

HUMANITARIAN TRENDS AND TRAJECTORIES TO 2030: NORTH AND SOUTH-EAST ASIA

Regional Consultation

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SUMMIT**
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North and South-East Asia will face a new set of humanitarian challenges from 2015 to 2030. The region is vulnerable to cumulative risks, with increasing urbanisation, population and asset exposure, new infectious diseases and climate extremes. Projections show the region moving to a 'severe' level of vulnerability, compounded by drought-related water and food shortages, which are anticipated to exacerbate existing malnutrition. Migration and displacement will continue, with figures predicted to exceed the 71 million displaced persons in North and South-East Asia between 2008 and 2012.

The number of people in need is projected to increase as the population across South-East Asia is expected to grow by 19% or 113 million between 2010 and 2030. Populations living in urban floodplains may rise to between 83 million and 91 million in 2030, and from between 119 million and 188 million by 2060. By 2070, Asia will be home to 15 of the world's top 20 global cities for the exposure of the population to vulnerability and 13 of the top 20 for exposure of assets. Climate extremes are expected to exacerbate the situation

with increased risk of riverine, coastal and urban flooding by 2030–2040, which would lead to widespread damage to infrastructure, livelihoods and human settlements. To date, moreover, insurance and other formal risk-sharing and transfer mechanisms have been under-used in hedging against disaster risk.

More investment is required to manage risk before a crisis hits; at present for every US\$1000 spent on emergency assistance, only US\$237 is spent on disaster risk management.

1

THE FUTURE THAT LIES AHEAD

This briefing supports the World Humanitarian Summit regional consultation for North and South-East Asia, being held in Tokyo 23–24 July 2014. It sets out the current trends and forecasts future threats and their humanitarian implications in the post-2015 era.



West and Central Africa

North and South-East Asia

South and East Africa

Eastern Europe, Western Europe and others

Latin America and the Caribbean

Middle East and North Africa

Pacific Islands

South and Central Asia

Global Consultation

- Brunei Darussalam
- Cambodia
- China
- Democratic People's Republic of Korea
- Indonesia
- Japan
- Lao PDR
- Malaysia
- Mongolia
- Myanmar
- Philippines
- Republic of Korea
- Singapore
- Thailand
- Timor-Leste
- Viet Nam

Data and information on Asia is often classified into sub-regions, with varying compositions of countries. The figures, graphs and data used in this report contain information referring specifically to the countries listed above, which the World Humanitarian Summit refers to as North and South-East Asia (unless stated otherwise).

2

DISASTER AND HUMANITARIAN TRENDS

NATURAL DISASTERS

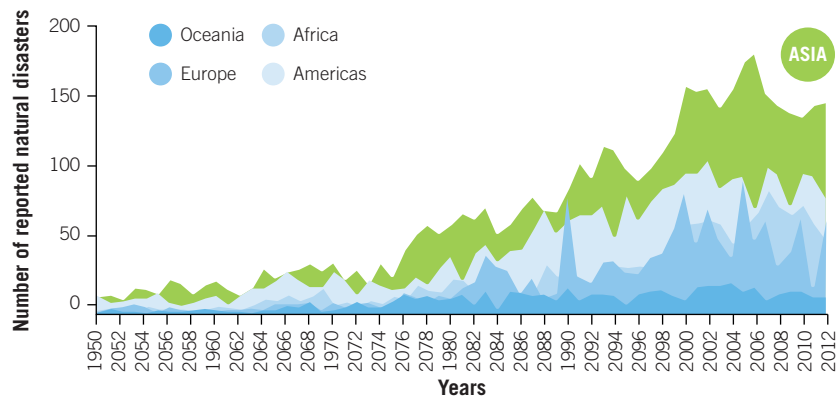
Disaster prevalence

Nearly 40% of natural hazard-related disasters occur in Asia, where 88% of people affected by such disasters live.¹

By 2030, up to 325 million extremely poor people will be living in the 49 most hazard-prone countries.² Of the 49, the following are in North and South-East Asia (starting with the most hazard prone):³

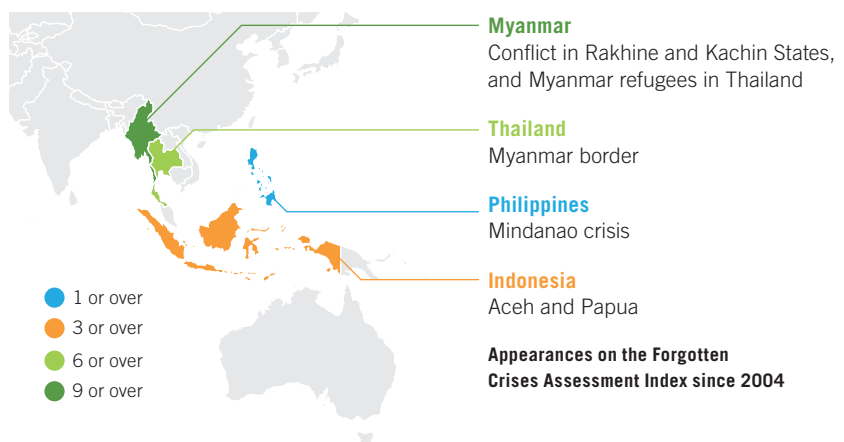
- Lao PDR
- Myanmar
- Thailand
- Viet Nam
- China
- Japan
- Philippines
- Indonesia
- Cambodia
- Malaysia
- Timor-Leste

Disaster trends by continent⁴



Forgotten crises in North and South-East Asia⁵

This map shows crises included in the ECHO Forgotten Crises Assessment Index between 2004–2014.



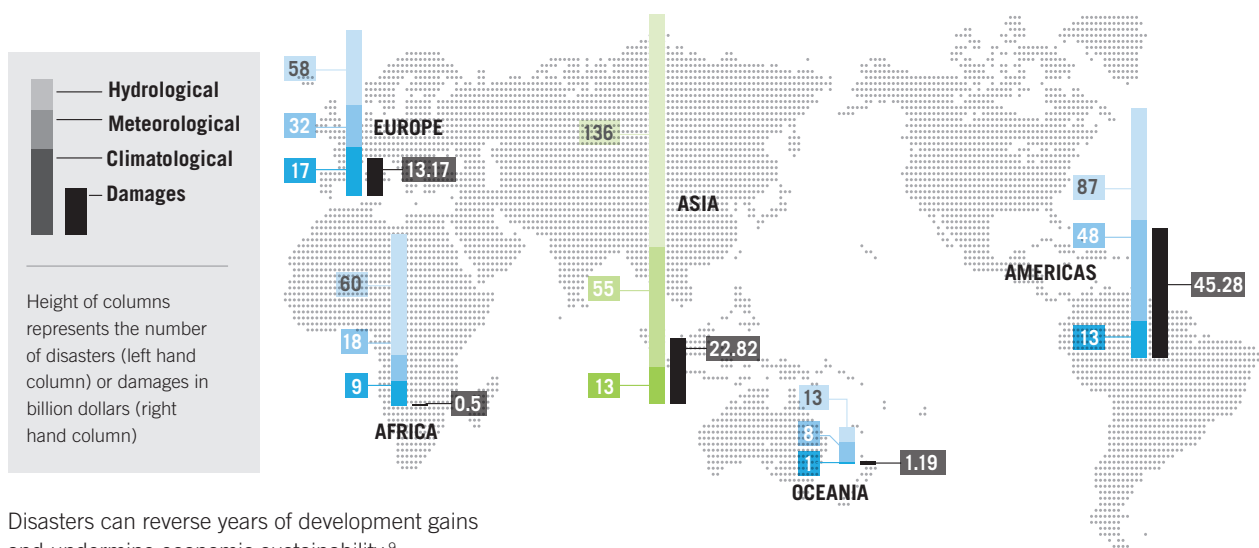
International attention to humanitarian crises in Asia has varied over time, and is usually dominated by catastrophic events, like the Indian Ocean tsunami, Sichuan earthquake and most recently Typhoon Haiyan in the Philippines. A number of countries in North and South-East Asia appear on the 'forgotten crises' index.⁶

Countries experiencing multiple hazards: now and in the future⁷

HISTORIC PERIOD (1971–2000)			2030			
Ranking	Country	Hazard	Ranking	Country	Hazard	
1	India	35	1	India	35	
	Mexico	35		Mexico	35	
	United States	35		United States	35	
4	Bangladesh	34	4	Bangladesh	34	
	Lao PDR	34		Lao PDR	34	
	Myanmar	34		Myanmar	34	
	Thailand	34		Nepal	34	
	Viet Nam	34		Thailand	34	
9	Belize	33	10	Viet Nam	34	
	China	33		Belize	33	
	Guatemala	33		China	33	
	Honduras	33		Guatemala	33	
	Nicaragua	33		Honduras	33	
	Philippines	33		Japan	33	
15	Japan	32	Nicaragua	33		
	Nepal	32	Philippines	33		
	Taiwan	32	17	Taiwan	32	
18	Indonesia	31	18	Bahamas	31	
19	Bahamas	30	Cuba	31		
	Cambodia	30	Haiti	31		
	Canada	30	Indonesia	31		
	Cuba	30	23	Cambodia	30	
	El Salvador	30	Canada	30		
	Haiti	30	El Salvador	30		
	Pakistan	30	Pakistan	30		
	Russia	30	Russia	30		
	27	Australia	29	27	Argentina	29
		Dominican Republic	29	Australia	29	
		Papua New Guinea	29	Bolivia	29	
30	Argentina	28	Brazil	29		
	Bolivia	28	Dominican Republic	29		
	Brazil	28	Papua New Guinea	29		
	Colombia	28	33	Colombia	28	
	Costa Rica	28	Costa Rica	28		
	Panama	28	Ecuador	28		
	Sri Lanka	28	Panama	28		
Turkey	28	Peru	28			
38	Ecuador	27	Sri Lanka	28		
	Madagascar	27	Turkey	28		
	Peru	27	40	Madagascar	27	
41	Albania	26	Mozambique	27		
	Georgia	26	42	Albania	26	
	Macedonia	26	Chile	26		
	Mozambique	26	Georgia	26		
	Venezuela	26	Former Yugoslav Rep. of Macedonia	26		
46	Chile	25	Venezuela	26		
	Timor-Leste	25	47	Malaysia	25	
			New Zealand	25		
			Timor-Leste	25		

Disaster impact and economic losses

Weather and climate-related disasters and regional average impacts (damages in US\$ billion), 2000–2009⁸

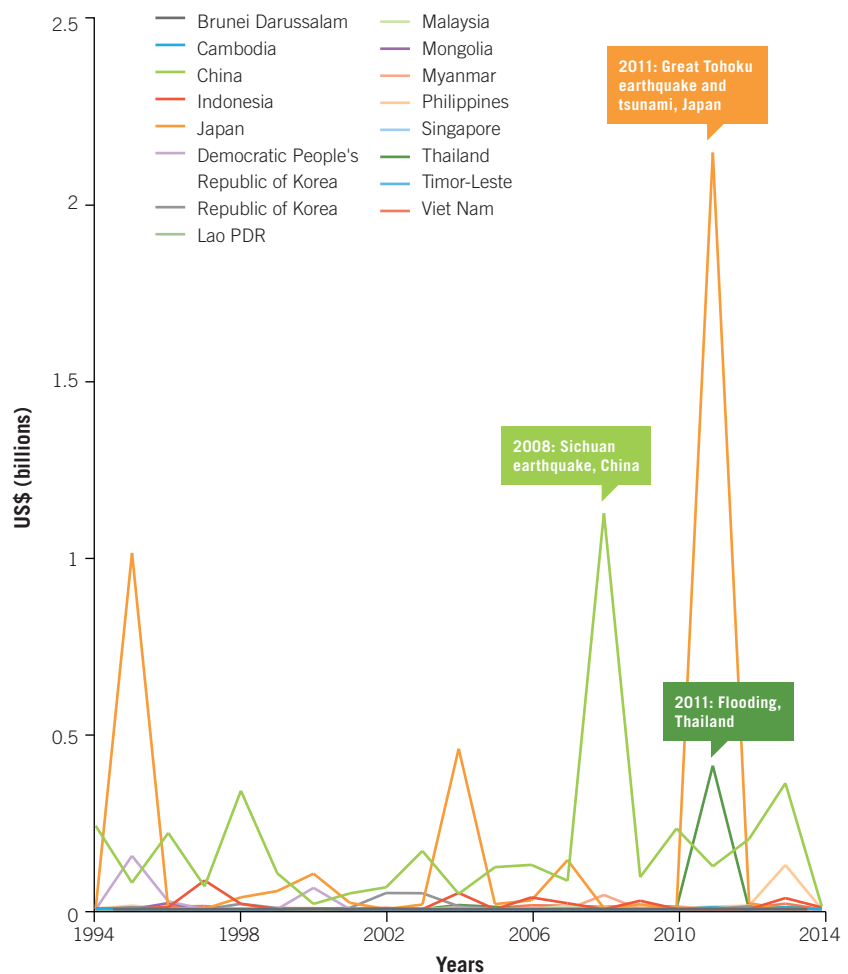


Disasters can reverse years of development gains and undermine economic sustainability.⁹

Global disaster data highlights considerable variations between mortality and economic losses by country, depending on their exposure to hazards, past events and level of economic development.¹⁰

The Great Tohoku earthquake and tsunami and the South-East Asian floods in 2011 contributed to the US\$294 billion in losses from disasters in the region during 2011. This amount was 80% of the annual global disaster losses of US\$366.1 billion. The region's single year losses in 2011 were equivalent to 80% of its total disaster losses for the decade 2000–2009.¹¹ This trend is likely to continue due to the direct economic impact of disasters and their effects on supply chains.

