Climate Centre

Region-level | Climate fact sheet

Asia Pacific

Figure 1 Map of UNESCO Asia Pacific's member states

1. Region overview

Asia Pacific is a large region that includes (from west to east) South Asia, East Asia, South East Asia and Oceania.

South Asia

The South Asian region consists of eight countries: Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan and Sri Lanka (United Nations Statistics Division (UNSD) 2010) and spans over 5,134,641 square kilometres (km^2) (1,982,496 square miles (sq mi)). The total population of this region is approximately 1,814,014,121 people (United Nations Department for Economic and Social Affairs (UNDESA) 2019). In 2018, South Asia's economy had a Gross Domestic Product (GDP) of 12.752 trillion US dollars (International Monetary Fund (IMF) 2018) and is a mix of agriculture, manufacturing and service sector. According to the World Bank's 2011 report – based on 2005 International Comparison Program Purchasing Power Parity – about 15.2 per cent of the South Asian population falls below the international poverty line of 1.90 US dollars/day, a stark decrease from 49.1 per cent in 1990 (World Bank 2014).

East Asia

The East Asian region consists of six countries and two Special Administrative Regions: China (with Hong Kong and Macau Special Administrative Regions of the People's Republic of China), Japan, Mongolia, North Korea, South Korea and Taiwan (officially the Republic of China). China, North Korea and South Korea do not recognize at least one other country due to political tensions, specifically over the division of Korea and the status of Taiwan (Kort 2005). The combined size of East Asia is 1,839,074 km^2 (4,571,092 sq mi) with a population of 1,666,471,330 people (UNDESA 2019). In 2020, the East Asian economy had a GDP of 23 trillion US dollars (IMF 2020) and is one of the world's leading manufacturing regions; with China, Japan, South Korea and Taiwan manufacturing a very wide range of products from toys to cars. The textile industry also provides employment to a considerable proportion of the population

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(Economy Watch 2010). According to World Bank statistics, the number of people living below the poverty line reduced by approximately one billion in East Asia over the last three decades. China has the largest population in the world; currently 15 per cent of China's population is living under the poverty line, earning less than 5.50 US dollars/day; This number is expected to decrease to 2 per cent by 2030 (Pavon 2019).

South-East Asia

The South-East Asian region consists of two geographic regions – mainland and maritime. Mainland South-East Asia includes six countries: Cambodia, Laos, Myanmar, Peninsular Malaysia, Thailand and Viet Nam. Maritime South-East Asia consists of: Brunei, Christmas Island (Australia), the Cocos (Keeling) Islands (Australia), East Malaysia, Timor Leste, Indonesia (except Western New Guinea, which is considered to be part of Oceania), the Philippines and Singapore (Shaffer 2015). The combined area of mainland and maritime South-East Asia is 4,545,792 km^2 (1,755,140 sq mi) with a population of 655,298,044 people (UNDESA 2019). South-East Asia has a diverse economy with a combined GDP of 9.727 trillion US dollars (Association of Southeast Asian Nations (ASEAN) 2014). The region's economy greatly depends on agriculture; with rice and rubber being prominent exports. Manufacturing and services are becoming more important (Baten 2016). Much of the economic development in South-East Asian countries, especially Cambodia, can be attributed to growing tourism (Mazumder *et al.* 2006). Laos, Cambodia and Thailand have shown remarkable progress towards the eradication of poverty. Thailand has eradicated poverty among those who were earning less than 3.20 US dollars/day and aims to reduce the poverty of people earning less than 5.50 US dollars/day to 1 per cent by 2028. Myanmar has also seen a steady reduction in poverty – currently 17 per cent of the population is earning less than 1.90 US dollars/day, while a similar percentage is expected to be earning at least 3.20 US dollars/day in the next ten years (Pavon 2019).

