CHAPTER 3

Investing to outpace disaster risk

The previous chapter showed that disasters slow down any progress that is made in reducing poverty and inequality. This is not inevitable. Governments can break this link by implementing a comprehensive portfolio of sectoral investments and policies. This will require additional finance, but it will also deliver co-benefits, through better education, health, social and infrastructure services, higher agricultural production and incomes. It will also lead to better results for the many disaster risk reduction interventions already underway in the region which will help to break the cycle between disasters, poverty, inequality and disempowerment.

The previous chapter revealed that those left behind in multi-hazard areas belong to the bottom 20 per cent of the wealth distribution, and are likely to be farmers who lack access to education and medical care, and women who do not have the power to make decisions or own property. Chapter 2 also highlighted the vulnerability of key critical infrastructure, within the education, housing and health sectors. Thus, for the groups likely to be left behind, these are the sectors that matter the most. This chapter demonstrates how sectoral investments can be adapted to deliver disaster risk reduction (DRR) for those left behind. If these strategies are to work, Governments will need to eliminate the barriers faced by those left behind in accessing land, early warning systems, finance, and decision-making structures.

The actions proposed in this chapter are transformative; they require a shift in the focus of disaster risk reduction from addressing only disaster impacts to addressing the fundamental drivers of vulnerability that make people susceptible to the impacts of disasters and climate change.

Investing more

Investment scenarios

This chapter presents the results of computable general equilibrium modelling (CGE) quantifying the relationship between poverty, inequality and disasters. For an explanation of how the model works, see Annex 3.1. Eleven scenarios were used to explore how the percentages of national populations living in poverty (at the $1.90, $3.20 and $5.50 a day thresholds), and the Gini coefficient, would potentially change over 2016–2030, depending on the levels of economic growth, disaster risk and sectoral investments. Modelling was conducted for 26 countries for which sufficient information is available. Collectively, these account for 90 per cent of the region's population.

A. Growth
B. Growth + investment in social protection
C. Growth + investment in education
D. Growth + investment in health
E. Growth + investment in infrastructure
F. Growth + disaster risk
G. Growth + disaster risk + investment in social protection
H. Growth + disaster risk + investment in education
I. Growth + disaster risk + investment in health
J. Growth + disaster risk + investment in infrastructure
K. Growth + disaster risk + investment in all four key sectors

Growth in each country is assumed, in the model, to be the average Gross Domestic Product (GDP) growth rate of the last five years. Between 2016 to 2030, in scenario A, this is projected to reduce the average percentage of the national populations living in extreme poverty ($1.90 a day) from 6.3 per cent to 2.4 per cent, and the average Gini index score from 35.45 to 34.72. In scenarios B to E, further

improvements are achieved by investing in social sectors and infrastructure in line with international norms. Scenarios B, C and D include investments in social sectors at the level of current global averages for public expenditure as a percentage of GDP. These are 11 per cent for social protection; 5 per cent for education; and 4 per cent for health. Scenario E includes investments in infrastructure at 2 per cent of GDP. Under each scenario, almost all countries eradicate extreme poverty at the $1.90 threshold, and at the $3.20 threshold reduce poverty to less than 30 per cent.

Impacts of disaster risk

These results do not hold when the model incorporates the potential impact of disasters, which will undermine any progress in human development. In scenario A, the average percentage of the national populations living in extreme poverty falls to 2.4 per cent, but in scenario F, it only falls to 3.6 per cent. There are comparable differences for the higher poverty thresholds. Additionally, while in scenario A the Gini coefficient falls, in Scenario F it rises to 37.15.

The analysis also highlights the 'high-impact' countries, namely Bangladesh, India, Lao People's Democratic Republic, Nepal, and Papua New Guinea, which have the largest differences between scenarios A and F; more than three percentage points in the number of people living under $1.90 a day in 2030. The 'moderate-impact' countries where the increase is between one and three percentage points are Indonesia, Myanmar, Pakistan, Philippines and Timor-Leste. 'Low-impact' countries, where the increase is less than one percentage point, are Armenia, Azerbaijan, Cambodia, China, Fiji, Georgia, the Islamic Republic of Iran, Kyrgyzstan, Mongolia, Sri Lanka, Tajikistan, Turkey, and Viet Nam. Even for most low-impact countries, the poverty level in 2030 is higher under scenario F than scenario A. Thus, disaster risk is expected to undermine the ability of economic growth to reduce poverty for most of the 26 countries. To protect development gains and eradicate poverty countries across the region must address disaster risk.

Countries for which Scenario F results in a Gini coefficient score in 2030 at least 2.5 points higher than for scenario A are Cambodia, China, Georgia, Indonesia, the Islamic Republic of Iran, Lao People's Democratic Republic, Malaysia, Myanmar, Papua New Guinea, Philippines, Sri Lanka, Thailand and Turkey. Countries for which the increase is between 1.0 and 2.5 points are Armenia, Azerbaijan, Bangladesh, Fiji, India, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Tajikistan, Timor-Leste and Viet Nam. No countries see an increase of below one point.

These results show that disasters erode development in all subregions, as well as in low-, middle- and high-income countries. To meet the Sustainable Development Goals (SDGs), all countries will therefore need to engage in disaster risk reduction.

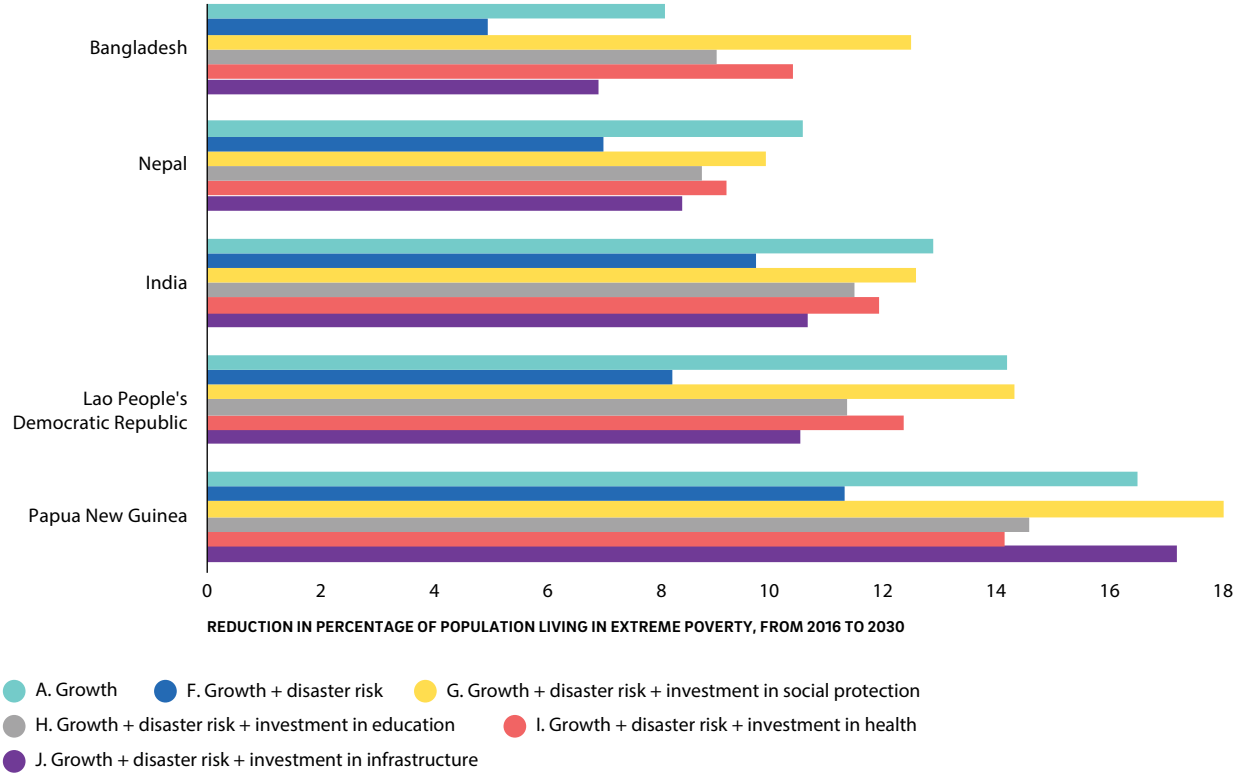
Reducing poverty and inequality through investments in key sectors

Scenarios G to J incorporate projected economic growth, disaster risk and investments in each sector. Figures 3-1 and 3-2 show the resulting changes in levels of extreme poverty from 2016 to 2030, for each of these scenarios, compared to scenarios A and F (growth, and growth with disaster risk). The results are displayed separately for high and medium impact countries so that different scales can be displayed. They show that for each country, growth will reduce poverty compared to 2016, this will be undermined by disasters, but poverty can be reduced again by investing in key sectors. The greatest benefits result from investment in social protection. This echoes earlier ESCAP reports which call for increased investment in social protection to ensure that nobody is left behind.[73]

Figures 3-1 and 3-2 demonstrate that the projected economic growth (scenario A) is expected to reduce poverty, but that these reductions are lower when disaster risk is taken into account (scenario F). Nevertheless, investments in each sector can mitigate this impact of disasters, and deliver higher reductions in poverty than scenario F.