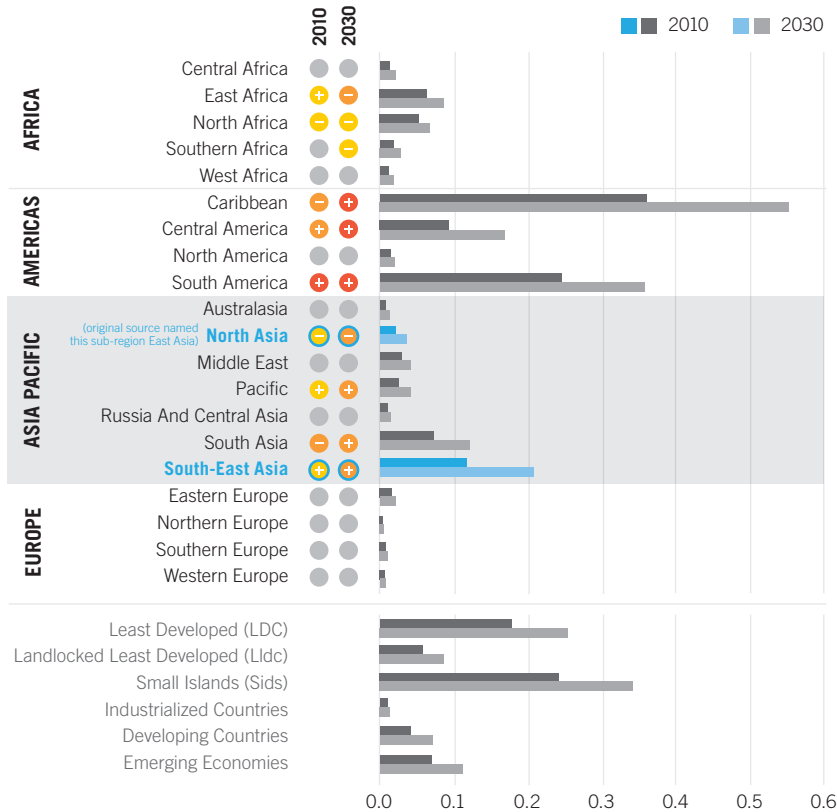
Economic losses by country¹²



Disaster impacts on mortality

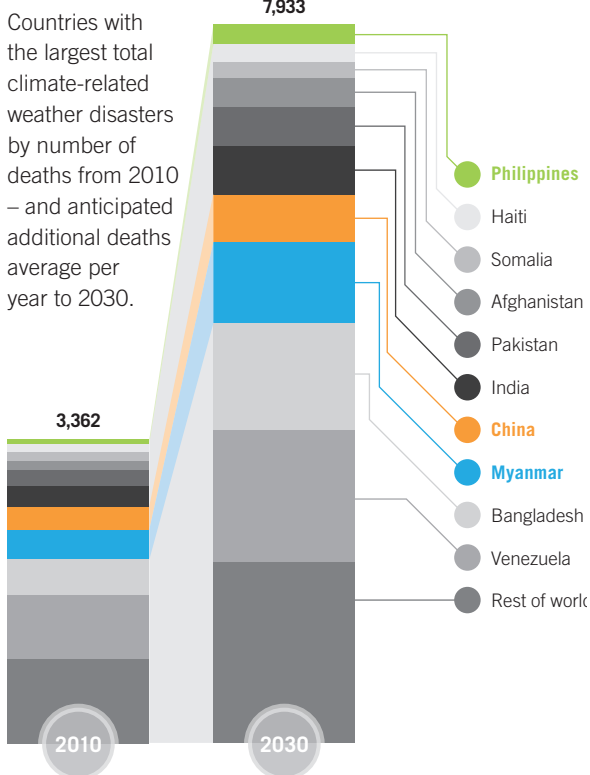
Regional disaster mortality: 2010 and 2030¹³

The regional and socio-economic distribution of additional deaths from extreme weather relative to population in 2010 and 2030. Deaths per 100,000, average per year

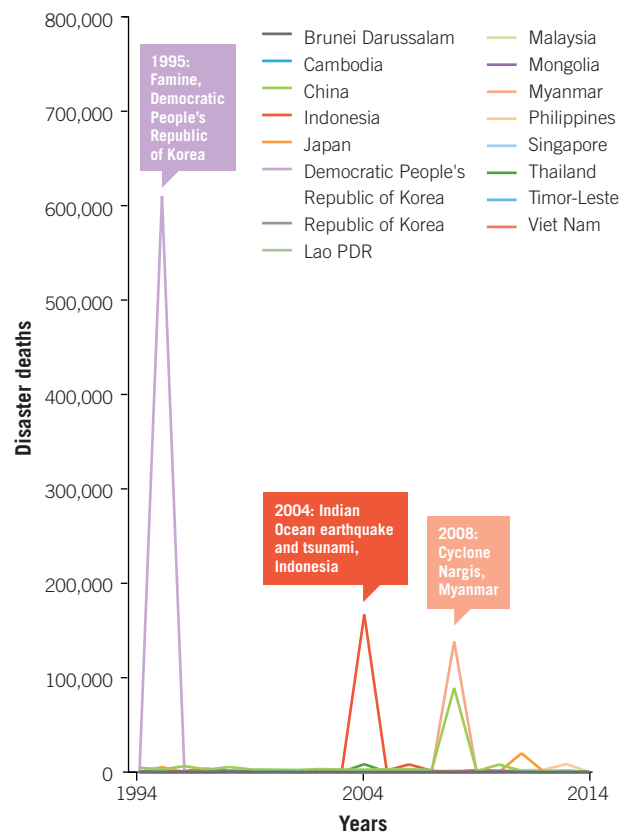


Countries of South-East and North Asia are expected to move from 'high' (yellow) to 'severe' vulnerability (red) by 2030. Corresponding increases in mortality impacts are also projected for both regions by 2030.

Global breakdown of countries with the largest mortality impacts¹⁴















Disaster impacts on mortality by country¹⁵



CHANGING CLIMATE TO DATE

Large parts of South-East Asia are exposed to a high degree of cumulative climate-related risks.¹⁶ The region is among the most vulnerable to climate change, due to its long coastlines, high concentration of population and economic activity in coastal areas, and heavy reliance on agriculture, natural resources and forestry.¹⁷

Observed changes in temperature and precipitation extremes since the 1950s¹⁸






Region and Sub-region	Trends in maximum temperature (warm and cold days)	Trends in minimum temperature (warm and cold nights)	Trends in heat waves/warm spells	Trends in heavy precipitation (rain, snow)	Trends in dryness and drought
North Asia	 Likely increase in warm days (decrease cold days)	 Likely increase in warm nights (decrease cold nights)	 Spatially varying trends	 Increase in some regions, but spatial variation	 Spatially varying trends
East Asia	 Likely increase in warm days (decrease cold days)	 Increase in warm nights (decrease cold nights)	 Increase heat wave in China  Increase in warm spells in northern China, decrease in southern China	 Spatially varying trends	 Tendency for increased dryness
South-East Asia	 Likely increase in warm days (decrease cold days) for northern areas  Insufficient evidence for Malay Archipelago	 Likely increase in warm nights (decrease cold nights) for northern areas  Insufficient evidence for Malay Archipelago	 Insufficient evidence	 Spatially varying trends, partial lack of evidence	 Spatially varying trends

Intergovernmental Panel on Climate Change (IPCC) classification of sub-regions




North Asia	Mongolia
East Asia	China, Democratic People's Republic of Korea, Japan, Republic of Korea
South-East Asia	Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste, Viet Nam

World Humanitarian Summit selected countries (for North and South-East Asia)¹⁹

Symbols

-  Increasing trend
-  Decreasing trend
-  Varying trend
-  Inconsistent trend/insufficient evidence
-  No or only slight change

Level of confidence in findings

-  Low confidence
-  Medium confidence
-  High confidence

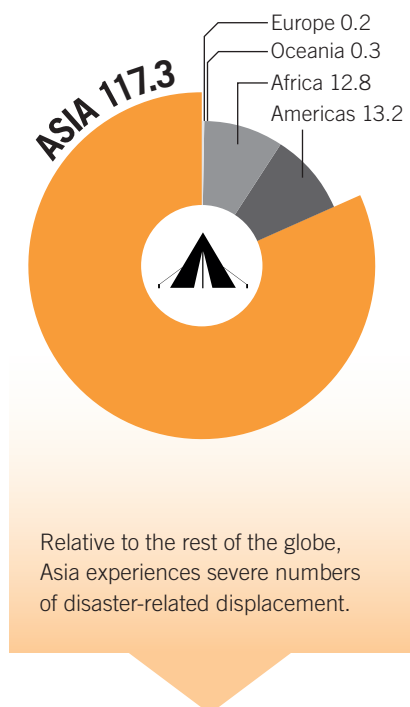
Observed changes in temperature and precipitation extremes, including dryness in regions of Asia since 1950, with the 1961–1990 period used as a baseline.

DISPLACEMENT, IDPs AND REFUGEES

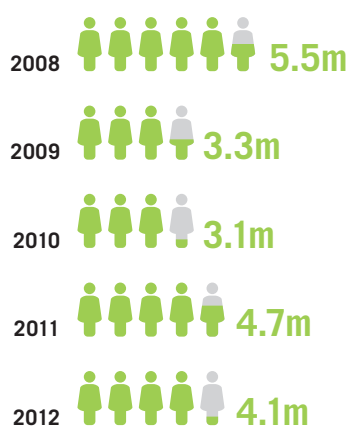
Disaster-induced displacement

Global disaster displacement per region, 2008–2012²⁰

Millions of internally displaced persons (IDPs) shown as global proportion (117.3 million displaced in Asia).



Total annual levels of disaster-related displacement in South-East Asia, 2008–2012 (millions of persons)²¹



Top 20 countries with the most displacement, 2008–2012²²

Ranking	Country	Displaced persons
1	China	49,782,000
2	India	23,775,000
3	Pakistan	14,991,000
4	Philippines	12,343,000
5	Nigeria	6,818,000
6	Colombia	3,289,000
7	Thailand	3,234,000
8	Bangladesh	2,999,000
9	Indonesia	2,479,000
10	Chile	2,133,000
11	Haiti	1,910,000
12	Myanmar	1,853,000
13	Mexico	1,830,000
14	Sri Lanka	1,578,000
15	Brazil	1,466,000
16	Japan	1,286,000
17	Viet Nam	1,079,000
18	United States	978,000
19	Niger	794,000
20	Mozambique	640,000

More than 71 million people became displaced in North and South-East Asia between 2008 and 2012.²³

Total new disaster-related displacement in North and South-East Asia, 2008–2012²⁴

Country	Total newly displaced by disasters (persons)
Brunei Darussalam	No data
Cambodia	311,500
China	48,830,600
Indonesia	1,595,800
Japan	1,285,800
Democratic People's Republic of Korea	284,500
Republic of Korea	5,500
Lao PDR	87,500
Malaysia	115,000
Mongolia	21,600
Myanmar	2,443,000
Philippines	12,178,900
Thailand	2,919,000
Timor-Leste	No data
Viet Nam	979,300
Total	71,057,900

2.2m

The 2004 Indian Ocean tsunami displaced 2.2 million people in 12 countries²⁵

15m

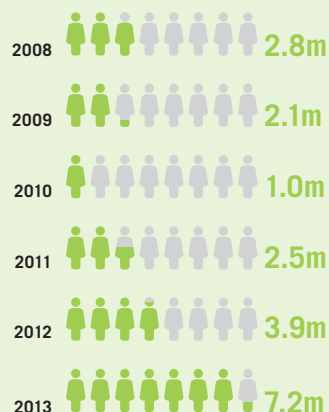
15 million people were displaced by the 2008 Sichuan earthquake in China²⁶

4.1m

4.1 million people were displaced by Typhoon Haiyan in the Philippines in 2013²⁷

PHILIPPINES

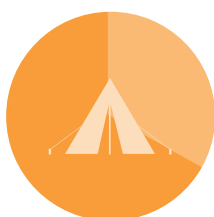
Annual total displacement by disasters 2008–2013 (millions of persons)²⁸



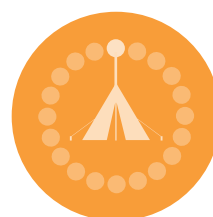
IDPs and refugees



Worldwide, by the end of 2013, **51.2 million persons** were forcibly displaced as a result of persecution, conflict, generalised violence, or human rights violations.²⁹



Asia and the Pacific was home to approximately 30% of a total **11.703 million refugees** at the end of 2013.³⁰



China is one of the top 20 refugee-hosting countries in the world, with approximately **301,000 refugees** at the end of 2013.³¹

Myanmar and Viet Nam were a major source countries of refugees, with approximately **479,600** and **314,100** respectively at the end of 2013.³²



Malaysia is a top destination country for asylum-seekers, with approximately **55,000** entering in 2013, largely from Myanmar.³³

Refugees, IDPs, returnees and stateless persons of concern to UNHCR by origin, end of 2013³⁴

Country	Refugees	Returned refugees	IDPs protected by UNHCR	Returned IDPs	Stateless people and other	Total population of concern
South-East Asia						
Cambodia	80	-	-	-	-	80
Brunei Darussalam	1	-	-	-	-	1
Indonesia	15,915	-	-	-	1	15,916
Lao PDR	7,795	-	-	-	-	7,795
Malaysia	768	-	-	-	-	768
Myanmar	524,646	3,009	372,000	27,383	216	927,254
Philippines	1,615	-	117,369	211,607	80,030	410,621
Singapore	99	-	-	-	-	99
Timore-Leste	19	-	-	-	-	19
Thailand	396	-	-	-	-	396
Viet Nam	316,107	-	-	-	68	316,175
North Asia						
China	219,919	-	-	-	-	219,919
Japan	210	-	-	-	-	210
Mongolia	3,340	-	-	-	-	3,340
Republic of Korea	716	-	-	-	-	716

Refugees, IDPs, returnees and stateless persons of concern to UNHCR by country/territory of asylum, end of 2013³⁵

Country	Refugees	Returned refugees	IDPs protected by UNHCR	Returned IDPs	Stateless people and other	Total population of concern
South-East Asia						
Cambodia	80	-	-	-	-	80
Brunei Darussalam	-	-	-	-	20,524	20,524
Indonesia	10,316	-	-	-	-	10,316
Lao PDR	-	-	-	-	-	-
Malaysia	140,552	-	-	-	120,000	260,552
Myanmar	-	3,009	372,000	27,383	810,000	1,212,392
Philippines	261	-	117,369	211,607	6,083	335,320
Singapore	3	-	-	-	-	3
Timore-Leste	2	-	-	-	-	2
Thailand	141,211	-	-	-	506,413	647,624
Viet Nam	-	-	-	-	11,000	11,000
North Asia						
China	301,427	-	-	-	-	301,427
Japan	9,326	-	-	852	-	10,178
Mongolia	13	-	-	-	16	29
Republic of Korea	2,944	-	-	-	194	3,138

Understanding the trends in conflict and violence-induced displacement is difficult for North and South-East Asia, as the quality of data on return and solutions is limited. Disaggregated data showing the location and size of IDPs by armed conflict, situations of generalised violence or violations of human rights, and their breakdown by age and sex, is only available in a few countries. Reports on return or other settlement options are incomplete.³⁶