Oceania

The Oceania region consists of Australia, New Zealand and the Pacific Islands, which further divide into three regions: Micronesia, Melanesia and Polynesia. There is a total of 14 sovereign states, 11 territories along with eight dependencies (Shvili 2021). Oceania has a combined land area of 8,525,989 km^2 (3,291,903 sq mi) and a population of over 41 million people (UNDESA 2019). The combined GDP of the region is 1.630 trillion US dollars (UNSD 2018); with Australia and New Zealand being the only developed nations in the region (Shvili 2021). Economic activity in Australia and New Zealand includes mining as well as the electrical and manufacturing sectors. The Pacific Islands have a service-based economy, including large tourism, education and financial services sectors. They also produce and export beef, cocoa, coconut, ginger, palm oil, sugar and timber. Fiji is one of the most developed of the Pacific Island economies, though it remains a developing country with a large subsistence agriculture sector (Central Intelligence Agency (CIA) 2021).

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1.1 Climate

South Asia

The climate of South Asia can be classified into three broad categories: dry, temperate and tropical (Pannell *et al.* 2020). South Asia's terrain ranges from the world's tallest mountain, Mount Everest, in the Himalayan mountain range (Nepal and China) at 29,029 feet (8,848 metres) above sea level (Yang and Zheng 2004) to Adam's Bridge in Sri Lanka which has submerged into the Indian Ocean (Garg 1992).

Temperatures across South Asia vary significantly, from an annual mean temperate climate of 11.9°C in Bhutan to a tropical climate of 27.6°C in the Maldives. This is largely due to the topography of the region. Precipitation also varies across the region; Pakistan gets the lowest annual precipitation of 301 millimetres (mm), while Bangladesh receives the highest precipitation of 2.4 metres (m). The main driver of precipitation in the region is the Southwest Monsoon. The climate of South Asia is affected by El Niño, which has a significant impact on the temperature, precipitation and cyclonic activity of the region (World Bank n.d.; Pannell *et al.* 2020).

