UN Photo

2 IMPACTS ON POVERTY AND INEQUALITY

IMPACTS ON POVERTY AND INEQUALITY

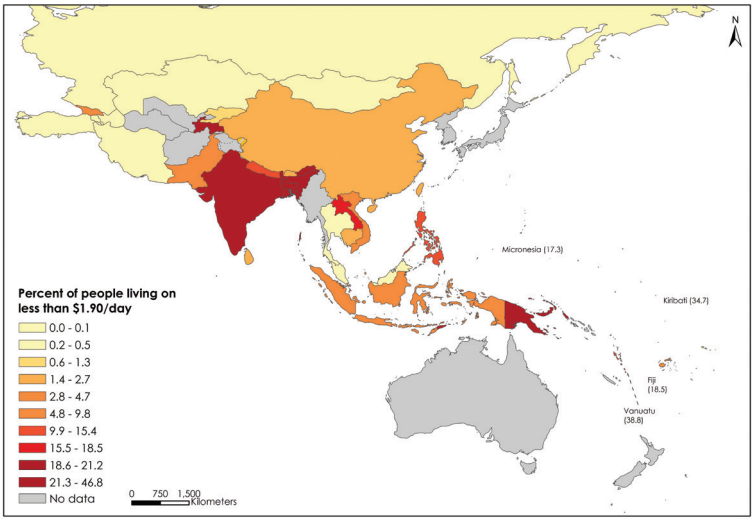
The extent of disaster damage is closely connected with poverty. The poorest communities tend to live in places and conditions that expose them to natural hazards so are least able to withstand disaster impacts. At the same time, disasters destroy many of their already meagre assets, increasing inequality and trapping people in poverty that can be transmitted from one generation to the next. As expressed in the Sustainable Development Goals, reducing disaster risk and reducing poverty and inequality are part of the same process.

The first Sustainable Development Goal has the ambitious aim of ending poverty entirely – in all its forms, everywhere. The Asia-Pacific region has already made remarkable progress in reducing poverty. Between 2000 and 2013, the proportion of people living under the $1.90 per day poverty line fell from 29.7 to 10.3 per cent.[1] One billion people exited extreme poverty. Nevertheless, 400 million people still live in extreme poverty – and 36 per cent of the population live close to the poverty line, on less than $3.10 per day.

Moreover, poverty reduction has been uneven across countries (Figure 2-1). Much of the success has been in China while progress has been slower elsewhere. In South and South-West Asia, between 2000 and 2013, the poverty rate fell from 34.2 to 17.3 per cent, but this still left 325 million people living in extreme poverty.[2]

Figure 2-1

Extreme poverty in Asia and the Pacific



Source: ESCAP statistical database (2017).

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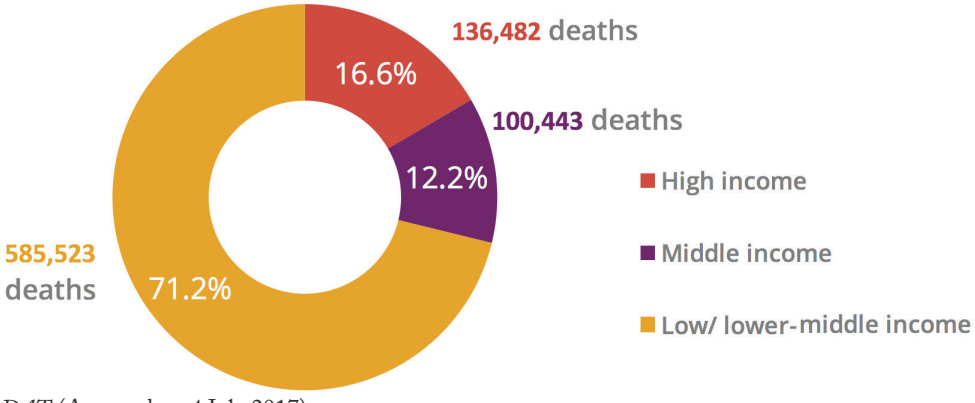
Convergence of disasters and poverty

There is a close two-way connection between disasters and poverty. The poorest nations and the poorest people have less capacity to mitigate the impact of disasters and are thus often the worst affected. Between 2000 and 2015, in Asia and the Pacific, the low- and lower middle-income countries experienced by far the most disaster deaths (Figure 2-2).[3] At the same time, disasters also drive people into poverty.[4 5 6]

These countries also lost more people per disaster event: on average, more than 8,000 people died per disaster – almost 15 times the average toll in the region's high-income countries. There was also an upward progression in the number of deaths per 100,000 inhabitants: low and middle-income countries had five times more disaster deaths than high-income countries (Figure 2-3). In fact, the actual death toll in the poorest countries is probably even higher than these data suggest, since many countries lack the resources to record the number of deaths.

Figure 2-2

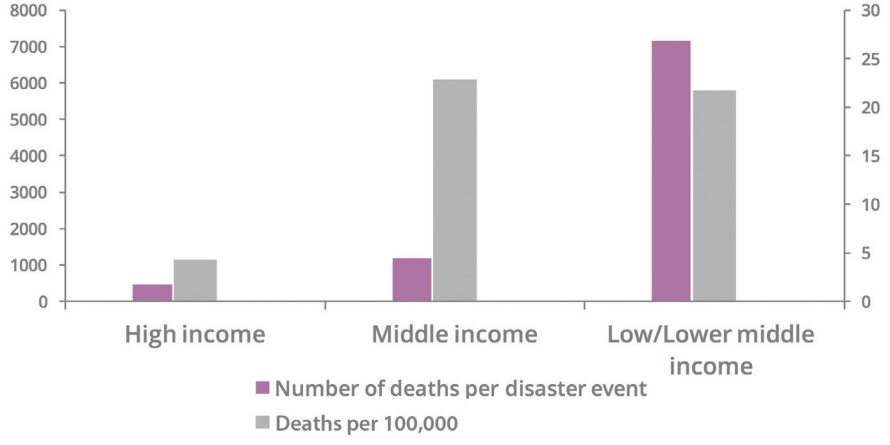
Deaths from natural hazards, by country income group, 2000–2015



Source: Based on EM-DAT. (Accessed on 4 July 2017)

Figure 2-3

Deaths per disaster event and per 100,000 inhabitants, by country income group, 2000-2015



Source: Based on EM-DAT. (Accessed on 4 July 2017).

Note: High-income countries, 3.1 billion people, middle-income 0.4 billion, low-/lower-middle income 2.7 billion.

While there are differences between rich and poor countries, the contrasts can be even more striking within countries, where the people more likely to be affected by disasters are the poorest. As illustrated in Figure 2-4 for Nepal and Pakistan, mortality from disasters is higher in the poorer districts.