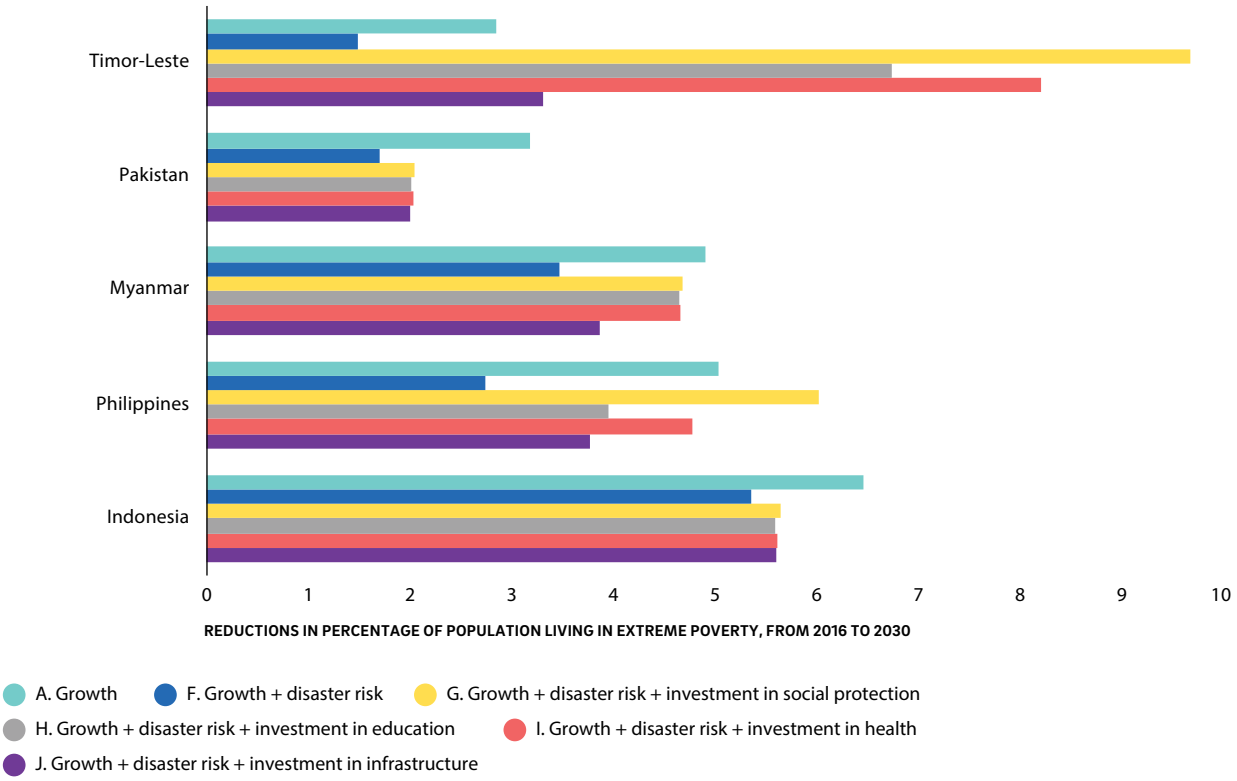
Translating these percentages into population numbers reveals how many people will be lifted out of poverty, and how many will be left behind. Across the 26 countries, approximately 272 million people were living in extreme poverty in 2016. Economic growth between 2016 and 2030 is expected to lift 220 million people out of extreme poverty by 2030. This will still leave 52 million people in extreme poverty, but incorporating disaster risk raises the figure substantially to 119 million (Figure 3-3). However, increasing investments in the social sectors so as to reach global averages would bring this number down: through social protection to 53 million; through health to 69 million; and through

FIGURE 3-1 Impact of investments on poverty levels, 2016–2030, high disaster impact countries



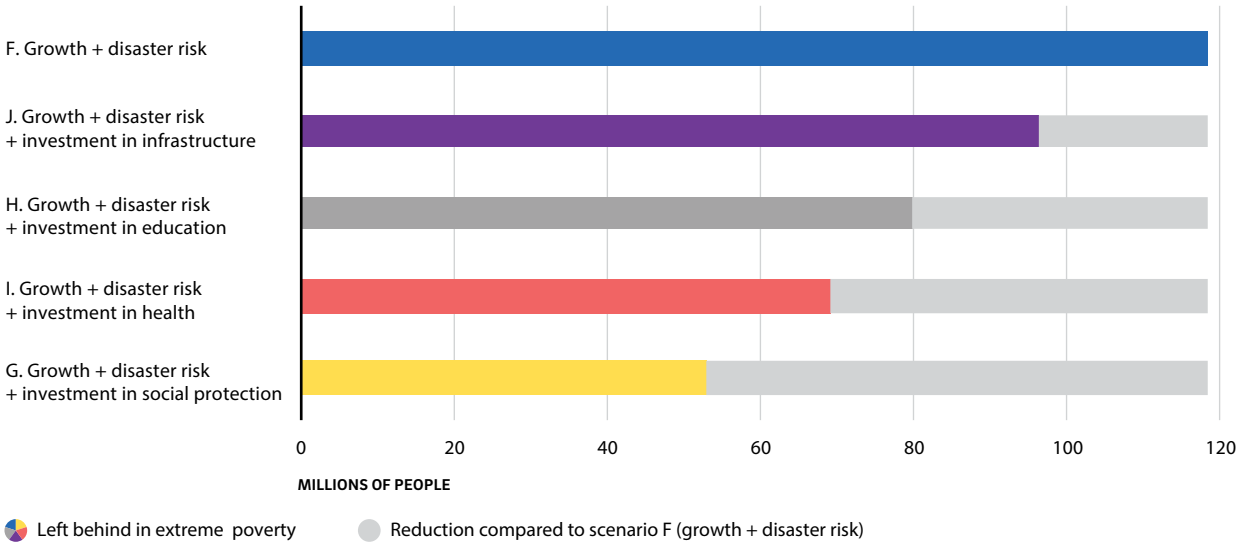
Source: ESCAP calculations based on CGE model simulation.

FIGURE 3-2 Impact of investments on poverty levels, 2016–2030, moderate disaster impact countries



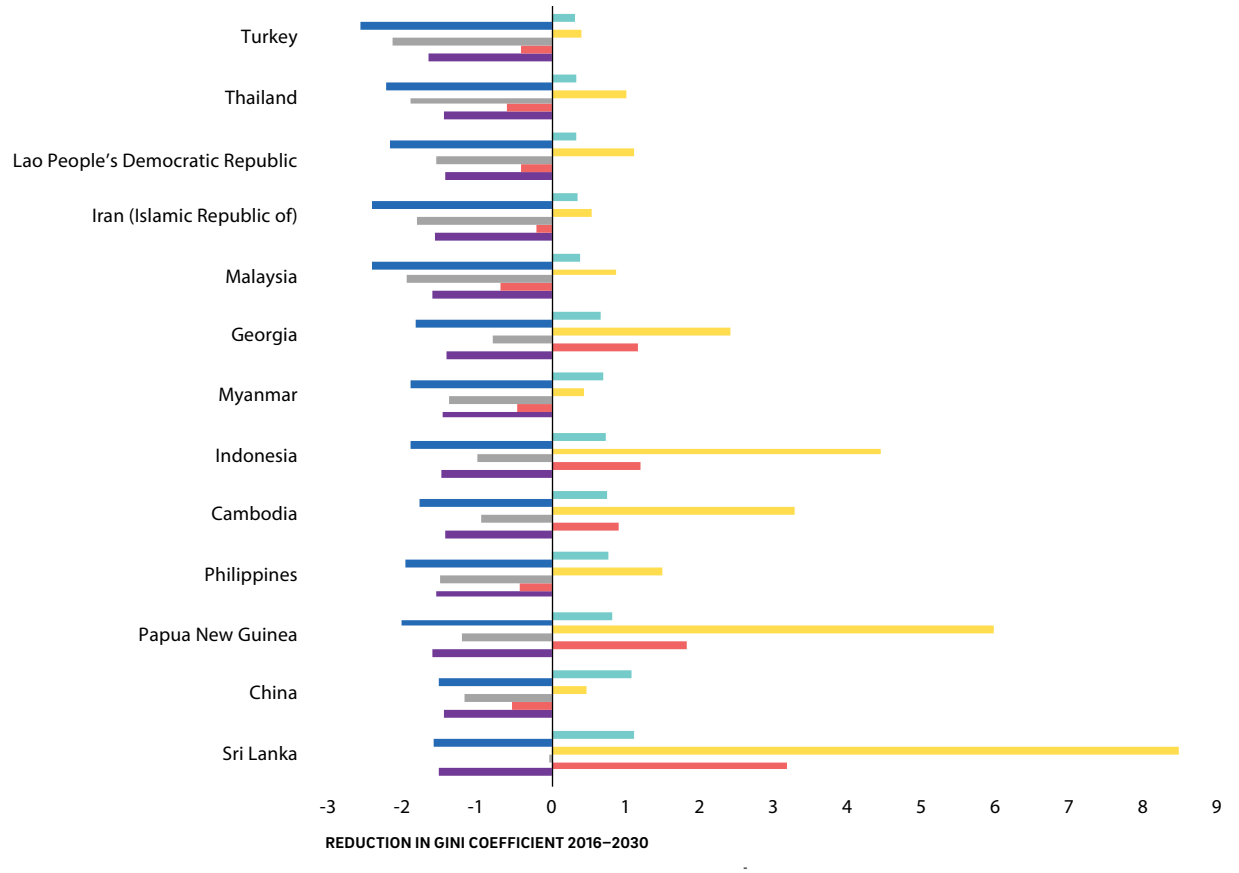
Source: ESCAP calculations based on CGE model simulation.
Note: Growth refers to a business as usual scenario, calculated based on the average GDP growth rate of the latest 5 years, in each country.

FIGURE 3-3 Projected number of people living in extreme poverty in 2030, with disaster risk



Source: ESCAP calculations based on CGE model simulation.

FIGURE 3-4 Impact of investments on inequality, 2016–2030, for high disaster impact countries



Source: ESCAP calculations based on CGE model simulation.
Note: A positive value corresponds to a reduction in the Gini coefficient and therefore a reduction in inequality, whereas the inverse is true for negative values.

education to 80 million. Furthermore, increasing expenditure on infrastructure to reach at least 2 per cent of GDP would bring this number down to 96 million.

Figure 3-3 demonstrates that, even with disaster risk, the number of people left behind in extreme poverty can be reduced by investing in any of the key sectors. The final scenario, K, incorporates investments in all four sectors. Here, extreme poverty is eradicated by 2030 in all countries except Timor-Leste and Papua New Guinea, which will require further investment. For further details, see Annex 3-2. This shows individual results for the 26 countries in the CGE model, for scenarios A, F and K, under the three poverty thresholds ($1.90, $3,20 and $5.50 a day).

These investments would also reduce income inequality as reflected by the Gini coefficient. Whilst inequality still increases within many countries from 2016 to 2030 under scenarios G-J, the increases are less than in scenario F. Furthermore, the scenarios result in reductions in inequality in particular countries. Figure 3-4 compares scenarios A, F and G-J for the 13 countries in which incorporating disaster risk has the highest impact on inequality. Scenario F results in a Gini Coefficient score at least 2.5 points higher than scenario A for each of these countries.

Figure 3-4 demonstrates that growth is expected to deliver small reductions in inequality, but disaster risk will increase inequality. For all 13 countries, inequality in 2030 is highest under F. However, the impact of disasters on inequality can be mitigated by investing in any of the 4 sectors. Results are most impressive for investments in social protection.