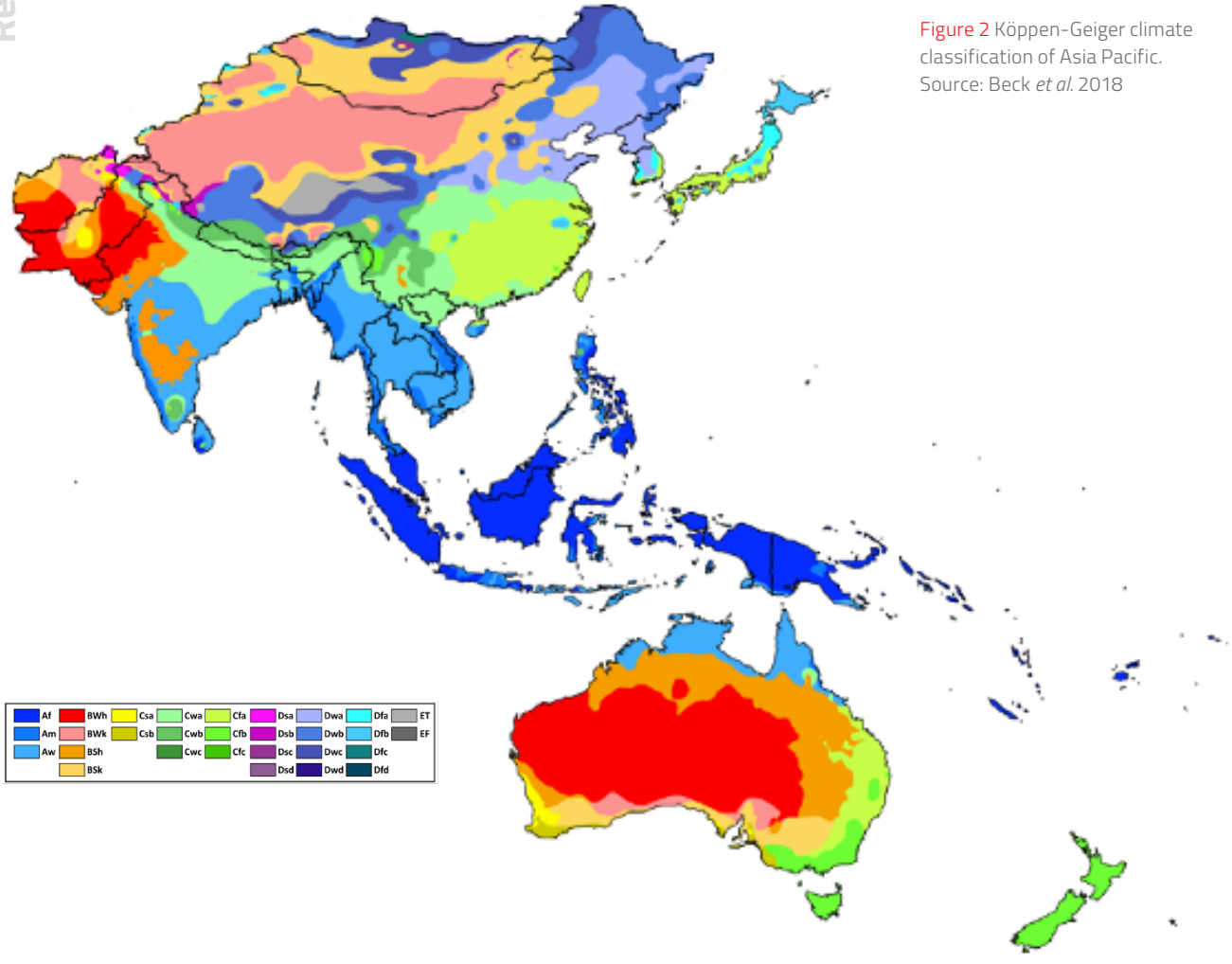

Figure 2 Köppen-Geiger climate classification of Asia Pacific. Source: Beck *et al.* 2018

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East Asia

The five major climate regions of East Asia are: humid subtropical, humid continental, semi arid, arid and highland. Annual mean temperatures vary significantly, partly because Japan is an island country and South Korea is mostly surrounded by water, whereas China has a varied terrain from the Himalayas to the coastal regions (World Bank n.d.). Monsoons strongly affect the temperature and precipitation of East Asia – annual mean precipitation varies, ranging from 574mm in China to 1.6m in Japan. The monsoon wind can also produce dust storms in dry parts of China (Wang *et al.* 2003).

South-East Asia

The climate of South-East Asia can be described as tropical, meaning the weather tends to be the hot and humid most of the year. The only countries in South-East Asia that experience a sub-tropical climate are Myanmar, Laos mountainous regions, and Northern Viet Nam (Owuor 2019). As the monsoon winds start to retreat from the South Asian region by the end of September, the Intertropical Convergence Zone (ITCZ) picks up moist wind and brings it into the South-East Asian region, covering much of Cambodia, Thailand and Viet Nam (NASA n.d.). Consequently, October is the wettest month in the region.

Temperatures vary slightly across South-East Asia due to its tropical climate. The average annual mean temperature across the region is 25.5°C (World Bank n.d.). South-East Asia experiences the Southwest Monsoon in the summer months, and the Northeast Monsoon and tropical cyclones in the winter months. Precipitation is high, ranging from 2.0m in Myanmar to 3.0m in Malaysia (World Bank n.d.). El Niño has an effect on monsoons, increasing their intensity; it also increases incidence and intensity of tropical storms, such as cyclones and typhoons. However, in general, South-East Asia experiences drought-like conditions during El Niño events and wetter conditions during La Niña events (ASEAN Specialised Meteorological Centre (ASMC) 2021).

Oceania

Temperature and precipitation vary across Oceania, due to Australia's mostly semi-arid climate and the Pacific Islands' tropical climate. The mean annual temperature varies from 9.7°C in New Zealand to 25°C in Papua New Guinea, and precipitation from 460mm in Australia to more than 3.0m in Papua New Guinea (World Bank n.d.). The El Niño Southern Oscillation (ENSO) has a significant impact on rainfall in the region. Northern Australia – which is closer to the tropics – has a more tropical climate, with hot and humid summers and warm and dry winters; as compared to other parts of the country, which are semi-arid and experience mild summers and rainy winters (Cai and Cowan 2009). Here, the maximum temperature can be as high as 50°C and the minimum as low as 0°C. New Zealand has a diverse landscape with a temperate and maritime climate that is wet, semi-arid to sub-tropical (Walrond 2009). Temperatures vary between 45°C in summer and 8°C in winter. The winter months receive high precipitation and cyclonic activity. Finally, the Pacific Islands have a tropical temperature with a mean annual average of 25°C. The ITCZ brings rain from March to November, while the South Pacific Convergence Zone brings it from October to April (National Oceanic and Atmospheric Administration (NOAA) 2013).

