

# CLIMATE CHANGE 2014:



Impacts and Future Risks: What Are the Effects of Climate Change and Options for Adaptation: How Can Society and Nature Adjust?



WIDESPREAD  
OBSERVED IMPACTS

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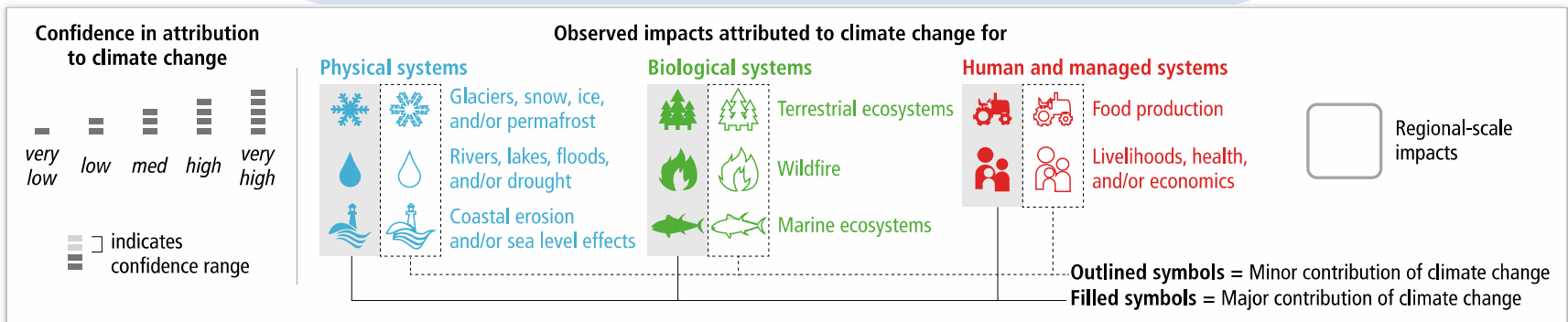
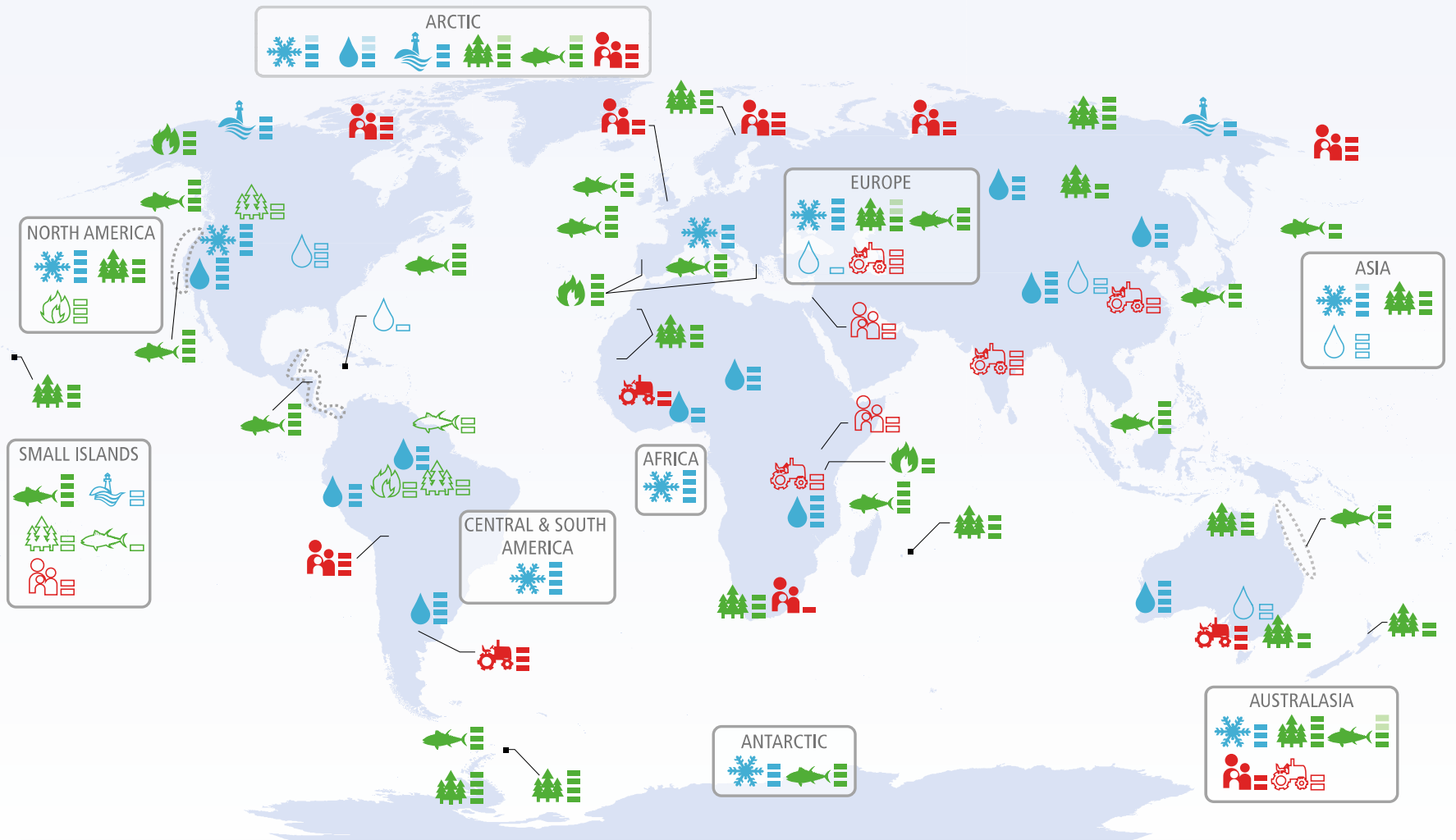
**A CHANGING WORLD**