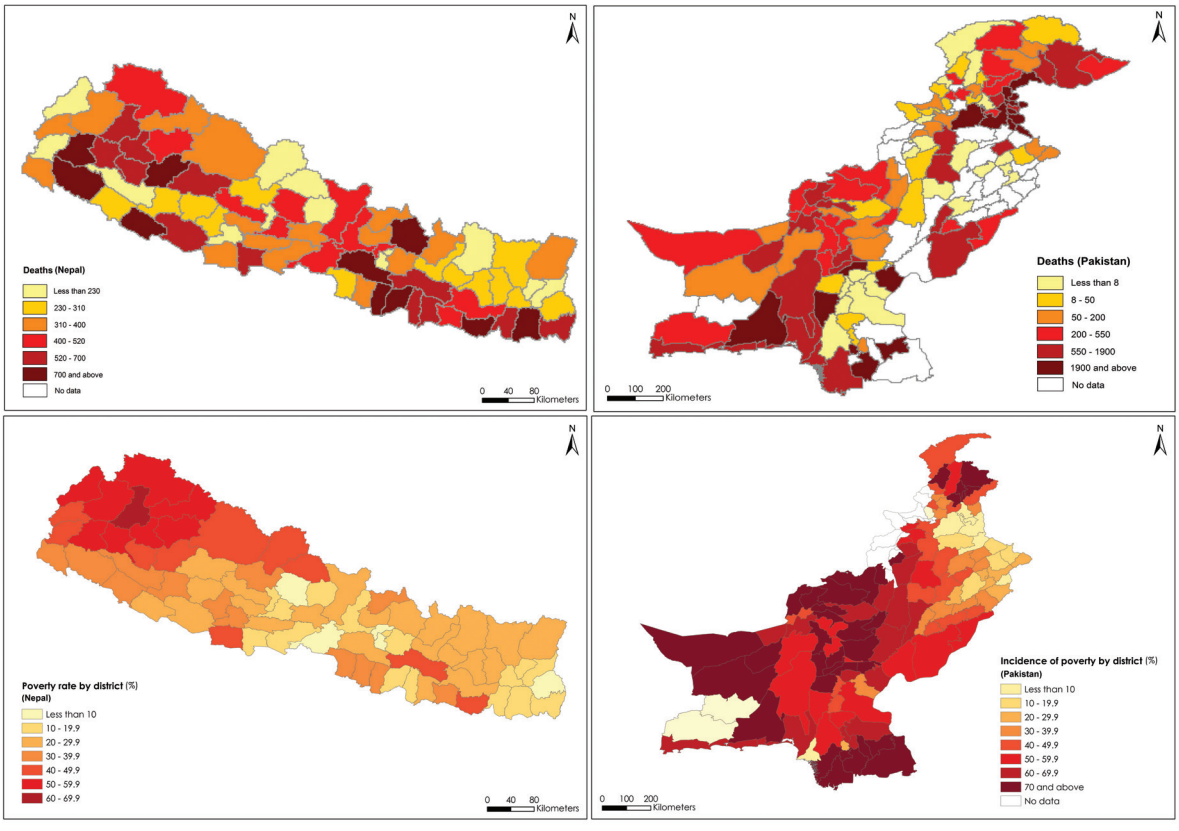
Natural disasters hit poor people harder because they live in vulnerable overexposed areas, have lower-quality assets, and in rural areas are more dependent on vulnerable agriculture and ecosystems; thus, they have less ability to cope and recover. In cities, poverty forces low-income households to occupy low-value land that may be exposed to floods, landslides and other hazards. Faced with recurring disasters, many households are often unable to break out of the poverty cycle. In addition to hitting the poorest, disasters can also cause the near poor – those living on between $1.90 and $3.10 per day – to fall into poverty. Figure 2-5 maps out the countries that have the highest concentrations of these vulnerable near poor.

Many post-disaster needs assessments have shown that disasters hit hardest at the poor and vulnerable – and can also become a tipping point for those who are living at the cusp of poverty (Figure 2-7).

Nepal earthquake 2015 – Nine of the 14 severely affected districts had human development index scores lower than the national average.

Figure 2-4

Deaths from disasters and poverty, by province, Nepal and Pakistan, 2000-2015



Source: Humanitarian Data Exchange, DesInventar, UNISDR and poverty data based on Nepal Central Bureau of Statistics, 2011; UNDP District Maps: Incidence of poverty, 2014–2015.

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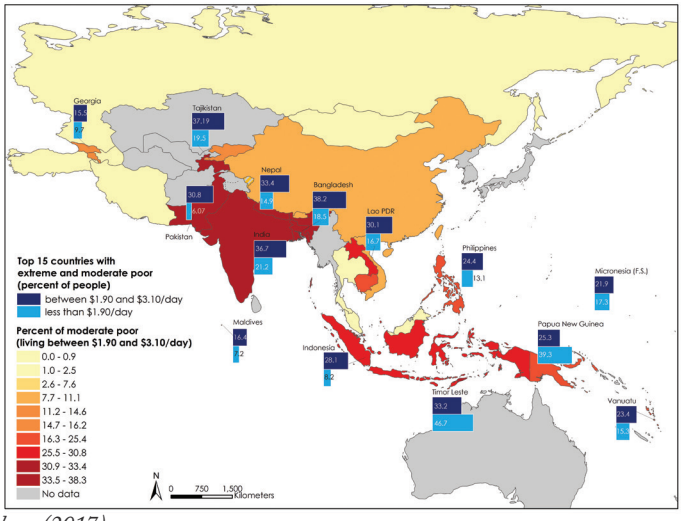
Figure 2-5

Vulnerable populations, living between $1.90 per day and $3.10 per day



Source: ESCAP statistical database (2017).

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Apart from the Kathmandu Valley, the central and western regions that were affected by earthquakes and the ensuing landslides were mostly rural and heavily dependent on agriculture. The widespread loss of livestock was a severe income shock.[7] The earthquake is estimated to have pushed an additional 750,000-900,000 Nepalese living close to the poverty line into poverty. [8]

Myanmar, cyclone Nargis, 2008– The poorest suffered extensive damage and loss of livelihoods, employment and income. Many lost income-earning opportunities for a substantial period of time – including smallholder farmers, communities dependent on small-scale inshore and off-shore fishing, and the landless poor and skilled workers. The jobs lost were largely in the informal sector such as seasonal work in agriculture, short-term jobs in community works, as well as in small-scale fishing, rice mills, fish processing, salt production, and wood cutting.

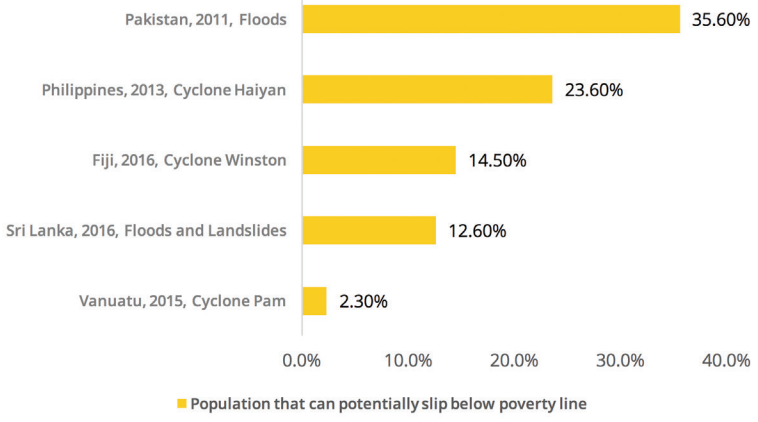
Pakistan, floods, 2011 – In the poor districts of Sindh and Baluchistan, the floods pushed many households deeper into poverty.[9] In Sindh, where a higher proportion of rural workers are land-less, the floods increased unemployment. The floods increased land salinity and degradation, reducing crop productivity. Small farmers, already under heavy debt, were unable to get new loans because they lacked collateral.[10] ESCAP estimates that around seven million of the near poor could have slipped below the poverty line.[11]

Fiji, cyclone Winston, 2016 – Hardest hit were the Northern and Eastern Divisions which had the highest poverty rates – at 48 and 40 per cent respectively. The path of the cyclone was primarily across rural areas where average household incomes are lower and housing is less robust. The poor fell deeper into poverty and many of the near poor fell below the basic needs threshold.[12] Around 14 per cent of the population could have slipped below the poverty line as a result.[13]

Philippines, typhoon Haiyan, 2013 – The typhoon hit the central Visayas region of the Philippines on 8 November 2013, with devastating effect.

