



Climate change and security



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Impacts of climate change in India

Observed changes and impacts in India

Increase in frequency of **heat waves**

- 18 heat waves reported between 1980 and 1998
- More than 3000 deaths caused by heat waves in 2003 in Andhra Pradesh

Lower number of rainy days along east coast and **droughts** in delta regions

- Exacerbation of existing water stress
- Severe degradation of ecosystems

Increase in **extreme rains** in north during monsoon

- Serious and recurrent floods in north-east states

Expected impacts in India

Losses in agricultural productivity

- Wheat yields could decrease by 5-10% per one-degree rise in temperature

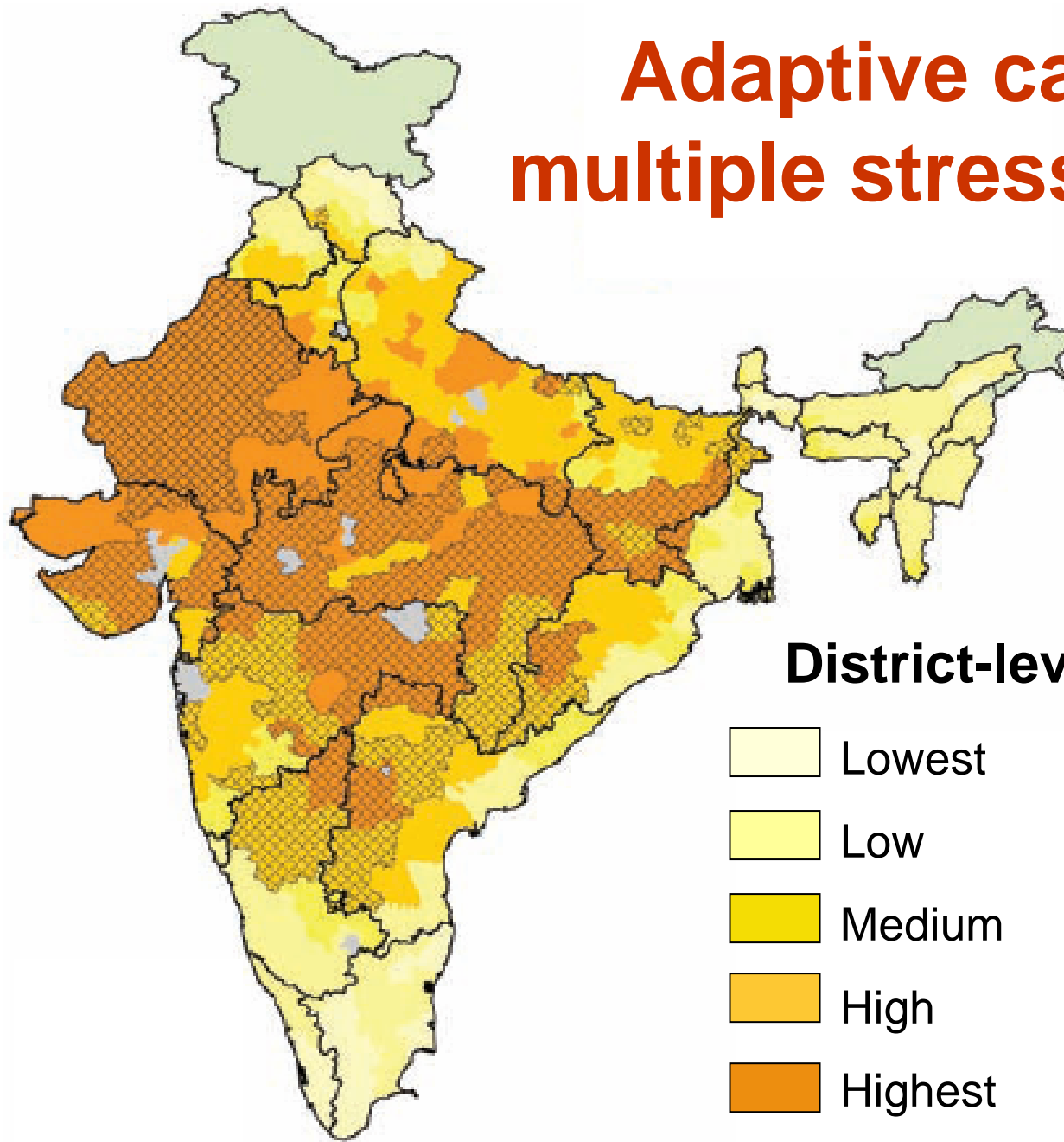
Decrease in freshwater availability

- Gross per capita water availability will decline from 1820 m³/yr in 2001 to 1140 m³/yr in 2050