An underwater photograph of a coral reef. The water is a deep, dark green. The reef is covered in various types of coral, many of which appear bleached and white, indicating significant environmental damage. A single, large, healthy-looking coral colony with a fan-like structure is prominent in the center of the frame. The overall scene conveys a sense of environmental degradation and the impact of climate change on marine ecosystems.

# WIDESPREAD OBSERVED IMPACTS

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# A CHANGING WORLD





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# CLIMATE CHANGE

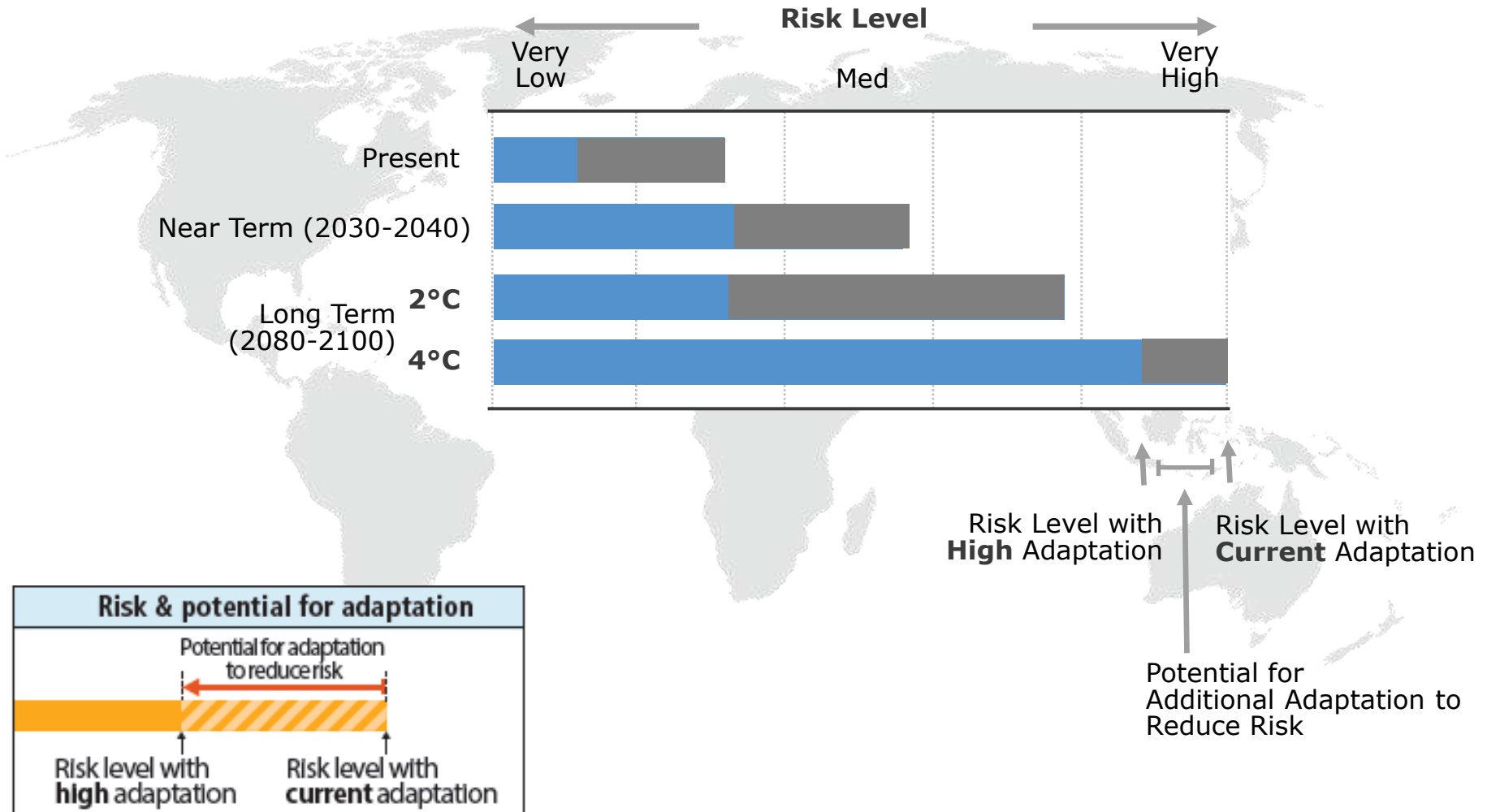
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## REDUCING AND MANAGING RISKS

ipcc

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

# Assessing risk



# Asia

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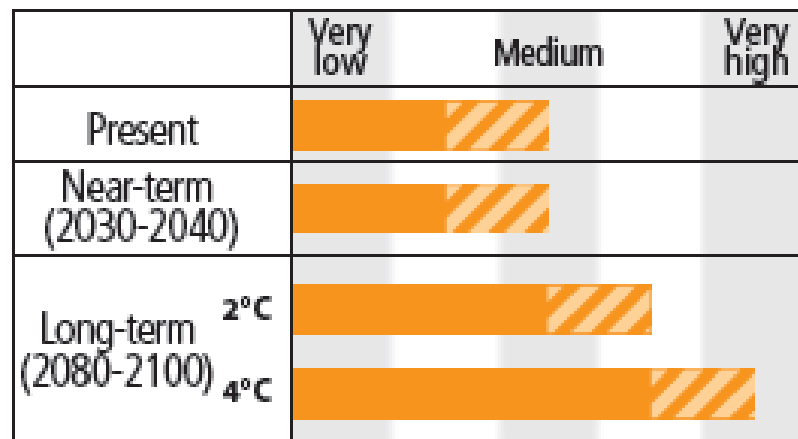
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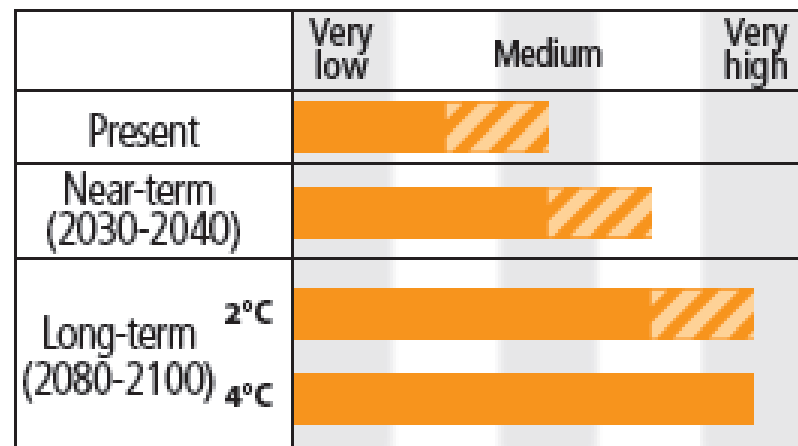
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# Key Risks in Asia