Figure 2-6

Estimated percentage of people falling into poverty from selected disasters



Source: ESCAP Statistical database and country post-disaster damage assessments .

Between 6,000 and 8,000 people were killed and some 4 million were left homeless, in an area that was already suffering high levels of poverty – 40 per cent of those living in the areas affected by Haiyan lived below the poverty line before the typhoon struck.[14] Around three million people living close to the poverty line could have been pushed into poverty.[15]

Vanuatu, cyclone Pam, 2015 – Tropical cyclone Pam disproportionately impacted vulnerable populations, including the poor. Poverty and unemployment in Vanuatu are expected to worsen.[16] These groups are at risk of sliding into poverty or deeper poverty, and given their disadvantages and scant access to resources, they are unlikely to recover their former standards of living.[17] ESCAP estimates that around 4,000 people could have slipped below the poverty threshold as a result.[18]

Well-being losses to the poor

In absolute terms, the rich may lose more because they have more to lose. What matters more, however, is the proportion of income or assets lost. The same absolute loss will matter more to a poor household than a rich one and widen the disparities (Figure 2-7).

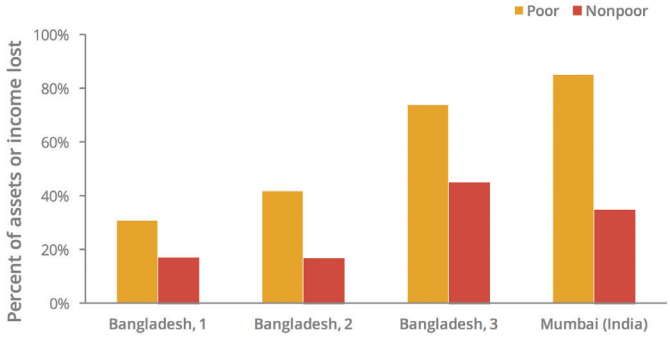
Poorer households have greater losses in well-being because they have fewer assets (which are worth more to them), their consumption is closer to subsistence levels, they cannot rely on savings to smooth disaster impacts, and their health and education are at greater risk.[21] Poor house-holds have less 'socioeconomic resilience' and are thus less able to minimize the impact of well-being losses. This resilience decreases with income.[22] In Bangladesh, for example, during and after floods, poorer households have less food available, reduce their meals and rely on less expensive food, and sell their assets at a much higher rate than their wealthier counterparts (Figure 2-8).[23]

Nutrition – In rural eastern India, in Odisha¸ for example, the prevalence of wasting and underweight were significantly higher in repeatedly flooded areas than in non-flooded areas (Figure 2-9).[24] Similarly in Nepal, poverty and child stunting have been strongly associated with floods. [25]

Education – Under pressure of poverty, families hit by disasters may take their children out of school. In Pakistan, for example, there was a significant drop in school enrolment with each progressive disaster – 2005 earthquake, and 2010 floods (Figure 2-10).

Figure 2-7

Percentage of asset or income loss by the poor and non-poor in floods

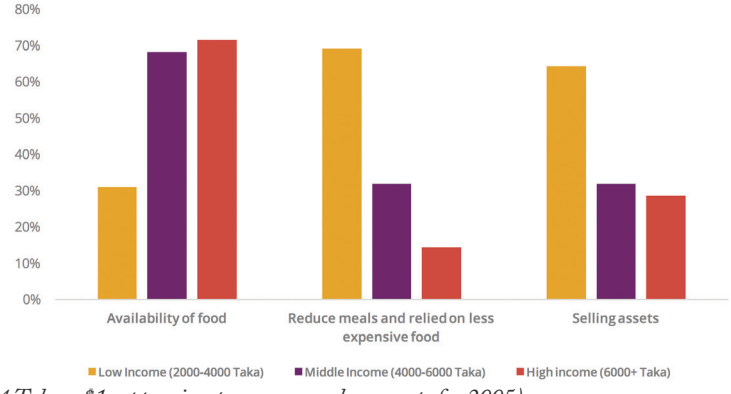


Source: World Bank (2016).

Note: Data generated by World Bank from three sources- Bangladesh 1: del Ninno et.al 2001; Bangladesh 2: Brouwer et.al. 2007; Bangladesh 3: Rabbani, Rahman, and Mainuddin 2013; Mumbai: Patankar and Parwardhan 2016 [19] [20]

Figure 2-8

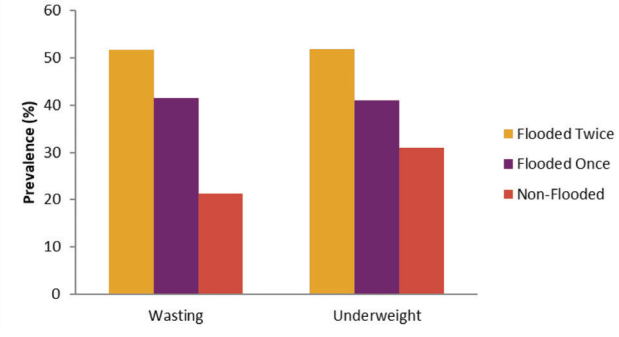
Household income level and food availability, changes in eating behaviour, and selling of assets during and after floods, Bangladesh



Source: Paul S.K. (2010). (64 Taka = $1, approximate average exchange rate for 2005).

Figure 2-9

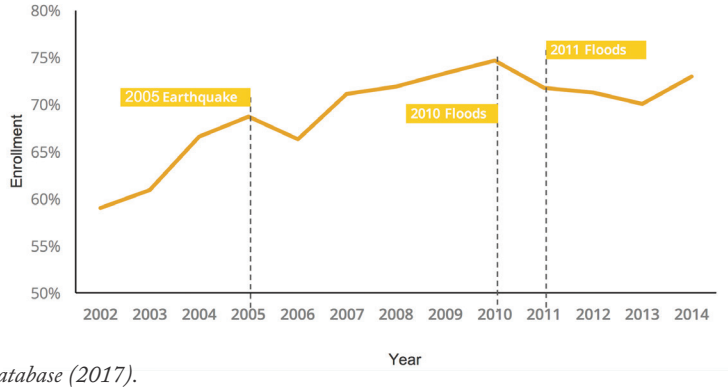
Child wasting and underweight in Jagatsinghpur district, Odisha, India



Source: Rodriguez-Llanes JM (2016).