The need to invest more

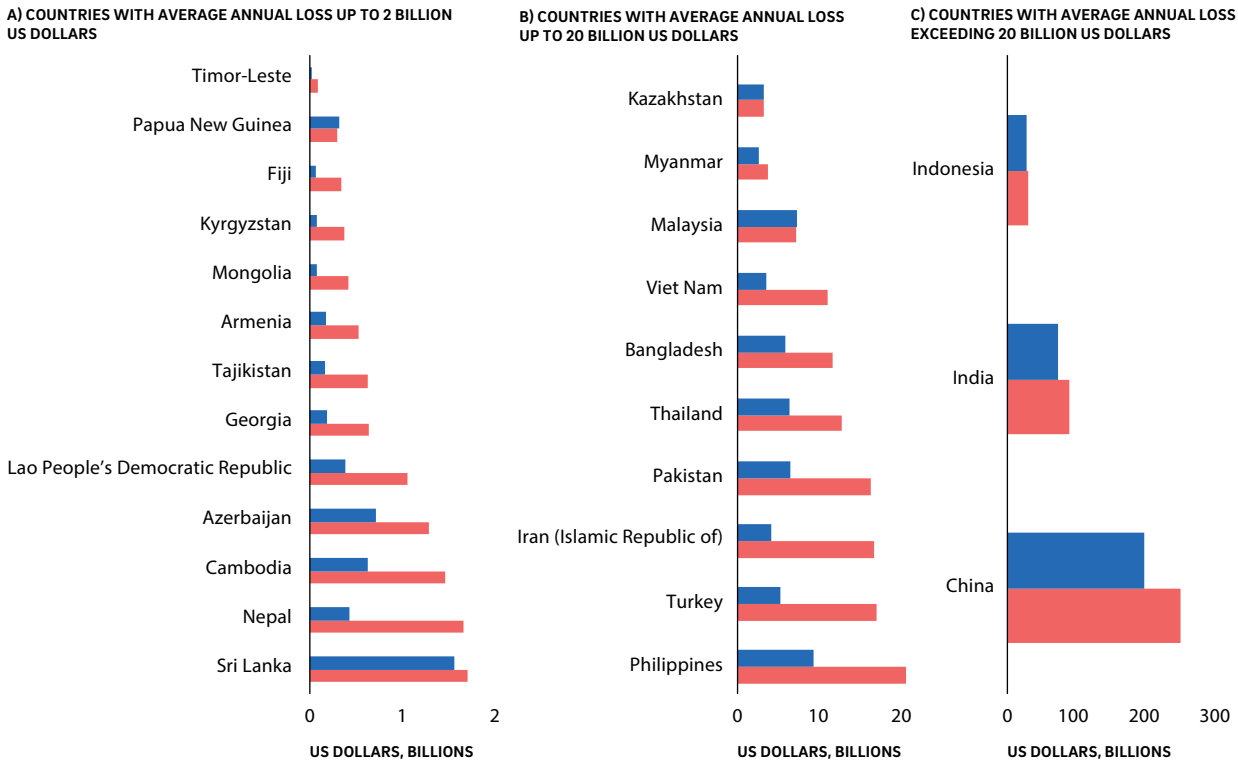
The overall message from the CGE modelling is that countries must invest more in key sectors in order to prevent disasters from reducing development gains. Projected rates of economic growth will not be sufficient to eradicate poverty or reduce inequality, given the levels of disaster risk. However, Governments can break the link between disasters, poverty and inequality by increasing investments in key sectors. This message reinforces the conclusion of the 2018 Social Outlook for Asia and the Pacific, which used similar CGE modelling to demonstrate that increasing investments in social policy provides an opportunity to lift people out of poverty.[74] To date, the region is investing less than global averages, and needs to catch up. The call to invest more in key policy areas is also in line with the 2019 Economic and Social Survey, which demonstrates that the region needs to pursue ambitions beyond economic growth.[75] A clear message is therefore emerging across the region; countries must invest more in people. This is particularly urgent for countries that have invested at rates lower than global averages from 2016 to 2019, and which therefore need to catch up in the next three to four years and continue at the level of global averages for the projected benefits to accrue.

Increasing investments will require significant additional finance. Whilst this is a daunting challenge, the additional amounts are still small compared to the damage and losses already sustained by countries in the region due to disasters. Increasing investments in social policy and infrastructure therefore offers a proactive and cost-effective approach to breaking the link between disasters and poverty. Figure 3-5 demonstrates how the figures measure up if countries meet global average investments in the social sectors, and 2 per cent of GDP in infrastructure. The average additional investment required per year to meet these levels, over the period 2016–2030, is compared to the Average Annual Loss (AAL), for each of the 26 countries.

Figure 3-5 demonstrates that the additional investments required per year are lower than AAL in 24 out of 26 countries. For 16 out of 26 countries, the additional investment required is even less than 50 per cent of the AAL. Moreover, the additional investments are less than the damage and losses sustained in major disasters. In Nepal, for example, the average additional investment required per year is $430 million, which is just 6 per cent of losses incurred due to the 2015 earthquake alone ($7 billion).[76] In Thailand, the average additional investment required throughout 2016 to 2030 is $6 billion, which is just 13 per cent of losses incurred due to the 2011 floods ($47 billion).[77]

The additional investments will also deliver benefits that cannot be captured only by comparing to disaster damage and losses. Improvements in social protection, health and education services, as well as in infrastructure, will improve the lives of everybody in society. Additional financing will also likely result in further gains than shown for individual spending scenarios, due to synergies between the sectors. Governments can maximize these synergies by investing more across multiple sectors simultaneously. Whilst additional financing presents a significant challenge, in many countries it will still

FIGURE 3-5 Average annual loss compared to annual additional investment to meet international norms



Source: ESCAP calculations based on CGE model and AAL probabilistic risk assessment.
Note: Additional investment figures refer to the difference between projected average annual investment if investment in each sector, from 2016–2030, continues at the same percentage of GDP as in 2016, and average annual investment required over 2016–2030, if investments in each sector meet international norms.

be cost effective to at least meet global averages, given that this will cost less than the impacts of disasters and will yield additional benefits.

Investing better

Governments can also do more to address disaster risk, poverty and inequality by investing better. The CGE modelling assumes that investments are 100 per cent efficient, with no leakages. Improving the quality of sectoral investments is therefore critical to ensuring that investing more will deliver the projected reductions in poverty and inequality.

Investing better must be achieved through a coherent approach. Governments should address all vulnerabilities through a comprehensive portfolio of sectoral investments combined with climate change action and disaster risk reduction. Policies that work for the general population may not work for the poor, near-poor and most vulnerable groups. Interventions must therefore be tailored to reach these groups. For example, in the case of small shocks, most households will be resilient if they are supported by basic social protection and are able to diversify their livelihoods. Larger shocks, however, will demand solutions that differ depending on the household. Wealthier households can access saving, credit and market insurance, while poorer households, who do not have these options, will need social insurance and scaled-up safety nets — financed by government reserve funds and insurance, and international aid.[78]

This section will present many ways in which investments in the key policy areas of education, social protection, health and infrastructure can be tailored to ensure that they strengthen disaster resilience for the poorest and most vulnerable groups. Similarly, it will show how to reach the same groups through investments in traditional entry points for DRR such as agriculture, livelihoods and land use planning.

Education

The CGE modelling shows that under a disaster risk scenario, investing 5 per cent of GDP in education will reduce the number of people left behind in poverty in 2030 from 119 million to 80 million. This reinforces evidence from across the region which indicates that investing in education offers an opportunity to strengthen disaster resilience throughout society. Investing in education is therefore a key entry point for breaking the link between disasters and poverty. This is particularly true for the most vulnerable groups, but it has to be inclusive.

Disasters disrupt educational continuity where school infrastructure is damaged, or when schools are used as emergency shelters, or students are injured or removed from school by parents who feel they cannot afford to keep them there.[79] Furthermore, many children have died from the collapse of school buildings following earthquakes, as in Sichuan in 2008, Gujarat in 2001 and Kashmir in 2005.[80]

Conversely, investments in school resilience can protect education and save children's lives. The benefits of preparedness were demonstrated by the 'Kamaishi miracle' in the Great East Japan Earthquake of 2011. The 2,900 schoolchildren in the city of Kamaishi, were protected by earthquake-resistant buildings and then evacuated to higher ground. Of the 1,000 casualties, only five were school children, who were not at school that day. This success follows the introduction in 2005 of disaster risk management education programmes which built on a local tradition of 'tendenko', meaning to evacuate without first searching for relatives or friends.[81]

Successful interventions have also been implemented on much larger scales. For example, many Governments have mobilized the political will after a disaster to invest in stronger school buildings. In 2001, the collapse of 11,600 schools during the Gujarat earthquake highlighted the vulnerability of Indian schools. In 2005, the Government of Uttar Pradesh passed the Disaster Management Act, mandating that all existing school buildings be made seismically safe. As a result, 6,844 new school buildings were redesigned within four months to incorporate earthquake resistance. In this case, strong governmental will at local and state levels, further strengthened by the impacts of a previous disaster, facilitated an extensive and rapid overhaul of school safety.[82] However, Governments across the region cannot wait for a disaster before they invest in school safety. There is a tendency for investments in school safety to be donor driven and only in response to disaster. Governments must look beyond reconstruction to ensure that funding is also available for ongoing maintenance, and to enforce compliance with resilient construction standards.

In some countries, education has been used to promote DRR, through comprehensive reform of national school curriculums to incorporate disaster preparedness. This has been demonstrated in the Russian Federation. The national curriculum stipulates the minimum amount of time that pupils should spend on risk education as well as compulsory topics that are relevant across the country. Turkey has also used education reform to promote disaster education at a large scale. A new curriculum features DRR as one of eight cross-cutting issues in all primary school subjects. This focus on risk was facilitated by two years of teacher training and the introduction of 15,000 school-based disaster awareness instructors. 5.9 million students have been reached as a result. These investments in training were possible due to sustained funding and political commitment at all levels.[83]

Large-scale interventions for DRR through education can be supported by integrating DRR into the education ministry. The Philippines, for example, has established a dedicated disaster risk reduction and management office within the education department. Its staff work in the central, regional and divisional offices of the department, ensuring that DRR is part of its annual planning and budgeting. Similar coherence between DRR and other ministries would allow countries to ensure that investments in the social sectors deliver disaster resilience.