INTERNATIONAL DISASTER FINANCE³⁷

Demands on the humanitarian system are increasing. This trend is expected to continue, putting additional strain on a system already stretched beyond its capacity.³⁸

A decade ago, the international humanitarian community assisted approximately 30–40 million people annually; this has risen to 50–70 million people in 2013, with funding requirements more than trebling to over US\$10 million per year.³⁹



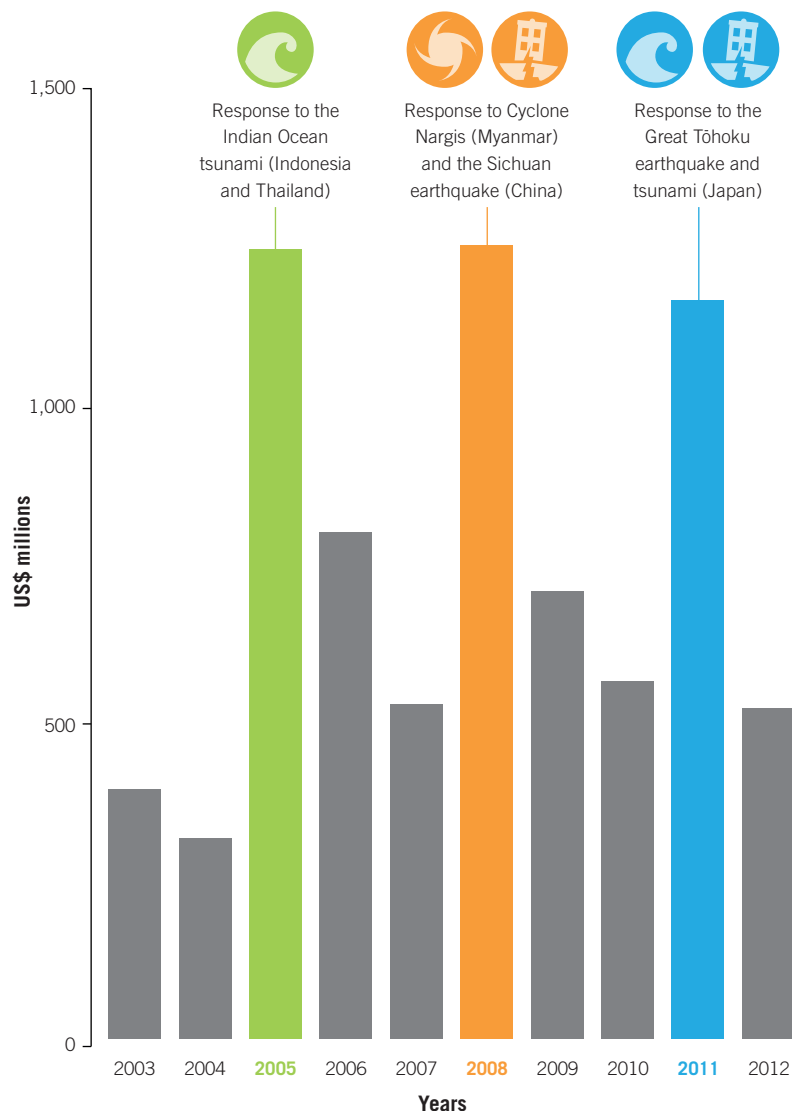
Humanitarian response across the region

Between 2003 and 2012 North and South-East Asian countries received a total of US\$7.6 billion in humanitarian funding (7% of the total country allocable humanitarian assistance in this period).⁴⁰

Volume of humanitarian assistance

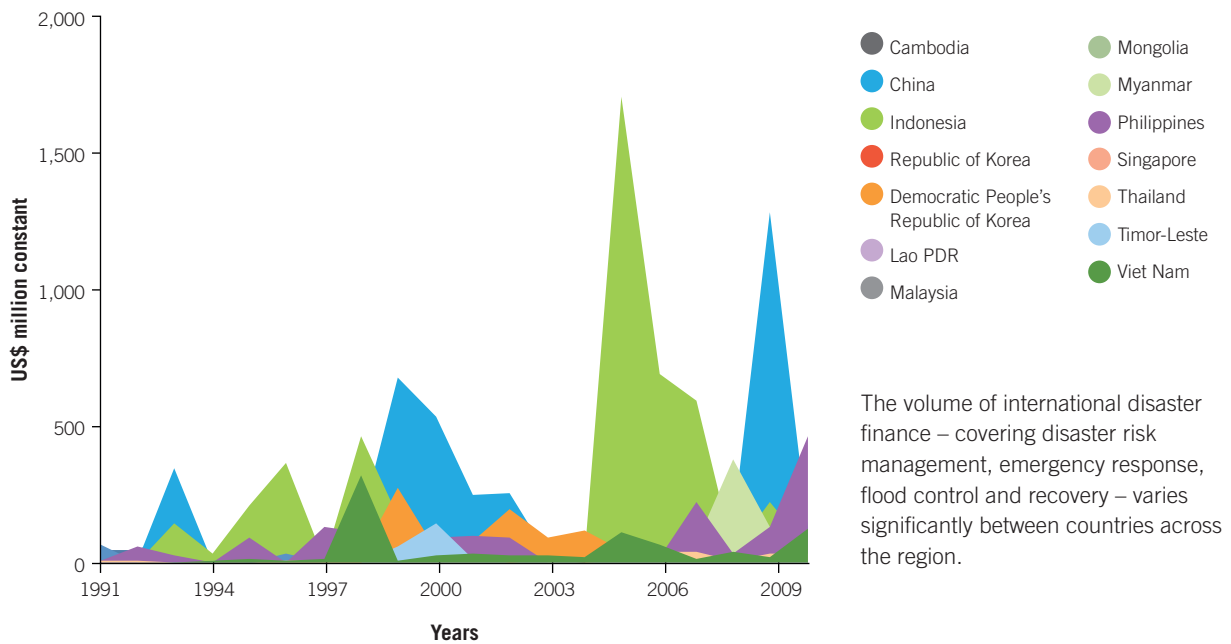
Indonesia (US\$2.7 billion) was the largest recipient between 2003 and 2012, followed by Myanmar (US\$1.2 billion). Indonesia, Democratic People's Republic of Korea and in recent years the Philippines account for the largest proportion of humanitarian response.⁴¹

International humanitarian response to selected countries 2003–2012⁴²

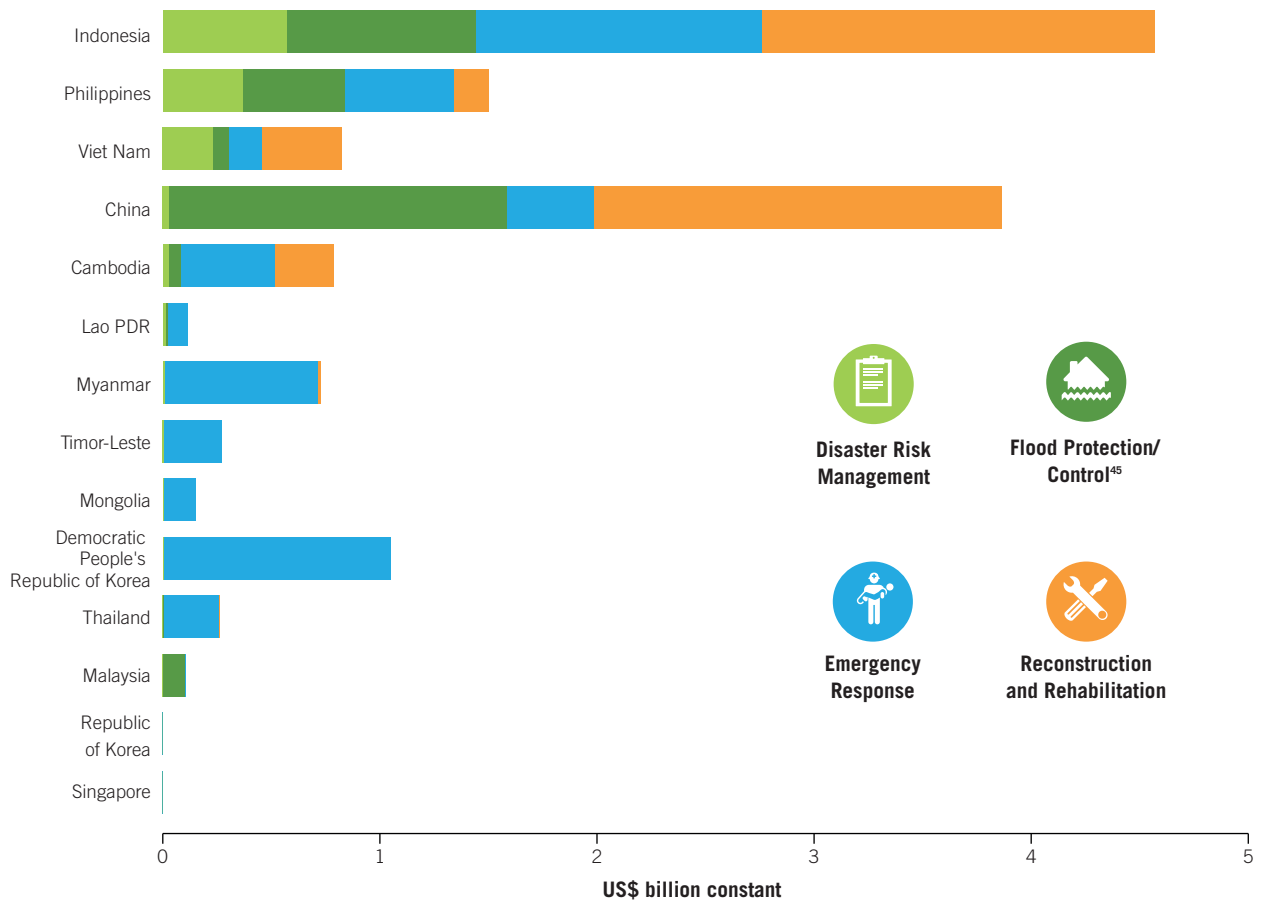


Disaster finance by country and category

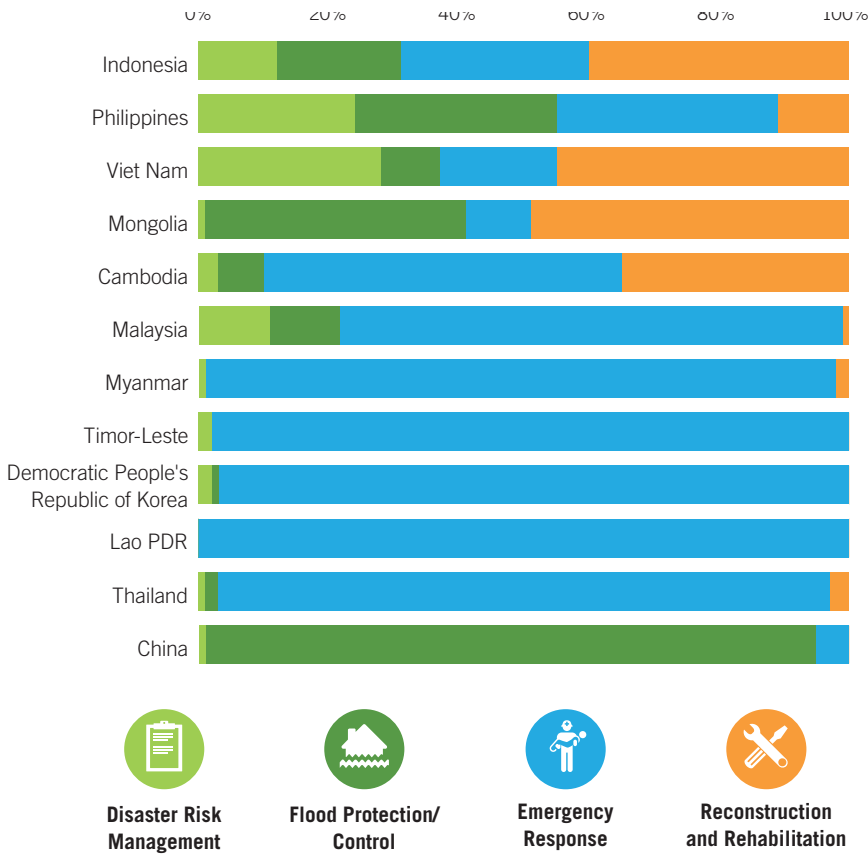
Evolution of total international disaster finance⁴³



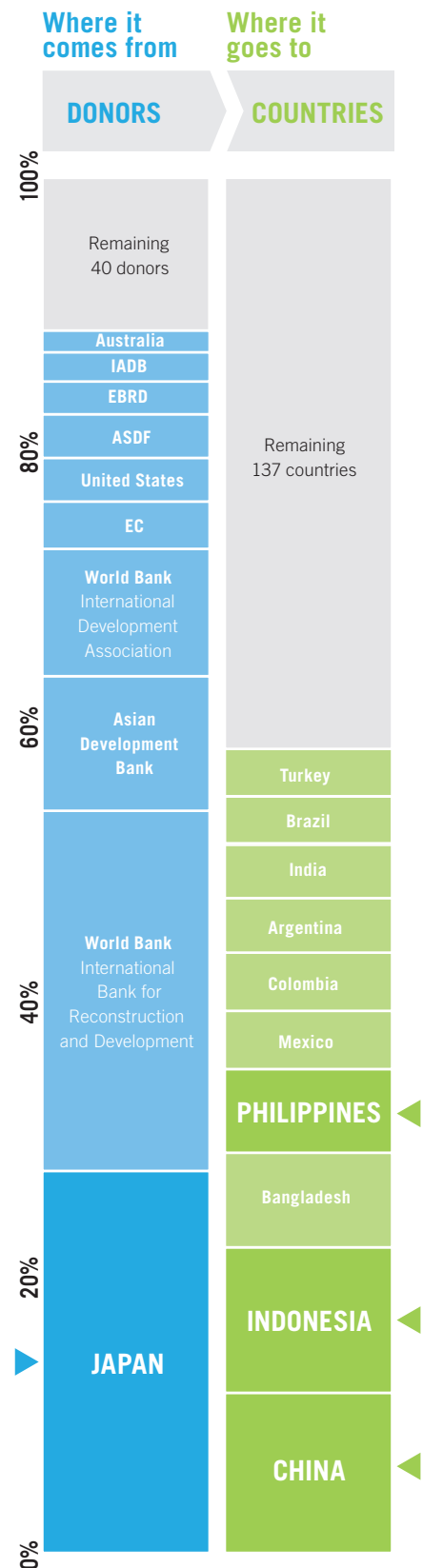
International disaster finance (volume), by category, 1991–2010⁴⁴



International disaster finance for North and South-East Asia (percentage), by category, 1991–2010⁴⁶



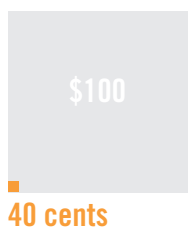
Disaster risk reduction financing⁵⁰



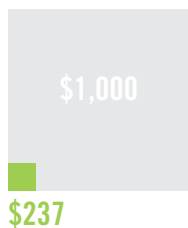
Disaster risk reduction financing

Funding for disaster risk reduction is low; historically, international disaster finance has contributed primarily towards emergency response.