Figure 2-10

Pakistan primary school enrolment drops following disaster



Source: ESCAP statistical database (2017).

In Sri Lanka in late 2016 and early 2017, due to a severe drought an average of 15 per cent of affected households had to reduce expenditures on education for their children to cope with income losses from floods; in Mannar district the proportion was 44 per cent and in Vavuniya it was 39 per cent. [26]

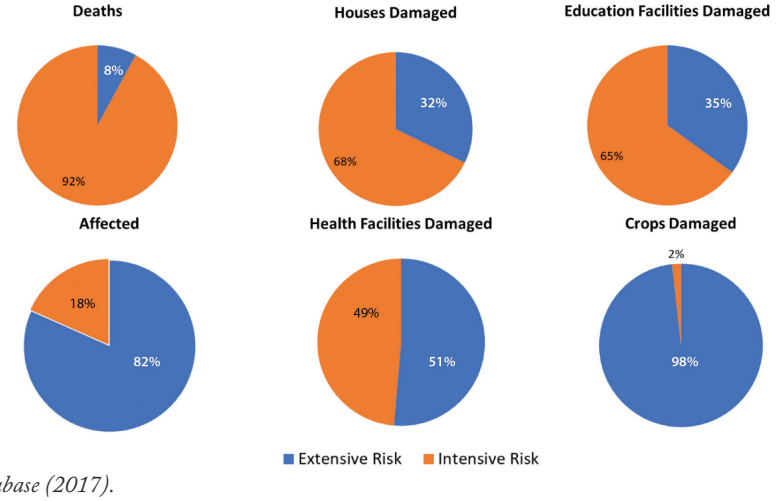
Extensive disasters

'Intensive' disasters like earthquakes and cyclones receive the most attention because they cause immediately visible damage to public assets – such as schools, health facilities and other infrastructure.[27] But the cumulative damage, particularly for the poor, is often greater for 'extensive' disasters such as droughts, persistent flooding, and small or medium-sized storms that deliver low-intensity but recurrent shocks. Sectors such as agriculture, health and education are the hardest hit by extensive disasters (Figure 2-11, Figure 2-12). Data from 18 countries in Asia and the Pacific show that while mortality rates and housing damage are higher for intensive disasters; extensive disasters make up a higher proportion of the damage in productive and social sectors. [28]

While intensive disasters attract donor attention, extensive disasters are underreported

Figure 2-11

Distribution of damage between extensive and intensive disasters, 18 Asia-Pacific countries, 2000–2013

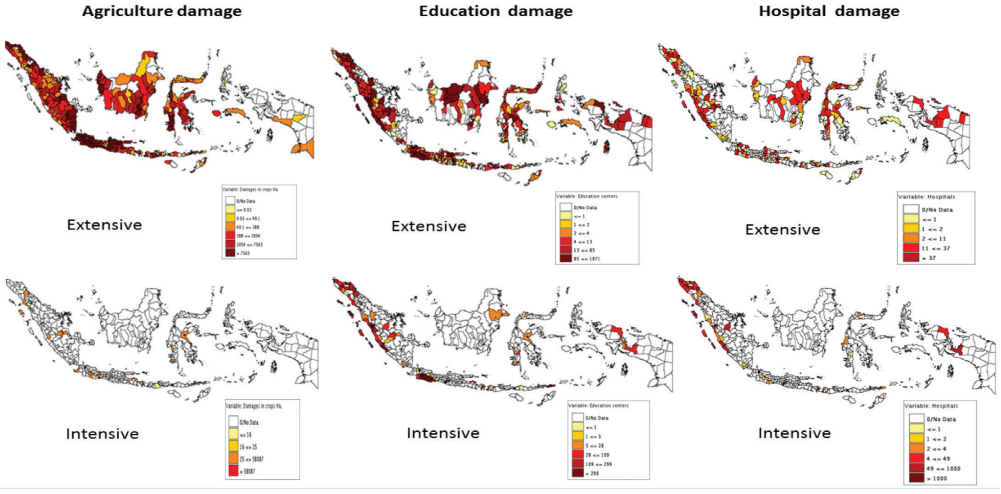


Source: DesInventar database (2017).

Note: Intensive disasters are those causing more than 30 deaths and destroying more than 600 houses.

Figure 2-12

Damage to agriculture, health, and education from extensive and intensive disasters, Indonesia 2000-2012



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and neglected. Severe storm damage to a poor household's roof can, for example, ruin harvested grains but government support is often not forthcoming because the storm was not considered a disaster. The poorest are the worst hit since their agriculture-based livelihood systems, which are already vulnerable to food insecurity, face crop failure, loss of livestock, and new patterns of pests and diseases.[29]

Cambodia, for example, experiences recurrent floods when heavy monsoon rains cause the banks of the Tonle Sap lake and the Mekong river to overflow resulting in high levels of crop damage undermining the livelihoods of farming households – and contributing to malnutrition, intergenerational transmission of poverty and widening inequalities.[30]

Similarly in Nepal, absolute poverty is closely linked with damage from two of the most common extensive disasters – flooding and drought.[31] Disruption of normal education and a lack of housing and food increased exposure to disease and imposed enormous psychological stress, adding to serious productivity and income losses.[32] Poorer women often work at home so housing losses simultaneously affect their assets, livelihoods and well-being.

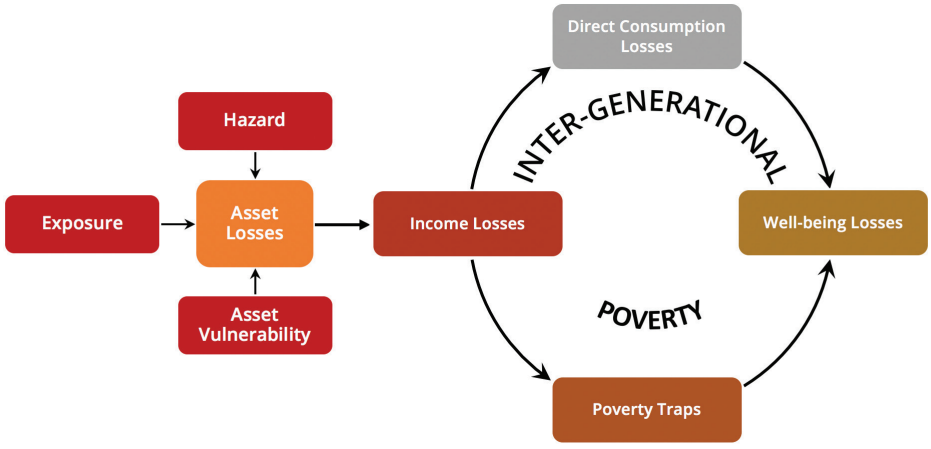
Intergenerational transmission

Poverty, like wealth, is often transmitted from one generation to the next.[33,34] This process will be sustained by disasters that deplete or destroy the assets and resources of the poor, increasing food insecurity, and eroding both parental and child health (Figure 2-13). Extensive disasters are particularly insidious. Droughts, for example, can last for years, even a decade, and lead to chronic, persistent malnutrition.