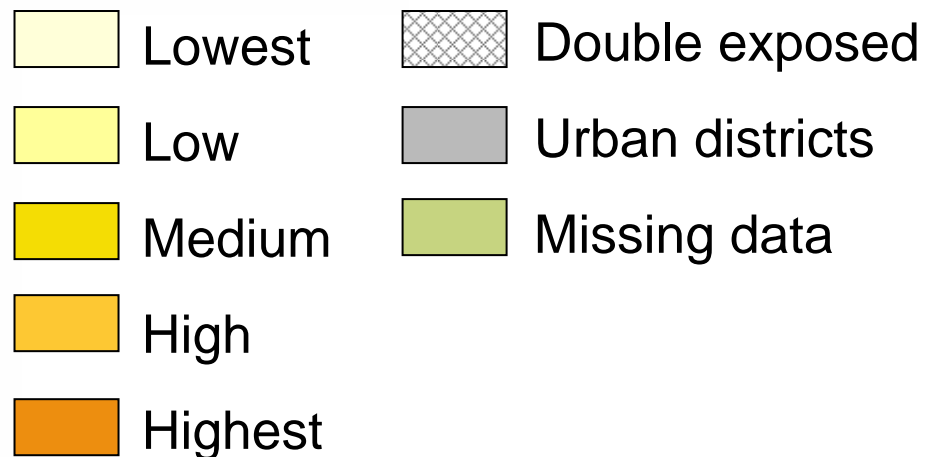
Coastal erosion and inundation of coastal lowland

- The potential impacts of 1 m sea-level rise include inundation of 5,763 km²

Adaptive capacity to multiple stressors in India



District-level vulnerability



Impacts of climate change on world security

Vulnerability of poor communities

The poor have **limited adaptive capacities** and are more dependent on **climate-sensitive resources**

In developing countries, vulnerability is often exacerbated by **existing stresses**

- ➡ **Climate change will act as a ‘threat multiplier’, especially in developing countries**



Impacts on poor regions

People exposed to increased **water stress** by 2020:



- 120 million to 1.2 billion in Asia
- 12 to 81 million in Latin America
- 75 to 250 million in Africa

Possible **yield reduction** in agriculture:



- 30% by 2050 in Central and South Asia
- 30% by 2080 in Latin America
- 50% by 2020 in some African countries

Crop revenues could fall by 90% by 2100 in Africa

Impacts on migration and conflicts

Numbers of environmental refugees could increase as **extreme events** and **famines** become more frequent

Rising ethnic conflicts can be linked to competition over increasingly **scarce natural resources**

➡ **The impacts of climate change on the poorest communities could prove particularly unsettling for the whole world**



Needs for adaptation and mitigation

Adaptation strategies

Developing **knowledge** on impacts and vulnerabilities

Integrating adaptation in wider policies

Improving **disaster preparedness** and management

Informing and **educating** to enhance the level of awareness and understanding

Improving **health care** systems

Promoting **good governance** including responsible decision making and communities empowerment

Stabilisation scenarios

Global mean temp. increase (°C)	Stabilization level (ppm CO ₂ -eq)	Year CO ₂ needs to peak
2.0 – 2.4	445 – 490	2000 – 2015
2.4 – 2.8	490 – 535	2000 – 2020
2.8 – 3.2	535 – 590	2010 – 2030
3.2 – 4.0	590 – 710	2020 – 2060

Mitigation targets

Under most equity interpretations and for low to medium stabilization targets (450-550ppm CO₂-eq), **developed countries** need to significantly reduce their emissions below 1990 levels:

- 10-40% by 2020
- 40-95% by 2050

Developing country emissions need to deviate below their projected baseline within the next few decades

- This requires urgent action in order to avoid lock-in of carbon-intensive technologies and patterns