Over a 20-year period just 40 cents of every US\$100 spent on development aid was invested in disaster risk reduction.⁴⁷



For North and South-East Asia for every US\$1,000 spent on emergency response, US\$237 is spent on disaster risk management.⁴⁸



In 2012, Japan was the largest donor of assistance in disaster prevention and preparedness allocating US\$146 million, which accounted for 22% of their bilateral humanitarian assistance. OECD Development Assistance Committee member countries total disaster prevention and preparedness spending was 6% of humanitarian assistance.⁴⁹

CONFLICT AND INSECURITY

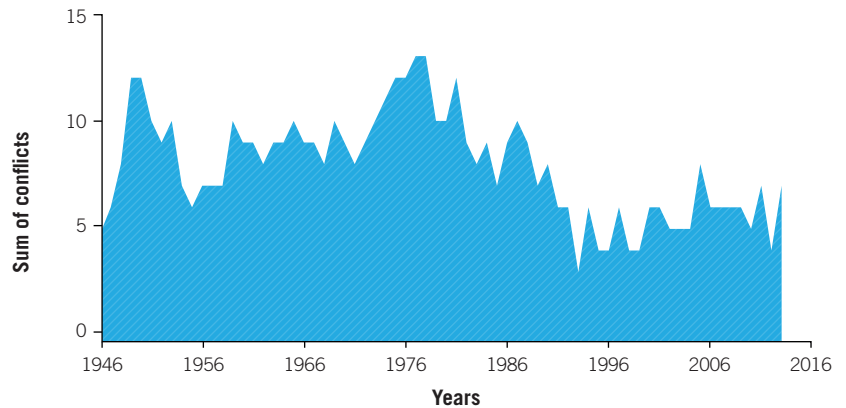
Asia continues to be one of the world's most conflict-affected regions accounting for one third of the world's ongoing conflicts in 2013.⁵¹ In addition to armed conflict, there is a growing trend of violence against minorities. Sexual- and gender-based violence remains high in many parts of the region. The most common type of conflict in Asia is sub-national conflict.⁵²



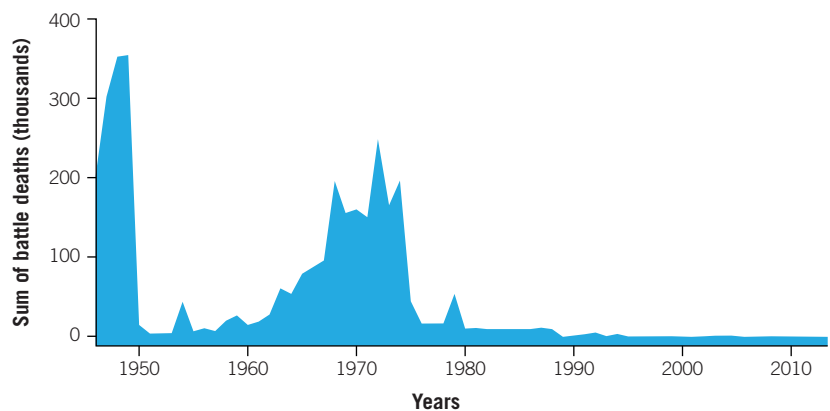
Sub-national conflict is the most deadly, widespread and enduring form of conflict in Asia, affecting more than 130 million people.⁵³ Between 1992 and 2012, there were 26 sub-national conflicts in South and South-East Asia alone.⁵⁴ In some cases, these conflicts have occurred in spite of rapid growth, such as Indonesia, Thailand, and the Philippines.

Total armed conflicts (internal and external) in North and South-East Asia (World Humanitarian Summit selected countries)⁵⁵

(Defined as the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths)



Total battle deaths in North and South-East Asia (World Humanitarian Summit selected countries)⁵⁶



Many of the sub-national conflicts in Asia are struggles for independence or greater autonomy. While in some cases ceasefires have been reached and peace agreements signed, other armed conflicts continue without resolution.

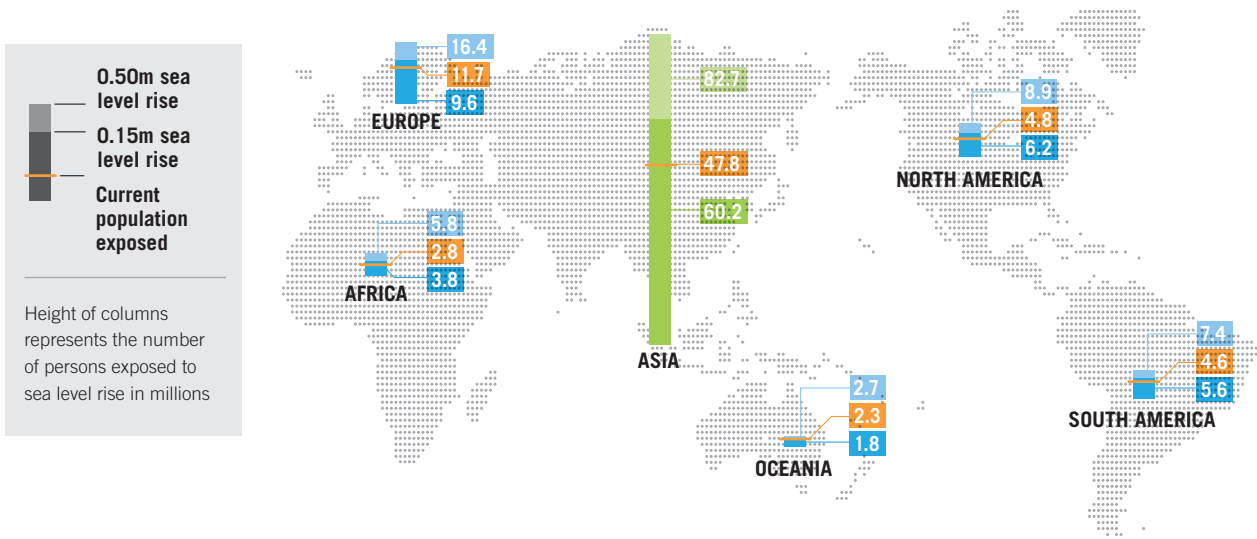
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FUTURE HAZARDS AND RISKS

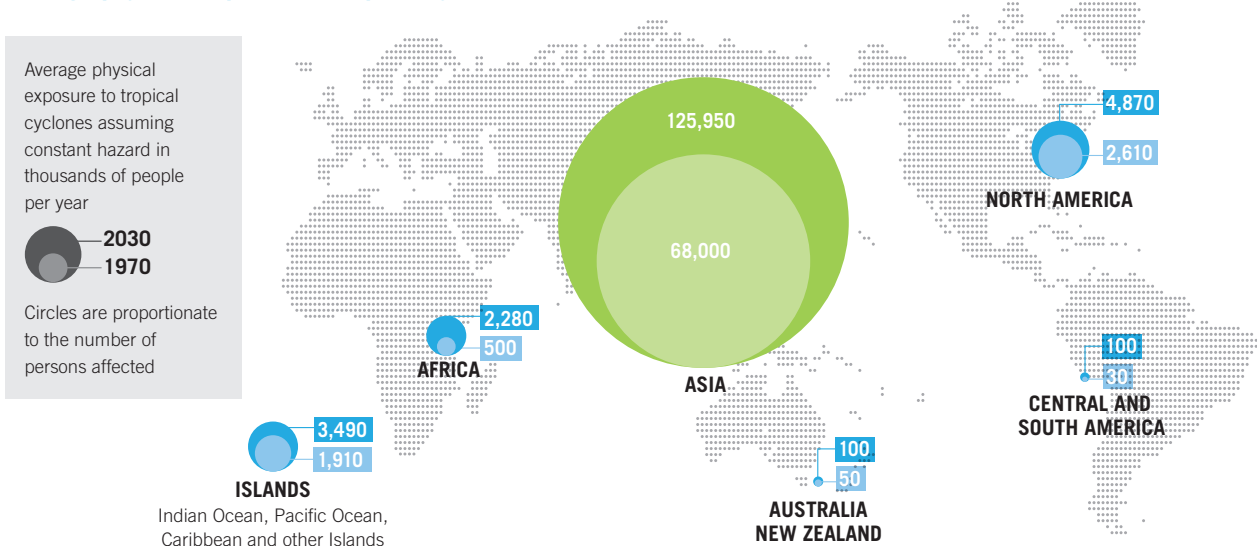
DISASTER EXPOSURE AND DAMAGE

Exposure in Asia

Population (in millions) exposed to rise in sea level by 2050⁵⁷



Average physical exposure to tropical cyclones⁵⁸





Spotlight on: flooding

The global risk of flood mortality is heavily concentrated in Asia. A large proportion of Asia’s population lives in low-elevation coastal zones that are particularly at risk from hazards, including sea-level rise, storm surges and typhoons.⁵⁹ Half to two thirds of Asia’s cities with 1 million or more inhabitants are exposed to one or multiple hazards, with floods and cyclones being the most significant.

With improvements in meteorological predictive models and early-warning systems, communities in all countries could be better protected than they are at present.⁶⁰ However, exposure is also increasing, with more people, infrastructure, assets and livelihoods built in hazard-prone areas.

By 2070, Asia is expected to include...



15 of the top 20 global cities for population exposure

The top North and South-East Asian cities in terms of **population exposure** to coastal flooding are expected to include Guangzhou, Shanghai and Ho Chi Minh City, Bangkok, Rangoon and Hai Phong.⁶¹ This trend is further threatened by the reality that in Asia, an approximately 0.15m sea-level rise will increase the population exposed from 47.8 million to 60.2 million by 2050. If there is a 0.5m sea level rise, the population exposed in 2050 will be approximately 82.7 million.⁶²



13 of the top 20 countries for asset exposure

The top Asian cities in terms of **assets exposed** to coastal flooding are expected to include Guangzhou, Shanghai, Tianjin, Tokyo, Hong Kong and Bangkok.⁶³ The IPCC states that there is ‘high confidence’ the assets exposed to coastal risks will increase significantly in the coming decades due to population growth, economic development and urbanisation.⁶⁴



Links to urbanisation, p26

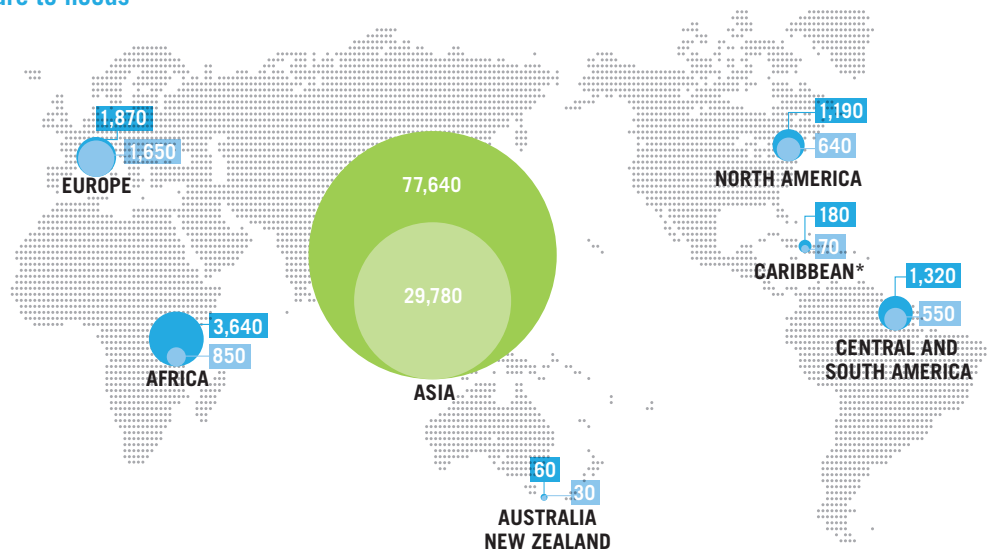
Average physical exposure to floods⁶⁵

Average physical exposure to floods assuming constant hazard in thousands of people per year



Circles are proportionate to the number of persons affected

*Only catchments bigger than 1,000 km2 were included in this analysis.

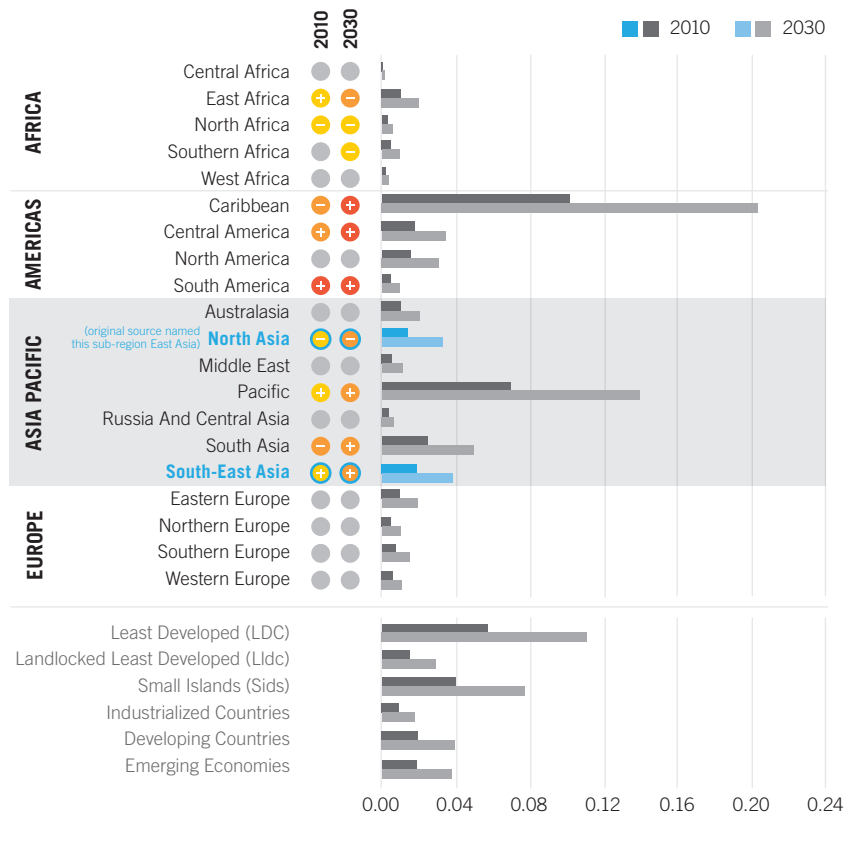


Projected disaster damage

Many countries in North and South-East Asia will move from 'high' (yellow) to 'severe' vulnerability (red) by 2030. As a result significantly increased damage is also projected for both regions by 2030.