BENEFITS TO THE WHOLE OF SOCIETY

Strengthening school safety, and delivering disaster preparedness through schools, reduces the vulnerability of school children. There is also growing evidence that children transmit disaster preparedness learnt in school to family members. This is particularly valuable in poorer households, providing a pathway to reach many vulnerable people.[84]

Governments can also extend school-based DRR in order to reach the wider community, including adults who have missed out on education. In the Islamic Republic of Iran, the Safe Schools — Resilient Communities programme implemented by the Ministry of Education and the International Institute of Earthquake Engineering and Seismology since 2015,

BOX 3-1 Identifying new possibilities for investments in DRR

In many countries, the DRR budget is part of disaster risk management, alongside preparedness, response and recovery. Some Governments have also created dedicated or special funds, and some funds might also come from international assistance. But, by and large, donors give much more for emergency response, reconstruction and rehabilitation, seeing DRR as a low priority.[a]

Increasing government expenditure on social policies and public services is very often financed by higher taxation which may decrease households' disposable income and impact inequalities. This has to be designed very carefully to prevent counter-productive consequences on inequalities.[b] Progressive tax policies are indeed central to realizing the benefits of the investments as described in this chapter.[c]

The solutions presented in this chapter requires a substantial broadening in the way Governments traditionally think about potential sources of financing for DRR. ESCAP (2018) calculations show that in many countries in the Asia-Pacific region, there is room for pursuing an expansionary fiscal stance without undermining fiscal sustainability so long as the deficit spending is used for sustainable development, such as enhancing human capacities. It may also be possible to redirect funds: Indonesia, Mongolia and Thailand have all reprioritized finance away from military expenditures and energy subsidies towards critical areas like education, health and social protection.[d]

Second, Governments can tap more funds from the private sector, by collaborating with Small and Medium Enterprises (SMEs), national companies, Multi-National Corporations (MNCs) and the investor community. At present, most work is with multi-national corporations and other large players who have sufficient capacity and can take on sizeable concessional financing arrangements. Furthermore, most of this support goes for the built environment or manufacturing industries but less so for agriculture.[e] There is scope for dealing with other parts of the private sector and for investing in sectors and locations that the private sector does not normally consider viable.

Third, countries can consider new and emerging sources of funding, such as the Green Climate Fund. Another option is blended finance, which combines financing from various public and private, domestic and international sources.[f] Least Developed Countries (LDCs), which the private sector considers riskier, find it more difficult to attract investment. Research is currently ongoing on overcoming barriers to implementing blended finance in these countries.[g]

Private sector funds must be deployed carefully. Decision makers must not allow private sector interests to overshadow the interests of those at risk of being left behind.

a Jan Kellet, A. Caravani and F. Pichon (2014).
b Sandra Baquie, Columbia University, Peer review comments (April 2019).
c In general, progressive tax policies are central to fostering a fairer distribution of income and wealth. In OECD countries, for instance, tax and transfers together bring down overall income inequality by more than a third, on average. This is a broad topic and is beyond the scope of this chapter. Readers are referred to Oxfam International and ESCAP (2017).
d ESCAP (2018c).
e PwC (2013).
f United Nations Capital Development Fund (UNCDF) (2019).
g Blended finance has been proposed as a solution for leveraging private capital for SDG related investments. The upcoming UNCDF report entitled 'Blended Finance in the Least Developed Countries', provides more information about the latest research into opportunities and challenges of utilizing blended finance for development in LDCs. See report at https://www.uncdf.org/bfldcs/home

has trained local facilitators to provide risk education and preparedness sessions to communities. These sessions build on the knowledge already gained by school children which, encompasses risk maps of local areas, shelter and evacuation procedures, and risk mitigation measures in the home.

Further empirical evidence suggests that investing in education continues to strengthen disaster resilience after a child has left school. Cross-country analyses have found that higher levels of education correlate with lower disaster death rates for many hazard types, even when controlling for income levels, health and degree of democracy.[85, 86] This suggests an inherent relationship between education and vulnerability to disasters, aside from links to opportunities for income generation and health.

Higher education levels also reduce the impact of disasters on livelihoods. Following the 2015 earthquake in Nepal, a higher number of education years was linked with lower death rates for both humans and livestock.[87] Education can also support disaster recovery. Five years on from the 2004 Indian Ocean tsunami in Aceh and North Sumatra, higher numbers of school years were associated with improved psycho-social and economic well-being and access to permanent housing over the long term.[88] Investing in education can thus reduce the vulnerability not only of schoolchildren, but of the society as a whole.

Furthermore, investing in education can facilitate the success of other DRR interventions. For example, literacy and financial literacy empower people to mitigate their disaster risk, by encouraging them to save and take out insurance. Higher literacy rates and numbers of school years are also associated with more diverse livelihoods and higher incomes, that increase people's ability to cope with economic shocks.[89]

Education can also empower people to engage with their Governments, both for mitigating risk and for recovering from disaster. Many studies demonstrate that more educated people will be more aware of disaster risk and can obtain the information and resources to reduce risk and also recover from the impacts of disasters.[90] During the 2010 drought and floods in Thailand, for example, villages whose inhabitants had more years of schooling were better able to apply for government financial assistance than villages whose inhabitants had fewer school years.[91] Education and literacy also support people to engage with their Governments to secure land rights, and advocate for themselves in grievance procedures related to social protection and post-disaster compensation.

EDUCATION MUST BE INCLUSIVE TO DELIVER DRR FOR THE MOST VULNERABLE

To reduce disaster risk of the most vulnerable, education-based interventions must be inclusive. At present, too many people continue to be left behind. This may not be evident from government statistics which typically do not disaggregate data on forms of exclusion according to gender, disability, socioeconomic status, ethnicity, caste or migration status. However, several empirical studies in disaster-prone areas show such forms of exclusion do restrict access to education, and that this can worsen following disasters.[92]

Particularly vulnerable are children with disabilities. They may be less able to take advantage of early warning systems, evacuations, shelter facilities and relief distributions because of medical conditions, and physical and social structures.[93] Their needs are widely ignored in many DRR policies.[94] Ensuring that they are at school will enable them to protect themselves, while also encouraging schools to better understand their specific vulnerabilities and capacities, which can then be addressed by more informed interventions. This must start in schools, with preparedness activities such as classroom evacuation drills addressing their specific needs and capacities.

School-based disaster preparedness also misses children that have a low attendance rate or are excluded from schools altogether due to economic circumstances. This includes children in informal urban settlements who live and/or work on the streets as well as those working informally as house help, which is particularly prevalent in South Asia. These children often have a double vulnerability as their lack of legal identity and exclusion from censuses renders them 'invisible' to the state.[95] Expanding access to education for these children provides an opportunity for Governments to address their vulnerabilities and to ensure that school-based DRR can deliver for them.

Expanding educational access is also vital post disaster, as children may be removed from school to provide domestic labour or generate income.[96] This reinforces marginalization, particularly of girls. Again, this may not be tracked in official statistics,

so school attendance rates must be disaggregated by age, sex and many socio-cultural-economic factors, and by seasonality. Research from India and Kenya demonstrates that educational access can be improved by interventions that extend beyond schools.[97] For example, Governments can provide cash transfers to parents who might otherwise remove children from school to support income generation after a shock, and invest specifically in migrant support programmes to reach children in migrant families who are excluded from censuses. In the Philippines, off-school learning approaches are used to promote educational continuity during times of disaster, when children are required to support household farming activities. Such interventions can also incorporate DRR to empower youth to strengthen the resilience of their communities.[98]

Social protection

The CGE modelling shows that, under a disaster risk scenario, investing 11 per cent of GDP in social protection will reduce the number of people left behind in poverty in 2030 from 119 million to 53 million. Increasingly, many forms of social protection have been used to strengthen disaster resilience, with demonstrated success over different time scales and at all stages of disaster management. As indicated in Table 3-1, social protection can be protective, preventative, promotive and transformative. As the risks from climate change rise, social protection can be expected to be adaptive, integrating climate, disaster risk and socioeconomic information. By promoting alternative strategies that yield higher and more reliable incomes, that do not increase exposure to climate risk and exacerbate climate vulnerabilities, social protection can help promote integrated solutions.

The region also offers many examples of such social protection systems, that are shock responsive.[99] These have in-built flexibility that allows them to be adapted in the event of a disaster. Table 3-2 illustrates five forms they can take. Each has benefits and challenges, so should be chosen based on individual context. Factors to consider include the numbers of people affected by the disaster, how much is known about them, how an inflow of cash may affect the local economy, the level of trust in the implementing agencies, and the ability of stakeholders to collaborate.[100]

Several countries in the Asia-Pacific region have already implemented shock-responsive social protection systems, that offer important lessons for other countries. ASEAN countries are in the process of developing regional guidelines, with support from the Asian Development Bank and the Food and Agriculture Organization of the United Nations. Meanwhile, the examples in Box 3-2 demonstrate how shock responsive social protection systems can facilitate quick responses, the pooling of resources and more rapid decision-making.

Ensuring that these systems respond to new patterns of vulnerability involves some form of identification of beneficiaries. Post-disaster programmes that apply conditions and targeting based on poverty can be counterproductive, as people may not be able to comply with requirements to provide identification documents or attend workshops. Governments are also likely to know little about new vulnerabilities created by the disaster, including increases in poverty. To avoid exclusion errors, and ensure that the most vulnerable people are reached, social protection systems should instead employ universal measures, where benefits are extended to everyone within an area or category such as age group, regardless of income or wealth and without any conditions.[101]

Identification for shock-responsive social protection systems should therefore be informed by exposure to hazards. Furthermore, with climate change vulnerabilities on the increase there is a need to design social protection programs that promote climate adaptation. This requires overlaying climate and disaster risk information on maps of hazard-prone areas to pre-identify how the social protection system should be expanded to reach more people after a disaster.[102]

TABLE 3-1 Social protection pathways for disaster resilience

	PROTECTIVE	PREVENTATIVE	PROMOTIVE	TRANSFORMATIVE
Social protection measures	Social services Basic social transfers Pension schemes Public works programmes	Social transfers Livelihood diversification Weather-indexed crop insurance	Social transfers Access to credit Public works programmes Access to common property resources	Promoting minority rights Anti-discrimination campaigns Social funds
Pathways for reducing disaster risk	Protects vulnerable groups from impacts of climate risks such as asset losses, disruption to livelihoods	Prevents erosive coping strategies, such as selling off livestock or withdrawing children from school	Promotes resilience through livelihood diversification Promotes opportunities arising from climate change	Transforms social relations to combat the discrimination that produces vulnerability
Examples of successful interventions	Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), India. Guarantees rural households employment for 100 days a year, so they can maintain their incomes even during drought. Public works programmes, such as irrigation and afforestation, reduce disaster risk. Helps participants smooth their incomes and diversify their livelihoods.	Index-based livestock insurance, Mongolia. Herders are provided with insurance for livestock deaths due to *dzud*. Led to reductions in distress asset selling.	Bihar Rural Livelihoods Project, India, provides rural households in disaster-prone areas with improved livelihood opportunities. Mobilizes women into self-help groups to support access to financial services including savings, credit and insurance. Interventions led to substantially higher incomes, diversified livelihoods, new microenterprises, reduced debts and increased household food security.	Chars Livelihood Programme, Bangladesh. Wide range of activities including public works, asset transfers, training, stipends and micro-enterprise development. Combined with transformative measures to empower the poorest groups, including the provision of leasehold farming to landless households, crop diversification and land transfers.