Potential pathways for intergenerational transmission are indicated in Figure 2-14. Households that lose assets because of disasters are more likely to be trapped in poverty, and less able to cope with subsequent shocks. This will also affect their children's well-being and prospects if it reduces their levels of nutrition or causes them to be withdrawn from school. This, in turn, affects their health and reduces their employment prospects and their opportunities for escaping poverty.

Figure 2-13

Intergenerational poverty: a conceptual map



Disasters widen inequality

Disasters cause disproportionately greater losses to poorer countries and people. More frequent and severe disasters will thus exacerbate inequalities. A common measure of inequality is the Gini index which ranges from 0 to 1, where 1 represents complete inequality. An analysis for 86 countries globally from 1965 to 2004 found that a natural disaster increased the Gini coefficient by 0.01 in the next year. Analysis by ESCAP among 19 countries in Asia and the Pacific suggests a similar significant relationship of 0.13, with disasters potentially widening existing inequalities (Figure 2-15) (See Appendix).

Disasters are especially likely to widen inequalities in urban areas. The region's cities already have striking disparities between rich and poor, but disasters are likely to increase these still further. Based on the UNEP/UNISDR multi-hazard risk index, 170 cities across Asia and the Pacific are located in areas of extreme risk, while 314 are in high-risk areas and 154 are in medium-risk areas. This risk emanates from tropical cyclones/typhoons, earthquakes, floods and land-slides (Figure 2-16). Because of the opportunities for trade, many of these cities have developed from ports, and these infrastructure links make coastal areas attractive even today for new economic zones (Figure 2-17).

Many cities are located in the areas where multi-hazard risks are growing rapidly. In the Asia-Pacific region by 2015-2030 it is estimated that the population in the 'extreme-risk' areas, is expected to grow more than 50 per cent in 26 cities, and by 35 to 50 per cent in 72 cities. As a result, the number of city dwellers exposed to extreme and high risks is likely to increase significantly, particularly in East and North-East Asia, South and South-West Asia, and South-East Asia.

Outside city limits, there are also risks in peri-urban areas. These are attractive for residents because they have low land and rental rates, but they also lack municipal building and development regulations and, as a result, often have unsafe buildings and inadequate infrastructure. In practice, they usually operate as extensions of cities, whose services are still called upon to respond to emergencies. These

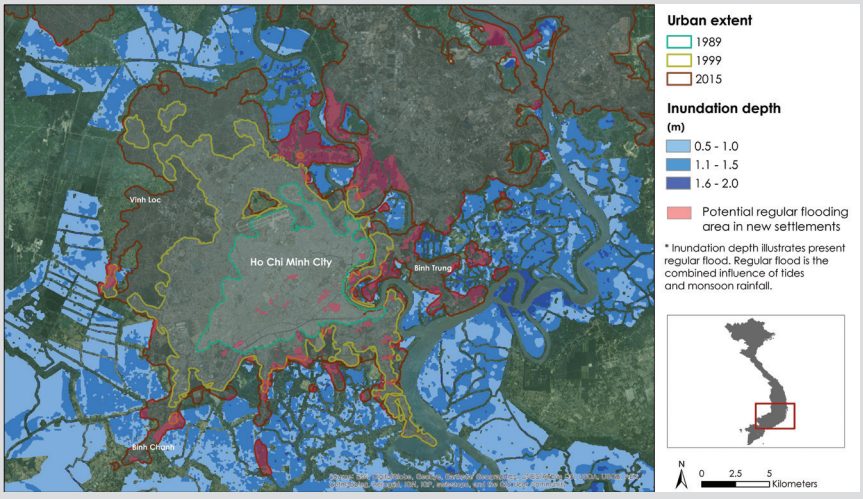
Box 2-1

Urban expansion and increased flood risk in Ho Chi Minh City, Viet Nam

The urban extent of Ho Chi Min City of Viet Nam has been increasing at a rapid rate from 8,430 hectares in 1989 to 22,015 hectares in 1999 and 99,391 hectares in 2015.[1] Currently, approximately 63 per cent of the city area is in low-lying areas, at an altitude of less than 1.5 meters above sea level.[2]

As the available space is limited to accommodate the rapidly growing urban population, residential neighbourhoods continue to develop in low-lying areas that are prone to regular flooding (defined as inundation depth of less than two metres). In 1999, only 578 hectares of built up areas were exposed to regular flooding events and by 2015, this area has expanded to around 4,242 hectares.

Potential regular flooding areas in new settlements



Source: ESCAP adapted from ICEM for regular flood levels. Available from http://www.icem.com.au/documents/MapCatalogue.pdf, and urban extent data from Atlas of Urban Expansion Available from http://www.atlasofurbanexpansion.org/

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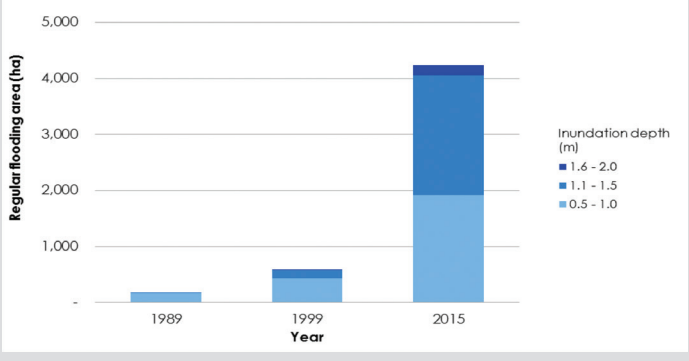
Regular flooding area in new urban settlements