Co-benefits of mitigation

Common drivers lie behind mitigation policies and policies addressing economic development, health, employment, energy security, and local environmental protection

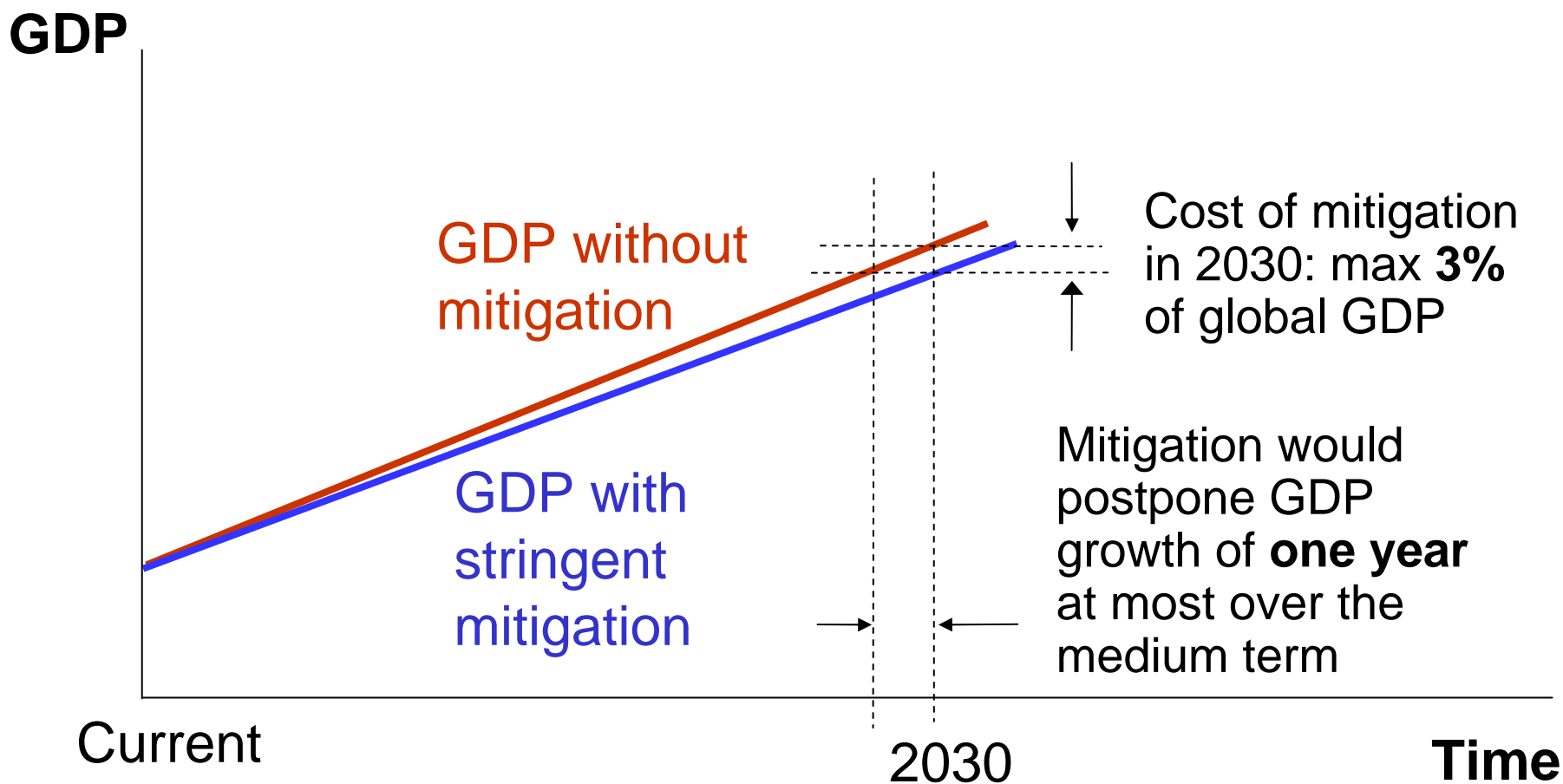
Linking policies provides opportunities for no-regrets policies and reduces mitigation costs

Such policy coherence is especially relevant for **developing countries**, where economic and social development is the top priority