Source: Adapted from Davies, Mark and others, 2009.

TABLE 3-2 Five forms of shock-responsive social protection

DESIGN	EXAMPLE	BENEFITS	CHALLENGES
Piggybacking — using part of an established system or programme such as the beneficiary list, staff, registration or payment mechanisms.	During typhoon Haiyan in Philippines (2013), the World Food Programme (WFP) and the United Nations Children's Fund (UNICEF) piggybacked onto the existing 4Ps cash transfer programme –enabling them to reach beneficiaries much quicker.	Use of established systems and relationships allows quicker delivery, and prevents the multiple, parallel instruments that can undermine the integrity of national systems, increase the administrative burden on the government, and confuse beneficiaries Most useful where a large or well-established and well-trusted system is already in place.	The need to carefully analyse an existing system delivered by another agency, and coordinate multiple agencies. Piggybacking on government systems may raise concerns about whether they will respect key principles of humanity, neutrality, impartiality and independence.
Vertical expansion — temporarily increasing the value or duration of an intervention to meet existing beneficiaries' additional needs.	Following tropical cyclone Winston in Fiji, the Government, with support from the World Bank, topped up the cash transfers for beneficiaries of all the national social protection programmes.	Increased protection for the most vulnerable. Established systems and relationships mean quicker delivery. Most useful where there is no risk of worsening local conditions, for example, by increased cash in local markets, and for mature systems that can both withstand the shock and stretch beyond their regular capacity.	The most vulnerable may not be reached, particularly where there are new vulnerabilities or the existing system fails to reach some groups. Calculating the size of top up. Adherence to pre-set procedures that could result in a slow response. Coordination, communication with communities.
Horizontal expansion — temporary inclusion of a new caseload into a social protection programme, by either extending geographical coverage, enrolling more eligible households in existing areas, or altering the enrolment criteria.	One of the main scale-up responses to the triple F crisis in Bangladesh. The Vulnerable Group Feeding programme was expanded by 25 per cent to reach 7.5 million households.	Could reach more disaster-affected people than through vertical expansion alone, and the extra beneficiaries could eventually be incorporated into the programme's regular caseload. Most useful where a disaster increases the number of vulnerable people, and an existing system has capacity to expand to include them.	Conceiving what the benefit is intended to cover; selecting new recipients; resourcing, adherence to pre-set procedures, communicating the changes to usual and new beneficiaries without diluting or obscuring the core objectives of the programme, or undermining its brand.
Parallel operation — designing an intervention with elements resembling others that already exist or are planned, but without integrating the two, e.g. align identification method, transfer value or delivery mechanism.	During the 2014 drought in Guatemala there was no robust, cash-based social assistance programme in the affected areas. WFP designed a cash-based emergency response that ran parallel to the social protection system, with the Government eventually taking over.	The new delivery system can be maintained for future disasters, strengthening the capacity of the Government for future disaster response. Most useful where a system is designed but not yet operational, and in areas with very weak capacity or high fragility.	Requires an understanding of the relative strengths of the options, which may be difficult in volatile contexts that are subject to frequent changes of government, personnel or policy.
Refocusing — adjusting the existing social protection programme to refocus assistance on groups within the caseload that are most vulnerable to the shock.	During cuts in public expenditure in Mongolia during the 2008 financial crisis, the universal Child Money Programme was initially maintained and made more progressive by providing more money to successive children, given the higher poverty rate among larger families.	Prioritises protection for those most in need. Most useful where a financial crisis occurs or budget cuts are made.	Trade-offs between coverage and amounts that can be transferred.

Source: Adapted from O'Brien, 2018.

BOX 3-2 Helping the poorest people bounce back quickly after a disaster

PHILIPPINES — TYPHOON HAIYAN 2013

The Government of the Philippines demonstrated the value of a comprehensive shock-responsive social protection system for addressing large-scale increases in vulnerability following a disaster.[a] The Government expanded the existing national conditional cash transfer programme Pantawid Pamilyang Pilipino Programme (4Ps). This prevented people from falling into poverty as a result of asset losses. The success was facilitated by prior preparation, including provisions for design change. Earlier, in 2013, the Department for Social Welfare and Development had declared that the conditions for cash transfer programmes could be waived for three months if a state of calamity was declared. This meant that once the typhoon hit, the cash transfers became unconditional even for households that had lost their identity cards. Furthermore, WFP and UNICEF piggybacked onto the programme's infrastructure. WFP was able to provide extra cash and rice to 105,000 households and UNICEF provided a top-up to 5,800 households with children for six months during recovery. In this way, the organizations were able to start within a month and benefit from lower transaction costs.

The expansion of the 4Ps programme demonstrates how social protection systems can be adapted over the long-term. In 2014, the cash transfer programme was expanded horizontally to include an extra 20,000 households. At the same time, the Social Security Scheme underwent vertical expansion. Members in disaster affected areas were granted a moratorium on repaying outstanding loans as well as pension advances, and salary loans and house repair loans on concessional terms. Four months after the disaster, more than 80,000 members had received relief assistance through salary loans and pension advances. Developing adaptive social protection systems therefore, allows Governments to capitalize on the opportunity to 'build back better' following a disaster.

This example demonstrates the value of social protection at all stages of the disaster management cycle. Even before the disaster, 4Ps monthly family development sessions that accompanied the cash transfers covered early warning systems and evacuation procedure. In the aftermath of typhoon Haiyan, these sessions were adapted to cover methods to recognize and cope with post-traumatic stress.

FIJI — CYCLONE WINSTON 2016

Cyclone Winston marked the first instance of a Pacific Island country delivering recovery assistance using an existing social safety net programme.[b] The Government used vertical expansion to increase payments to beneficiaries of three existing schemes. 90,000 recipients of the Poverty Benefits Scheme, the poorest 10 per cent of households, received a lump sum of F$600 (US$280). 3,257 households with children and single mothers benefiting from the Care and Protection Allowance Scheme received F$300 (US$140) and 17,232 elderly people benefiting from the Social Pension Scheme received a lump sum of F$300. Each of these cash transfers was paid in addition to the usual benefits as well as housing vouchers provided through a reconstruction scheme.

This approach facilitated rapid delivery and the payments were well utilized by recipients with repaired dwellings and agricultural land and restored food stocks and repaired neighbourhood infrastructure. According to the World Bank, the impact of the cyclone on the poorest Fijians was reduced by more than 20 per cent and the cost-benefit ratio was greater than 4.[c] However it failed to address the increased vulnerability of the near-poor who were just above the income threshold for government assistance programmes. Disaster assistance may thus affect the balance of vulnerabilities between socioeconomic groups. To address this the Poverty Benefit Scheme could be extended to include details of near-poor households so as to permit a horizontal expansion at times of disaster.

a Gabrielle Smith, and others (2017).
b A. Mansur, J. Doyle, and O. Ivaschenko (2018).
c Adapted and expanded from Government of the Republic of Fiji and World Bank (2017).

The examples in the Philippines and Fiji (Box 3-2) demonstrate that Governments can take ex-ante steps to adapt social protection schemes to ensure that they will be able to reach the most vulnerable people. To do so, Governments can prepare through:[103]

· *Guidelines* — Develop guidelines for disaster-responsive social protection in collaboration with Non-Governmental Organizations (NGOs) and the private sector, including plans for expanding and piggybacking on existing schemes.

· *Contingency plans* — Develop contingency plans for specific disaster scenarios which take expected future climate changes into account.

· *Databases* — Expand databases on poor and vulnerable households to include near-poor households who will likely need extra support.

· *Delivery systems* — Ensure delivery systems for cash transfers are accessible for poor and marginalized groups, particularly those in remote rural settlements or with limited access to the required technologies.

· *Communications plans* — Develop communication plans for informing recipients on how to access extra post-disaster support. It is also important to explain the basis for expanding existing schemes to prevent tension between recipients and non-recipients.

· *Financial resources* — Secure financial resources for measures that reduce disaster risk and strengthen adaptive capacity. Also align short-term contingency funds with the wider emergency-related contingency budget with access to contingent credit facilities when needed.

Health

The CGE modelling shows that under a disaster risk scenario, investing 4 per cent of GDP in health will reduce the number of people left behind in poverty in 2030 from 119 million to 69 million. Investing in health offers a pathway for breaking the many links between disasters, health and poverty. For example, disasters directly impact health through fatalities, casualties and consequences for mental health. Indirectly, they cause infectious disease outbreaks by disrupting water and sanitation infrastructure, and decrease food security and nutrition by disrupting agriculture and livelihoods. Particularly impacted are vulnerable groups such as pregnant women, children, elderly people and minorities.[104, 105] There are also greater risks of gender-based violence and malnutrition among women and children.[106]

Simultaneously, disasters reduce health care access by damaging infrastructure such as hospitals, clinics, medical equipment, and transport systems, and by affecting skilled personnel. Many disasters in the region have resulted in catastrophic disruptions to health systems, as cascading impacts render many services inaccessible or inoperable. Following the 2015 earthquake in Nepal, for example, 446 public health facilities and 16 private facilities were destroyed, whilst damages were sustained to a further 765 health facilities.[107] This underlines the importance of resilient health infrastructure, including smaller health clinics which may not sustain the greatest economic costs but offer vital support for the poorest and most vulnerable people in rural areas. This was demonstrated by the 2015 floods and landslides in Myanmar, in which almost all of the 21 health care facilities destroyed were station hospitals, rural health centres and sub-centres.[108]

