **subsistence agriculture**

# Who is most vulnerable to the impacts of climate change?

## Observed human vulnerability to climate change is a key risk factor and differs globally

Vulnerability at the national level varies. Vulnerability also greatly differs within countries. Countries with moderate or low average vulnerability have sub-populations with high vulnerability and vice versa.

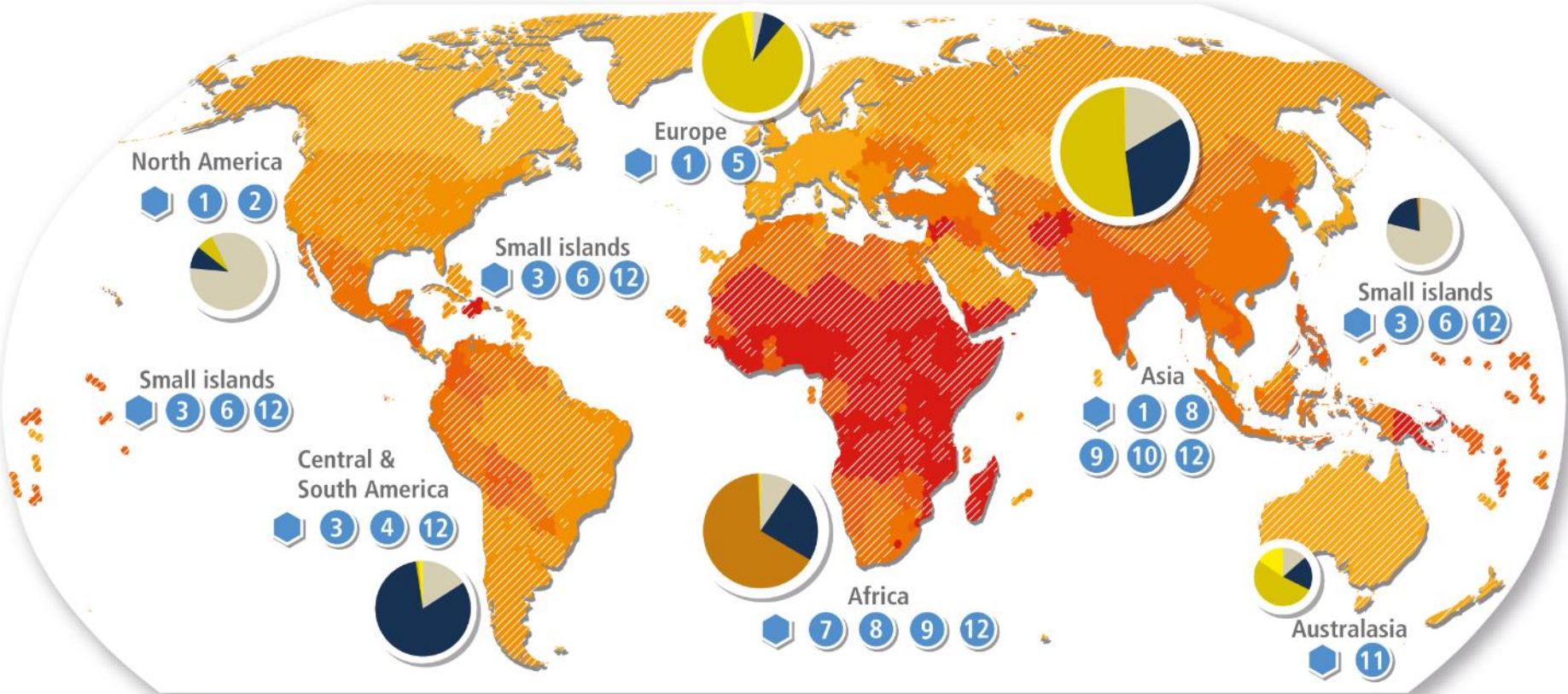
### Relative vulnerability

- Very high
- High
- Medium
- Low
- Very low

### Population density

- High
- Low

Examples of Indigenous Peoples with high vulnerability to climate change and climate change responses (4.3.8, 5.10.2, 5.13.5, Box7.1, 8.2.1, 15.6.4) and the importance of Indigenous Knowledge (Box9.2.1, 11.4, 14.4, Cross-Chapter Box INDIG)



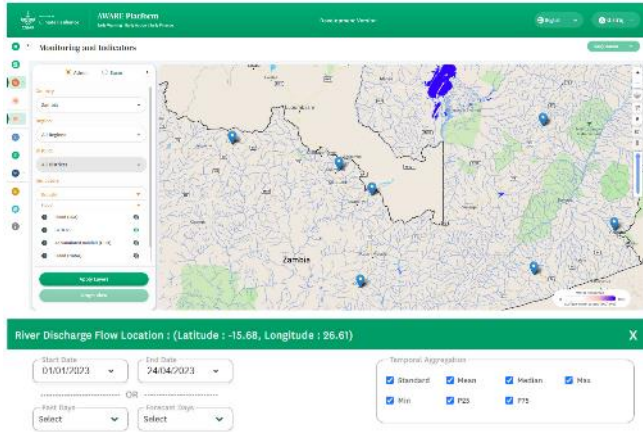
### Pie charts

- Flood
- Storm
- Drought
- Heat
- Wild Fires

The size of the pie charts show average mortality per hazard event per region between 2010 and 2020. The slices of pie charts show the distribution of deaths from a particular hazard.

# What to do? Mitigation, Adaptation and Resilience

## Early-warning decision support – AWARE Platform



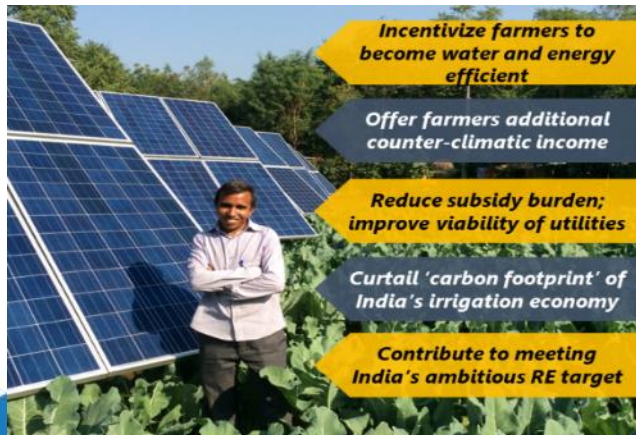
Identifies risks and develops plans to mitigate risks for governments, humanitarian agencies and funders.

## Wetlands for urban resilience



Nature-based solutions to help make cities more resilient to flooding – with Colombo a leading example

## Solar-powered irrigation



Renewable energy for climate change mitigation in the agricultural sector

## Index-Based Flood Insurance



Application of space-based technologies to make affordable insurance available to smallholder farmers



# Conclusions

- **Just transition to renewable energy sources** such as solar and wind power to reduce reliance on fossil fuels and mitigate greenhouse gas emissions
- **Adaptation strategies to enhance resilience** to climate extremes
- **Investing in infrastructure, community resilience and evidence-based solutions**
- **Comprehensive assessments**, including for water security