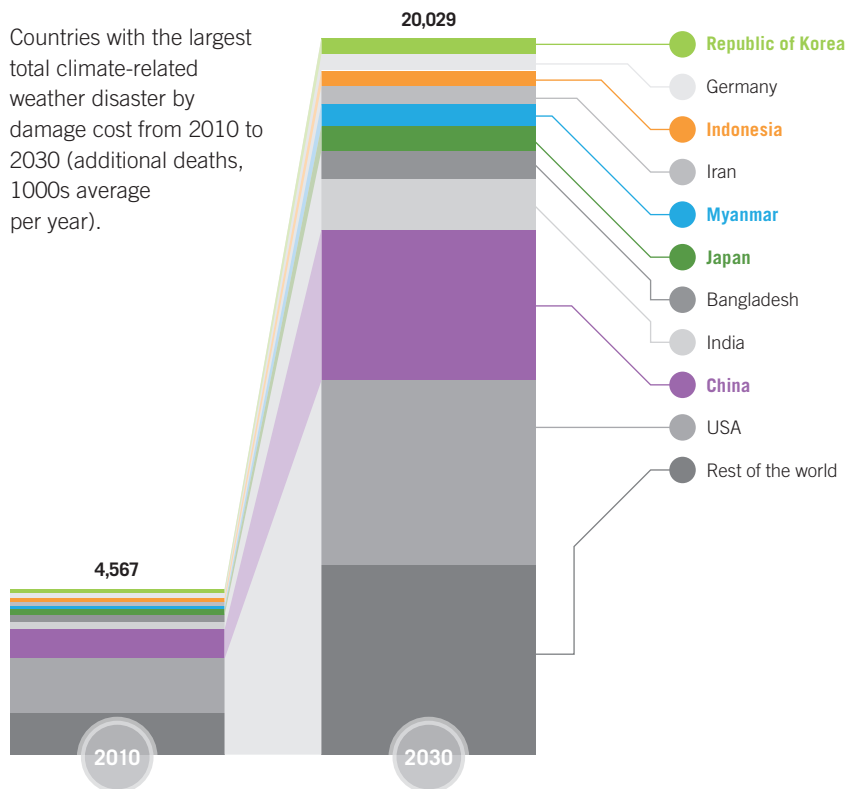
Damage costs, by region⁶⁶

The regional and socio-economic distribution of climate-related damage relative to GDP in 2010 and 2030. Additional damage cost (percent of GDP)

















Largest damages by cost, by country⁶⁷

Countries with the largest total climate-related weather disaster by damage cost from 2010 to 2030 (additional deaths, 1000s average per year).



CHANGING CLIMATE EXTREMES






Projected changes in temperature and precipitation extremes, including dryness⁶⁸

Region and Sub-region	Trends in maximum temperature (the frequency of warm and cold days)	Trends in minimum temperature (the frequency of warm and cold nights)	Trends in heat waves/warm spells	Trends in heavy precipitation (rain, snow)	Trends in dryness and drought
North Asia	 Likely increase in warm days (decrease in cold days)	 Likely increase in warm nights (decrease in cold nights)	 Likely more frequent and/or longer heat waves and warm spells	 Likely increase in heavy precipitation for most regions	 Inconsistent change
East Asia	 Likely increase in warm days (decrease in cold days)	 Likely increase in warm nights (decrease in cold nights)	 Likely more frequent and/or longer heat waves and warm spells	 Likely increase in heavy precipitation for most regions	 Inconsistent change
South-East Asia	 Likely increase in warm days (decrease in cold days)	 Likely increase in warm nights (decrease in cold nights)	 Likely more frequent and/or longer heat waves and warm spells  Low confidence in changes for some areas	 Inconsistent signal of change across most models (more frequent and intense heavy precipitation suggested over most regions)	 Inconsistent change




IPCC classification of sub-regions	World Humanitarian Summit selected countries (for North and South-East Asia) ⁶⁹
North Asia	Mongolia
East Asia	China, Democratic People's Republic of Korea, Japan, Republic of Korea
South-East Asia	Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste, Viet Nam

The projections are for the period 2071–2100 (compared with 1961–1990) or 2080–2100 (compared with 1980–2000).

Symbols

-  Increasing trend
-  Decreasing trend
-  Varying trend
-  Inconsistent trend/insufficient evidence
-  No or only slight change

Level of confidence in findings

-  Low confidence
-  Medium confidence
-  High confidence

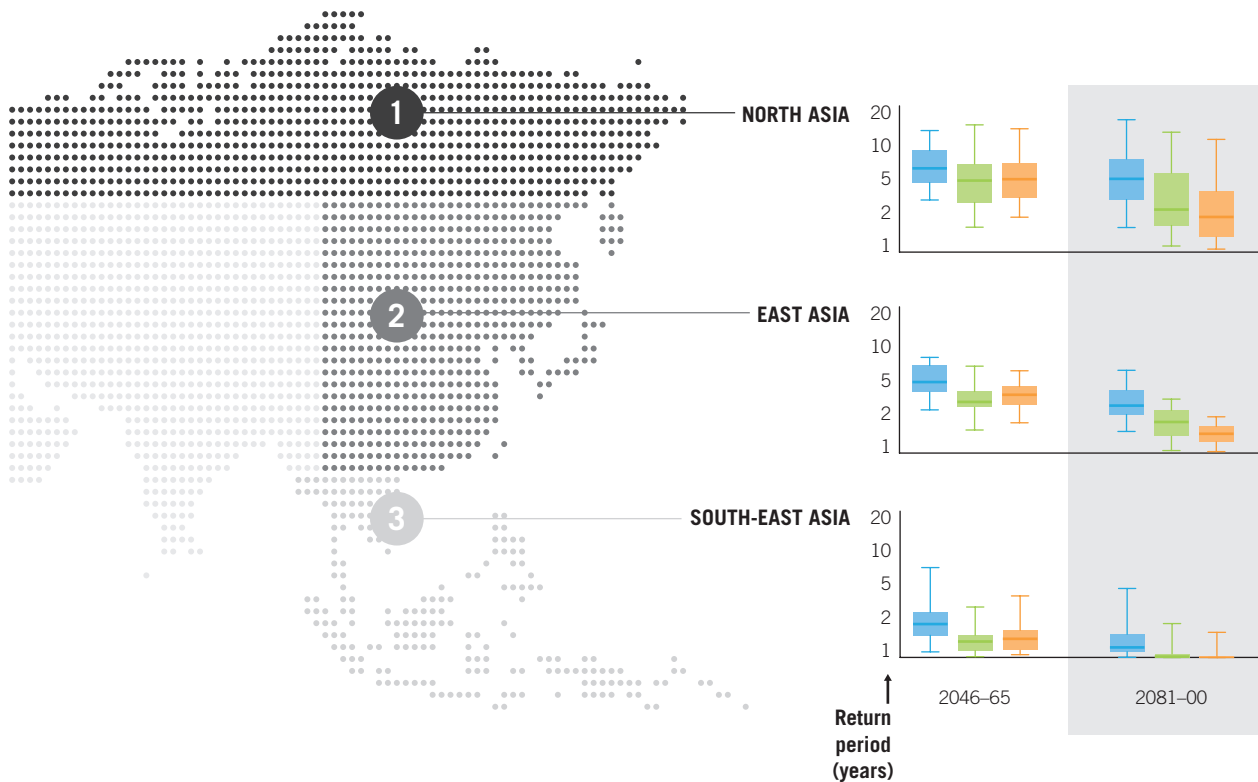
In the near term (2030–2040), there will be what the IPCC refers to as ‘medium’ confidence of increased risk of **riverine, coastal and urban flooding** leading to widespread damage to infrastructure, livelihoods and settlements in Asia, driven by increased extreme rainfall, sea-level rise and cyclones.⁷⁰

There will be a ‘medium’ level of risk of **drought-related water and food shortages** causing malnutrition (high confidence), driven by increasing average temperatures, extreme temperatures and drying trends. Average temperatures are projected to exceed 2°C above the late-20th century baseline over most land areas of Asia in a high-emissions scenario.⁷¹ Potentially, these risk levels can be reduced to ‘low’ levels through adaptation action.

In the near term, there will be a ‘high’ level of **increased risk of heat-related mortality** (high confidence), driven by increased average and extreme temperatures, with potential to be reduced to ‘medium’ levels through adaptation action.⁷²

Sea-level rise is expected to affect capture fisheries and aquaculture production in river deltas, including the lower Mekong River basin, which supports the world’s largest freshwater capture fishery.⁷³

Temperature changes in Asia⁷⁴

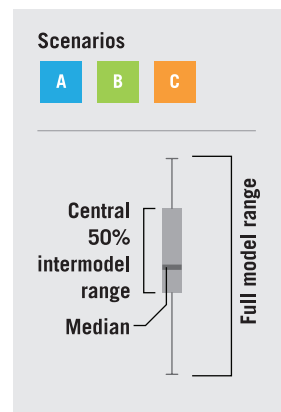


These graphs show how often the hottest day in the last 20 years of the 20th century could be experienced by the middle and end of the 21st century. These are shown in three different emissions scenarios defined by the IPCC (renamed here as A, B and C for ease).

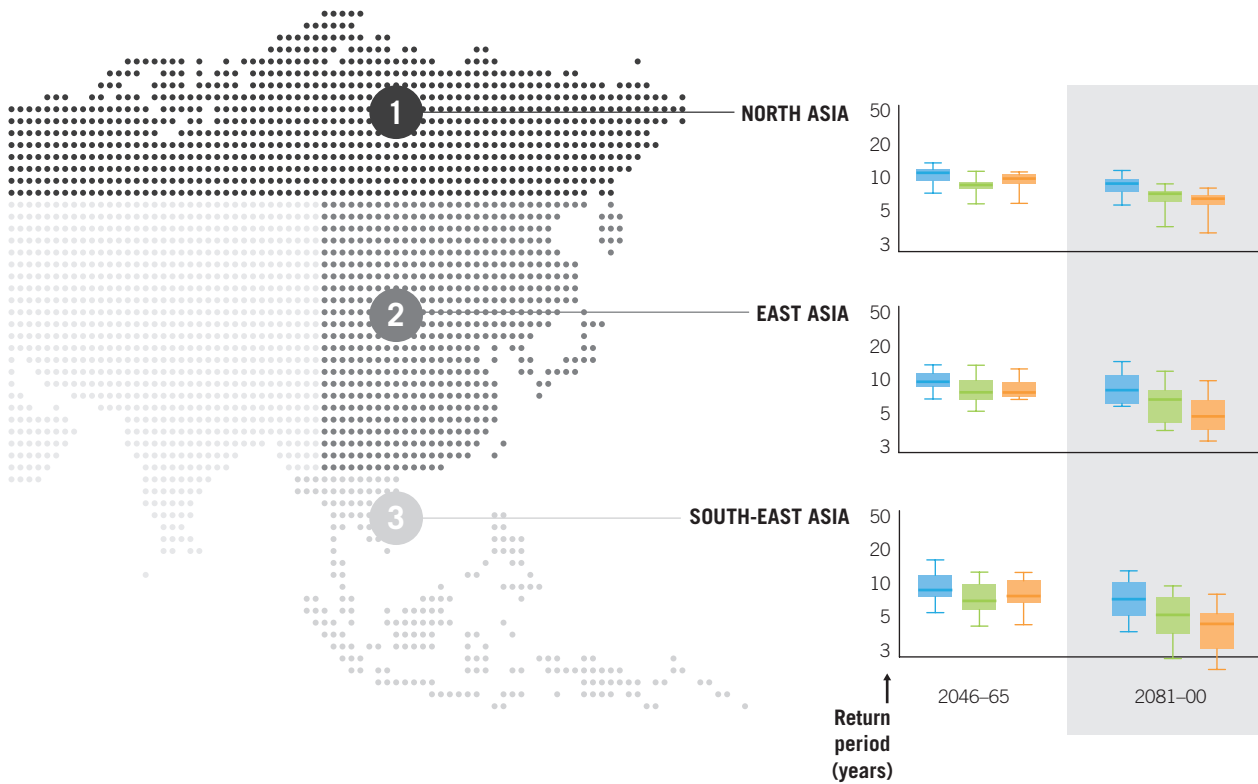
A describes a convergent (homogenous) world with rapid changes towards a service and information economy and introduction of clean and resource-efficient technologies.

B describes rapid economic development and growth, with balanced technological development across all sources, i.e. neither fossil intensive nor all non-fossil sources.

C is a fossil-intensive world with self-reliance and local identity, regional economic development, fragmented and slower growth.



Precipitation changes in Asia⁷⁵



These graphs show how often the wettest day in the last 20 years of the 20th century could be experienced by the middle and end of the 21st century. These are shown in three different emissions scenarios defined by the IPCC (renamed here as A, B and C for ease). For example, in East Asia, the wettest day experienced in the last 20 years at the end of the 20th century is likely to happen every 10 years by the end of the 21st century depending on the emissions scenario.

DISEASE OUTBREAKS



North and South-East Asia is a 'hotspot' for new, emerging and re-emerging infectious diseases, including those with pandemic potential; zoonotic diseases such as SARS and Avian Influenza H5N1 have severely affected the region in recent years.⁷⁶ Continuing population growth and mass migration, leading to deforestation and disruption of animal habitats, are likely to exacerbate these risk factors and may increase the likelihood of zoonotic disease outbreaks post-2015.⁷⁷



Climate-related diarrhoeal diseases and malnutrition are predicted to increase in the region by 2030, related to the rise in coastal water temperature, flooding and population displacement following disasters.⁸¹ Environmental degradation will place further stress on access to food and water, with direct and indirect consequences for human health.⁸²



Acute infectious diseases pose a significant problem in the region, and are predicted to increase in the next 10 to 15 years. In 2009, the World Health Organization (WHO) estimated that the South-East Asia region contributed 27% of the global total of infectious and parasitic diseases.⁷⁸ One causal factor is suboptimal vaccination coverage, leading to annual outbreaks of diseases such as measles in China, the Philippines, Thailand, and Myanmar (varying from 1000 to 20,000 cases).⁷⁹ Population growth in the region is likely to intensify this problem, and will threaten the success of disease eradication campaigns elsewhere.