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1.2 Climate change

Historical Climate

Temperature

The increase in average annual temperature across the Asia Pacific region has risen significantly, compared to the past century (World Bank n.d.). In the past 60 years, the annual mean temperature has increased variably across the South Asia region; with the lowest increase of 0.16°C in Sri Lanka and the highest increase of 0.75°C in Bangladesh. In East Asia, the temperature has increased by approximately 0.9°C. South-East Asia has seen a minimum increase of 0.3°C in Malaysia to 0.8°C in Myanmar; while there has been a 0.75°C increase across Oceania (World Bank n.d.). Warming is strongly biased towards the winter and post monsoon months (November–February) in South and South-East Asia (World Bank n.d.).

Since the 1950s, cold nights and days have decreased and warm nights and days have become more frequent. Furthermore, heat waves are becoming increasingly more frequent in the majority of Asia – with South Asia particularly affected by extremely high temperatures (IPCC 2014).

Precipitation

Total annual precipitation amounts range from 301mm in Pakistan to 2.4m in Bangladesh (World Bank n.d.). Precipitation trends have varied significantly across the region over the past 60 years; but overall, there has been a 7–15 per cent decrease in annual precipitation. Heavy precipitation events have increased in frequency across South Asia while decreases have also been observed in light rainfall events.

East Asia has experienced a reduction in precipitation. Annual mean precipitation ranges from 574mm in China to 1.6m in Japan. The incidence of drought has also increased in the past 60 years (World Bank n.d.)

South-East Asia has experienced a significant increase in precipitation due to greater cyclonic and typhoon activity attributed to ENSO; except for Indonesia where precipitation has decreased by 3 per cent since 1990 (World Bank n.d.).

Precipitation has generally decreased in the Oceania region (NOAA 2013). But rising air temperatures have increased surface evapotranspiration; substantially increased glacial retreats; and exacerbated water shortage in the region. 28 per cent of the glacial area in the region has disappeared since 1975 due to an increase in temperature (Maurer *et al.* 2019).

Projected climate

Temperature

Projected annual mean temperatures are variable across the region. According to the Representative Concentration Pathway (RCP) 8.5 ensemble, in 2040–2059 the mean annual temperature will rise between 1.41°C (Sri Lanka and Maldives) to 2.51°C (Afghanistan) in South Asia; 2.04°C (Japan) to 2.68°C (Mongolia) in East Asia; 1.35°C (Philippines) to 1.74°C (Myanmar) in South-East Asia; and 1.18°C (Fiji) to 1.84°C (Australia) in Oceania (World Bank n.d.).

Heatwaves and extremely high temperatures are projected to become more frequent and intense in the near-future. Particularly in South Asia, heat waves are projected to become common place by 2050 – with major health and economic implications (Im *et al.* 2017; Saeed *et al.* 2021).

Precipitation

Projected changes in precipitation are variable across the region and highly uncertain. According to the RCP 8.5 ensemble, in 2040–2059 annual precipitation in South Asia will increase between

12.36mm in Pakistan to 180.3mm in the Maldives, except for Afghanistan where a -2.89mm decrease is expected (World Bank n.d.).

In East Asia, precipitation is expected to increase between 33.3mm in Mongolia to 87.42mm in Japan in 2040-2059.

In South-East Asia, precipitation is expected to increase between 82.94mm in Indonesia to 158.68 in the Philippines (World Bank n.d.).

In Oceania, precipitation is expected to increase in New Zealand and Papua New Guinea and decrease in Australia and Fiji (World Bank n.d.). The region is expected to experience a higher number of heavy rainfall events as well as the increasing incidence of drought and dry spells (World Bank n.d.).

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1.3 Climate variability

There are a number of climate stressors in the Asia Pacific region ranging from droughts; melting glaciers; increasing intensity of rainfall causing floods; tropical storms causing wind damage; flooding; and wildfires. These stressors add pressure to the already existing economic, environmental and governance challenges, such as agricultural and pastural loss as well as the degradation of biodiversity, natural habitats and ecosystems, increasing the vulnerabilities of already impoverished areas (United States Agency for International Development (USAID) 2010).

