

People and Planet:

Addressing the Interlinked Challenges of Climate Change, Poverty and Hunger in Asia and the Pacific



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People and Planet: Addressing the Interlinked Challenges of Climate Change, Poverty and Hunger in Asia and the Pacific

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Foreword

The first global stocktake presented at COP28 highlights that global collective climate action is not progressing fast enough to reduce carbon emissions or build necessary adaptive capacity to climate impacts. In the Asia-Pacific region, the consequences of this lack of progress are evident – climate change is pushing up hunger and poverty, with poor and vulnerable people and developing countries carrying the heaviest burden while being most ill-equipped to cope and adapt.

While the interlinkages between climate, poverty and food insecurity are complex, yet clear, so too is the need for integrated responses to these challenges. Bringing climate action, poverty reduction and hunger alleviation closer together presents a vital opportunity to drive effective implementation for transformational change.

Integrated approaches that synergize sustainable development projects with decent work, just transitions and responsive and adaptive social protection systems help to recognize and better mitigate trade-offs. This is evidenced in ongoing initiatives like multi-sectoral disaster risk reduction, and the promotion of green jobs in various sectors, alongside the integration of public works into disaster response. Transformative change requires us to row in the same direction in many lanes, including with respect to enablers like education, institutional capacity building, innovative financing and partnerships.

We are in a critical decade for action, hence incremental progress will be insufficient if we are to achieve the SDGs and fulfil the commitments of the Paris Agreement in a way that is inclusive, especially for the most vulnerable people in the region.

This edition of the Asia-Pacific Sustainable Development Goals (SDG) Partnership Report – *People and Planet: Addressing the interlinked challenges of climate change, poverty and hunger in Asia and the Pacific* – focuses on how the varying impacts of climate change across the region are interacting with poverty and hunger against the background of continuing cost-of-living pressures, global conflict and increasing climate shocks at a time when many countries are still recovering from the fiscal strains of the COVID-19 pandemic, over-extended borrowing and the high cost of debt.

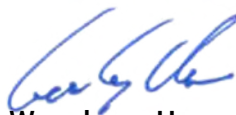
The report provides a stocktake of climate impacts on Goal 1 (no poverty) and Goal 2 (zero hunger), with analysis of impacts across the region, as well as subregional and country level insights. Importantly, the report identifies lessons and practices from across the region that can provide inspiration for ways forward on accelerating climate action while reducing poverty and hunger.

We are pleased to issue this joint report as we re-double efforts across our organizations to support and strengthen regional and national systems and capabilities to deliver on these outcomes for Asia and the Pacific.



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of the United Nations and
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Key messages

The Asia-Pacific region has made steady progress in recent decades in reducing poverty and hunger. The impact of this development is evident in increasing food security, reduced prevalence of malnutrition and related improvements in health and well-being. Further gains are still needed, but they are hampered by multiple crises, including the lingering impacts of the COVID-19 pandemic and the increasing effects of climate change.

The impacts of climate change, including slow and sudden onset weather events, are reducing the ability of countries to continue to advance SDG 1 (No Poverty) and SDG 2 (Zero Hunger). This report examines this issue at the regional and sub-regional level, identifying specific impacts of climate change on agricultural and labour productivity as well as food supply chains and food security. The report highlights how responses at the intersection of climate change, poverty and hunger can provide transformative change to drive SDG 1, 2 and 13. Key enablers of change are also examined. The key findings from this report are:

The impacts of climate change on poverty and hunger in Asia and the Pacific

- ▶ Climate hazards are increasing and projected to become more severe and frequent with impacts leading to reduced agricultural and labour productivity, loss of livelihoods, and human displacement. These hazards strain socio-economic and environmental systems, and hinder efforts to promote food security and alleviate poverty.
- ▶ The burdens of climate impacts are unevenly distributed. Poorer countries and people are more exposed and less able to adapt. The compounding impact of high exposure to climate hazards and vulnerable populations with low coping capacity is leading to increased poverty and food insecurity. This, in turn, reduces the resilience of vulnerable populations, including women, children, older persons, persons with disabilities and indigenous groups.
- ▶ Global and regional policies do not adequately support the integration of climate priorities and actions to address poverty and hunger. There are, however, opportunities for greater integration through actions linking social protection, resilient food systems, climate adaptation, disaster risk reduction, and sustainable agricultural practices with countries' emissions-reductions commitments, or Nationally Determined Contributions (NDCs), and National Adaptation Plans (NAPs).

Climate change solutions to combat poverty and hunger

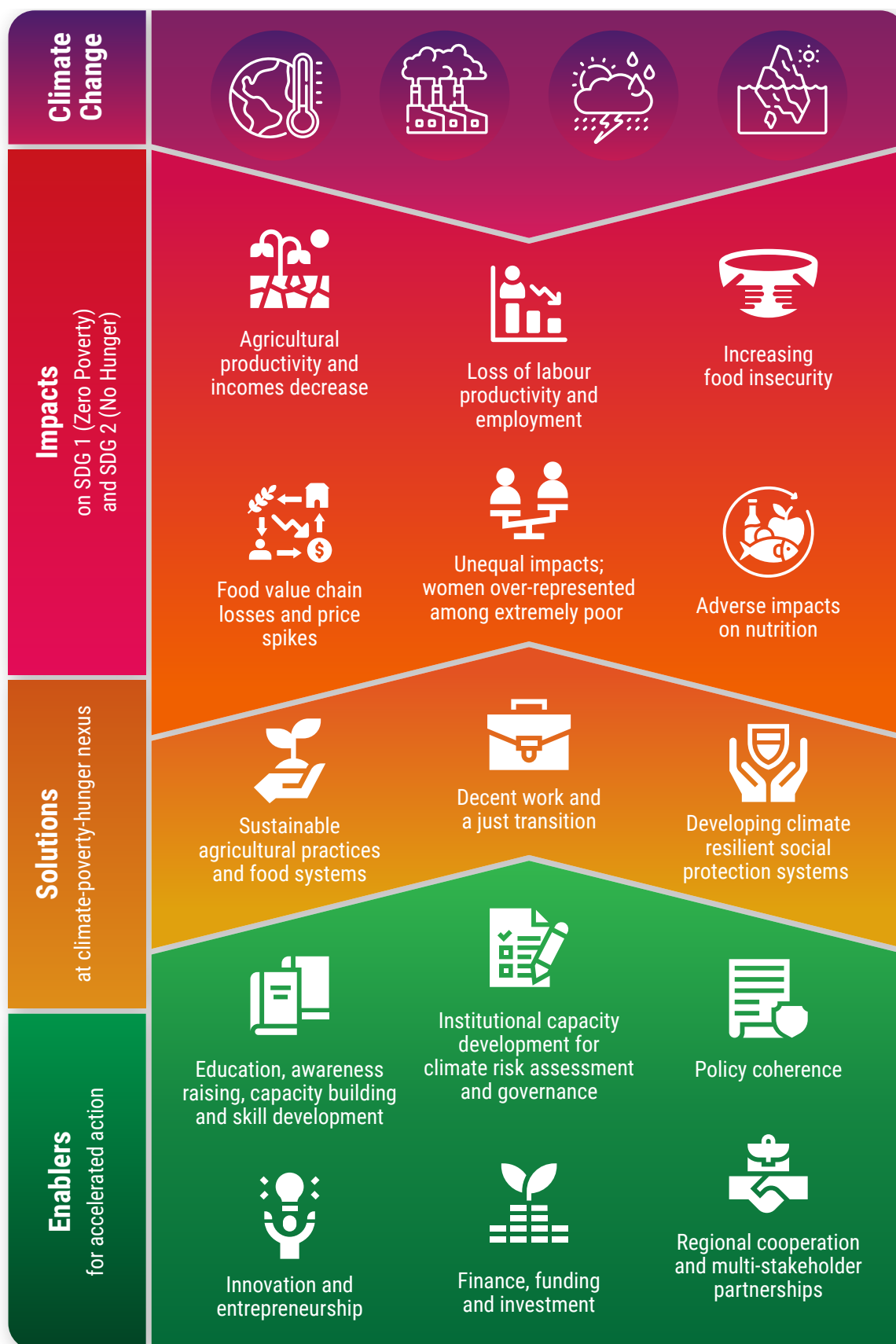
- ▶ Integrated responses to current development challenges need to reflect the interlinkages between climate, poverty and food insecurity. Bringing climate action, poverty, and hunger alleviation actions closer makes implementation more effective as integrated approaches can unlock synergies and help guide complex decision-making when delivering transformative change.

- ▶ Sustainable food systems approaches can address the challenge of providing food security and adequate nutrition to the region's growing population. Designed properly, such systems can support sustainable livelihoods of millions of farmers and reduce the environmental and climate impacts of food production. When combined with actions that make the food systems more resilient to climate risks and hazards, an approach that considers the food system in its totality can effectively address poverty, hunger and climate change.
- ▶ Action on climate change will be an important source of new jobs. Ensuring that this work is decent – productive, with fair income, offering security and equal treatment of men and women – can contribute to alleviating poverty and hunger. Making sure that these jobs are inclusive, through skills development and programs to build work experience, can help raise incomes of poor people.
- ▶ Developing social protection systems that provide a safety net for vulnerable people and can build their capacity to prepare, adapt and respond to climate impacts will help tackle the underlying causes of poverty and food insecurity, and reduce vulnerability to climate change impacts. Both broad-based and shock-responsive social protection are important. Although underdeveloped in the Asia-Pacific region, the former, with its underlying service delivery infrastructure, is critical for delivering assistance rapidly and effectively in crisis situations.