The existing burden of chronic infectious diseases (such as Tuberculosis (TB) and HIV/AIDS) is forecast to continue, with HIV cases in some Asian countries currently increasing at a rate of 25% annually.⁸³ China, Myanmar and Thailand are among the 41 countries with the highest number of TB/HIV patients. As HIV infection is seen as a powerful risk factor for converting latent TB into active TB, there is also a potential rise in the incidence of TB infections and resulting mortality.⁸⁴



The threat of vector-borne diseases, such as dengue fever and malaria, are predicted to worsen in the next 10 to 20 years. At present, they are a major cause of illness in the region, with 70% of global dengue cases recorded in South-East Asia. Climate change will exacerbate this threat, bringing warmer temperatures and increased rain fall, expanding vector habitats.⁸⁰



There will be an increasing burden of non-communicable diseases. By 2025, the proportion of people living in urban areas in Asia will have risen to 50%. Urbanisation leads to lifestyle changes often associated with increases in non-communicable diseases, such as cardiovascular disease. Projections suggest that by 2020, chronic diseases will account for three-quarters of all deaths worldwide, with South-East Asia predicted to experience the greatest increase.⁸⁵ Climate change has also been linked to a rise in non-communicable disease, with heat waves associated with cardiovascular disease, and ozone with respiratory diseases.

4

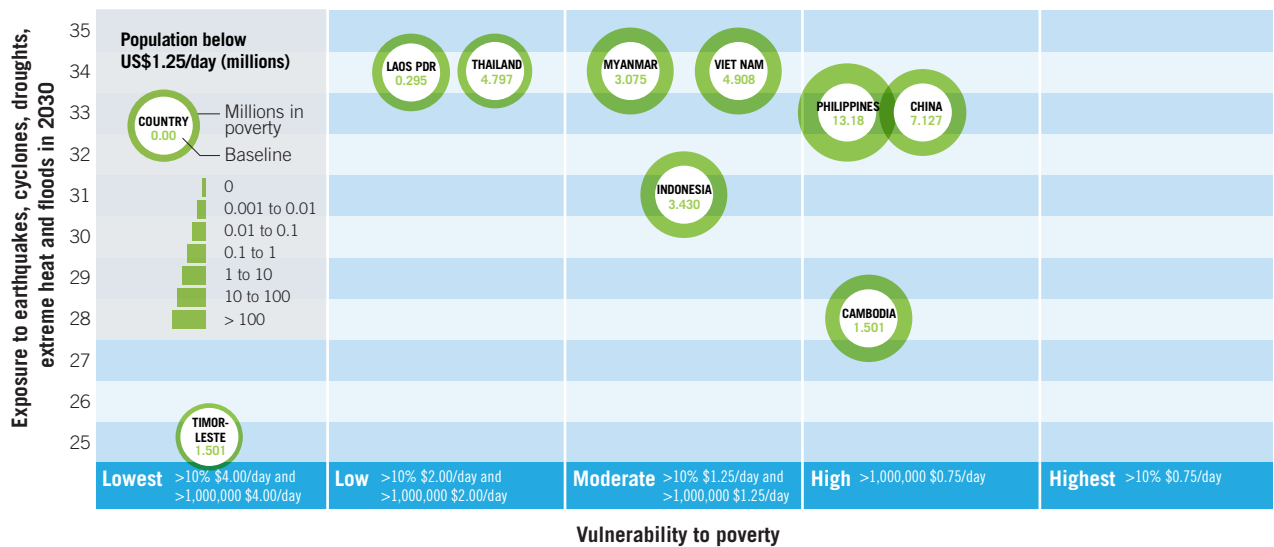
FUTURE VULNERABILITY

POVERTY AND IMPOVERISHMENT

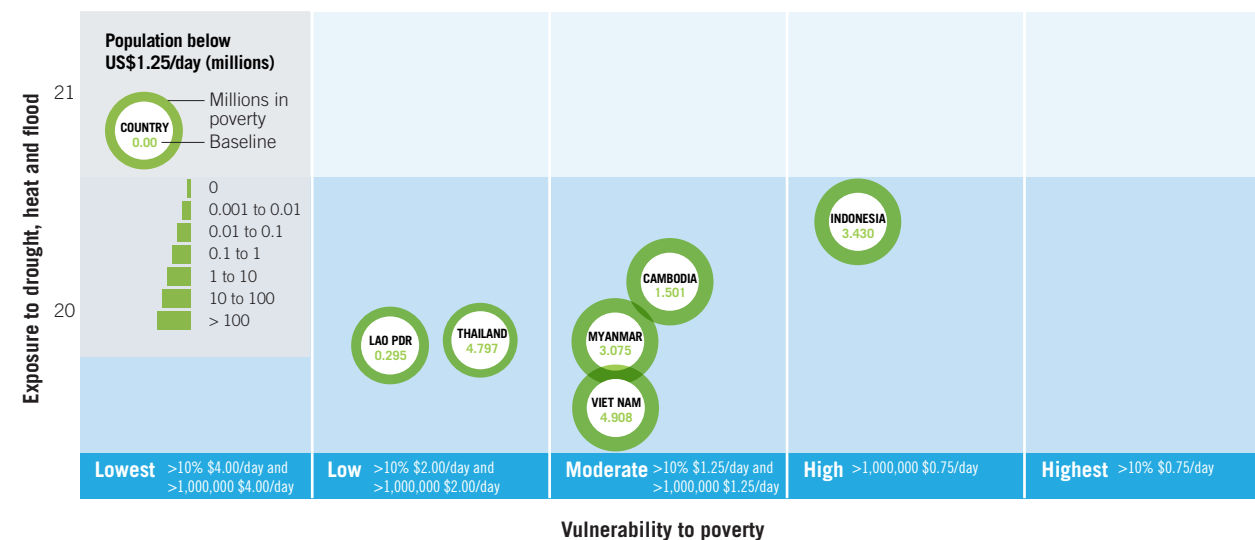
Poverty

Projected poverty levels in 2030 in countries ranking highest on the multi-hazard index (earthquakes, cyclones, droughts, extreme heat and floods)⁸⁶

According to a multi-hazard index, constructed by ODI, UK Met Office and RMS in 2013, Lao PDR, Myanmar, Thailand and Viet Nam jointly rank (along with Bangladesh and Nepal) as the fourth most at-risk countries worldwide, while China, Japan and Philippines fall in the next most at-risk category.⁸⁷ Indonesia, Malaysia and Timor-Leste also rank highly on the index.⁸⁸

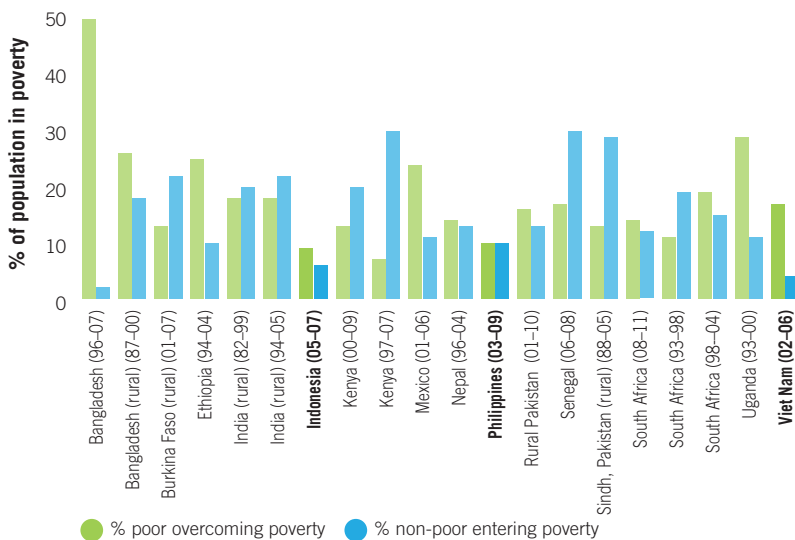


Projected poverty levels in 2030 in countries with the highest exposure to droughts, extreme heat and floods⁸⁹



Impoverishment

Impoverishment can cancel out development progress⁹⁰



The figure shows historic poverty averages for the dates attached to each country name.

The risk of impoverishment is predicted to rise.⁹¹ Ambitions to eradicate extreme poverty by 2030 will have to focus not only on strategies for people to overcome poverty, but also to prevent future impoverishment.



Of the countries in North and South-East Asia, China, People's Democratic Republic of Korea and Philippines are expected to remain highly vulnerable to poverty in 2030 with more than 1 million people living in severe poverty (US\$0.75/day) and Cambodia, Indonesia, Myanmar and Viet Nam moderately vulnerable to poverty with more than 1 million people living on less than US\$1.25/day.⁹²



It has been argued that a more realistic poverty line above which people are unlikely to fall into poverty is US\$10/day,⁹³ approximately 5 billion people worldwide are therefore vulnerable to future impoverishment. In North and South-East Asia, 1.25 billion people are predicted to be living on less than US\$10/day in 2030.⁹⁴

With the risk of food price shocks expected to continue, households with a high proportion of income spent on food will remain at risk of impoverishment.⁹⁵ Although the share of workers in 'extreme' and 'moderate working' poverty are expected to continue to decline across East and South-East Asia, the projected share of 'near poor' workers is expected to change very little in South-East Asia.⁹⁶ The future risk of impoverishment in a country can be seen from recent poverty dynamics and the extent to which poverty escapes can be sustained. In Indonesia, for example, a high proportion of people escaping poverty is cancelled out by the number of people entering poverty.⁹⁷



Links to food security, p25

FOOD SECURITY AND MALNUTRITION

Food security

The outlook to 2022 sees real prices of food staples falling slightly from 2014, but remaining higher than historical lows. Key staples, rice, wheat, and maize prices are set to be 70%, 65% and 32% higher in real terms in 2020/22 than in the early 2000s. This is due to slowing production growth and stronger demand, including for biofuels.⁹⁸ Rises in the oil price and higher rural wages across Asia, particularly China and Thailand, have, and will continue to push up costs of production.⁹⁹ Higher demand for cereals will also contribute to price increases.



70%



65%



32%

In the medium term it is likely that increases in incomes will more than offset impacts of steady price rises.¹⁰⁰ The risk of price shocks, however, remains:

“As long as food stocks in major producing and consuming countries remain low, the risk of price volatility is amplified. A wide-spread drought such as the one experienced in 2012, on top of low food stocks, could raise world prices by 15–40 percent.”¹⁰¹

Spotlight on: agricultural productivity and climate change

Agriculture contributes 10–20% of Gross Domestic Product (GDP) in many South-East Asian nations, more in others, and approximately 10% and 16% of GDP in China and Mongolia respectively.¹⁰² In the near term (2030–2040), Asia is expected to experience a decline in productivity of key agricultural crops, including rice, maize and wheat, due to drought.¹⁰³ As the frequency and intensity of heat waves increases, more than half of afternoon hours are projected to be lost by 2050 because workers will need rest

breaks, further affecting productivity in labour-intensive sectors such as agriculture.¹⁰⁴ Large economic losses are anticipated in the agricultural sector in many North and South-East Asian countries. For instance, in China the total loss due to drought projected in 2030 is expected to range from US\$1.1–1.7 billion for regions in northeast China and about US\$0.9 billion for regions in north China.¹⁰⁵ Adaptation measures have the potential to avert up to half these losses.¹⁰⁶

Malnutrition and stunting

Despite progress, malnutrition – including the hidden hunger of micronutrient deficiency – remains a key challenge in both East and South-East Asia, where some 167 million and 65 million people respectively were estimated to be undernourished in 2011/13 (compared to 279 million and 140 million in 1990/92).¹⁰⁷

Stunting prevalence is expected to decrease to 2.7% in Eastern Asia and 18% in South-East Asia by 2025,¹⁰⁸ but levels vary widely across the region: stunting affects about 9% of Chinese children, close to 40% of Indonesian and Cambodian, and 58% of Timor-Leste children.¹⁰⁹

While declines in such indicators of food insecurity are expected, inequalities within countries will remain. In Indonesia, for instance, stunting rates for the poorest quintile increased in recent years, while falling among the wealthiest.¹¹⁰ The high share of poor households' food expenditures (over 75% in Lao PDR, Mongolia and Timor-Leste)¹¹¹ exacerbate the risk of food price shocks for vulnerable people.¹¹²

To meet the ongoing challenge of improving food security, political will is needed to tackle chronic poverty, and to improve water supply, sanitation, primary health care and nutrition.¹¹³

PATTERNS OF URBANISATION

Some of the largest urban agglomerations are located in Asia (e.g. Tokyo, Shanghai, Beijing, Chongqing, Manila, Guangzhou, Guangdong, Jakarta, Tianjin, Shenzhen, Jakarta, Seoul). China alone has six megacities (exceeding 10 million) and ten cities with populations between 5 million and 10 million. By 2030 it will add another megacity and six more large cities. That said, smaller settlements, those with less than 1 million residents, are often fast-growing and in many cases have weak local governments and fewer resources to deal with increasing pressures on services.¹¹⁴



Spotlight on: migration and climate change

Extreme weather events displace populations in the short term because of their loss of place of residence or economic disruption.

Although only a small proportion of displacement leads to more permanent migration,¹¹⁵ the increasing incidence and changing intensity of extreme weather will lead to increased levels of displacement.¹¹⁶

Most displaced people attempt to return to their original residence and rebuild as it is practical to do so. Structural economic causes of social vulnerability may determine whether temporary displacement becomes or leads to permanent migration.