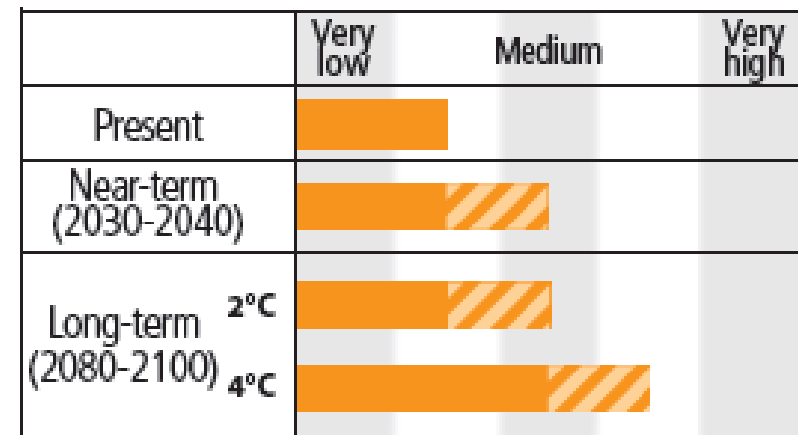
Increased coastal, riverine and urban flooding leading to widespread damage to infrastructure and settlements in Asia (medium confidence)



Increased risk of heat-related mortality (high confidence)



Increased risk of drought-related water and food shortage causing malnutrition (high confidence)