Enabling actions for transformative change

- ▶ Transformative climate change solutions require the right enabling environment. This report highlights the role of six enablers: education, awareness raising and skill development; policy coherence; institutional capacity building; innovation and entrepreneurship; finance, funding and investment; regional cooperation and multi-stakeholder partnerships.
- ▶ Multiple actors shape the enablers. They include governments; civil society organisations; private sector; research and training organisations; financial institutions such as domestic, international and multilateral development banks; and international organisations. All these actors need to integrate climate issues into their operations and thus enhance their institutional capacity.
- ▶ Each of these actors work with communities at different scales. This requires coherence and coordination. The speed and scale of needed climate action means that no country can afford to go it alone – there is therefore a vital role for stepping up regional cooperation. Countries need to learn and replicate best practices from across the region and beyond.
- ▶ Integrating climate policies, including adaptation, disaster risk reduction and decarbonisation strategies, with an inclusive social development agenda can help governments secure investments and stage interventions that tackle climate change in a way that also reduces poverty, hunger and inequality.

Addressing the interlinked challenges of climate change, poverty and hunger



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Abbreviations

ADB	Asian Development Bank	MoCC	Ministry of Climate Change
ASEAN	Association of Southeast Asian Nations	NABARD	National Bank of Agriculture and Rural Development
AWD	Alternate Wetting and Drying	NAPs	National Adaptation Plans
CA	Conservation Agriculture	NDCs	Nationally Determined Contributions
CASIC	Conservation Agriculture and Sustainable Intensification Consortium	NPC	National Planning Commission
CDRF	Climate Disaster Risk Financing	PCCMHS	Pacific Climate Change Migration and Human Security
COP	Conference of the Parties	PICAP	The Pacific Insurance and Climate Adaptation Programme
DRM	Disaster Risk Management	PKR	Pakistani Rupees
DRR	Disaster Risk Reduction	PPP	Purchasing Power Parity
EA	East Asia	PUGs	Pasture User Groups
ENSO	El Niño–Southern Oscillation	PWP	Public Work Programs
ESCAP	Economic and Social Commission for Asia and the Pacific	RCP	Representative Concentration Pathways
ETM	Energy Transition Mechanism	RUAs	Rangeland Use Agreements
EU	European Union	SCP	Sustainable Consumption and Production
FAO	Food and Agriculture Organization	SDGs	Sustainable Development Goals
FIES	Food Insecurity Experience Scale	SEP	Sufficiency Economy Philosophy
FRP	Floods Response Plan	SEWA	Self Employed Women's Association
GDP	Gross Domestic Product	SA	South Asia
GI	Geographical Indicator	SEA	South-East Asia
GIS	Geographic Information System	SIDS	Small island developing States
GW	gigawatts	TBTP	Ten Billion Tree Tsunami Programme
ILO	International Labour Organisation	TPM&E	Third Party Monitoring and Evaluation
MASM	Mongolian Agency for Standardization and Metrology	UNDP	United Nations Development Programme
MDB	Multilateral Development Banks	UNFCCC	United Nations Framework Convention on Climate Change
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act	UNIDO	United Nations Industrial Development Organization
MHT	Mahila Housing Trust		
MNET	Ministry of Nature, Environment and Tourism		

Explanatory notes

The Asia-Pacific region, unless otherwise specified, refers to the group of members and associate members of the Economic and Social Commission for Asia and the Pacific (ESCAP) that are within the Asia and the Pacific geographic region (the Asian Development Bank and the United Nations Development Programme, partners in this publication, have differing regional compositions). Some countries are referred to by a shortened version of their official name in the figures, as indicated in brackets in the listing below.

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Least developed countries: Afghanistan, Bangladesh, Cambodia, Kiribati, Lao People's Democratic Republic, Myanmar, Nepal, Solomon Islands, Timor-Leste and Tuvalu.

Landlocked developing countries: Afghanistan, Armenia, Azerbaijan, Bhutan, Kazakhstan, Kyrgyzstan, Lao People's Democratic Republic, Mongolia, Nepal, Tajikistan, Turkmenistan and Uzbekistan.

Small island developing States: Cook Islands, Fiji, Kiribati, Maldives, Marshall Islands, Federated States of Micronesia, Nauru, Niue, Palau, Papua New Guinea, Samoa, Singapore, Solomon Islands, Timor-Leste, Tonga, Tuvalu and Vanuatu. Developing Asia and the Pacific: ESCAP region, excluding Australia, Japan and New Zealand. Developed Asia and the Pacific: Australia, Japan and New Zealand. The classification of countries into income groups is from the World Bank.

Symbols and units

References to dollars (\$) are to United States dollars, unless otherwise stated. The dash (–) between dates signifies the full period involved, including the beginning and end year.

Introduction

The impacts of climate change in the Asia-Pacific region threaten to undo hard-won gains in sustainable development that countries have made in recent decades. Climate change is putting increasing strain on biophysical systems, including land, water, biodiversity, and ecosystems, and exacerbating food insecurity and poverty across the region. Poor and vulnerable people, who contribute little to global carbon emissions, are affected the most by climate change and are the least equipped to cope and adapt.

The year 2023 marked the halfway point for achieving the Sustainable Development Goals (SDGs). Progress towards the SDGs in the region has stalled, with only 15 per cent of the necessary progress made toward the Goals.¹ On current trends, Asia and the Pacific will miss 90 per cent of the 116 measurable targets under the 17 Goals. Worryingly, the region is falling back on Goal 13 (Climate Action). Countries in special situations, including least developed countries, landlocked developing countries and Small island developing States, have made less progress on SDG 13 than on any other goal. Furthermore, the global stocktake, a five-yearly review by countries to assess progress towards the long-term climate goals of the Paris Agreement, shows that progress is lacking in all areas.²

Following decades of inroads in reducing extreme poverty, progress on Goal 1 (No Poverty) and Goal 2 (Zero Hunger) has halted. Since the onset of the COVID-19 pandemic, more people have been pushed back to living in extreme poverty and severe food insecurity. While climate change is not the sole reason

for these trends, this report illustrates how it is making them worse. There is a clear overlap between the people living in poverty and those facing food insecurity. Both groups are also the most vulnerable to climate change impacts and face the most severe climate-related impacts on their livelihoods. Reducing these vulnerabilities, by fostering and securing livelihoods, will strengthen the resilience of resilience of poor and vulnerable groups to climate impacts and help reignite progress on SDG 1 and 2.

There is an urgent need for climate adaptation action to reduce these vulnerabilities. However, there is also a growing recognition of the limits to adaptation, especially given continuing and worsening climate impacts, meaning that some irretrievable losses may be inevitable. The ongoing global dialogue on loss and damage, most recently at the Conference of the Parties (COP) 28, is an expression of this growing awareness. It also highlights the need to map how compensation and funding can mitigate some of these losses and ensure that loss and damage do not lead to greater poverty and hunger.

This SDG Partnership report focuses on the interlinkages between climate change, poverty and hunger against the background of multiple crises and provides recommendations on how to integrate climate action, poverty and hunger alleviation with the ultimate goal of enabling transformative change in Asia and the Pacific.

The report is divided into three chapters. Chapter 1 provides a stocktake of climate impacts on Goal 1 and 2 in the Asia-Pacific

region, including the effects of sudden onset climate events such as storms, floods, and heat waves, as well as longer term impacts such as rising temperatures, changing rainfall patterns and sea level rise. An analysis of the impacts at the country, sub-regional and regional level shows that the burden of climate change affects communities and people across the region very differently.

Chapter 2 identifies innovative solutions and responses to the impacts of climate crisis in the region. It highlights good practices, policies, programmes and partnerships, that further knowledge and provide inspiration for more effective and stronger climate action that also makes meaningful advances in tackling poverty and hunger. The approach the chapter takes is aligned with the six key transition points that have been highlighted as one of the United Nations' high-impact initiatives to accelerate the implementation of the 2030 Agenda.³ These transition points centre on food systems; energy access and affordability; digital connectivity; education; jobs and social protection; and climate change, biodiversity loss and pollution.

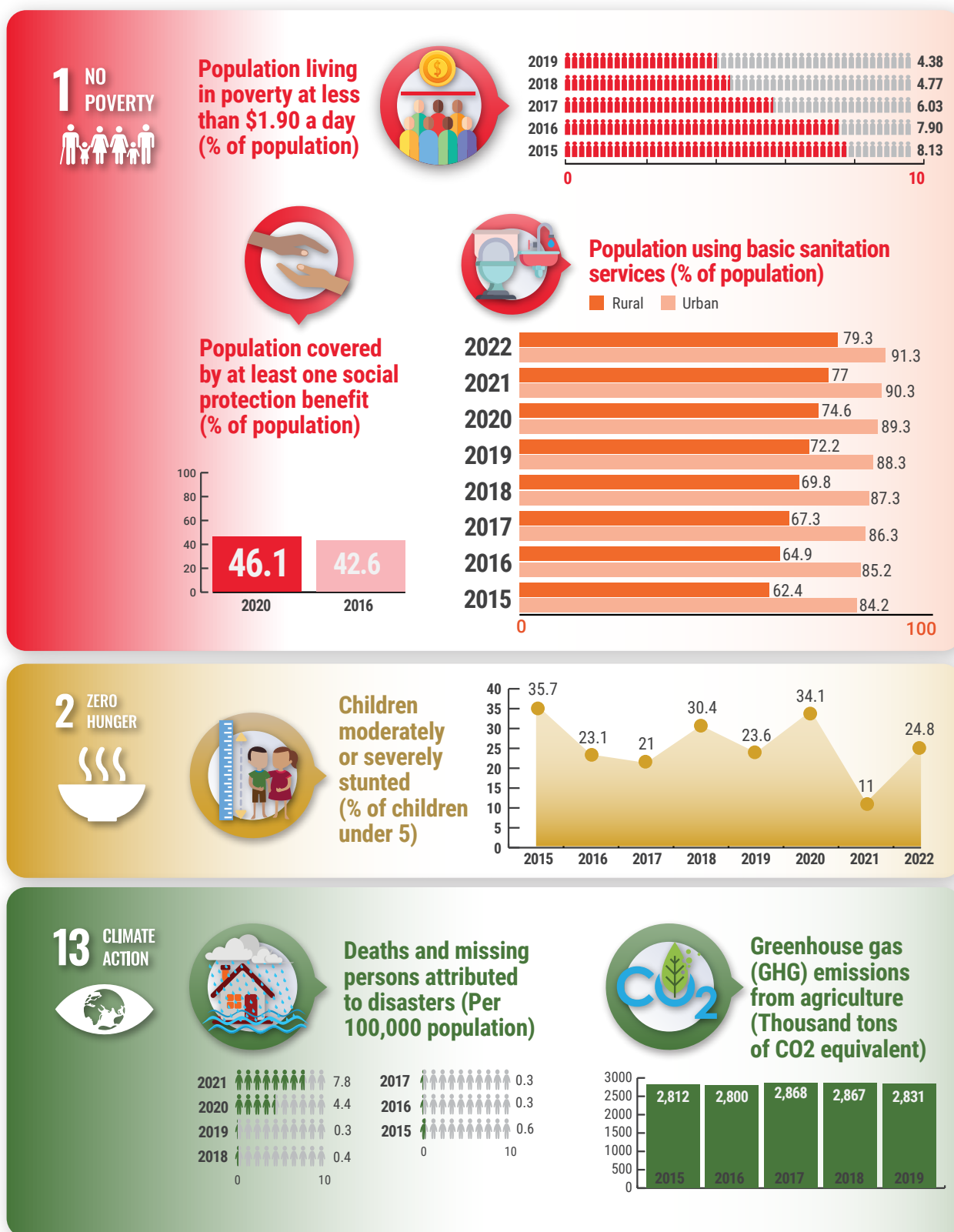
The responses in Chapter 2 exemplify three of the above points – food systems, jobs and social protection and climate change, biodiversity loss and pollution – and are organised under three focus areas:

- I. sustainable agricultural production and food systems to ensure food security, nutrition and livelihoods,
- II. decent work and just transition in the context of climate change and climate action, and
- III. climate-resilient and adaptive social protection systems.

Transformative change is necessary to meet the global development goals amid the changing climate of the planet. It must occur in how resources are managed and allocated, and by pursuing SDGs and decarbonisation in a way that is inclusive, especially for the most vulnerable people in the region, namely women, older persons, children, persons with disabilities and indigenous peoples.

Chapter 3 examines the key enablers of transformative change. These range from education and financing to regional cooperation and multi-stakeholder partnerships. The enablers require action from the public and private sectors, and various stakeholders, such as education and research institutions, financial institutions, civil society and international organisations. The action must be taken at the local, national, regional and global level. Finally, the chapter provides recommendations on how to ensure that policymakers and other stakeholders take action at the climate-poverty-hunger nexus.

Figure 1: Progress of key SDGs, 2016-2022



Source: Authors using data from the Asia-Pacific SDG Gateway (accessed on 4 January 2024)



The Impacts of Climate Change on Poverty and Hunger in Asia and the Pacific



CHAPTER

1

Climate change poses major challenges to the environment, economic growth, and human development in the Asia-Pacific region and beyond. Floods, droughts, and cyclones are common in the region and impact poor communities especially. In 2023, some 146 natural hazards, mostly floods and storms, were reported. These events affected 47 million people and caused economic losses of more than \$41 billion⁴ – slightly lower than in 2022.⁵ The data also show that the region is a global hotspot of flooding. Between 2000 and 2023, 1,665 flood disasters hit the region (41 per cent of the global total), killed 88,816 people (68 per cent of global flood-related deaths), and affected 1.6 billion people (91 per cent of the global total). The economic losses in the region during the period stood at \$452 billion.⁶

The losses from rapid onset climate hazards, such as floods and cyclones, are especially severe in the Pacific. Between 2015 and 2020, Small island developing States in the sub-region suffered the highest relative economic losses, with an average loss of nearly 9 per cent of GDP.⁷ This average, however, masks the extreme impact of specific disasters. To illustrate, when tropical cyclone Harold hit Tonga in 2020, economic losses amounted nearly 28 per cent of Tonga's GDP.⁸

Moreover, climate change generates a series of slow-onset hazards such as rising temperatures, ocean acidification, glacier retreat and sea-level rise. Air temperatures have been increasing noticeably since the turn of the century across the region, and glaciers in the

Himalayan region are continuing to melt rapidly.⁹ Climate change also alters the frequency and characteristics of so-called teleconnections, that is, significant links between weather phenomena at widely separated locations on earth. The most well-known examples include the El Niño–Southern Oscillation (ENSO) and the South Asian monsoon. Climate models project that El Niño will occur more frequently, with weather-related disruptions across Asia and the Pacific.¹⁰

Combined, these hazards strain socio-economic and environmental systems and undermine the region's ability to further sustainable development. While awareness of these climate impacts is increasing, a sound understanding of their destructive impact on food security and poverty alleviation is still lacking. Climate change is certainly not the sole cause of poverty and hunger but it is adversely impacting these critical areas and associated SDGs. It is important to see climate change in the context of other environmental challenges as well, such as desertification, loss of biodiversity, land and forest degradation, and salinization. These challenges are occurring in parallel and, compounded with climate impacts, are shaping the conditions for worsening poverty and hunger. This chapter provides an assessment of these impacts in Asia and the Pacific and identifies opportunities for mainstreaming climate-related policies into broader national sustainable development agendas. Box 1 shows the definitions of food security and poverty used in this chapter.

Box 1: Definitions

Food security is a situation when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. Six food security dimensions can be identified: food availability, economic and physical access to food, food utilization, stability over time, sustainability, and agency.¹¹ The concept of food security has evolved to recognize the centrality of agency and sustainability, along with the four other dimensions of availability, access, utilization and stability. In this chapter, food security is measured using SDG 2.1 and 2.2 targets and related indicators, particularly 2.1.1 (prevalence of undernourishment); 2.1.2 (prevalence of moderate or severe food



insecurity in the population, based on the Food Insecurity Experience Scale (FIES)); 2.2.1 (prevalence of stunting among children under five years of age); and 2.2.2 (prevalence of malnutrition (overweight) among children under five years of age). Hunger is defined as an uncomfortable or painful physical sensation caused by insufficient consumption of dietary energy. It is measured using indicator 2.1.1 (prevalence of undernourishment).

Food systems encompass the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products that originate from agriculture, forestry or fisheries, and parts of the broader economic, societal and natural environments in which they are embedded.¹²

Poverty is broadly defined as a pronounced deprivation of well-being related to lack of material income or consumption, low levels of education and health, vulnerability and exposure to risk, and voicelessness and powerlessness.¹³ When specific poverty thresholds are considered, they are mentioned in the text. For the overview on progress in poverty reduction the report draws on the SDG indicators 1.1.1 (proportion of the population living below the international poverty line) and 1.2.1 (proportion of population living below the national poverty line).

Image source: UN/Eric Kanalstein

1.1 Climate change impacts as drivers of poverty and hunger

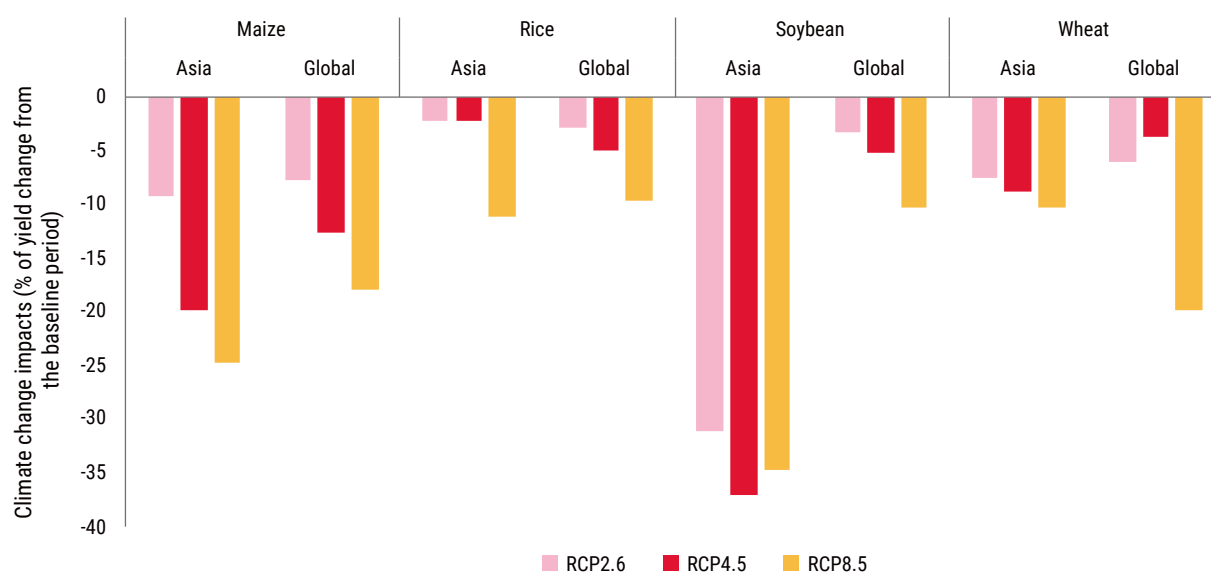
1.1.1 Climate change threatens the region's ability to eradicate poverty and hunger

Climate change is already fundamentally affecting global food systems, and projections suggest that impacts will worsen unless mitigation and adaptation actions are stepped up significantly. Increasing variability of weather patterns, rising temperatures, changing precipitation patterns and more frequent occurrences of extremes climate events negatively impact entire food systems, starting with production and stretching to include storage, transport, and consumption. Women

are particularly vulnerable; they constitute the majority of small-scale farmers producing one third of the world's food. Despite this, their access to and adoption of climate-resilient agriculture is limited by a lack of finance and insecure land rights. Women are less likely than men to own agriculture land in 40 out of 46 countries in the Asia-Pacific region.¹⁴

At the production level, global, regional and site-specific crop studies suggest that climate change will lead to a fall in yields of major crops in the region. In the absence of adaptation, mean crop yields for all major crops in Asia and the Pacific are set to decline steeply (see Figure 2). Even if emissions are greatly reduced, yields are still expected to diminish with the Asia-Pacific region being hit the hardest.¹⁵ Soybean,

Figure 2: Projected mean yield changes for major crops by end of the century relative to the baseline period (2001–2010) under three different emission scenarios (Representative Concentration Pathways)



Source: Authors using data from Hasegawa et al. 2022.¹⁷

Note: Global averages are shown for comparison. RCP2.6 represents a scenario where greenhouse gas emissions are strongly reduced, resulting in a best estimate global average temperature rise of 1.6°C by 2100 compared to the preindustrial period. RCP8.5 is a scenario where greenhouse gas emissions continue to grow unmitigated, leading to a best estimate global average temperature rise of 4.3°C by 2100. RCP4.5 is a medium stabilisation scenario, with varying levels of mitigation.

a staple in the diet of many far eastern countries in the region, is projected to suffer the biggest fall in yield.¹⁶

Especially in countries closer to the tropics where agriculture depends on irrigation (such as Bangladesh, India and Pakistan), rising heat and water scarcity will severely constrain crop production. The adverse impacts on rice and wheat yields are less pronounced compared to global averages, but expected to increase significantly for higher emission scenarios, which are projected to lead to shorter growing periods through higher temperature, and thus reduced yields.