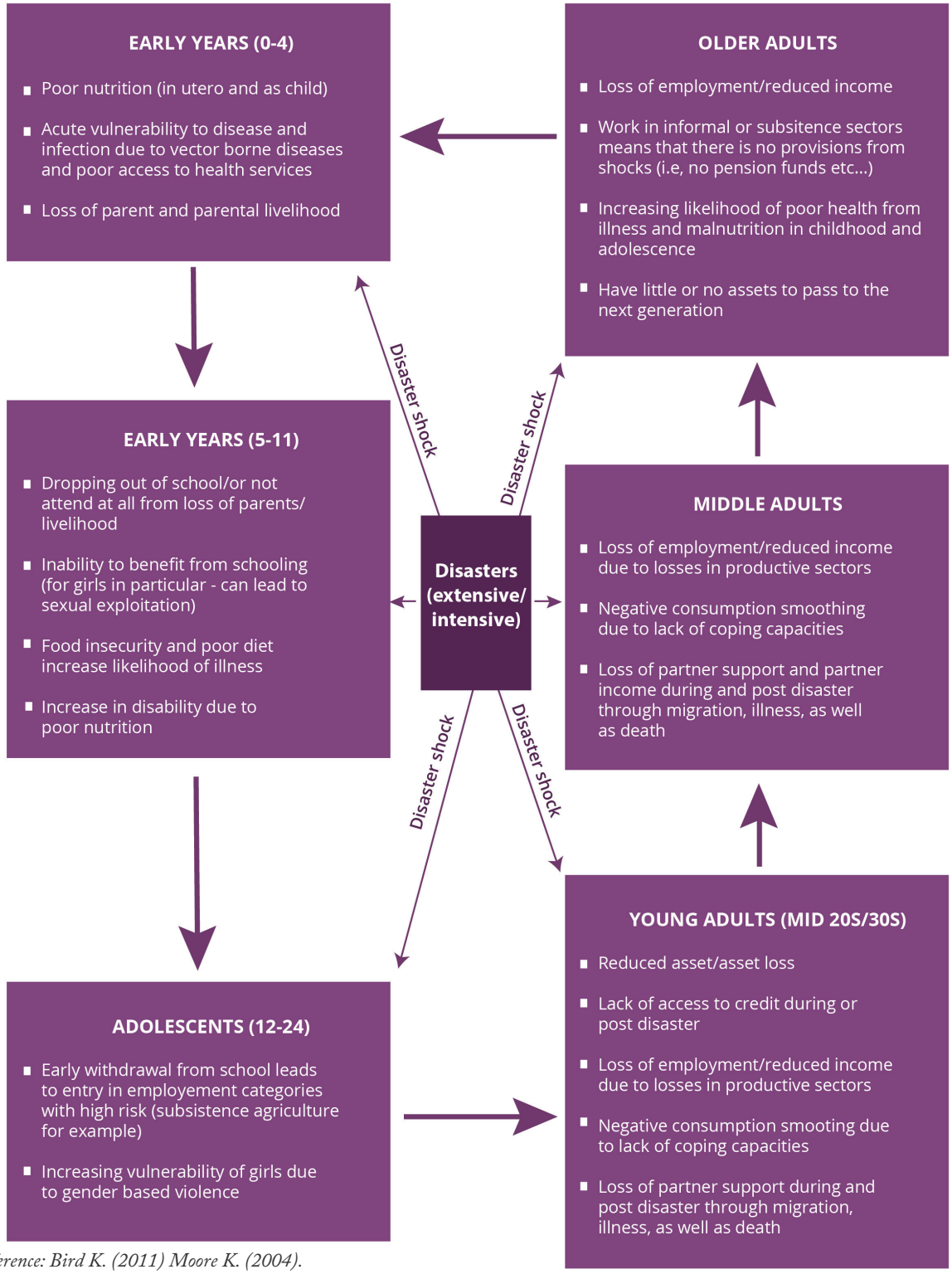


1. Angel et al., Atlas of Urban Expansion—2016 Edition, Volume 1: Areas and Densities, New York: New York University, Nairobi: UN-Habitat, and Cambridge, MA: Lincoln Institute of Land Policy, 2016.

2. Mekong Commons, Stemming the rising tide: Flooding and local lives in HCMC, 13 March 2016. Available at http://www.mekongcommons.org/stemming-rising-tide-flooding-local-lives-hcmc/ (accessed on 23 August 2017)

Figure 2-14

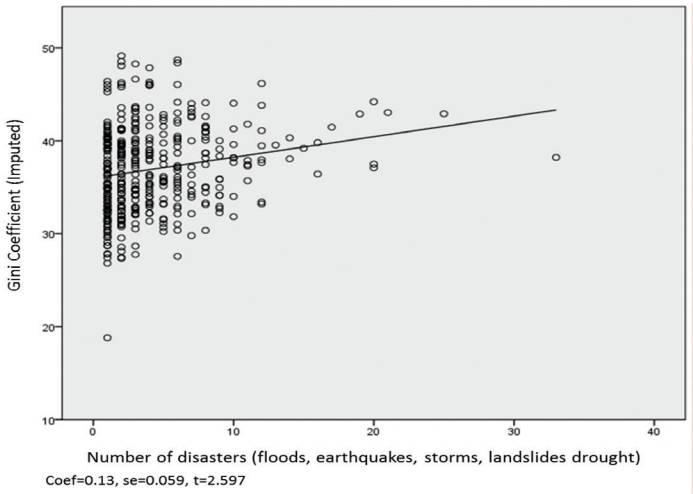
Intergenerational transmission of poverty



Reference: Bird K. (2011) Moore K. (2004).

Figure 2-15

Relationship between number of disaster occurrences and Gini coefficient in 19 selected countries in Asia and the Pacific



Source: Based on EM-DAT and World Bank Indicators data.
Note: For further explanation, see Appendix.

transitional zones between urban areas and rural zones provide critical ecosystem services that if eroded or mismanaged can heighten the risks of floods, droughts and landslides.[35] Even when peri-urban areas are formally subsumed into cities it is difficult to correct constructions or rebuild to meet planning and safety standards. In Ho Chi Minh City, for example, land and markets pushed the poor and vulnerable to settle in peri-urban areas with higher risk and exposure to floods. As a result, the area exposed to flood increased by more than 24 times between 1989 and 2015 (Box 2-1).

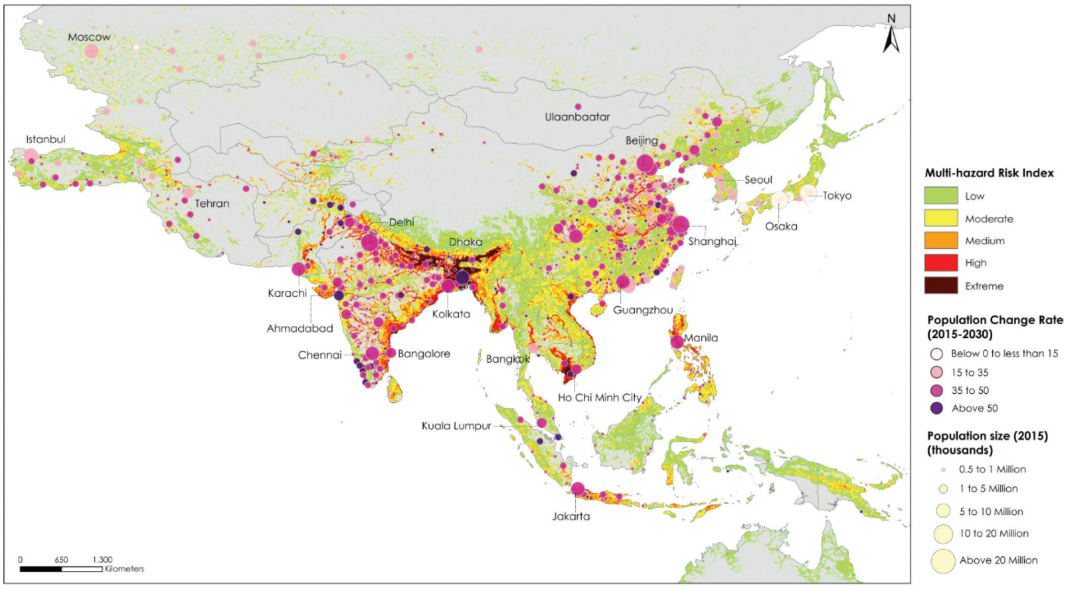
Disasters in cities and peri-urban areas are likely to exacerbate inequalities. This can be illustrated by an analysis of 57 Asia-Pacific cities. For the group of nine megacities (10 million or more people) 56 per cent of their inhabitants live in cities that have medium or high levels of in-equality and are located in extreme disaster risk areas (Figure 2-18). For the group of nine large cities (5 to 10 million people) 78 per cent of their inhabitants live in cities that have medium to extreme inequality and are located in extremely high disaster risk areas. But it is not only large cities that have poor and vulnerable populations, have high levels of in-equality and are at high risks from disasters. In the group of 23 medium-sized cities 37 per cent of inhabitants live in cities that have high inequality coupled with extreme disaster risks. This number increases to about 60 per cent of the population living in cities of 0.5-1 million.