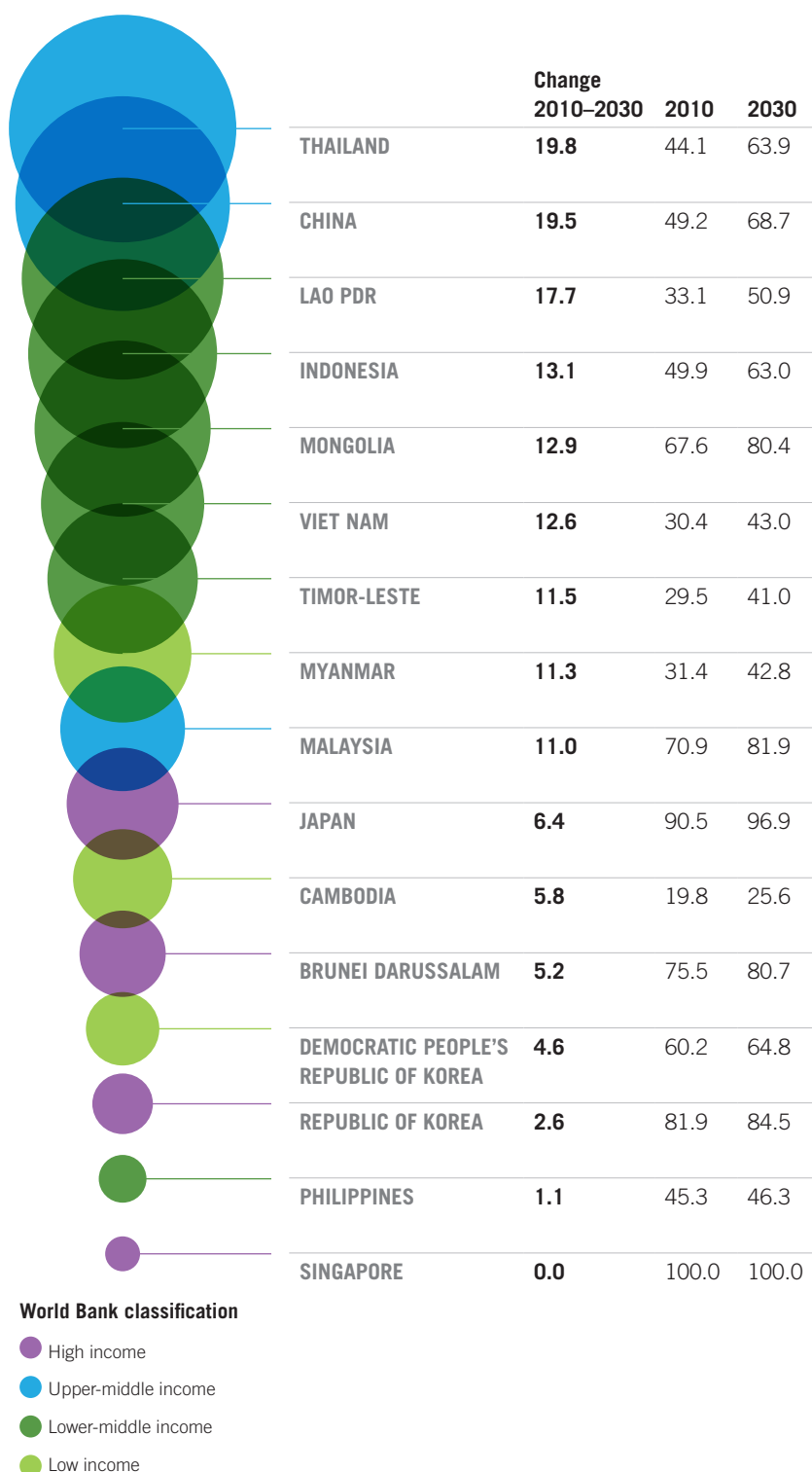
Vulnerability is inversely correlated with mobility; those most exposed and vulnerable to the impacts of climate change have least capability (or access to resources needed) to migrate.

Migrant populations may be exposed to more hazardous climatic conditions in their new destinations. Low-income migrants, as well as being socially excluded, cluster in high-density areas that are often highly exposed to flooding and landslides, with these risks increasing with climate change.

Examples of climate-induced migration from Asia:

- In Viet Nam, the cumulative impacts of seasonal flooding increases outmigration rates in the Mekong Delta.¹¹⁷
- In Mongolia, diversity in herders' mobility strategies in response to climate change has been observed.¹¹⁸

Percentage of population living in urban areas¹¹⁹



Future demographic changes in Asia will be strongly linked to migration and urbanisation. Estimates indicate that between 2011 and 2030, an additional urban population of 276 million in China, as well as 218 million in India will account for 37% of the total increase of global urban population.¹²⁰ Indonesia and the Philippines will contribute to 9 countries that will make up a further 26% of global urban growth.¹²¹

Populations living in urban floodplains in Asia, as a whole, may rise from 30 million in 2000 to between 83 and 91 million in 2030, and then to 119–188 million in 2060 according to different scenarios of the future.¹²²

Increasing urbanisation brings with it new challenges for managing and responding to risk. In the case of earthquakes, it will result in mass casualties and building collapse.¹²³ Enforcement of building codes, land zoning, clearing of evacuation routes and emergency access, amongst other risk management practices, are often lacking or non-existent in many rapidly growing cities.¹²⁴

DEMOGRAPHICS

Both Singapore and Thailand are expected to reach Japan's life-ageing population levels by 2030, with approximately 23% aged 65 and over. Viet Nam is also expected to experience rapid ageing.¹²⁵ This is projected to reach 47.7% by 2030, due to factors such as better health care and increasing **food security**.¹²⁶



Links to food security, p25



The population across North and South-East Asia is expected to increase despite projected declining population growth rates. The population across South-East Asia will **increase by 19% or 113 million** between 2010 and 2030.¹²⁷ Population growth will occur in North Asia. However, in the approach to 2050, slower population growth rates are projected for the Democratic People's Republic of Korea, Republic of Korea, and Japan, with China due to slip onto negative growth by 2030.¹²⁸



An ageing population is projected across North and South-East Asia due to declining birth rates and increasing life expectancy. Across Asia, fertility rates are projected to decline, reaching an average of **2.01 children per women by 2030**.¹²⁹ There is disparity across the continent, with South-East Asia expected to decrease to an average of 1.86 children per woman, reflecting one of the quickest regional reduction rates in fertility across the continent, while China will maintain its lower fertility rates. This is expected to coincide with longer life expectancy and subsequent higher dependency ratios.¹³⁰

INTERNATIONAL DISASTER FINANCE



The number and extent of humanitarian crises are increasing and will continue to overstretch the humanitarian financing system up to 2030 and beyond.

Of the top 40 countries receiving humanitarian aid, only 19 are also among the top 40 recipients of development aid.¹³¹ This implies an imbalance between those countries that are facing crises and those that are receiving the support necessary to address long term challenges associated with their risk profiles.



Studies exploring disasters across Asia suggest that changes are required in the way risk is managed in national and international systems.¹³²

To reflect this, there need to be changes in the financial architecture – to overcome challenges in fragmentation, the lack of coherence and inconsistencies in what is funded, when and where.¹³³ It has been asserted that a fundamental shift in understanding of *where* responsibility for risk lies is required, with greater ownership and ex-ante action required by governments and mainstream development actors.¹³⁴ Risk-informed development assistance will become part of the new mantra for the post-2015 era.

Calls for change to the current system include:

- Situating disaster risk reduction in development (as opposed to just humanitarian) budgets;¹³⁵
- Using multi-year climate funding to support disaster risk reduction and conflict prevention as part of longer-term sustainable development objectives;¹³⁶
- Greater financial investment in disaster risk reduction;¹³⁷
- Possible new funding mechanisms to support risk reduction, such as emergency preparedness.¹³⁸

In North and South-East Asia, Japan is widely held as an example of best practice in disaster risk reduction. In the post-2015 era, governments in the region are likely to assume more responsibility for ex-ante and ex-post disaster action.¹³⁹ Countries such as Indonesia and the Philippines are already held as examples where government investment in reducing disaster risk has translated into budget allocations for managing risk – at higher volumes than international financing.¹⁴⁰

Insurance coverage

Typhoon Haiyan caused in excess of US\$12.5 billion in damage to Philippines and Viet Nam; only US\$1.5 billion was insured.¹⁴¹

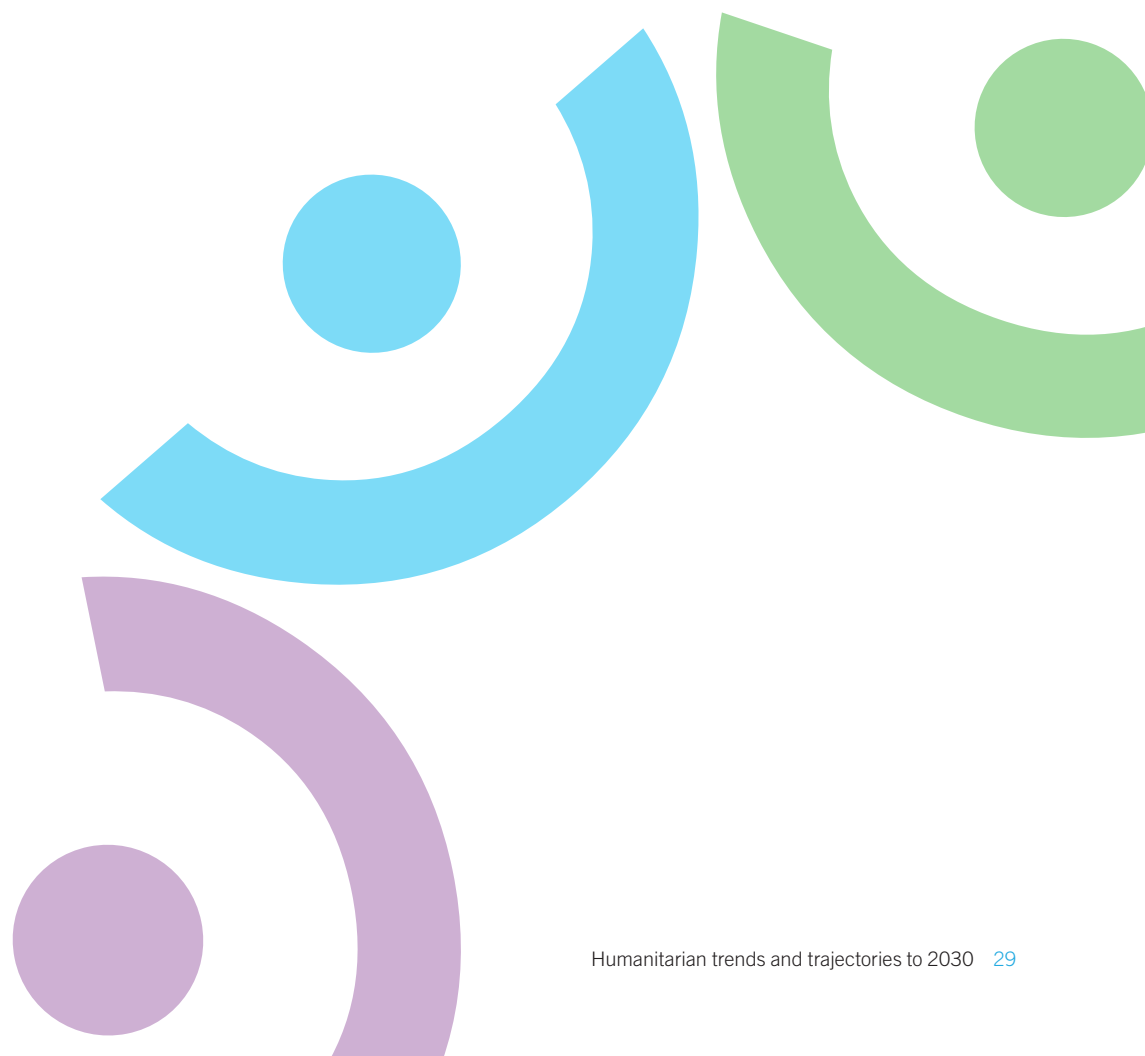
Insurance is widely considered a cost-effective mechanism for promoting risk management and encouraging financial resilience.¹⁴² Insurance and other formal risk-sharing and transfer mechanisms have so far been under-developed and under-used in hedging against disaster risk across Asia.¹⁴³ For example, the ratio of the insurance capital to the whole finance industrial capital in China is 1:33, compared with an average 1:5 in developing countries.¹⁴⁴

Insurance markets in North and South-East Asia are and will continue to open up, buoyed by the expansion of innovative insurance products, increasing demand for formal risk-transfer mechanisms, and growing exposure to risk of people and assets.

Catastrophe insurance shows some prospects for growth as demand for insurance expands in countries where purchase of coverage is a condition of obtaining or providing loans and mortgages (such as Malaysia, Singapore and Viet Nam). However, a lack of baseline data and high transaction costs (resulting in higher premiums) continue to act as barriers to increased uptake of indemnity insurance, particularly in lower-income countries. Greater support for risk information and modelling

capacity is expected in the coming decades, including the option of regional risk-information platforms and shared databases.¹⁴⁵

Parametric insurance offers one of the largest trends in growth. Index-based schemes are increasingly used in the agriculture and livestock sectors, and expanding into other sectors such as health. There is also significant interest across Asia in extending the remit of parametric schemes to insure governments against covariate risk and compound disasters.¹⁴⁶ The option of developing regional intergovernmental catastrophe insurance pools is therefore attractive – through the Association of South-East Asian Nations (ASEAN) – similar pools have been set up in the Caribbean and Pacific regions.



UNDERSTANDING AND MANAGING RISK

Most humanitarian crises can be predicted to some extent. While they cannot always be prevented, the suffering they cause can often be greatly reduced.¹⁴⁷ Understanding crisis risk – the probability of one occurring and its likely impact – is a fundamental step in reducing and managing it.¹⁴⁸

InfoRM¹⁴⁹ identifies countries at high risk of humanitarian crisis that are more likely to require international assistance. It is based on three dimensions of risk: hazards and exposure, vulnerability and lack of coping capacity. This composite index provides a useful, simplified understanding of country-based risk realities.

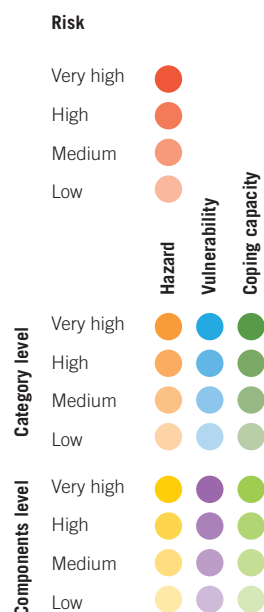
Taking a holistic understanding of risk (which captures both natural and man-made crises), using index like InfoRM, can help the national and international community support proactive crisis management in countries across North and South-East Asia.