These projections, however, do not factor in the impacts of climate change on pests, pollinators and biodiversity. Without adaptation, falling crop yields will push more people into poverty and undernourishment, especially in countries that are already food insecure and densely populated.

Climate change also alters conditions that sustain marine and freshwater fisheries.

Impacts include changes in temperature, ocean acidification and lower oxygen levels. Under future climate scenarios, tropical parts of the region are projected to face reduced fisheries catch by 2050, with the productivity of fisheries expected to fall by almost one half compared with current levels.¹⁸ This is an acute emerging crisis, given that the region accounts for 86 per cent of jobs in the global fishery and aquaculture industries. An illustration of the severity of the crisis is that seven Asia-Pacific countries — Kiribati, Micronesia, Solomon Islands, Marshall Islands, Tuvalu, Palau and Myanmar — are among the world's 14 most at-risk to marine fisheries loss.¹⁹ In Association of Southeast Asian Nations (ASEAN) alone, there are an estimated 30 million fishers, at least 150 million people rely on fish for their food security and another 60 million people are working in related industries such as boating or fishing gear manufacturing.²⁰ While their contribution to the fisheries sector is often unrecognized and undervalued, women play a vital role throughout the value chains of fisheries in Asia and the Pacific. As the consequences of global warming take hold and

environmental degradation makes fish scarcer, women's capacity to sustain households and communities across the region will be much reduced.²¹

Climate change also poses a significant threat to freshwater fisheries through rising water temperatures and reduced water availability. The impacts are largest in tropical and sub-arid regions of Asia and the Pacific. Inland fisheries in South-East Asia, South Asia and Australia are at particular risk. Climate change impact assessments of major river basins that support inland fisheries show that in Ganges, Mekong and Krishna rivers basins more than half of freshwater species are at high risk in a 4.5 degrees warmer world (Figure 3). These basins are home to large numbers of poor people whose livelihoods depend on fisheries.

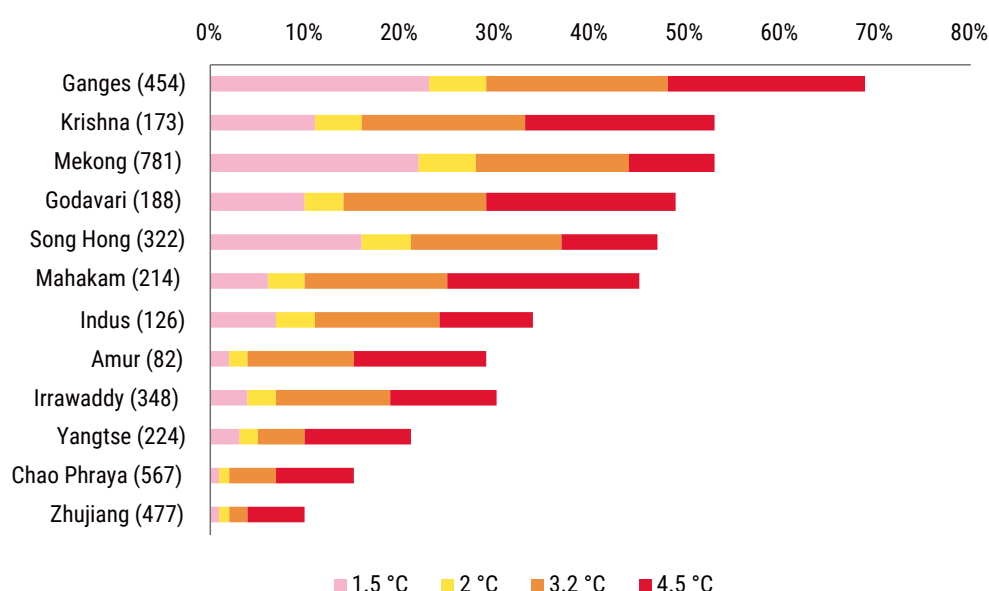
Beyond crop production and fisheries, livestock-related systems also face severe climate impacts. The region is home to a rich diversity of pastoralist communities. Most of the herdsmen live in rural areas, where poverty and deprivation rates are high. The Food and Agricultural Organization (FAO) reckons the number of people raising livestock globally in

pastoral and agropastoral systems exceeds 180 million, with between 30 to 40 per cent living in Asia and the Pacific.²³ Poverty is more prevalent among pastoralists than in the general population. In Mongolia, for example, 28.4 per cent of people live in poverty. In rural areas, where nearly three in five poor people are herders, the incidence of poverty stands at 31 per cent.²⁴ Pastoral systems are particularly vulnerable to climate change. The observed impacts comprise, among others, changes in pasture productivity, reduced animal growth rates and productivity, and increased pests and diseases.²⁵

Pastoralist communities are adapting to some of these stressors. In the Hindu Kush Himalayas region, for example, pastoralists are diversifying their livelihood by complementing livestock grazing with income from wage labour, labour migration and tourism services.²⁶ However, the extent to which such adaptation will be feasible under high-end climate change is uncertain.

The impacts of climate change, especially droughts and flooding, on food systems affect post-production activities, too. By 2050, post-

Figure 3: Climate change impacts on freshwater fisheries in Asia's largest river basins



Source: Authors based on data from Barbarossa et al. (2021).²²

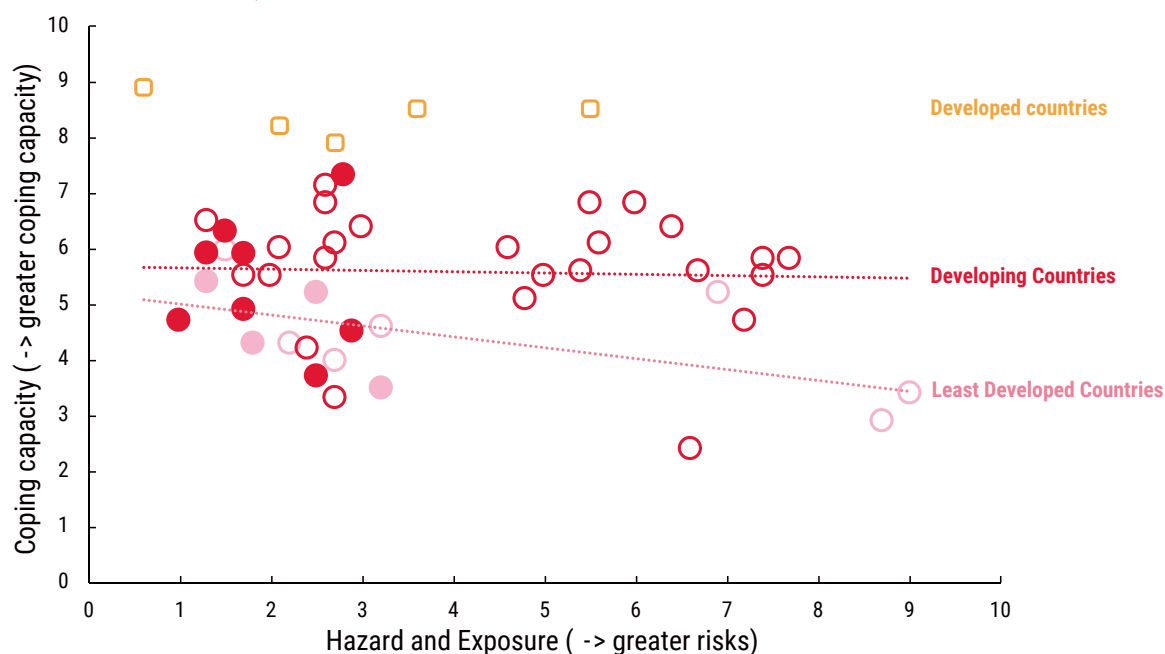
Note: The number in parenthesis indicates the number of freshwater fish species considered. The horizontal axis shows the climate change risk to freshwater fisheries, measured as the fraction of freshwater fish species in a given basin potentially affected by higher temperature and more variable freshwater flows under climate change and under a scenario of no dispersal.

harvest losses of rice in Viet Nam could be as high as 80 per cent and in Indonesia losses of fresh vegetables could be as high as 50 per cent.²⁷ Climate-related shocks can also destroy storage facilities or make food perish more quickly and affect food safety. Higher temperatures favour thermophilic bacterial and fungal growth, which affect food safety and increase spoilage.²⁸ Transport of food will also be increasingly hit by climate-related shocks, especially in countries with poor infrastructure. Climate change impacts also influence the retail distribution and consumption stage of food systems. Another risk is that declining food availability, because of climate change, might push up food prices, lead people to spend less on food and thus reduce their caloric intake and lead to less healthy diets. Moreover, food aid dependence might increase because of climate change. When the nutritional quality of food aid is low, as for instance observed in the Marshall Islands between 2008-2013, higher food aid dependence might lead to an increase of chronic diseases and other poor health outcomes.²⁹

1.1.2. Poorer countries and people are more exposed and are less able to adapt

A comparison of coping capacity and exposure to climate-related shocks and non-climate shocks in the Asia-Pacific region shows that developed countries are less exposed and more resilient in the face of shocks than least developed and developing countries (Figure 4). Another finding is that countries with a higher exposure, and thus a greater need to adapt, typically have a lower coping capacity due to a lack of financing, infrastructure, and institutional capacity. The climate crisis is thus exacerbating economic inequalities, concentrating wealth and power, and heightening economic insecurity among vulnerable groups such as children, women and girls, older persons and persons with disabilities.³⁰ This dynamic reduces the physical and economic resilience of those countries and their vulnerable communities, creating a vicious cycle for vulnerable groups, and further stalling of progress on SDG 1 and 2.