Reducing disaster risk in cities

Urban risks and disasters are often very different from the rural events with which most governments are more familiar. And compared with those in developed countries, disasters in urban areas of developing countries tend to be more destructive and much harder to recover from.[36] This is due to poor quality development, lack of resources and political will. Disaster management is made more difficult in urban areas by the complexities in land tenure, high densities and more high-rise structures, as well as the need to support floating populations due to rapid migration.

Figure 2-16

Multi-hazard disaster risks of cities in Asia and the Pacific



Source: ESCAP based on urban data from UN-DESA (2014). World Urbanization Prospects: The 2014 Revision, CD-ROM Edition; and multi-hazard risk index from UNEP/UNISDR (2013). Global Risk Data Platform. Available at http://preview.grid.unep.ch/ (Accessed on 7 August 2017).

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Figure 2-17

Coastal cities and economic zones in China

Source: Based on "University of Texas Libraries"

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Figure 2-18

Classification of population in mega and large cities in Asia-Pacific according to disaster risk and inequality

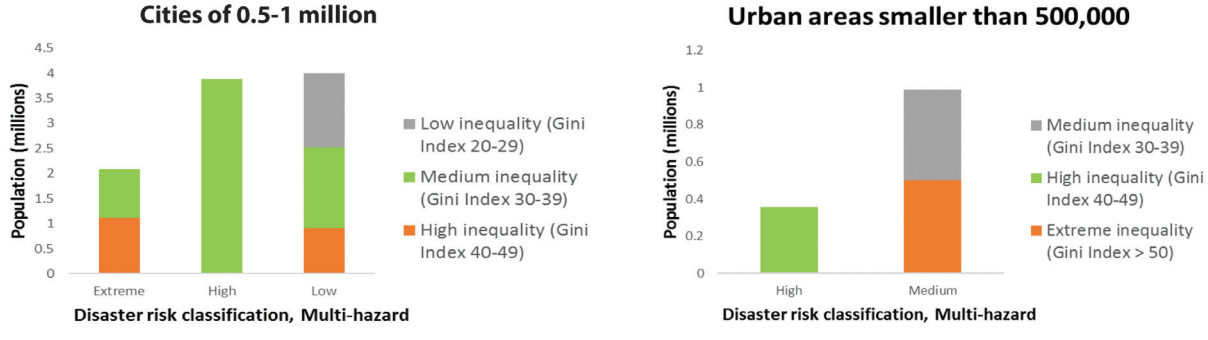
Source: Based on city Gini Index from State of World Cities 2010/2011, population data from UN-DESA, 2014, and estimated risk index for multiple hazard from UNEP and UNISDR, 2013.

Notes: Categories of risk are based on cumulated risk of cyclones, earthquakes, floods and landslides and expected annual losses per unit area]. The estimated risk index ranges from 1 (low) to 5 (extreme).

Notes: 9 Megacities of 10 million or more, Total population=140 million; 9 Large cities of 5-10 million, Total population=73 million; 23 medium sized cities of 1-5 million, Total population = 47 million

Figure 2-19

Classification of population in medium-sized and small cities in Asia-Pacific according to disaster risk and inequality



Source: ESCAP based on city Gini Index from State of World Cities 2010/2011, population data from UN-DESA, 2014, and estimated risk index for multiple hazard from UNEP and UNISDR, 2013.

Notes: Categories of risk are based on cumulated risk of cyclones, earthquakes, floods and landslides and expected annual losses per unit area]. The estimated risk index ranges from 1 (low) to 5 (extreme).

Notes: 13 cities of 0.5-1 million, Total population = 9.9 million; 3 cities smaller than 500,000, Total population = 1.3 million.

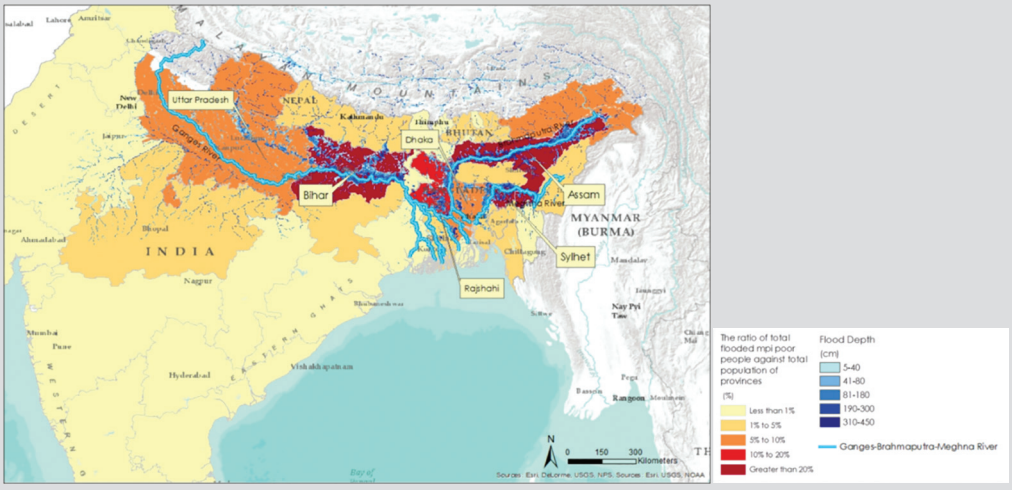
Box 2-2

Disasters and poverty in the Ganga, Brahmaputra and Meghna basin

The Ganga, Brahmaputra and Meghna basin demonstrates an amalgamation of poverty, in-equality and vulnerability to disaster. This is one of the richest basins in the world in terms of the potential of its natural resources – hydropower generation, fisheries, forestry, irrigated agriculture, navigation, environmental amenities, tourism, minerals, oil and gas. Nevertheless, three of the basin countries are among the poorest nations in the world.[45] Average GDP per capita in the basin is less than $2 per day. In India and Bangladesh, for example, national poverty rates are higher in the states and districts surrounding the Ganges basin than elsewhere in the country.[46]

The basin is perennially hit by hydro meteorological disasters. In the Indian state of Bihar, for example, there have been floods from the basin's rivers every year since 1979 (with over 20 million people affected in 1987, 2004, and 2007.[47] Around 35 million poor people in this area are exposed to flood risks.

Floods and poverty in the Ganga, Brahmaputra and Meghna basin



Source: ESCAP based on Multidimensional poverty index, ESRI, GAR PI, ESRI base map admin boundaries, and Worldpop

Disclaimer: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations; Dotted line (in grey) represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.