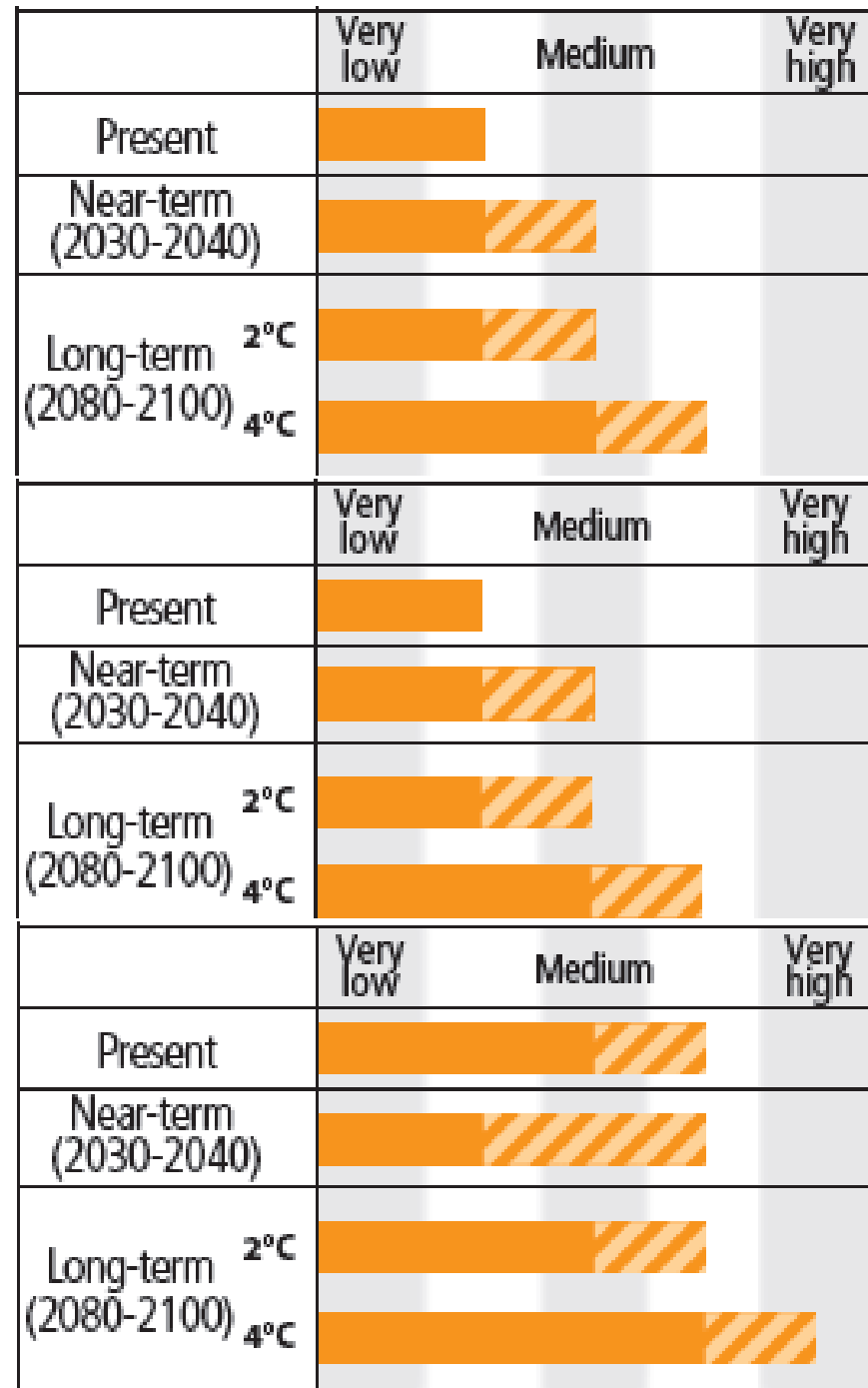


# Key Risks in Asia

Increased risk of flood-related deaths, injuries, infectious diseases and mental disorders (medium confidence)

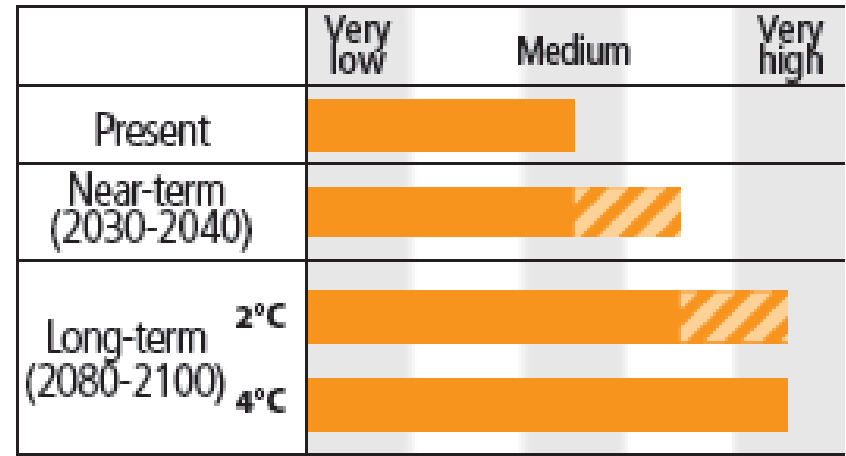