Figure 4: Coping capacity and exposure to climate-related other shocks in Asia and the Pacific, 2023



Source: Authors using INFORM database (accessed on 20 December 2023).

Note: Coping capacity refers to country-system capacity (INFORM hazard and exposure, and coping capacity indexes, points out of 10). Dotted line shows estimated linear relationship for developing economies and least developed countries. Coping capacity is the inverse of the 'lack of coping capacity' in INFORM. Countries are classified following the United Nations classification from the World Economic Situation and Prospects 2023. Filled markers indicate Small island developing States.

Figure 5: Nexus connecting climate change to poverty and food insecurity through labour, assets and price channels at the household level



Source: Authors.

The combination of high country-level exposure to shocks and low coping capacity causes poverty and food insecurity to rise at the household level. Poor households feel the impacts of climate change in multiple ways, including in the areas of labour supply and productivity, asset accumulation, and price and consumption (see Figure 5).³¹

High temperatures weigh on labour supply, especially in the case of farm workers and other outdoor work. While assessing the effects of climate change on labour is tricky, region-wide estimates suggest that the working hours start declining rapidly at temperatures of more than 21.5°C for high-exposure work conditions (e.g., outside work with no shade). The threshold beyond which working hours drop significantly

for low-exposure conditions, namely indoor work, has been found to be around 20.2°C.³²

Rising temperatures also affect labour productivity, which is estimated to drop off sharply when heat stress from direct sunlight is felt above 25°C and hits zero at temperatures of 39°C.³³ When these effects are seen in the context of climate change projections, Asia and the Pacific emerges as the world's second most affected region after Africa (Figure 7). Labour productivity in the region is projected to fall by 6.7 percentage points at 1.5°C warming (and 10.4 and 18.6 percentage points at 2.0°C and 3.0°C warming, respectively).³⁴ Countries near the equator, notably in South-East Asia, are projected to see the largest climate-related drops in labour productivity.

Poor households are at greater risk of losing their assets following climate shocks. In Bangladesh, for example, multiple studies all reach the same conclusion: in relative terms poor people lose more assets when floods or cyclones hit (between 5 per cent to more than 20 per cent) than non-poor people.⁴³ Similar inequalities in asset losses from climate-related shocks have been observed in Sri Lanka, where on average people in the bottom income quintile account for only 7 per cent of total asset losses from fluvial floods but incur nearly one third of total losses in wellbeing.⁴⁴ Box 3 presents additional evidence on the growing flood exposure of poor people in Asia and the Pacific. In Cambodia, Myanmar and the Philippines, households often sell assets to cope with drought, which occur the most in areas with high poverty and malnutrition.⁴⁵ At times, households also find alternative sources of income; however, this often requires that people temporarily or permanently migrate. In the case of Small island developing States, a lack of economic opportunities following major disasters is a key driver of labour migration to larger economies, such as Australia and New Zealand.

Climate change also impacts household food insecurity and poverty through prices. Food price spikes that follow extreme weather or climatic events disproportionately affect poorer households. In the aftermath of the devastating floods in Pakistan in 2022, the price of wheat and other basic food items hit record highs.⁴⁷ Poor households ended up spending a large share of their income to feed themselves, leaving them unable to buy nutritious foods. The impacts of climate change on nutrition are further explained in Box 2.. This dynamic further compromises the adaptive capacity of poorer people to climate change impacts. A global study on food price changes and child undernutrition found that wasting increases in the wake of food price shocks. The impact was more pronounced in South Asia and South-East Asia than in Africa, despite the former having higher economic development.⁴⁸ This can be explained by high rates of wasting in South Asia and South-East Asia, as well as poor maternal nutrition and health, low birth weight and a relatively low post-neonatal mortality rate.⁴⁹

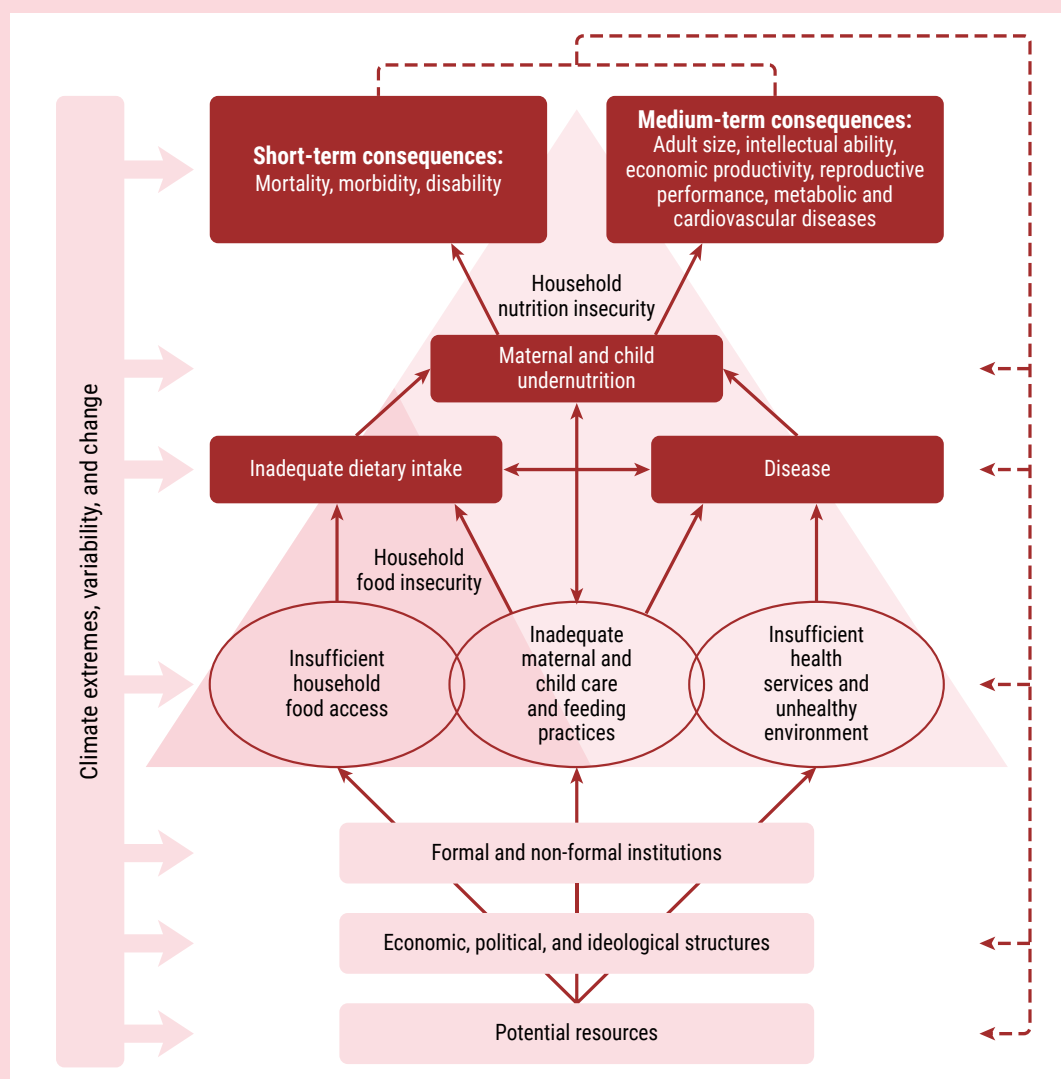
Box 2: Climate change impacts on nutrition

The Global Syndemic of Obesity, Undernutrition, and Climate Change report, published by the Lancet Commission, on the impacts of climate change on nutrition speaks of a global 'syndemic' or synergy of epidemics.³⁵ Malnutrition in all its forms, including obesity, undernutrition, and dietary risks for non-communicable diseases (NCDs), is already the biggest cause by far of health loss globally. Climate change is expected to exacerbate malnutrition, particularly undernutrition. The direct and indirect pathways through which climate change affects nutrition outcomes are shown in Figure 7. The outcomes differ widely across the region, with the most vulnerable populations bearing the brunt of the climate change impacts.