The monsoon is an important climatic phenomenon which is generated by a reversal of winds, causing heavy seasonal precipitation in the region (IPCC 2007). In terms of climate variability, the El Niño–Southern Oscillation (ENSO) is said to have an impact on the two monsoon seasons: the Southwest Monsoon and the Northeast Monsoon. In the El Niño phase, monsoons are expected to be lighter than usual and in the La Niña phase monsoons are expected to be heavier than usual (Ratna 2020). Monsoon season brings very heavy rains causing massive flooding and landslides, which can lead to a high number of casualties and internally displaced people (IDP) as well as infrastructural damage. Variability in monsoon rains significantly impacts the agriculture sector in South Asia, which is heavily reliant on timely monsoon rains. Loss of crops substantially increases food insecurity in the region and leads to increased hunger and health-related issues (UCAR n.d.).

Tropical storms and cyclones in the Indian Ocean and North Pacific, along with typhoons in the South Pacific, are formed in warm tropical oceanic regions. ENSO is one of the strongest climatic variations that has an impact on tropical storms, increasing their incidence and intensity (Wang and Chan 2002). Typhoons are generated in the north Pacific and approach China from the east, heading towards Viet Nam and the Philippines. Cyclonic activity in the Indian Ocean picks up between July and December and peaks in August, bringing extreme precipitation into the region, with Bangladesh the country most vulnerable to cyclones. Tropical storms can lead to flooding, wind damage and coral reef erosion (NOAA 2020).

El Niño (ENSO) significantly affects the Oceania region, causing an increase in the incidence and intensity of droughts and bush fires during El Niño (Australian Government, Bureau of Meteorology (BOM) 2008) and flooding in the La Niña phase due to above-average rainfall. Cyclones also bring heavy rains and flooding into the region (NOAA 2013). Developing long-term projections for ENSO dynamics remain a major challenge to the scientific community, although seasonal outlooks have become quite accurate.

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2.Humanitarian sectors and climate change

2.1 Water and habitat

Water is an integral part of the Asia Pacific region, supporting its agriculture sector, energy structure and economic growth (Visvanathan 2018). There are many water- and habitat-related challenges across the region, including rapid glacier melt, increasing aridity, damage to coastal ecology and sea level rise.

The depletion of shared water resources and an increasing population are critical challenges that face the South Asian countries, which receive their water supply from glacial melt and monsoon rains (UNDESA 2014). In the future, cross-border tensions could grow as a result of competing for water for irrigation, energy generation, water, sanitation and hygiene (WASH) and other economic activities. Biodiversity and ecosystems, both which are critical to the region's economy and population, could be adversely affected by changes in glacier melt and mountain snowmelt, altering river flows and sea level rise (Asia Society 2009). These problems are expected to increase with climate change.

Glaciers in the Himalayan mountain range support the Indus basin, which is one of the largest in the world and shared by six countries in South Asia: Afghanistan, Bangladesh, northern India, Nepal, Pakistan and Tibet. Glaciers and snowpack melt contribute significantly to the Indus basin river runoff and support approximately 270 million people in the region (Lodrick and Ahmad 2021). Due to climate change causing an increase in temperatures and accumulating deposits of black carbon on glacial surfaces, glacial melt is accelerating and occurring earlier in the year – resulting in earlier peak flows, longer summer droughts and high flood risk (Mani 2021). Glacial melt is one of the major contributors to loss of water and habitat – approximately 28 per cent of glaciers in the South Asian region have depleted over the past century and a further third are expected to deplete by 2050. Is also increases the risk of glacial lake outburst floods (GLOF). Due to GLOF, downstream communities and agricultural produce, especially in Pakistan and Nepal, are at risk of flooding in the short-term and more extensive drought in the future (Gilany *et al.* 2020).