Increased risk of water and vector-borne diseases (medium confidence)

Exacerbated poverty, inequalities and new vulnerabilities (high confidence)

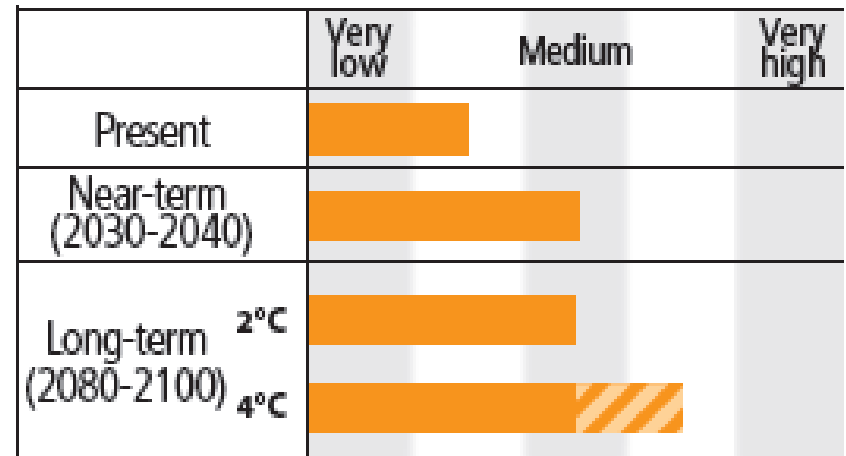


# Key Risks in Asia

Coral reef decline in Asia (high confidence)



