

# Fact sheet - Asia

## Climate Change Impacts and Risks

### Observed and projected climate change impacts

Rising temperatures increase the likelihood of the threat of heatwaves across Asia, droughts in arid and semi-arid areas of West, Central and South Asia, floods in monsoon regions in South, Southeast and East Asia, and glacier melting in the Hindu Kush Himalaya region (*medium confidence*). {ES-Ch10; 10.3.1}

### Ecosystems

Observed biodiversity or habitat losses of animals or plants have been linked to climate change in some parts of Asia (*high confidence*). {ES-Ch10; 10.4.2.1.2}

Future climate change would cause biodiversity and habitat loss in many parts of Asia using modelling approaches (*high confidence*). Future climate change would reduce the suitable habitat of certain protected plants. {10.4.2.2.2}

The risk of irreversible loss of coral reefs, tidal marshes, seagrass meadows, plankton community and other marine and coastal ecosystems increases with global warming, especially at 2°C temperature rise or more (*high confidence*). {ES-Ch10}

### Health

Climate change is increasing vector-borne and water-borne diseases, undernutrition, mental disorders and allergy-related illnesses in Asia by increasing hazards such as heatwaves, flooding and drought, and air pollutants, in combination with more exposure and vulnerability (*high confidence*). {ES-Ch10}

In addition to all-cause mortality, deaths related to circulatory, respiratory, diabetic and infectious diseases, as well as infant mortality, are increased with high temperature (*high confidence*). {10.4.7.1}

Increases in heavy rain and temperature will increase the risk of diarrheal diseases, dengue fever and malaria in tropical and subtropical Asia. More frequent hot days and intense heatwaves will increase heat-related deaths in Asia. {ES-Ch10}.

### Cities and Settlements

Climate change has caused direct losses due to the damage in infrastructure, disruption in services and affected supply chains in Asia (*medium confidence*) and will increase risk to infrastructure as well as provide opportunities to invest in climate-resilient infrastructure and green jobs (*medium confidence*). {ES-Ch10}

### Water

By mid-21st Century, the international transboundary river basins of Amu Darya, Indus, Ganges could face severe water scarcity challenges due to climatic variability and changes acting as stress multipliers (*high confidence*). {ES-Ch10}

Due to global warming, Asian countries could experience an increase in drought conditions (5-20%) by the end of this century (*high confidence*). {ES-Ch10}

### Cryosphere

Glacier lake outburst flood will threaten the security of the local and downstream communities in High Mountain Asia (*high confidence*). {TS.C.4.2}

Observed changes in climate resulted in permafrost warming and increased thaw depth in undisturbed locations, but in built up areas these transformations were exacerbated by human activities. By 2050, it is likely that 69% of fundamental human infrastructure in the Pan Arctic will be at risk (*medium confidence*). {10.4.6.3.7}

### Food

Increased floods and droughts, together with heat stress, will have an adverse impact on food availability and prices, resulting in increased undernourishment in South and Southeast Asia (*high confidence*). (TS.C.4.6)

### Energy

Asian countries are experiencing a hotter summer climate, resulting in increase of energy demand for cooling at a rapid rate, together with the population growth (*high confidence*). Decrease in precipitation influences energy demand as well as desalination, underground water pumping and other energy-intensive methods are increasingly used for water supply (*high confidence*). {ES-Ch10}

Among 13 developing countries with large energy consumption in Asia, 11 are exposed to high-energy insecurity and industrial-systems risk (*high confidence*). {ES-Ch10; 10.4.1}

Key risks and adaptation options in select cities across Asia

		Central Asia	North Asia	West Asia	South Asia		East Asia		Southeast Asia			
		Tashkent	Salekhard	Riyadh	Ahmedabad	Mumbai	Dhaka	Guangzhou	Shanghai	Kuala Lumpur	Jakarta	Ho Chi Minh City
Population (thousands of people)	Observed (2020)	916	55	7,231	8,059	20,411	21,006	13,302	27,058	7,997	13,923	8,602
	Projected (2035)	1,388		9,058	11,295	27,343	31,234	16,741	34,341	10,467	18,649	12,236
Key risks	Floods	/	/	●	*	●	●	●	●	●	●	●
	Sea level rise	na	na	na	na	●	●	●	●	na	●	●
	Heat, urban heat island	/	●	●	●	●	●	●	●	●	●	*
	Extreme rain	/	/	●	*	●	●	●	●	●	●	●
	Drought, water scarcity	/	/	●	●	*	●	*	*	●	●	/
	Cyclones	na	na	na	na	○	●	/	●	/	na	/
	Permafrost thaw	/	●	na	na	na	na	na	na	na	na	na
Progress	Institutional	/	●	●	●	*	●	●	●	●	●	●
	Infrastructural	/	●	/	●	●	●	●	●	●	●	●
	Ecosystem-based	/	/	/	●	*	●	●	●	●	●	●
	Behavioural	/	/	●	●	*	/	●	*	*	●	●



Figure 1: Risks and key adaptation options in select cities across Asia. Cities were chosen to ensure coverage of different sub-regions of Asia, represent different risk profiles, different city sizes (based on current population and projected growth) and reported progress on different adaptation strategies (infrastructural, institutional, ecosystem based). {Figure 10.8, full line of sight in SM10.4}

Migration

There is *robust evidence, medium agreement* that increased climate variability and extreme events are already driving migration and *medium evidence, medium agreement* projecting that longer-term climate change will increase migration flows across Asia. Despite methodological disagreement on detection and attribution of migration due to climate change, there is *medium confidence* that higher warming and associated changes in frequency and intensity of slow-onset events (such as drought and sea level rise) and rapid-onset events (such as cyclones and flooding) will increase involuntary displacement in the future, especially under SSP3\* and SSP4 pathways. In 2019, Bangladesh, China, India and the Philippines each recorded more than 4 million disaster displacements. In Southeast and East Asia, cyclones, floods and typhoons triggered internal displacement of 9.6 million, almost 30% of total global displacements. {ES-Ch10; Box 10.2}

Adaptation Options and Barriers

Barriers

There are significant barriers to climate resilient development such as fragmented, reactive governance; inadequate evidence on which actions to prioritise and how to sequence them; and finance deficits. Some Asia countries and regions offer solutions to overcome these barriers: through use of advanced technologies (in situ observation and remote sensing, a variety of new sensor technologies, citizen science, artificial intelligence and machine learning tools); regional partnerships and learning; improved forecasting capabilities; and better risk awareness (*high confidence*). {ES-Ch10}

Adaptation options

Options such as climate-smart agriculture, ecosystem-based disaster risk reduction and investing in urban blue-green infrastructure meet adaptation, mitigation and Sustainable Development Goals simultaneously, presenting opportunities for climate resilient development pathways in Asia (*high confidence*). Climate risks, vulnerability and adaptation measures need to be factored into decision making across all levels of governance (*high confidence*). {ES-Ch10}

\* Please see 'Introduction to WGII AR6 Fact Sheets'