Sea level rise is another challenge affecting various countries in the Asia Pacific, with the magnitude of sea level rise varying across the region. The largest increase in sea level during 1993–2001 was recorded at 15–25mm per year for Indonesia and the Philippines; while moderate levels of 0–10mm were recorded for Cambodia, Thailand and Viet Nam. Sea level rise also significantly affects the Pacific Islands (National Intelligence Council (NIC) 2009). According to current levels of climate change and variability, in addition to those already affected by sea level rise another 160 million people are expected to be impacted by increased rates of annual flooding, while an additional 200 million people are expected to live below the sea level line by 2100. Approximately 70 per cent of these people live in eight countries in South Asia: 43 million people in China; 32 million people in Bangladesh and 27 million people in India. Indonesia, Japan, the Philippines, Thailand and Viet Nam are also expected to be at high risk (Kulp and Strauss, 2019).

Coastal regions are some of the hardest hit by the impacts of climate change due to high population density, pollution, unsustainable fishing practices and rising sea levels (Food and

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Agriculture Organization (FAO) 2018). Mangroves and coral reefs are two key coastal ecosystems that are expected to be significantly impacted by climate change in the Asia Pacific. Damage to coastal ecosystems will directly impact the livelihoods of local people, severely impacting tourism, fishing and agriculture. Destruction of local infrastructure is inevitable due to the increased inundation of coastal regions as well as increased flooding and storm surges caused by rising sea levels (FAO 2018). Sea level rise, increased natural disasters and reduced water resources are interrelated effects of climate change on the coastal regions of the Asia Pacific, impacting agriculture, forests, infrastructure and livelihoods. Careful management is needed to minimize the consequences of climate change in these regions (Church *et al.* 2004).

2.2 Economic security

The Asia Pacific has a versatile economy, ranging from agriculture and fisheries to industry and tourism. All types of economic activity as well as a growing population demand freshwater resources to which climate change is a big threat.

Agriculture plays a central role in South Asia's economy (Ingco 2003). The sector relies heavily on irrigation to support the production of the primary crops of wheat, rice, cotton, fruit and vegetables. Climate stressors affect the monsoon and glacial melt that, in turn, affect the supply of water to the region which is critical to agricultural productivity; eventually leading to agricultural and economic losses (Wang *et al.* 2017). In 2019, the contribution of the agriculture, livestock and fisheries sectors to GDP was an average of 16.3 per cent across the region, and provided livelihoods to at least two-thirds of the population (World Bank 2019).

Climate change does not affect each crop the same way in each country. Despite some crops having more favourable conditions for growth, in general the region is likely to face a reduced production of crops and, consequently, an adverse effect on food security by 2050 (FAO 2017). Food prices are likely to increase as a result, making people more vulnerable to hunger (FAO 2017). Cotton yield is most at risk due to climate change. Three of the top five cotton producing countries are in South Asia: China, India and Pakistan. The combined production of the 2019/2020 season was 14,035,000 metric tons (Hortmeyer 2020). Under the RCP 8.5 ensemble, it is estimated that cotton production will reduce by up to one-third or 43 million metric tons by 2100 (Jans *et al.* 2020). Under the same scenario, it is projected that global cereal prices will increase by more than 300 per cent by 2080 as a result of productivity declines. To sustain agricultural productivity, South and East Asia will have to expand their irrigation systems by 10 per cent under a 1°C warming scenario, which will require investment in water efficiency to avoid further exacerbating water stress in the region. Livestock production and yields are likely to suffer a decrease, due to diminishing grassland and overgrazing. Increasing temperatures will also lead to an increase in diseases and pests that will eventually impact crop yields and livestock production (FAO 2011).

An increase in demand for renewable energy sources, especially hydropower, puts added stress on limited water resources. The Mekong River is a bio-diverse river, and also the tenth largest in the world, that originates in China and runs 2,600 miles passing through Cambodia, Laos, Myanmar, Thailand and Viet Nam. Millions of inhabitants in the region depend on the river for their livelihoods through agriculture, fisheries and hydroelectricity. Thailand and Laos compete to produce hydroelectricity while Cambodia and Viet Nam rely primarily on the river for their agriculture and fishing industries. The Mekong River also provides critical transportation corridors; however, due to climate change the river and its

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inhabitants are at high risk of exposure to severe storms, warmer temperatures, irregular precipitation patterns and sea level rise (Smith and Gross 1999).