Costs of mitigation in 2030

Stabilisation levels (ppm CO₂-eq)	Range of GDP reduction (%)	Reduction of average annual GDP growth rates (percentage pts)
590 - 710	-0.6 – 1.2	< 0.06
535 - 590	0.2 – 2.5	< 0.1
445 - 535	< 3	< 0.12

Impacts of mitigation on GDP growth



Need for cooperation

Need for enhanced cooperation

Climate change will impede nations' abilities to achieve **sustainable development** pathways

Most **mitigation technologies** are owned by and developed in industrialised countries

- ➡ Adaptation and mitigation in developing countries remains a major challenge that can only be met with increased **international cooperation and funding**

Possible areas of cooperation between Norway and India

Adaptation:

- Assessment of impacts (glaciers, marine ecosystems)
- Disaster management

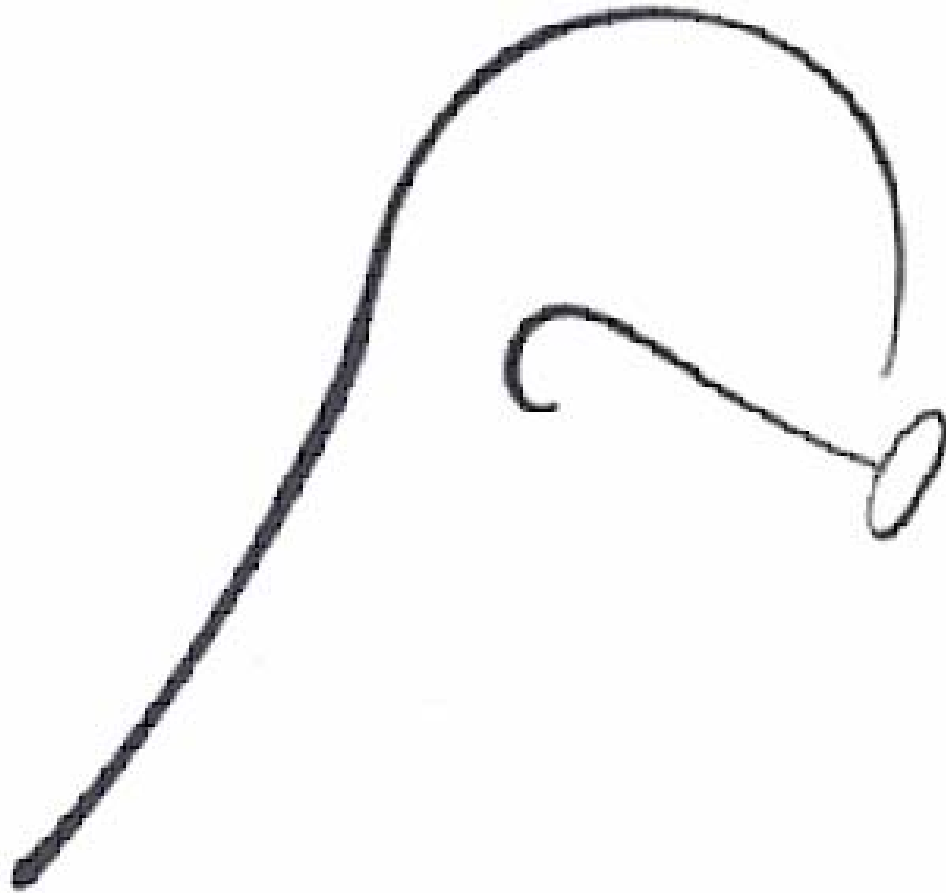
Mitigation:

- Carbon Capture and Storage
- Energy efficiency
- Renewable energies
- Forestry

**Cooperation should involve institutions, business
and research communities from both sides**

"The great project I envisage for Norway in the years to come is to promote combined efforts to meet two of the most formidable challenges of our time: the environmental threat that we are all facing and the totally unacceptable fact that more than one billion people are living in absolute poverty. **These two challenges must be addressed together, not separately**"

~ Erik Solheim, Minister of Environment and Development Cooperation



Gandhi was once asked if he expected India to attain the same standard of living as Britain. He replied:

It took Britain half the resources of the planet to achieve this prosperity. How many planets will a country like India require!