Disaster impacts on health intersect with poverty and vulnerability. The poorest groups are most affected, as they often struggle to pay for health care following a disaster due to disruptions to livelihoods, asset losses and competing expenditures for response, such as food and shelter. This may lead to catastrophic health expenditure, which SDG 3 defines as 10 per cent of household consumption expenditure. Additional expenditures and drops in income are particularly burdensome for the poor who have limited savings to absorb such shocks. They also devastate the near-poor. The World Health Organization (WHO) states that such health expenditures are the leading cause of pushing the near-poor back into poverty, affecting 100 million people globally each year.[109]

The linkages between disasters, health and poverty are also compounded by vulnerabilities such as age and gender. This was demonstrated by the 2018 floods in Kerala, which severely affected maternal and child health. Despite gender-targeted evacuations and hospitalizations, the additional medical needs of many women and children were not met, due to lost patient records and damage to maternal health facilities and their equipment, medical, hygiene and nutritional supplies. This highlights the need to prepare for specific health vulnerabilities within hazard-prone areas, to prevent disasters from exacerbating health inequalities.[110]

THE VALUE OF UNIVERSAL HEALTH CARE

A universal health care system (UHC) provides everyone access to good quality essential health care services, medicines and vaccines and reduces disaster impacts, particularly for the poor and vulnerable groups.[111] As a large scale, government-funded public good, any UHC system is an inherently political project. It will therefore require strong political commitment as well as context-specific pathways for financing, governance and delivery. One common requirement is that for the health-care system to be sustainable and equitable, it must be risk informed. This requires the capacity to assess the unique vulnerabilities within each context, robust information systems that can direct investments, adaptive funding mechanisms, and a retainable workforce and supply chains that can be augmented during disasters. Each of these capacities must also be resilient to shocks. This is best achieved through a whole-of-government and whole-of-society approach that engages a range of national sectors, plus academics, civil society organizations, and health professionals.[112]

The UHC in Thailand demonstrates the potential for rapidly introducing a full-scale system.[113] Launched in 2001, when the country was still recovering from the 1997 Asian financial crises, the Universal Coverage Scheme reached 47 million people within one year, including 18 million who were previously uninsured. People were no longer at risk of catastrophic health expenditures. Between 2004 and 2009, this prevented an estimated 292,000 households from falling into poverty. The UHC system was realized when gross national income was only $1,900 per capita, but was possible due to political commitment, a strong civil service, active civil society organizations, support from the population, and collaboration amongst stakeholders at multiple levels of government and different industries.[114] All of these carry lessons for other countries.

Ensuring affordable healthcare requires an integrated approach that considers the multiple dimensions of vulnerability and marginalization that restrict access for the poorest groups. This is highlighted by the aftermath of typhoon Haiyan in the Philippines, during which the most significant economic barriers to healthcare for poor groups included not only the cost of health services, but other associated expenses which made healthcare unaffordable. In the first week following the disaster, respondents who declined to travel to health facilities cited a range of reasons, including a lack of money for consultation and transportation, as well as poor road conditions, long distances to the health facilities, and some closure of facilities. Over the longer-term recovery, the majority of respondents continued to cite the costs of consultation (58 per cent and 46 per cent) and transportation (25 per cent and 46 per cent) as the main barriers.[115] Interventions to ensure access to healthcare during disaster recovery must therefore address the intersecting barriers that exacerbate marginalization of the poor.

This integrated approach should be applied to social policy more broadly, so that Governments can capitalize on synergistic benefits from multiple interventions. For example, investments in household livelihood resilience can facilitate access to education as families can afford to send children to school even after disasters, whilst investments in education can encourage the expansion of cash transfer schemes, as more literate potential recipients will be more able to access information about changes to their entitlements.

Critical infrastructure

The CGE modelling shows that the link between disasters and poverty can be broken by investments in infrastructure. Under a disaster risk scenario, investing 2 per cent of GDP is expected to reduce the number of people left behind in poverty in 2030 from 119 million to 96 million. The total investment needed in all countries of the region is not known, however many reports are calling for countries to invest more in physical and social infrastructure, and to ensure that the infrastructure is disaster-resilient. They should pay particular attention to critical infrastructure — the physical structures, facilities, networks and other assets that are essential to the social and economic functioning of a community or society.

Investment should also focus on the infrastructure that serves the poorest groups. The poorest and most vulnerable often live in informal settlements and remote rural areas where hazard exposure is high and the infrastructure is vulnerable, reducing people's capacity to cope when hazards occur. This was demonstrated by the 2015 earthquake in Nepal, which caused losses and damages to the local road network totalling $42.7 million and $125 million respectively, or nearly 1 per cent of its GDP. As a result, people could not access health care or pursue their livelihoods. The impacts were particularly severe for women who depended on the road network to

access urban markets for agricultural livelihoods, and for ethnic minority groups who lived in the most remote of settlements.

Housing infrastructure is also a particularly important entry point for strengthening the resilience of the poorest groups. The poorest people typically live in poorly constructed houses in areas of multiple hazard exposure. Such houses are likely to collapse during a disaster, resulting in death, casualties and economic damage. Before a disaster, the impacts could be reduced by improved housing design and retrofitting.

Post-disaster reconstruction also offers an entry point for strengthening resilience of housing. For example, following the Bam earthquake in the Islamic Republic of Iran in 2003, the Government financed low-income housing programmes by providing a financial and technical support package to each household, regardless of tenancy, socioeconomic conditions, or household make-up. The fixed amounts led to the replacement of big houses with smaller ones designed for single families which were built quite quickly. However, this approach meant that the reconstruction process was longer for households with more complex social arrangements. Moreover, larger extended families living in the same neighbourhood were disrupted by policies that allocated units in a residential complex in the city outskirts. This underlines the importance of designing infrastructure investment that is tailored to the needs of poor groups, by taking into account not only income and wealth, but also social dynamics such as household structure.[116]

It is also essential for investments in infrastructure to be informed by long-term climate change projections, as they may change the return periods of various hazards, meaning that past disaster risk probabilities will no longer provide robust guidance for infrastructural resilience standards.

Land use planning

Land use planning provides another tool for ensuring that new housing is not exposed to disaster risk, by identifying the safest zones for new developments, and restricting development or adjusting building standards for hazard-prone zones. Planning can also be used to control city layouts, for example, to reduce flooding and to facilitate rescue operations and evacuation procedures.[117] The aim should be to enable quick self-evacuation during a disaster. The significance of this was demonstrated by the 2018 tsunami in Sulawesi, Indonesia, in which crowded buildings, limited road access and blockages prevented many people, who had received early warning signals, from making a timely evacuation. Most people were able to successfully evacuate in the regency of Donggala and only 40 died. In the city of Palu, on the other hand, evacuation was severely restricted and the death toll, around 1,000 people, was much higher.[118]

Land use planning must also account for climate change, particularly in coastal regions and small island states that rely on flood risk management to address rising sea levels and risks of storm surges.[119] In these locations, Governments should limit development in exposed areas and ensure continuity in energy and water supplies along with effective waste management.[120] Adaptive pathways must be followed, prioritizing interventions to address most likely climate scenarios but also identifying alternative pathways and providing for other eventualities.[121]

In order to deliver strengthened disaster resilience for the poorest and most vulnerable, land use planning must also address competing local interests. For example, structural measures that reduce flood risk for expensive land may also increase flood risk in cheaper lands occupied by marginalized groups. Further, measures to protect and improve certain areas may increase property values so that the original residents can no longer afford rents and are displaced to land that may have even higher hazard exposure. Such outcomes are more likely when risk reduction is framed as a private responsibility rather than a public good, and where the affected vulnerable communities are not incorporated into the decision-making process. Land use planning must therefore negotiate multiple perspectives and needs. This can be achieved by incorporating participatory and inclusive consultations, so that interventions are chosen by consensus and have legitimacy among a variety of social groups.[122]

Risk-informed land use planning can also be enshrined in legislation. This has been recognized in the Philippines, where the National Land Use and Management Act (2018) requires the local authorities to identify disaster-prone areas and take the necessary measures for risk reduction. The Act also specifically addresses the danger that infrastructure may heighten disaster risk, forbidding, for example, dams that would interrupt the connectivity of river

systems, disrupt coral ecosystems or alter seasonal flood regimes unless there were measures for mitigation.

Agriculture

In the Asia-Pacific region, the agricultural sector is severely affected by disasters. Its losses due to drought alone constitute 68 per cent of all disaster losses sustained in the entire region. This has huge consequences for those whose livelihoods depend upon agriculture, who are often poor or near-poor, and living in rural areas. However, Governments can intervene to strengthen agricultural resilience, through implementing a comprehensive package of interventions including market support, technology acquisition, and nature-based solutions. In order to be sustainable and to reach the poorest and most vulnerable, these interventions must be informed by climate and disaster risk.

Interventions for strengthened agricultural resilience can be achieved on a large scale, through comprehensive policy reform. This was demonstrated in Thailand, where almost 40 per cent (about 12.6 million farmers) of the total labour force is engaged in agriculture. In 2013, the Ministry of Agriculture and Cooperatives introduced the Smart Farmer Development Project. The aim was to improve rural livelihoods through training in agricultural production, to support livelihood diversification. By registering farmers that participate, the implementing agency is able to track performance and offer appropriate assistance, including during disasters.[123]

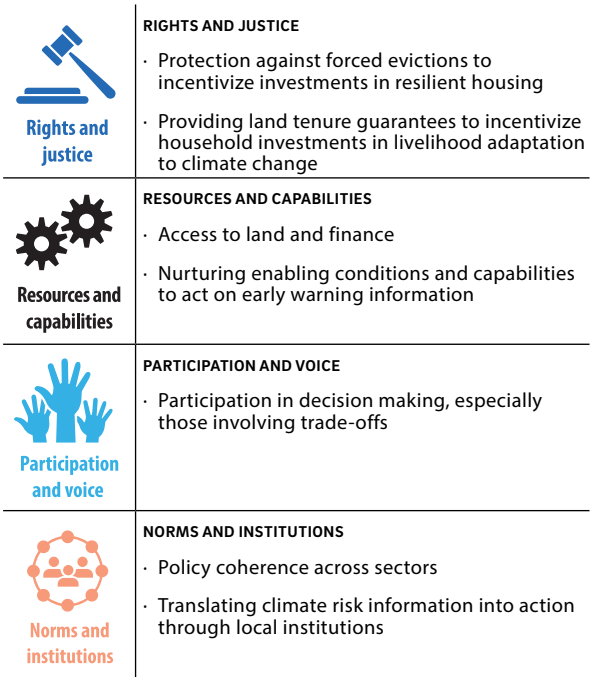
Nature-based solutions have emerged as a key entry point for building community resilience. In Bangladesh, for example, the Government is protecting rural communities along coastal belts from storms, typhoons, and tsunamis, by encouraging mangrove afforestation. The mangroves provide a double benefit; as a natural barrier against these hazards and an alternative income source.[124] Similarly, in southern Viet Nam, the Government has reversed the decline in mangrove coverage by establishing a protective mangrove forest between the sea dike and coastline. In northern Viet Nam, NGOs are helping reforest 18,000 hectares along a 100-kilometre stretch of sea dike.[125]