Much emphasis is placed on floods that affect the basin's rural poor, but it also has large urban areas with high levels of poverty and inequality and which are exposed to high flood risk. Protecting people in the basin will mean building disaster resilience into agriculture, irrigation, infrastructure, water resources management, and urban planning. Recent advances in weather forecasting, based on space applications, have enabled longer lead times of five to eight days for flood forecasts. However, these advances in science rarely reach the communities who live along these vast rivers.

Pro-poor development in the basin will also require solutions that cut across national boundaries. Countries can cooperate on data sharing, joint investments, benefit sharing, joint monitoring, and joint operations and management.

This was evident, for example, after the Nepal earthquake of 2015. The Government had to assess damage for over 40 urban centres, identify the affected populations, and work out compensation for dwellers in commonly owned high-rise buildings.[37]

While much discussion takes place around the risk posed to the urban poor, there are also serious risks for other segments of urban populations. Even the not-so-poor are living and working in buildings of suspect quality: many of modern high-rise buildings that pierce the skylines of the region's cities may not be very robust. Construction workers often fail to understand or execute building drawings, contractors and designers may have a poor understanding of building codes and regulations, and city governments often lack the capacity to enforce them. Earthquakes in India, Nepal, Indonesia, and Taiwan, Province of China, have clearly exposed such vulnerabilities.

Asia-Pacific cities have millions of people at risk, but they are also emerging as leaders for community-based disaster risk reduction, as well as for climate change mitigation and adaptation. CITYNET, for example, the regional network of local authorities for the management of human settlements, has a disaster cluster with over 35 Asia-Pacific cities. This trains city managers in disaster risk reduction and management, facilitates urban risk profiling, and disseminates best practices in disaster preparedness.[38] These efforts are reflected in the New Urban Agenda of Habitat III.[39]

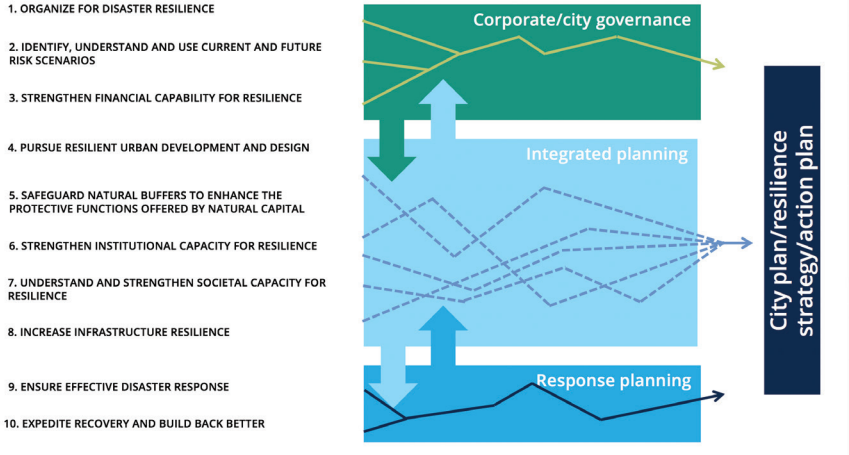
UNISDR has identified ten essentials for making cities resilient (Figure 2-20).[40]

It is also important to involve the private sector in disaster risk management. ARISE, for example, is a private sector stakeholder group, with over 140 companies and organizations, headquartered in 38 countries and active in 150, which is currently working with UNISDR to realize disaster-resilient societies.[41]

Another example is MIT's Urban Risk Lab which is working with three cities in Indonesia – Greater Jakarta, Bandung and Surabaya – as well as Chennai in India, to use social media for gathering, sorting and displaying information about flooding in real time.[42] The

Figure 2-20

Ten essentials for making cities resilient



Source: UNISDR (2017).

disaster mapping platform for Indonesia, www.petabencana.id, is based on Google maps and easily customizable for any city in the world. It uses a simple phone app through which people can log incident reports that then get collated to generate decision support data as well as useful public information. A similar platform is being piloted in India.

In recent years, city-to-city partnerships have been instrumental in sharing experiences and gaining access and knowledge to policy tools for risk-sensitive and pro-poor urban development. The partnerships include sharing strategies on strengthening institutions, risk assessments, and effective practices. Such partnerships are particularly beneficial to smaller and more remote cities to bridge technical and other knowledge gaps.[43]

Reducing poverty, inequality and disaster risks – together

Building resilience of the poor and vulnerable means ensuring that they have the wherewithal and coping capacity to survive and bounce back from disasters. This will require multi-faceted interventions to enhance their capacity 'to resist, to absorb, to accommodate and to recover'.[44] These interventions are the subject of later chapters in this report, starting from the next chapter which is concerned with agriculture and the rural poor.

ENDNOTES

1 ESCAP, 2016c.
2 Ibid.
3 Low and lower-middle income countries are Bangladesh, Bhutan, Cambodia, India, Indonesia, Lao PDR, Micronesia, Nepal, Myanmar, Pakistan, Papua New Guinea, the Philippines, Solomon Islands, Sri Lanka, Tajikistan, Timor-Leste, Tonga, Uzbekistan, Vanuatu, and Viet Nam.
4 Hallegatte et al., 2016.
5 Shepherd et al., 2013.
6 CRED and UNISDR, 2016.
7 Government of Nepal, NPC, 2015a.
8 Ibid.
9 Government of Pakistan, ADB & World Bank, 2011.
10 Ibid.
11 Using the same methodology as Government of Nepal, NPC, 2015a & 2015b.
12 Government of Fiji, 2016.
13 Using the same methodology as Government of Nepal, NPC, 2015a & 2015b.
14 UNICEF, 2014.
15 Using the same methodology as Government of Nepal, NPC, 2015a & 2015b.
16 Vanuatu Daily Post, 2015.
17 Ibid.
18 Using the same methodology as Government of Nepal, NPC, 2015a & 2015b.
19 Brouwer et al., 2007.
20 Patankar et.al., 2016.
21 Ibid.
22 Hallegatte et al., 2016.
23 Paul, 2010.
24 Rodriguez-Llanes, 2016.
25 Gaire et al., 2016.
26 Government of Sri Lanka & WFP, 2017.
27 UNISDR, 2015b.
28 The variables used to define the threshold between intensive and extensive disaster losses are mortality and housing destruction. Statistically, the threshold is fixed at: Mortality: less than 30 people killed (extensive); 30 or more killed (intensive); or Housing destruction: less than 600 houses destroyed (extensive); 600 or more houses destroyed (intensive). This threshold has proved robust even as the universe of national disaster databases continues to grow (UNISDR, 2015b).
29 FAO, 2008.
30 Phuong et al., 2015.
31 Ibid.
32 Karna, 2017.
33 Kabeer, et al. 2009.
34 Bird, 2011.
35 ACCCRN, n.d.
36 UNISDR, 2015c.
37 Government of Nepal, NPC, 2015a.
38 CITYNET, 2017.
39 UN, 2017.
40 UNISDR, 2017.
41 UNISDR, ARISE, 2017.
42 MIT, Urban Risk Lab, 2017.
43 ESCAP, 2014.
44 UNISDR, 2009.
45 Dinar et al., 2007.
46 World Bank, 2015.
47 Ibid.