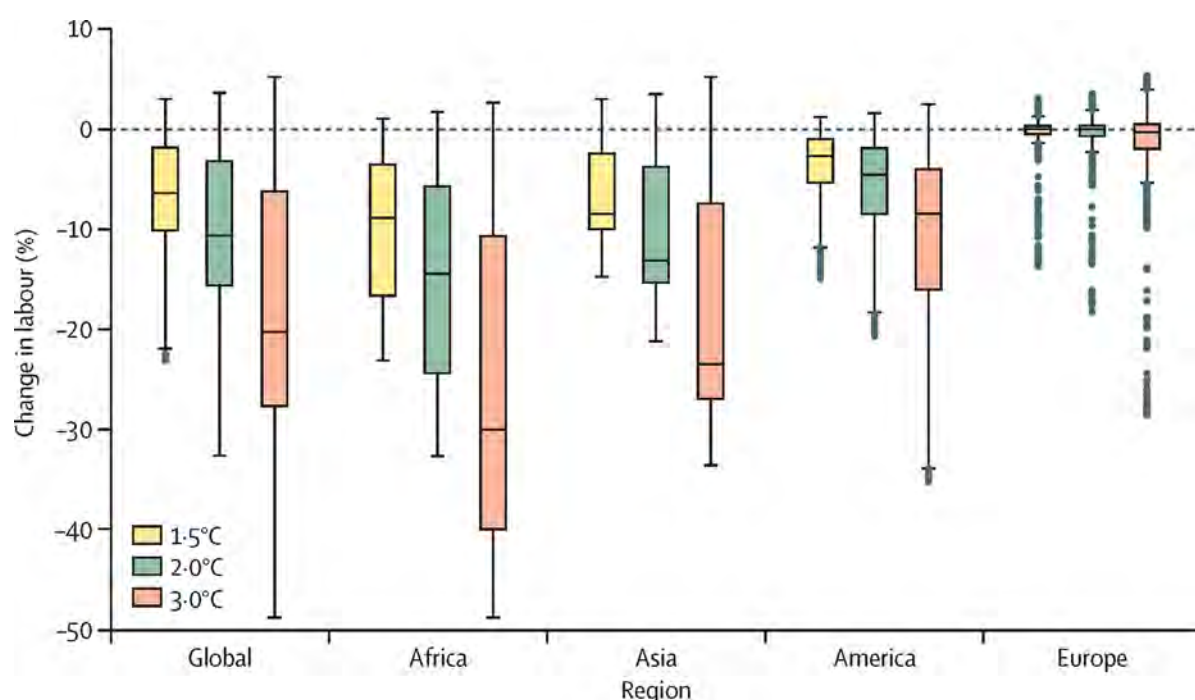
While there are no region-wide assessments of the impacts of climate change on nutrition, multiple studies have shown a link between climatic change and poor nutritional outcomes in Asian countries. In Indonesia, a delayed onset of the monsoon is associated with greater chronic malnutrition and acute malnutrition.³⁶ In Papua New Guinea, frequent El Niño-related droughts resulted in increased food and water insecurity, particularly in the highlands and rural areas.³⁷ In the Pacific, climate change effects on agriculture and fisheries are likely to drive up the reliance on imported foods of low nutritional quality, leading to a rising prevalence of obesity.³⁸

South Asia is at particularly high risk of climate-driven undernutrition due to a mix of historical weather exposures, existing nutritional deficits, and a lack of sanitation access.³⁹ Across Bangladesh, India, Pakistan and Nepal, exposure to precipitation extremes during the first year of a child's life decreases height-for-age and increases stunting in children. These impacts are most pronounced in children who live in India or Pakistan, and those whose mothers have no education or belong to a disadvantaged caste, or who do not have access to an adequate toilet. These findings are confirmed by studies at the sub-national level. In the Chittagong division, Bangladesh, higher temperatures also negatively affect children's nutritional status.⁴⁰ Higher temperatures reduce the size of rainfed areas planted with rice, thus affecting nutritional options for households, with far-reaching consequences for child development and economic opportunities in vulnerable areas. In the south Indian state of Kerala, flood conditions have been shown to increase the likelihood of stunting and prevalence of malnutrition among children aged under five.⁴¹

Figure 7: Pathways through which climate change, variability and extreme events affect nutrition



Source: Tirado, M. C. and others (2013).⁴²

Figure 6: Reductions in effective labour under climate change

Source: Shouro Dasgupta and others (2021).⁴⁶

Note: Population-weighted (SSP2) changes (percentage points) in global and regional effective labour under various global warming scenarios compared with pre-industrial levels, 1986–2005.

Women are overrepresented among the extreme poor in Asia and the Pacific and bear the brunt of rapid and slow onset climate impacts due to underlying gender inequalities. The region is expected to experience twice the global average increase in the incidence of extreme poverty under the worst case climate trajectory – at 18.1 per cent compared with a global average of 9.1 per cent. Women in the region are forecast to be more vulnerable to climate change, with female extreme poverty set to rise to 17.1 per cent under the worst climate path scenario compared to 9.3 per cent for women globally.⁵⁰

Pregnant women who experience the adversity of a drought and subsequent food spikes are at a higher risk of having a newborn with stunting⁵¹ and of developing anaemia.⁵² This can be explained by the eroding effect that higher prices and price fluctuations have on household purchasing power, especially in urban areas. Households that are forced to cut their spending on food, health, childcare, and education will likely suffer the short-

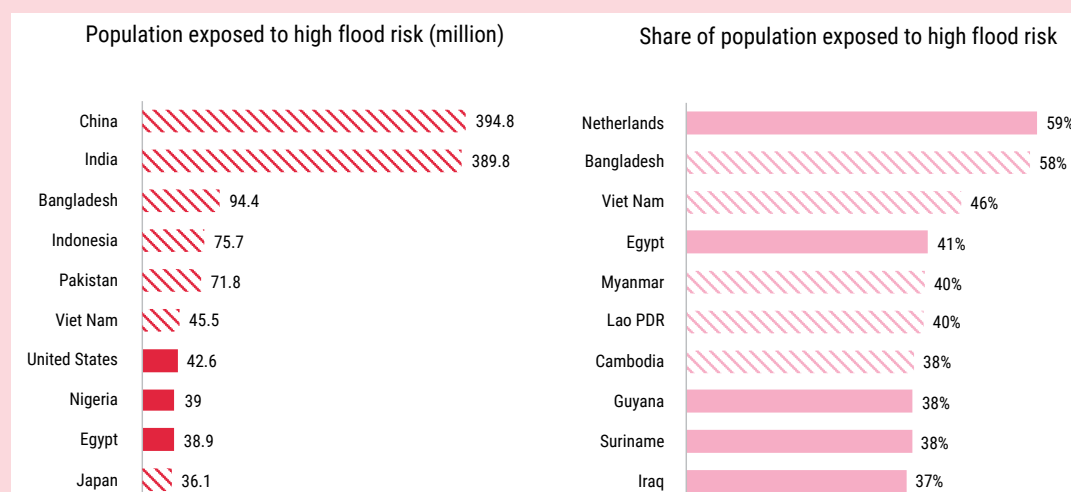
term consequences of early childhood undernutrition (for example, poor health and increased mortality) and its long-term effects on the intergenerational transmission of poverty through illiteracy and diminished economic productivity.⁵³

Women in the region already dedicate four times more time than men on unpaid domestic and care work and this burden intensifies during climate-related shocks.⁵⁴ For example, women tend to have a disproportionate responsibility for collecting fuel and water, and securing food to meet household needs. As climate change and environmental degradation make these natural resources harder to come by, the burdens faced by women will rise. Women also depend more on natural resources for their livelihoods, making them more vulnerable to rapid and slow climate impacts. Furthermore, following climate disasters, women, girls, and gender minorities are at heightened risk of violence and harmful practices, including intimate partner violence, child marriage and sexual exploitation.⁵⁵

Box 3: Exposure to floods and poverty in Asia and the Pacific

The Asia-Pacific region is a global hotspot of flood risks. Global assessments find that 1.81 billion people, or nearly a quarter of the world's population, are directly exposed to 1-in-100-year floods (fluvial, pluvial, and coastal), with inundation depths greater than 0.15 metres.⁵⁶ Of these, 1.24 billion people live in East Asia and South Asia, where China (395 million) and India (390 million) account for over one-third of global exposure. Six of the top ten countries with the highest number of people exposed to floods are in the region (Figure 8). When considering relative exposure, namely the share of a country's population exposed to flooding, five countries in the region are in the global top ten. Flood exposure is particularly high for countries where human settlements concentrate along rivers (e.g., Myanmar, Lao People's Democratic Republic, Cambodia, Bangladesh, and Pakistan) and in coastal areas (China, Viet Nam, Indonesia).

Figure 8: Asia and the Pacific is a global hotspot of flood risk



Source: Authors based on Rentschler and others (2022).⁵⁷

Note: Countries in Asia and the Pacific are striped.

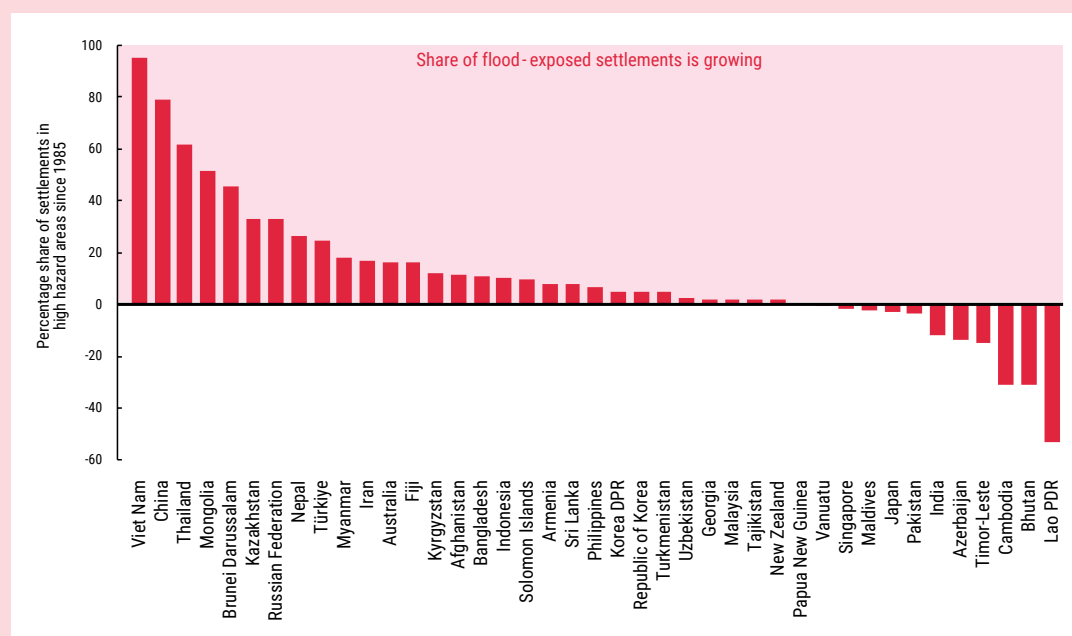
The level of climate risk varies between population groups. Poorer communities are more exposed to and bear the brunt of flooding. Poverty and flooding are interlinked in many ways: many poor households are located in flood-prone areas, they often lack household-level flood protection, and coping mechanisms that support recovery tend to be scant. These conditions can have long-term consequences for human health and development, including greater psychological distress and exposure to diseases. The challenge is greatest in South Asia, where more poor people live in flood-prone areas than anywhere else. In India, about 65 million people live in extreme poverty and are exposed to high flood risks. In Bangladesh, this figure stands at 7.5 million.⁵⁸

While global warming will drive up flood risk, local patterns of urbanization and spatial development remain the primary determinants of flood risk. In many parts of the region, human settlements are growing much faster in flood-prone areas than in

flood-safe areas. Figure 9 shows the difference between settlement growth in safe and high-hazard areas for selected countries in Asia and the Pacific between 1985 and 2015. In most countries in the region, settlements in high-hazard flood zones have expanded much more than settlements in flood-safe areas. This trend is most acute in East Asia, where settlements in high-hazard areas have expanded 60 per cent faster than in areas not affected by flooding.⁵⁹ This means that rather than adapting to climate change, exposure to climate-related flooding is increasing in many countries.