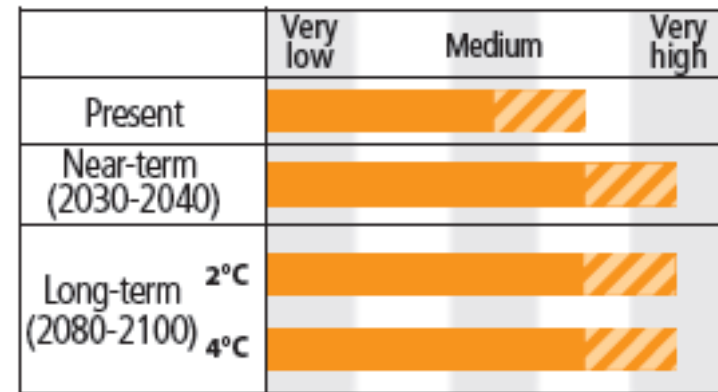
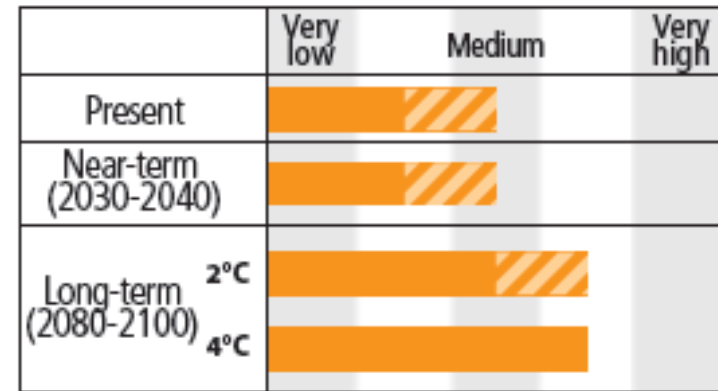
Mountain-top extinctions in Asia (high confidence)



# Key Risks in Asia

Increased risk of crop failure and lower crop production could lead to food insecurity in Asia (medium confidence)

Water shortage in arid areas of Asia (medium confidence)



## KEY CONCLUSIONS: IPCC-WG2

### Chapter 24, Asia

- ❑ Water scarcity is expected to be a major challenge for most of the region due to increased water demand and lack of good management (*medium confidence*)
- ❑ There is *low confidence* in future precipitation projections at a sub-regional scale and thus in future freshwater availability in most parts of Asia.
- ❑ Integrated water management strategies could help adapt to climate change, including developing water saving technologies, increasing water productivity, and water reuse.

# Adaptation is already occurring

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- Combining Traditional and Scientific Knowledge
  - Adapting Communications Infrastructure
  - Coastal & Water Management
  - Environmental Protection & Land Planning
  - Disaster Risk Management
  - Municipal-Level Actions
  - Adapting Energy & Public Infrastructure
  - Development Planning
  - Early Warning Systems
  - Mangrove Reforestation
  - Water Resources Management
  - Disaster Risk Management
  - Basic Public Health
  - Livelihood Diversification
  - Ecosystem-Based Adaptation
  - Water Resources Management
  - Resilient Crop Varieties
  - Planning for Sea-Level Rise
  - Planning for Reduced Water Availability
  - International Cooperation
  - Marine Spatial Planning

# Effective risk management and adaptation are tailored to local and regional needs and circumstances

- Changes in climate extremes vary across regions
- Each region has unique vulnerabilities and exposure to hazards
- Effective risk management and adaptation address the factors contributing to exposure and vulnerability