The fisheries industry supports many livelihoods in the Asia Pacific. Climate change is expected to cause disruption to aquatic and coastal systems, severely impacting the population of fisheries and aquaculture (FAO 2018). South-East Asian countries will be the most economically vulnerable to the negative impacts on these sectors (Allison *et al.* 2009).

Tourism is a big industry for the Pacific Islands and parts of South-East Asia. Climate change is expected to impact tourism due to temperature variability, storm surges, sea level rise, changes in rainfall patterns and coral bleaching – all of which threaten biodiversity and ecosystems, and severely impact food and water supply and livelihoods across the region (WWF n.d.).

2.3 Health

Health is a basic human right and essential to development. Despite a fast-growing economy, the Asia Pacific faces a variety of climate-sensitive health challenges including maternal and child health, communicable diseases and emerging diseases (Sen *et al.* 2017; WHO 2008).

Climate change impacts maternal and child health through food insecurity and undernutrition, lack of potable water, poor hygienic conditions, infectious diseases and natural hazards such as floods, heatwaves and tropical storms amongst others (Hanna and Olivia 2016). According to the Asian Development Bank, the Asia Pacific accounts for 41 per cent of the 9.2 million children who die before they turn five years old, 44 per cent of more than 500,000 pregnant women who die, and approximately 56 per cent of newborn deaths each year. About 60 per cent of children affected by stunted growth and two-thirds of low weight births in the world live in the Asia Pacific region (ADB n.d.).

Climate change has, and will have, a significant impact on the distribution and burden of infectious diseases (Escobar *et al.* 2016). An increase in the number of deaths can be linked to a lack of clean water supply and sanitation as well as waste management systems (ADB n.d.), and climate change directly impacts water-borne diseases such as cholera and food-borne diseases (McIntyre *et al.* 2017). Waterborne diseases affect many people in South and South-East Asia (UNICEF n.d.). Freshwater can be considered a security issue when a high number of deaths are attributed to drinking unsafe water. Waterborne diseases are largely caused by inadequate sewage treatment and cause approximately 60 per cent of infant mortality throughout the world. Approximately 25,000 people die every day due to water-related diseases (Smith et al 1999). An estimated 4 billion people per year contract diarrheal disease and, among that number, approximately 3–4 million die annually – most of them young children (ibid 1999).

Unsanitary water is clearly a major health threat for millions of people in the developing world, and also affects the health of aquatic animals. Despite an improvement in WASH, the Asia Pacific region faces the challenge of having 369 million people without access to basic sanitation services and 165 million people lacking access to basic drinking water (UNICEF 2020). Climate change also affects health indirectly through pollution and infrastructure damage; for example, flooding due to heavy monsoon rainfall or tropical storms can lead to poor disease management and, therefore, allow vector- and waterborne diseases to thrive and spread (Boyce *et al.* 2016). Recent analysis has linked El Niño to a five-fold increase in the size of the malaria epidemic that followed an El Niño year in South and South-East Asia (WHO n.d.).

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Vector-borne diseases are a major climate-sensitive health challenge in the Asia Pacific region (Messina *et al.* 2015). Chikungunya, dengue fever, yellow fever and zika fever are some of the vector-borne diseases that continue to spread in the Asia Pacific. Dengue fever is the most rapidly spreading mosquito-borne disease, with 30 times increase in global incidence over the past 50 years (World Health Organization (WHO) 2009), and an estimated 100–390 million dengue fever infections reported worldwide each year (Bhatt *et al.* 2013). Dengue fever spread throughout the region due to the trade of used tyres that carried the dengue larvae (Benedict *et al.* 2007). The Aedes mosquito, which is a carrier of all these diseases, thrives in tropical and warm regions. With an increase in temperature, the habitat of this mosquito is projected to expand, putting more people at risk.

Extreme events such as droughts and heatwaves can increase morbidity and mortality, especially amongst the most vulnerable populations: children, women and the elderly. Simultaneously, an increase in the frequency and intensity of storms can worsen floods and landslides, resulting in injury and death, while limiting survivors' access to electricity, clean water and healthcare services due to infrastructural damage to supplies, roads and hospitals (Hales, Edwards and Kovats 2016). Climate change impacts such as floods, droughts and desertification negatively impact agriculture and livestock causing crop failures, decreasing food security and significantly impacting human health and nutrition, especially for those who are immunocompromised as a result of tuberculosis and HIV/AIDS (Schooley 2018).