North and South-East Asia InfoRM ranking¹⁵⁰

	Viet Nam	Timor-Leste	Thailand	Singapore	Republic of Korea	Philippines	Myanmar	Mongolia	Malaysia	Lao PDR	Japan	Indonesia	Democratic People's Republic of Korea	China	Cambodia	Brunei Darussalam	
	8.2	4.8	6.8	0.0	4.2	9.4	9.1	3.3	3.5	4.9	8.4	7.9	4.8	8.4	6.3	0.0	Natural
	4.0	4.6	6.9	1.4	3.1	6.9	8.5	2.4	4.3	4.3	2.4	4.9	3.9	4.8	4.4	1.1	Human
	6.6	4.7	6.9	0.7	3.7	8.4	8.8	2.9	3.9	4.6	6.3	6.6	4.4	7.0	5.4	0.6	HAZARD
	3.1	5.9	2.3	0.8	0.6	3.0	7.0	2.8	2.8	5.4	0.6	3.4	7.1	2.5	5.1	1.5	Development and Deprivation
	3.3	1.7	4.2	1.3	2.0	5.0	5.8	3.6	4.4	4.7	1.8	4.9	x	3.5	4.8	x	Inequality
	1.7	7.2	0.0	0.0	0.0	0.1	0.4	3.5	0.0	3.0	0.0	0.1	0.2	0.0	3.2	0.0	Aid Dependency
	2.8	5.2	2.2	0.8	0.8	2.8	5.0	3.2	2.5	4.6	0.7	3.0	4.8	2.1	4.5	1.0	Socio-Economic Vulnerability
	0.0	0.0	4.9	0.0	0.0	5.0	7.2	0.0	5.4	0.0	0.7	5.2	0.0	5.2	0.0	0.0	Uprooted people
	1.7	9.5	1.8	0.8	1.0	2.9	3.8	3.6	0.9	3.3	0.3	2.1	4.6	0.7	3.8	1.6	Health Conditions
	3.1	7.2	1.3	0.2	0.3	3.4	4.5	1.6	1.8	6.3	0.2	3.4	3.2	0.9	4.7	0.6	Children U5
	0.5	0.0	10.0	0.0	0.0	10.0	0.2	0.0	0.0	2.5	0.2	0.3	9.9	4.0	2.7	0.0	Recent Shocks
	3.2	8.8	3.6	x	3.8	3.7	x	5.4	2.7	6.9	3.6	4.1	8.1	4.8	3.7	2.0	Food Security
	2.2	7.5	5.8	0.3	1.4	6.3	3.1	2.9	1.4	5.0	1.2	2.6	7.4	2.8	3.8	1.1	Other Vulnerable Groups
	1.2	4.8	5.4	0.2	0.7	5.7	5.5	1.6	3.6	2.9	1.0	4.0	4.7	4.1	2.1	0.6	Vulnerable Groups
	2.0	5.0	4.0	0.5	0.8	4.4	5.3	2.4	3.1	3.8	0.8	3.5	4.7	3.2	3.4	0.8	Vulnerability
	4.4	6.3	3.5	1.2	1.5	4.3	7.1	6.0	2.6	4.3	1.9	3.8	x	2.5	6.8	6.0	DRR
	6.3	7.2	5.7	1.0	3.6	5.8	8.1	6.2	3.9	7.1	2.4	6.1	9.0	5.4	7.3	3.6	Governance
	5.3	6.7	4.6	1.1	2.5	5.0	7.6	6.1	3.3	5.7	2.2	5.0	9.0	3.9	7.0	4.8	Institutional
	2.6	7.7	3.5	1.5	3.1	3.5	6.6	3.6	2.0	5.7	3.4	4.3	5.8	3.2	6.2	2.4	Communication
	3.5	6.5	3.1	0.0	1.2	3.3	5.1	6.1	2.6	6.4	1.4	5.4	3.7	4.3	7.5	6.5	Physical infrastructure
	5.7	9.7	4.6	2.3	2.6	6.6	7.5	4.1	5.4	8.8	1.8	8.0	0.0	5.0	6.9	4.1	Access to health care
	3.9	8.0	3.7	1.3	2.3	4.5	6.4	4.6	3.3	7.0	2.2	5.9	3.2	4.2	6.9	4.3	Infrastructure
	4.7	7.4	4.2	1.2	2.4	4.7	7.1	5.4	3.3	6.4	2.2	5.4	7.0	4.1	7.0	4.6	Lack of coping capacity
	4.0	5.6	4.8	0.7	1.9	5.6	6.9	3.3	3.4	4.8	2.3	5.0	5.2	4.5	5.1	1.3	Risk

The ranking ranges from 0.0–10.0 with the notion that higher is worse.

Countries ranking high in InfoRM are anticipated to require humanitarian assistance when a hazard event occurs; the country would have difficulty coping with complex emergencies in which large groups of people would be unable to meet their basic needs.



Endnotes

1. ADB (2013) *Food Security in Asia and the Pacific*. Manila: ADB and LIU Institute for Global Issues.
2. Shepherd, A., Mitchell, T., Lewis, K., Lenhardt, A., Jones, L., Scott, A., and Muir-Wood, R., 2013. *The geography of poverty, disasters and climate extremes in 2030*. London: Overseas Development Institute. p.vii. Available: <http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/8633.pdf>
3. This incorporates 11 out of the 16 countries considered by the World Humanitarian Summit for North and South-East Asia.
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5. Global Humanitarian Assistance Team (2013) *Forgotten crises*. Global Humanitarian Assistance website uploaded 24/06/2014. Source: <http://www.globalhumanitarianassistance.org/infographics/forgotten-crises>
6. In the European Commission's Humanitarian aid and Civil Protection department (ECHO) *Forgotten Crisis Assessment 2013–2014*, only Myanmar appears (from the World Humanitarian Summit list of North and South-East Asian countries). The *Forgotten Crisis Assessment index* is based on four indicators: vulnerability, media coverage, public aid per capital, qualitative assessment of ECHO geographical units and experts. Source: http://ec.europa.eu/echo/files/policies/strategy/fca_2013_2014.pdf
7. Shepherd, A., Mitchell, T., Lewis, K., Lenhardt, A., Jones, L., Scott, A., and Muir-Wood, R., 2013. *The geography of poverty, disasters and climate extremes in 2030*. London: Overseas Development Institute. p40. Available: <http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/8633.pdf>
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The original source (IPCC SREX) does not provide definitions of hydrological, meteorological or climatological in its glossary, it can broadly be understood as the following: hydrological, referring to the water cycle, includes flooding and avalanches; climatological, often referring to a 30 year average of weather and its variability, includes extreme temperatures, drought and wildfires; meteorological refers to cyclones and storms/wave surges.
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19. South-East Asian World Humanitarian Summit countries also in the IPCC sub-region definition: Brunei Darussalam; Cambodia; Indonesia; Lao People's Democratic Republic; Malaysia; Myanmar; Philippines; Singapore; Thailand; Timor-Leste; Viet Nam. The SREX report also includes the following countries for this sub-region: Papua New Guinea. East Asia World Humanitarian Summit countries also in the IPCC sub-region definition: Democratic People's Republic of Korea; China; Japan; Republic of Korea. North Asia World

Humanitarian Summit countries also in the IPCC sub-region definition for: Mongolia. The SREX report also includes the following countries for this sub-region: Russia (East of Urals).

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23. Internal Displacement Monitoring Centre (IDMC) *Disaster-induced Displacement Database, as of 16 July 2014/07/16*. North and South-East Asia refers to the countries selected by the World Humanitarian Summit. For some countries little or no displacement data was identified for some or all years.
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27. Internal Displacement Monitoring Centre (IDMC) *Disaster-induced Displacement Database, as of 16 July 2014/07/16*
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34. UNHCR (2014) *Global Trends 2013*. Geneva: United Nations High Commission for Refugees.
35. IDMC (2013) *Global figures*. Internal Displacement Monitoring Centre (IDMC) website. Available: <http://internal-displacement.org/global-figures>
36. 'International Disaster Finance' indicates all disaster finance mobilised by international sources. It includes: Disaster

Risk Management, Flood Prevention and Control which merged together are classified as Disaster Prevention and Preparedness; Emergency Response; and Rehabilitation and Recovery. The data is from the Disaster Aid Tracking (DAT) database developed by the Global Facility for Disaster Reduction and Recovery (GFDRR) and Development Gateway on the AidData platform (Source: <http://www.aiddata.org>). It is the same data used in the Financing Disaster Risk Reduction Report Kellett, J. and Caravani, A. (2013) *Financing Disaster Risk Reduction. A 20 year story of international aid*. London: Overseas Development Institute. Available: <http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/8574.pdf>

The DAT database contains all aid flows related to disasters during the period 1991–2010. Values are in constant 2009 US dollars. The category of 'disaster prevention and preparedness' includes disaster risk management and flood control measures, which are classified under 'development aid'. The category 'emergency response' may include some aid components related to non-disasters, as in several cases it was not possible to identify the precise nature of emergency aid flows.

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38. OCHA (2013) *World Humanitarian Data and Trends 2013*. New York: United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA). Available from: docs.unocha.org/sites/dms/Documents/WHDT_2013%20WEB.pdf
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40. The analysis focuses on the list of World Humanitarian Summit countries for North and South-East Asia and the data sources include the Organisation for Economic Co-operation and Development's (OECD) Development Assistance Committee (DAC), United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) Financial Tracking Service (TFS) and Central Emergency Response Fund (CERF).

The total international humanitarian response figures are Global Humanitarian Assistance's own calculation (method available on request) and the disaster prevention and preparedness figures come from the Organisation for Economic Co-operation and Development's (OECD) Development Assistance Committee (DAC) creditor reporting system.

41. The analysis focuses on the list of World Humanitarian Summit countries for North and South-East Asia and the data sources include the Organisation for Economic Co-operation and Development's (OECD) Development Assistance Committee (DAC), United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) Financial Tracking Service (TFS) and Central Emergency Response Fund (CERF).

The total international humanitarian response figures are Global Humanitarian Assistance's own calculation (method available on request) and the disaster prevention

- and preparedness figures come from the Organisation for Economic Co-operation and Development's (OECD) Development Assistance Committee (DAC) creditor reporting system.
42. The analysis focuses on the list of World Humanitarian Summit countries for North and South-East Asia and the data sources include the Organisation for Economic Co-operation and Development's (OECD) Development Assistance Committee (DAC), United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) Financial Tracking Service (TFS) and Central Emergency Response Fund (CERF).
The total international humanitarian response figures are Global Humanitarian Assistance's own calculation (method available on request) and the disaster prevention and preparedness figures come from the Organisation for Economic Co-operation and Development's (OECD) Development Assistance Committee (DAC) creditor reporting system.
 43. Data and analysis provided by Alice Caravani, Overseas Development Institute. Method available upon request: <http://www.odi.org/experts/688-alice-caravani>
Note that Singapore and Republic of Korea were removed from the figure as the international financing was primarily for response, which is subject to misinterpretation as the national investments support ex-ante risk management.
 44. Data and analysis provided by Alice Caravani, Overseas Development Institute. Method available upon request: <http://www.odi.org/experts/688-alice-caravani>
 45. Data and analysis provided by Alice Caravani, Overseas Development Institute. Method available upon request: <http://www.odi.org/experts/688-alice-caravani>
 46. Of the ex-ante investment, a significant proportion of disaster risk management funding is for flood protection/control (separated in the figure). Brunei Darussalam and Japan are missing from the analysis as there is no data available for these two countries.
 47. Kellett, J. and Caravani, A., (2013) *Financing Disaster Risk Reduction. A 20 year story of international aid*. London: Overseas Development Institute.
 48. Based on 14 countries identified by World Humanitarian Summit as North and South-East Asia (as no data is available for Japan and Brunei).
 49. Sourced from Development Initiatives based on the Organisation for Economic Co-operation and Development's (OECD) Development Assistance Committee (DAC) Creditor Reporting System data.
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 55. Independently sourced by Håvard Mokleiv Nygård at The Peace Research Institute Oslo (PRIO). Contact: <http://www.prio.org/Data/Armed-Conflict/>
The graph shows (annually) the number of conflicts that satisfied the UCDP – PRIO armed conflict definition: An armed conflict is a contested incompatibility which concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths. See: Gleditsch, N. P., Wallensteen, P., Eriksson, M., Sollenberg, M., & Strand, H. (2002). *Armed conflict 1946–2001: A new dataset*. *Journal of peace research*, 39(5), 615–637.
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The model was updated after ODI published the report. The data shown here uses the correct (updated) estimate for Thailand. For additional clarifications contact Amanda Lenhardt: <http://www.odi.org/experts/1072-amanda-lenhardt>

X axis: The Poverty Vulnerability Index was constructed by setting the highest vulnerability category to include those countries projected by the optimistic scenario to have the largest proportion of people living US\$0.75/day in 2030. The index points therefore to those countries likely to face high rates of poverty despite the major factors determining levels of poverty being projected as optimistically. The second highest vulnerability threshold includes those countries projected to have more than one million people living below US \$1.25/day in 2030, based on the assumption that such a high number of people living in poverty would affect a country's disaster resilience, though to a lesser extent than having a high proportion of people living in poverty. The subsequent categories were based on the same principles, using higher poverty lines of US\$1.25, \$2.00 and \$4.00/day respectively.

Y axis: To assess the spatial and temporal characteristics of natural hazards that are relevant to poverty and disaster risk, five key hazards have been selected for their relevance

to major natural disasters in areas with high poverty: earthquakes, droughts, floods, high temperatures, and tropical cyclones. These hazards account for the main observed geophysical, climatological, meteorological and hydrological natural disasters as identified by the Centre for Research on Epidemiology of Disasters (CRED). These new hazard indices were created in order to make use of the latest climate projection data, recently made available through the CMIP5 (Coupled Model Inter-comparison Project) dataset of climate projections for the IPCC Fifth Assessment Report (IPCC AR5). The indices use, therefore, the most up-to-date projections available. In order to evaluate how the five hazards included in this assessment combine, we have developed the Multi-hazard Indicator (MHI). This assigns a 'hazard rating' on a scale of 1 to 7, to each of the hazard indicators at a given location, at the resolution of the climate models used. This information is also aggregated by country, taking the highest level of hazard that occurs anywhere (on any grid points) within the area of that country. The MHI value is simply the sum of the hazard indicator level for each of the contributing five hazards.

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The model was updated after ODI published the report. The data shown here uses the correct (updated) estimate for Thailand. For additional clarifications contact Amanda Lenhardt: <http://www.odi.org/experts/1072-amanda-lenhardt>

For additional explanation, see endnote above.
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