Source: IPCC, 2012

ipcc

INTERGOVERNMENTAL PANEL ON climate change

# Chapter 24, Asia: Coverage of Information

Sector	Topics/issues	North Asia		East Asia		Southeast Asia		South Asia		Central Asia		West Asia	
		O = Observed impacts, P = Projected Impacts	O	P	O	P	O	P	O	P	O	P	
Freshwater resources	Major river runoff	/	x	/	/	/	/	/	x	x	x	x	
	Water supply	x	x	x	x	x	x	x	x	x	x	x	
Terrestrial and inland water systems	Phenology and growth rates	/	/	/	/	x	x	x	x	x	x	x	
	Distributions of species and biomes	/	/	/	/	x	x	x	/	x	x	x	
	Permafrost	/	/	/	/	/	x	/	/	/	/	x	
	Inland waters	x	x	/	x	x	x	x	x	x	x	x	
Coastal systems and low-lying areas	Coral reefs	NR	NR	/	/	/	/	/	/	NR	NR	/	/
	Other coastal ecosystems	x	x	/	/	x	x	x	x	NR	NR	x	x
	Arctic coast erosion	/	/	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Food production systems and food security	Rice yield	x	x	/	/	x	/	x	/	x	x	x	/
	Wheat yield	x	x	x	x	x	x	x	/	x	x	/	/
	Corn yield	x	x	x	/	x	x	x	x	x	x	x	x
	Other crops (e.g., barley, potato)	x	x	/	/	x	x	x	x	x	x	/	/
	Vegetables	x	x	/	x	x	x	x	x	x	x	x	x
	Fruits	x	x	/	x	x	x	x	x	x	x	x	x
	Livestock	x	x	/	x	x	x	x	x	x	x	x	x
	Fisheries and aquaculture production	x	/	x	/	x	/	x	x	x	x	x	x
	Farming area	x	/	x	/	x	x	x	/	x	/	x	x
	Water demand for irrigation	x	/	x	/	x	x	x	/	x	x	x	x
Human settlements, industry, and infrastructure	Pest and disease occurrence	x	x	x	x	x	x	x	/	x	x	x	x
	Floodplains	x	x	/	/	/	/	/	/	x	x	x	x
	Coastal areas	x	x	/	/	/	/	/	/	NR	NR	x	x
	Population and assets	x	x	/	/	/	/	/	/	x	x	x	x
Human health, security, livelihoods, and poverty	Industry and Infrastructure	x	x	/	/	/	/	/	/	x	x	x	x
	Health effects of floods	x	x	x	x	x	x	/	x	x	x	x	x
	Health effects of heat	x	x	/	x	x	x	x	x	x	x	x	x
	Health effects of drought	x	x	x	x	x	x	x	x	x	x	x	x
	Water-borne diseases	x	x	x	x	/	x	/	x	x	x	x	x
	Vector-borne diseases	x	x	x	x	/	x	/	x	x	x	x	x
	Livelihoods and poverty	x	x	/	x	x	x	/	x	x	x	x	x
Economic valuation	x	x	x	x	/	/	/	/	x	x	x	x	

## Principles for Effective Adaptation

Adaptation is place- and context-specific, with no single approach for reducing risks appropriate across all settings (*high confidence*).

Adaptation planning and implementation can be enhanced through complementary actions across levels, from individuals to governments (*high confidence*).

A first step towards adaptation to future climate change is reducing vulnerability and exposure to present climate variability (*high confidence*). Strategies include actions with co-benefits for other objectives.

Adaptation planning and implementation at all levels of governance are contingent on societal values, objectives, and risk perceptions (*high confidence*). Recognition of diverse interests, circumstances, social-cultural contexts, and expectations can benefit decision-making processes.

Decision support is most effective when it is sensitive to context and the diversity of decision types, decision processes, and constituencies (*robust evidence, high agreement*).

Existing and emerging economic instruments can foster adaptation by providing incentives for anticipating and reducing impacts (*medium confidence*).

Constraints can interact to impede adaptation planning and implementation (*high confidence*).

Poor planning, overemphasizing short-term outcomes, or failing to sufficiently anticipate consequences can result in maladaptation (*medium evidence, high agreement*).

Limited evidence indicates a gap between global adaptation needs and the funds available for adaptation (*medium confidence*).

Significant co-benefits, synergies, and trade-offs exist between mitigation and adaptation and among different adaptation responses; interactions occur both within and across regions (*very high confidence*).