Moreover, these settlements on hazardous lands are typically poorer as the safer and more productive locations are too expensive and often already taken by higher-income earners. In addition, poorer people are attracted to flood-prone areas by cheap or untenured housing and proximity to low-income jobs. This trend has been observed in several countries in the region, including in India,⁶⁰ Nepal⁶¹ and the Philippines.⁶² Out of the region's 1.3 billion people highly exposed to flood risk by 2050, some 318 million people live on less than \$3.2 a day. Using the poverty threshold of \$5.50 a day, this figure rises to 557 million people. This means that in the region almost one in two people who are highly exposed to flood risk live in poverty (or near poverty). In these hotspots, implementing risk-sensitive land-use and urban development policies that target poorer households must be an urgent priority. There is also a need to build institutional capacity and policies that better integrate nexus approaches when considering climate hazard risk assessment and governance, and innovation, technology and data (see Chapter 3).

Figure 9: Settlement growth in flood zones between 1985 and 2015 in select countries in Asia and the Pacific



Source: Authors based on Rentschler and others (2023).⁶³

1.1.3. Climate impacts and forced displacement

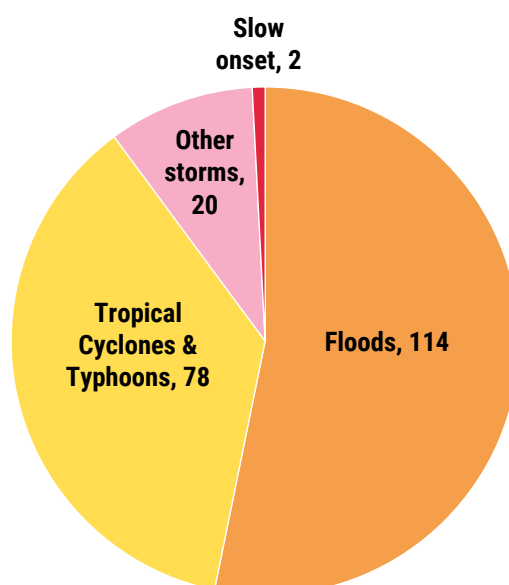
The majority of climate-related human displacement recorded globally occurs in Asia and the Pacific. During 2010-2021, some 213.5 million displacements due to climate-related shocks such as floods, storms, drought, wildfires, and extreme temperatures were recorded in the region (Figure 10). The largest displacements were observed in China, the Philippines, India, Pakistan, and Bangladesh. In 2022, floods affected 33 million people in Pakistan, triggering the internal displacement of 8.2 million people, making it the world's largest disaster displacement event in the last decade.⁶⁴ Although displacements can be temporary, they can also uproot populations lastingly, with rippling effects on human development, urbanization and the prospect of social and economic transformation.

Rapid onset events are responsible for most of the disaster-related displacements. The impact of slow-onset climate-shocks, such as drought and sea-level rise, is much more difficult to gauge, and records may underestimate the impact on human mobility. With about half of their citizens living within 10 kilometres of the coast, Pacific small island States are highly

exposed to slow-onset climate-related events such as coastal erosion, saline intrusion, and sea-level rise. Estimates suggest that in the Pacific as many as 50,000 people are forcibly displaced by climate-related disasters every year.⁶⁵ Analysis combining satellite imagery and local knowledge shows that at least 11 islands across the northern Solomon Islands have either disappeared over recent decades or are currently experiencing severe erosion because of sea-level rise and higher wave energy, forcing communities to relocate.⁶⁶

In some of these vulnerable areas, relocation is already being considered as an adaptation option. For example, Vanuatu developed the National Climate Change and Disaster-Induced Displacement Policy ("Displacement Policy"),⁶⁷ which recognizes the importance of relocation. The policy has resulted in the development of standard operating procedures on planned relocations. In 2023, Australia and Tuvalu signed the Falepili Union, an international treaty that recognizes the existential climate-related threats faced by Tuvalu and supports the development of arrangements for citizens of Tuvalu to permanently relocate to Australia.⁶⁸ Moreover, Australia is planning to offer up to 3,000 Pacific engagement visas per year for all Pacific islanders and Timor-Leste.⁶⁹

Figure 10: Internal displacement (million people) during 2010-2021, breakdown by rapid-onset climate hazard for countries in Asia and the Pacific



Source: Authors using data from Internal Displacement Monitoring Centre and Asian Development Bank (2022).⁷⁰

Note: Figure does not include displacement in response to slow-onset sea level rise. Other includes wildfires, landslides, and wave action.

1.2 Underlying vulnerabilities and structural issues make climate action more difficult and urgent

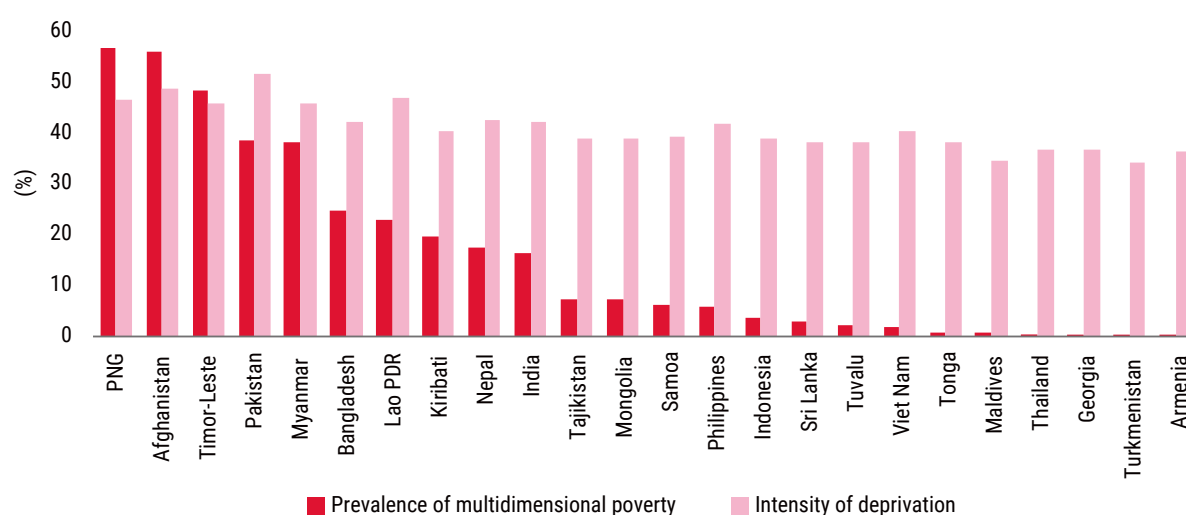
SDG 1 aims to end poverty in all its forms everywhere by 2030. Its targets include the eradication of extreme poverty and increasing access to social protection, among others. Table 1 presents the change in two key indicators of SDG 1 between 2015 and 2022 in the Asia-Pacific region (the analysis focuses on the two indicators for which data was available). Many countries show little to no progress or backsliding, implying that poverty has remained constant or increased. The findings are conditional on the indicators as defined in the SDG framework and might be influenced by the sensitivity of measured outcomes to poverty thresholds and the multi-dimensional nature of poverty.

Between 1990 and 2019, the prevalence of extreme poverty in developing Asia fell from 58 per cent to 5 per cent.⁷² Much of the dramatic reduction was driven by remarkable progress in China, Indonesia, Kyrgyzstan, Nepal, Tajikistan and Viet Nam, where poverty rates decreased by more than 30 percentage points.⁷³ The

COVID-19 pandemic and recent global shocks drove up poverty in the region, making its eradication more challenging. About one third of the countries in the region had at least 20 per cent of their population categorised as multidimensionally poor between 2016–2021 (Figure 11).

Progress on SDG 2 (zero hunger) has reversed in recent years, on the back of the combined impacts of climate change, local crises, the pandemic and the Russian invasion of Ukraine. The total number of undernourished people in the region rose in 2021 and 2022, albeit at a slower pace than during the first year of the pandemic.⁷⁵ One quarter of people living in the region were food insecure in 2021. That year, more than 460 million people suffered severe food insecurity and an additional 586 million suffered moderate food insecurity. The latter figure means that half of the world's poor faced moderate to severe food insecurity.⁷⁶ Women in the region suffer more from food insecurity than men: 20.8 million women in Central and Southern Asia were pushed into food insecurity (which is 5.5 million higher than the figure for men).⁷⁷ The long-term impacts of hunger have devastating knock-on effects on socio-economic and health outcomes. The region is home to over 75 million

Figure 11: Prevalence and intensity of multidimensional poverty in Asia and the Pacific in 2023



Source: Asian Development Bank (2023).⁷⁴

Note: The prevalence of multidimensional poverty refers to the percentage of the population with a deprivation score of at least 33.3 per cent. Meanwhile, the intensity of multidimensional poverty denotes the average deprivation score among multidimensionally poor people. In this case, an intensity of more than 40 per cent implies that, on average, multidimensionally poor individuals are experiencing deprivation in approximately 40 per cent of the dimensions or indicators used to measure poverty.