Nature-based solutions have also proven successful in empowering communities in Northern Samar in the Philippines, which is exposed to storm surges and other coastal hazards. To counter these risks, 250 households have worked together on an integrated strategy that involved disaster-resilient aquaculture, ecological mangrove restoration and value-chain development in mud crab fattening and marketing, an initiative which won an Equator Prize for boosting biodiversity while increasing incomes. This pilot was so successful that the provincial government introduced a mud crab ordinance to scale up the strategy for the entire province.[126]

Strengthening agricultural livelihood resilience also offers a pathway for reducing disaster impacts on women specifically. Disasters can heighten disadvantages for women and the burden increases when men migrate from disaster-prone areas in search of employment. Despite being temporary heads of household, women can be denied access to male-led local decision-making structures.[127] In Nepal, the Department of Agriculture is building on a successful pilot to combine climate-smart agriculture with financial inclusion. This includes seed banks through which women are provided with seeds that are well suited to the local climate and resistant to climate shocks. In Cambodia, farmers have been supported with simple rainwater harvesting technologies to ensure constant water supply during the dry season. A combination of drip irrigation and technical support to horticulture provides significant labour savings, especially where women spend up to three hours a day collecting water, saving time for further income-generation. Plastic mulch has also reduced the need for weeding, thereby reducing women's workload.[128]

Empowering and including

As Governments increase the amount invested and the range of policy interventions used for reducing disaster risk, it is important to consider which groups are currently being excluded from policy interventions, and how this exclusion manifests itself. Empowerment and inclusion approaches are needed to address the barriers that exclude certain vulnerable groups from the benefits of DRR interventions and other government investments in social policy, infrastructure and agriculture. This section identifies critical action areas, guided by the empowerment and inclusion framework presented in the ESCAP-ADB-UNDP SDG partnership report (2019) on: rights and justice, norms and institutions; resources and capabilities; participation and voice.



Access to land

In both rural and urban areas, the most vulnerable people are often those who do not have secure land tenure and are therefore unlikely to invest in disaster resilience. In the Philippines, for example, tenant farmers who are vulnerable to evictions have little incentive to re-invest in their livelihoods or to move beyond subsistence agriculture.[129] Empirical evidence shows that in Khulna, Bangladesh's third-largest city, unauthorized informal owners live with the constant fear of eviction and have little incentive to improve their environment. They are unable to elevate their land to the surrounding levels with less hazard exposure, and many have constructed dwellings in risky locations, using inferior materials.[130]

Lack of secure land and property rights is thus a persistent problem that must receive more attention. In urban areas alone, more than a quarter of the region's total urban population live in slums or informal settlements which lack security of tenure.[131] There are many reasons for this, including sociological, legal, political and economic factors as well as weak land registration and systemic biases against women, or indigenous groups. Furthermore, the very groups that need to secure these rights often lack the education or literacy requirements to claim them.[132]

Conversely, people who have security of tenure or ownership are more likely to invest in disaster risk reduction and adaptation, follow evacuation orders, and take advantage of services and post-disaster recovery support.[133] Empirical evidence from drought-prone areas in Mongolia, for example, shows that security of land tenure has encouraged landholders to invest in adaptation measures such as sustainable pasture use, construction of irrigation systems and development of drought-resistant crops.

Measures to provide land tenure security for poor and vulnerable people are therefore critical. The strongest instrument for guaranteeing land tenure is legislation. This could guarantee the rights of agricultural lessees to exclusive possession and enjoyment of home lots. Nevertheless, to be effective, legislation needs to be accompanied by soft measures such as capacity strengthening for government staff to recognize the rights of marginalized groups, informing remote communities of their rights, and incentives such as tax breaks for applying for land registration.

BOX 3-3 Innovative finance for adaptive social protection systems

The financing mechanism of the Chars Livelihoods Programme in Bangladesh allows the programme to be shock responsive. It is first and foremost a disaster risk reduction initiative which aims to reduce the vulnerability to flooding of poor households living chars (fluvial islands). But it also has the capacity to expand and support disaster response. Built into the project design is an annual contingency budget that can either be used for disaster response to support the beneficiaries of the main programme, or if unspent, can be redistributed to increase funding for the regular program activities. Since the programme aims to reduce flood risk, the need for the contingency fund reduces over time.[a]

a ADB (2018).

Legislative change and capacity strengthening at the government level can also be supported by innovative forms of tenure security, such as community land banks, long-term leases and usufruct agreements, that can provide secure, affordable and socially acceptable housing arrangements.[134] These can be used to ensure that

land tenure can accommodate traditional collective ownership and have the flexibility to recognize traditional patterns of mobility. In Mongolia, for example, pastoralists have traditional customary rights to land approved by municipal and district councils to allow migration and rangeland rights in case of emergencies.[135] In drought-prone areas, land tenure must accommodate collective ownership and have the flexibility to recognize traditional patterns of mobility. In Viet Nam, some rural landholders need mobility to access less flood-prone land for agriculture during the wetter months.[136]

Access to finance

Another problem that hinders disaster resilience is exclusion from financial services. Poor groups may be excluded from banking for many reasons; a lack of assets to borrow against, poor credit history, financial illiteracy, as well as weak regulatory frameworks. As a result, they may be less able to achieve diversified and resilient livelihoods, invest in disaster risk reduction, or accumulate sufficient savings to smooth consumption after disasters. They may also be unable to access social protection schemes such as insurance and cash transfers, which are delivered to bank accounts. Women are at a particular disadvantage.[137] After disasters strike, poor women often experience a double burden as they take on increased economic responsibility for the household but are denied access to financial services.[138] Without financial support, households may resort to erosive coping strategies such as distressed asset sales, removing children from education or delaying health expenditures.

Financial inclusion refers to the use of a range of instruments to expand access to traditional financial services, including microfinance, insurance, small loans, and mobile banking. These strengthen disaster resilience by providing the opportunity to accumulate savings, which can be invested in risk mitigating measures such as crop diversification or retrofitting homes. Small loans can also prevent households from falling into poverty following disasters, by covering specific expenditures such as medical or funeral costs.[139] Risk reduction can also be implemented at the community scale through workshops and 'credit-plus' initiatives that accompany microfinance institutions and Village Savings and Loan Associations (VSLAs). Such workshops can include sessions on how to pursue riskier, higher yield livelihoods, or how to protect agricultural assets from local hazards.

These financial instruments work best in a supportive macro-economic environment.[140] This will require:

A regulatory framework — A transparent regulatory system will promote growth and competition in non-traditional financial services and offer users greater choice and flexibility to match their needs and capacities.

Support to service providers — Governments can strengthen the capacity and motivation of service providers through education and training so that banks and their employees have greater trust in poorer clients. Governments can also strengthen the financial literacy and technologies of service providers so that they have the capacity to reach the most vulnerable.

TABLE 3-3 Financial instruments for disaster resilience

INSTRUMENT	DESCRIPTION
Microfinance institutions	Provides loans and savings for income-generation activities and risk reduction as well as insurance, educational and health loans. Through 'credit plus' operations, microfinance institutions may also provide complementary services such as skills education and training, and workshops to promote best practices for agriculture, health and nutrition.
Innovative insurance	Provides businesses, farmers and households with rapid access to post-disaster liquidity, so that they need not get into debt.
Village savings and loans associations (VSLAs)	Provide simple savings and loan facilities in remote rural communities, to finance recovery. These associations also strengthen social networks that can be used to develop collective coping strategies and support mechanisms.
Mobile banking	Provides alternative forms of banking such as internet banking, card payment systems, mobile banking and point of sales This avoids the time and expense of travelling to banks and increases access to insurance and loans.

Source: Haworth and others, 2016.

Sound infrastructure — Investing in technological and infrastructure — enhancing internet connectivity and extending the coverage and sophistication of datasets. Investing in roads and public transport to make it easier to reach services.

Improving traditional financial services — Engaging with the domestic service providers to enable them to expand and scale up new and affordable financial services.

Working with vulnerable groups — Working directly with poor communities to strengthen their capacity, financial literacy and trust in the financial system and encourage them to take advantage of available services.

IMPROVING INSURANCE

One of the most common financial risk transfer tools is insurance, though this is not widely used in the Asia-Pacific region, especially for disasters. In the ASEAN countries, for example, less than 10 per cent of property damage insurance covers catastrophic disasters.[141] This is partly because many people cannot afford insurance and may not trust the providers, while insurers are often unwilling to cover disasters due to natural hazards because of limited risk information and high operational costs.[142] Insurance penetration is also restricted in the region by issues of fiscal policy such as capital controls, absence of liquidity flows, and accessing re-insurance markets. However, insurance can have many benefits (Table 3-4). Apart from acting as a safety net, it can increase credit ratings and investment in risk reduction.[143]

Governments can make special efforts to increase the take-up of insurance. In India, the Modified National Agricultural Insurance Scheme has reached a high number of participants by distributing information about the scheme through local actors trusted by targeted groups, such as farmers groups and societies, crop growers' associations, self-help groups and NGOs working with agriculture. In Cambodia, the take-up of insurance among low-income groups has been increased by providing vouchers to cover the costs of transport to enrolment locations. The requirement to travel could also be addressed through the provision of digital technologies, thereby increasing access for groups who are not only impoverished but also marginalized by their remote location.

Premium costs can also be kept low through public-private partnerships. For example, in Mongolia the Index Based Livestock Insurance Project takes a risk-layering approach via public-private partnerships. Progressive scales of livestock losses are covered first by self-insurance, then market-based insurance and finally a social safety net. Herders themselves absorb the cost of small losses that do not affect the viability of their business (less than 7 per cent of livestock), whilst larger losses (between 7 per cent and 30 per cent) are covered by the private insurance industry, and catastrophic losses (over 30 per cent) are covered by the Government.[144] This minimizes premium costs for the herders, whilst reducing the burden on the Government which only has to pay out for infrequent, larger shocks.