2.4 Protection

The internal displacement of people across the Asia Pacific can be attributed to disasters, conflict and forced displacement. According to United Nations Office for the Coordination of Humanitarian Affairs, the total number of IDP and refugees in 2020 were 9.2 million – 3.3 million refugees and 4.4 million IDP (United Nations High Commissioner for Refugees (UNHCR) 2021). The highest number of IDP caused by conflict were in Afghanistan, India, Myanmar and Philippines (IDMC 2019a). Displaced people, including IDP and refugees, are often particularly vulnerable to climate extremes. This includes flood events that can quickly destroy the limited infrastructure in camps, as well as heatwaves that leave people with few options for cooling and shelter – with women and people with disabilities facing additional protection challenges (UNCHR 2020).

In 2018, the total number of IDP due to natural hazards were 2.4 million, out of which 590,000 were refugees and 1.8 million were IDP (IDMC 2019b). The highest concentration of natural hazard-induced displacement occurred in Afghanistan, Bangladesh, China, India, Myanmar and the Philippines. In 2019, the Philippines and China recorded 7.6 million new displacements due to typhoons alone, while 9.6 million displacements were recorded in East Asia and the Pacific, and 3.8 million in South Asia (IDMC 2019b).

Internal displacement is becoming an urban phenomenon because climate shocks, conflict and development force people to flee from rural to urban areas. Dhaka, the capital of Bangladesh, is a prime example, where many people migrated to the city to find employment after flooding destroyed their homes and livelihoods. Rapid urbanization has also increased displacement risk due to tropical cyclones exposing coastal metropolitan cities (IDMC 2019a).

Around the world, people in detention frequently have heightened vulnerability to natural disasters due to: spatial marginalization resulting from prison locations on hazard-prone land

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and/or isolation from emergency evacuation services; limited to no connections to social networks, which are crucial aspects to hazard resilience; and, political marginalization, including lack of policies and services to prevent disaster impacts on imprisoned populations (Gaillard and Navizet 2012). These existing vulnerabilities, coupled with more frequent and intense disasters due to climate change, may leave prison populations in especially precarious positions exposed to hazards such as extreme heat, extreme cold, floods and cyclones.

2.5 Policy

All countries in the region have signed and ratified the 2015 Paris Agreement. A key process under the Paris Agreement is the development of Nationally Determined Contributions (NDCs). NDCs are developed at national level by all countries and outline each country's commitments to self-determined climate change mitigation and adaptation targets. NDCs are revised and resubmitted every five years with the intention to ratchet up commitments with each resubmission. The NDC process is outlined in Article 4, Paragraphs 2 and 3 of the Paris Agreement (UNFCCC 2015)

National mitigation commitments around the Asia Pacific region (and the world) focus on energy, transport, industry, land use and agriculture. Adaptation commitments include actions to improve food security; strengthen coastal protection; and enhance water resource management; as well as bolster early warning systems, ecosystem protection solutions, urban resilience measures and health etc. The United Nations Framework Convention on Climate Change (UNFCCC) maintains an NDC registry where each country's official communication can be accessed. All countries are currently working on the next round of submissions for COP 26, which has been rescheduled to late 2021 due to the COVID-19 pandemic (UNFCCC 2020).

Another key process under the UNFCCC is the development of a National Adaptation Plan (NAP). NAPs are a process for least developed countries (LDCs) to outline their longer-term adaptation priorities in greater detail. Technical guidelines to develop NAPs were released in 2012 (UNFCCC 2012). Many of these plans have been developed around the Asia Pacific region or are currently under advanced development. The UNFCCC maintains a database of submitted NAPs.

The predecessor to this process was the National Adaptation Programme of Action (NAPA) which was established in 2001 as part of the LDC work programme. NAPAs prioritize and detail a country's urgent and immediate climate change adaptation needs. As of 2017, 51 countries around the world had submitted NAPAs. A database of submitted needs is hosted on the UNFCCC website.

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