TABLE 3-4 Benefits of insurance for poor and vulnerable groups

BENEFIT	EXAMPLE
ACTING AS A BUFFER AND SAFETY NET	
Prevention of negative coping strategies such as distress asset sales	Pastoralist households in Mongolia that purchased Index-Based Livestock Insurance recovered faster from the *dzud* of 2009/10, as they were less likely to resort to selling livestock early. Two years after the disaster, insured households owned between 22 and 27 per cent more livestock.[145]
UNLOCKING OPPORTUNITIES THAT INCREASE PRODUCTIVITY	
Increase savings	Evidence from Ethiopia, Senegal and Haiti demonstrates that insurance payouts support farmers to increase their savings.
Improve creditworthiness	Banks have more confidence in herders covered by the index livestock insurance, and have offered herders loans at decreased interest rates.[146]
Increasing investment in higher-return activities	Farmers in China with insurance are more likely to raise sows and tobacco, both risky production activities with potentially large returns.[147] In flood-prone areas of the Sirajganj district in Bangladesh, villagers with Index Based Flood Insurance (IBFI) invest more in seeds or fertilizers to grow more crops and enhance yields.[148]
SPURRING TRANSFORMATION IN RISK MANAGEMENT	
Incentivizing risk reduction behaviour	Modified National Agricultural Insurance Scheme in India features a discount provision if all farmers in a unit area adopt better water conservation and sustainable farming practices for better risk mitigation.[149]

Source: Adapted from Schaefer and Waters, 2016.

Insurance cover can extend beyond losses in assets and income to cover injury and death. In Sri Lanka, the SANASA Insurance Company has offered

coverage not only for losses of livestock, but also for accidental death and hospitalization, all within one premium. This approach of bundling insurance packages increased the number of participating farmers.

Governments can also promote innovations such as parametric insurance, in which payouts are determined by defined parameters of the causal event such as rainfall or temperature, rather than the actual losses as with traditional, indemnity insurance. This facilitates quicker payouts with reduced costs, as providers simply need to verify the hazard occurrence based on transparent and readily available data instead of undertaking on-site assessment.

Parametric insurance is therefore well suited for supporting immediate response and short- to medium-term recovery needs following low frequency, high magnitude shocks, and where the use of transparent data overcomes low trust in the insurance industry. The subsequent chapter will explore how parametric insurance can utilize new technologies in order to extend coverage to poor and vulnerable groups whose livelihoods are highly exposed to climate risks.[150] Nevertheless, an important issue with parametric insurance is that it has a higher basis risk, that event-triggered payouts may not relate accurately to actual loss, than for indemnity insurance. For longer term recovery needs, indemnity insurance may be more effective.

In fact, no form of insurance is a panacea. Whilst it can help to protect poor people from low-frequency, high-intensity shocks, it is less suitable for slow-onset hazards associated with climate change such as sea-level rise and salinization. And insurance for the high-intensity shocks that are certain to become more frequent with climate and environmental change would require prohibitively high premiums.[151] Nor can insurance mitigate the non-economic costs of disasters, such as psychological impacts and disruptions to social networks. Further, the provision of insurance for poorer households should not be used to transfer the responsibility of addressing climate risk to those who are most vulnerable to the consequences of climate change. Rather, insurance must be seen as one part of a comprehensive risk management strategy, in which households have different support available for different shocks. Governments should support this using a layered approach to disaster risk financing. This provides flexibility to use different mechanisms to respond to different severities of events on different timescales, and will likely include various forms of insurance, as well as sovereign reserves, contingent credit, budget reallocation and sovereign debt.

Capability to act on early warning

With a few days warning, people can evacuate their livestock and other moveable livelihood assets to higher grounds, ensuring their own safety and protecting their assets.[152] Early warnings with longer lead time, such as seasonal climate forecasts can enable farmers to adjust their weather and climate-sensitive activities to avoid losses of inputs (seeds, fertilizer) and production.

Just as important as access to information is the capacity to act on it. Experience from West Java, Indonesia, has shown that to respond to climate information, farmers require a broad range of support from agricultural ministries, local agricultural services, and cooperatives.[153] If farmers are to act upon climate information, however, they will also need resources, in the form of seeds, fertilizers, water and credit.

The content and delivery of information must be tailored to people's circumstances and capacity to respond.[154] This is particularly important for people with physical, psycho-social and cognitive disabilities or those who have limited mobility due to advanced age. Their access to evacuation routes, public shelters, and relief distribution points must be addressed.[155] For this purpose, when designing policy, planning and interventions the relevant agencies can collaborate with organizations of people with disabilities. Following cyclone Pam in Vanuatu, in 2015, the Government found that people with disabilities not only had limited to access to evacuation shelters, but also faced barriers to access almost all services and activities.[156]

Response to early warnings is also influenced by security of land tenure and livelihood. People living in informal settlements are less likely to evacuate before a disaster. For example, people affected by typhoon Haiyan explained they did not want to leave before the storm because they feared that landowners would take the opportunity to bar them from returning. As a result, men typically choose to stay during disasters to protect their possessions and to make sure their family members could return.[157] Similarly, for cyclone Phailin which struck

the coastal state of Odisha, India in 2013, around 95 per cent of people evacuated. Those who did not, some of whom perished, were families concerned about their livestock. This shows the importance of putting in place arrangements for securing the safety of assets during evacuation.[158]

Participation in decision-making

Those who are left behind also tend to be the ones excluded from decision-making at various levels, from the household to national levels. Multidimensional inequality therefore tends to generate the means for its own perpetuation. Decades of development work have produced compelling evidence that it is fairer and far more efficient to involve people in making the decisions that affect their lives. For this, the starting point is widely available information. For example, a Right to Information Act has been introduced in India and information systems are being made more available to the general population in Bangladesh. Both innovations have reported positive results for development.[159] Sri Lanka offers an interesting insight into the benefits of empowering farmers to decisions through the existing local norms and practices (Box 3-4).

To ensure access to decision-making, Governments need to provide spaces for stakeholder participation and to encourage pressure from the bottom up to strengthen the bargaining power of marginalized citizens. This is particularly important for effecting the changes in public investment priorities advocated earlier in this chapter, which have to be articulated and championed. In India, for example, the National Rural Employment Guarantee Act, along with a series of other transformative social legislations, were enacted in response to population movements and demands.[160]

Governments also need to negotiate trade-offs. Land use changes, in particular, tend to produce winners and losers, with poorer people often having to relocate and lose access to their natural resource base. Governments therefore need to respond to the voices of the poorest. Ignoring their voices can in any case be very costly, as happened, for example, with the delays and opposition encountered by the Greater Dhaka Integrated Flood Protection Project (1991) and the Jakarta Coastal Defense Strategy (2012). Both cases demonstrate the need to include lower-income residents in the design process from the outset and to identify solutions that deliver strengthened disaster resilience for all residents.[161]

BOX 3-4 Empowering farmers to make decisions through climate and market information

Access to climate and other information can foster inclusiveness in decision-making. Insights from Sri Lanka suggest that forecasts are most effective in influencing risk management decisions when integrated into social processes. Seasonal forecasts from the Department of Meteorology are shared and discussed at pre-season meetings among farmer leaders, irrigation operators, agricultural extension officers and local officials. Through these meetings, the forecast is blended with local and contextual knowledge and market information to assess the risks during the season. The resulting insight empowers the farmers to make informed choices and decide on the level of trade-offs that are acceptable to them; whether to plant paddy or switch to less-intensive crops or forego planting altogether.

Sri Lanka offers an interesting insight into how social institutions, in tandem with climate information, can empower farmers to make risk-sensitive decisions. When a below-average rainfall is forecast, which means reduced irrigation coverage, farmers enact a collective drought management strategy called 'bethma'. This practice involves dividing the fields that can be serviced with irrigation water during the season equally among all participating families, regardless of ownership. Everyone thus receives equal access to land and water. Empirical studies suggest that farmers who participated in bethma have been better able to cope with Sri Lanka's recent succession of droughts.[a]

a Field work notes by ESCAP staff, September 2018; Burchfield, and others (2018).

Governments need to screen policies and decisions to ensure that they take into account the particular needs and circumstances of the poorest and marginalized.[162] DRR-related laws and plans need to ensure the active participation of marginalized groups. Recently, Mongolia, Philippines, Samoa, Vanuatu and Viet Nam have all taken significant steps in this regard.[163]

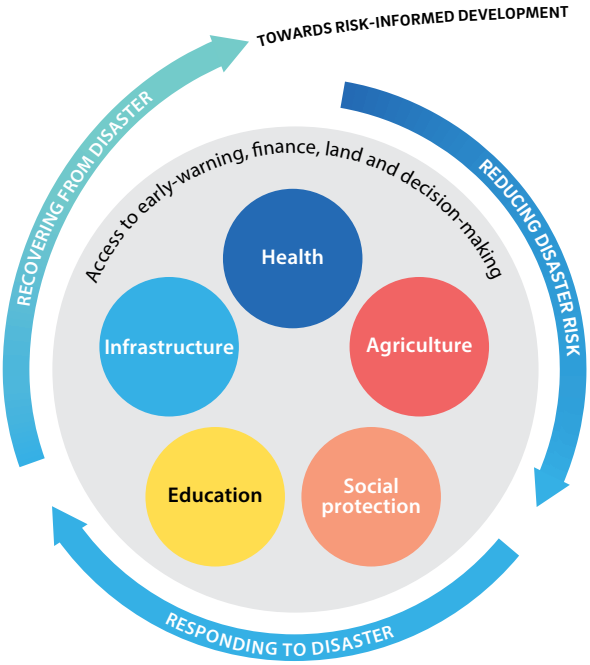
Breaking the cycle

This chapter has demonstrated that disasters threaten to reverse development gains, but that it is possible to break this link by investing more and investing better to reach those who are left behind. This will be difficult. Countries need to mobilize additional finance. They will also need to move beyond the traditional focus of DRR efforts on preventing only disaster impacts to preventing the fundamental causes that make people vulnerable to the impacts of disasters and climate change.

Figure 3-6 demonstrates how the investments and policies discussed in this chapter interact over the time phases of disaster management, to strengthen disaster resilience of those usually left behind. These interventions can break the cycle of disasters, poverty and inequality and facilitate risk-informed development.

The next chapter explores how such interventions can also be supported by emerging technologies to provide new ways of strengthening disaster resilience for the poorest and most vulnerable people in the region.

FIGURE 3-6 Breaking the link between disasters, poverty and inequality



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