Table 1: Progress towards selected SDG 1 and 2 target indicators in selected Asia-Pacific countries between 2015-2022

Country	SDG 1.1 Proportion of employed population living below the international poverty line, aged 15+, total (%)	SDG 1.2 Proportion of population living below the national poverty line, total (%)	SDG 2.1.1 Prevalence of undernourishment (%)	SDG 2.2.2 Prevalence of stunting among children under five years of age (%)	SDG 2.2.2 Prevalence of malnutrition (wasting and overweight) among children under five years of age (%)
Afghanistan ⁷¹	--	--	-8.8	6.5	0.9
Armenia	0.0	3.3	--	3.7	1.9
Australia	--	--	--	0.0	-4.9
Azerbaijan	0.0	-1.0	--	2.2	1.4
Bangladesh	8.9	--	3.6	7.6	-0.2
Bhutan	0.8	--	--	4.1	0.5
Brunei Darussalam	--	--	--	3.8	-0.2
Cambodia	6.7	--	2.1	6.0	-1.0
China	0.8	--	--	1.6	-1.2
Fiji	-2.0	--	2.6	0.8	-0.6
Georgia	0.6	4.1	0.7	2.3	4.6
India	5.9	--	-2.6	5.8	-0.5
Indonesia	2.6	1.1	1.4	1.9	-0.1
Japan	--	--	--	0.9	-0.2
Kazakhstan	--	-2.5	--	3.3	2.6
Kiribati	--	--	-1.2	1.1	0.1
Kyrgyzstan	0.5	-1.2	1.0	2.9	0.7
Lao PDR	2.6	--	2.0	7.6	-1.1
Malaysia	--	--	3.4	-2.7	0.4
Maldives	--	--	--	1.4	1.7
Marshall Islands	--	--	--	3.8	-0.2
Mongolia	0.0	--	-0.4	3.1	-0.6
Myanmar	--	--	0.3	4.3	0.5
Nauru	--	--	--	3.7	-0.4
Nepal	2.4	--	0.9	8.2	-0.3
Pakistan	1.1	--	-6.4	6.5	1.1
Papua New Guinea	1.4	--	-0.9	-1.9	-3.1
Philippines	2.9	5.4	3.9	2.2	-0.7
Samoa	--	--	2.7	-1.6	-1.0
Republic of Korea	--	2.4	--	0.1	1.0
Singapore	--	--	--	0.2	-0.4
Solomon Islands	0.1	--	2.6	1.1	-1.2
Sri Lanka	0.6	--	3.8	0.3	0.0
Tajikistan	2.4	--	7.0	7.3	1.2
Thailand	-0.1	0.9	1.7	0.9	0.7
Timor-Leste	5.8	--	5.3	4.1	0.6
Tonga	--	--	--	2.8	2.5
Turkmenistan	0.3	--	-0.2	3.2	0.9
Tuvalu	--	--	--	1.5	0.6
Uzbekistan	5.6	-4.2	--	3.4	1.6
Vanuatu	--	--	1.0	-2.7	-0.2
Viet Nam	1.1	1.4	2.1	3.7	-2.3

Source: Authors using the Asian Development Bank's Key Indicator Database (accessed on 4 December 2024).

children who suffer from stunted growth; with nearly one in ten children aged less than 5 experiencing wasting.

Inadequate nutrient intake and absorption lead to stunting and wasting and are detrimental to children's physical and cognitive development. Children facing these conditions that weaken immunity are more at risk of succumbing to common infections and are also more prone to developing non-communicable diseases, both early on and later in life. In this way, hunger and food insecurity contribute to perpetuating poverty. Without interventions, these dynamics can critically curtail people's productive capacity and their ability to seize opportunities that enhance their livelihoods.

Sluggish progress towards SDG 1 and SDG 2 heightens vulnerability to climate change. When poor people are unable to escape poverty, their ability to adapt to climate change is much reduced. For example, living in poor quality housing with inefficient or no cooling makes people more vulnerable to heatwaves.⁷⁸ This so-called "cooling gap" is particularly large in the South Asia region, where almost 1.5 billion people, or 92 per cent of the sub-region's population, are vulnerable, due to a mix of severe climatic conditions and poverty.⁷⁹ Similarly, poor households are less able to cope with climate-related food price shocks because they typically lack facilities to store and freeze food at home. Unsurprisingly, households in poorer areas across Asia are less likely to own a refrigerator, making them more reliant on either fresh local produce which might be affected by droughts and floods (as observed in Pakistan in 2022), or processed foods that are often more expensive or less nutritious, or both.⁸⁰

1.2.1. Depleted natural capital heightens vulnerability to climate impacts

The depletion of the region's natural capital heightens vulnerability to climate change, hinders poverty reduction and threatens food security. Environmental assets are critical for human well-being and provide significant economic and social benefits. Global analyses

show that the pursuit of economic development and the preservation of the natural capital are not mutually exclusive.⁸¹ Across Asia and the Pacific, countries can improve the use and management of their natural capital, while achieving their SDGs. This entails, for example, planting crops in climates and geographies that are suited for them, avoiding raising livestock on lands suitable for agriculture, or replanting deforested areas.

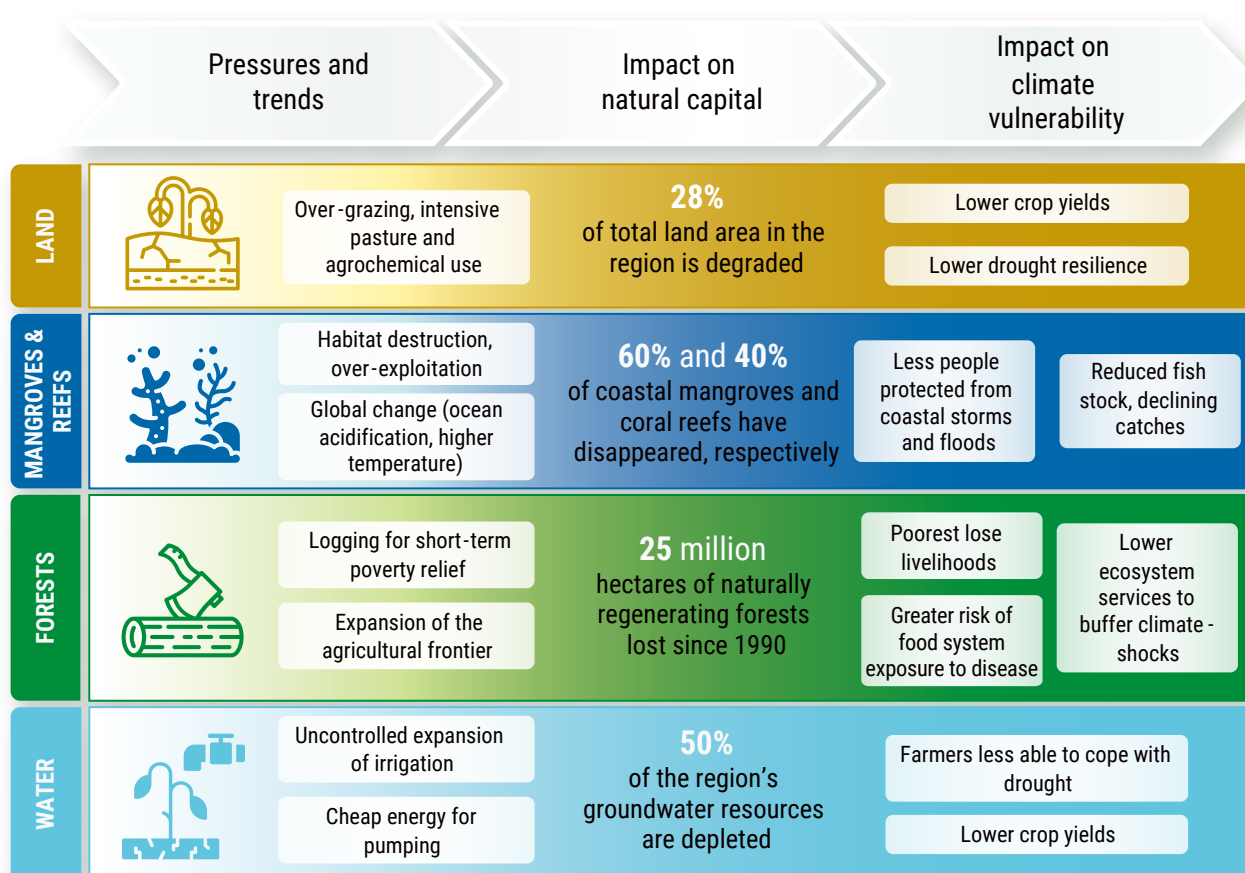
Unless countries act, the depletion of natural capital will continue to undermine economic development and speed up the loss of biodiversity and ecosystem services, including pollination, water purification and pest control.⁸² In the region, four types of natural capital are being depleted at an alarming rate: land; forests and related biodiversity; mangroves and coral reefs and related biodiversity; and freshwater resources (especially groundwater) (see Figure 12).

Land degradation from soil erosion, loss of carbon and soil nutrients, salinization, and waterlogging all threaten agricultural productivity and negatively affect the wellbeing of large numbers of people. An estimated 850 million hectares, or 28 per cent of the region's land area, is affected by land degradation.⁸³ Many farmers practice agricultural burning for clearing land and enabling quick crop turnover. This agricultural burning can reduce water retention and soil fertility by up to 30 per cent, increasing erosion rates and farmers' need to compensate with fertilizers and irrigation. The black carbon emitted is a harmful air pollutant as well as a greenhouse gas exacerbating climate change.⁸⁴ While region-wide estimates of the number of people affected are lacking, research suggests that about 30 per cent of the rural population, or about 1 billion people, are affected by land degradation in East Asia and South Asia alone.⁸⁵ This leads to lower soil fertility and increases erosion, with rippling effects on agricultural productivity, and the overall resilience of food systems. Degraded land is also more vulnerable to slow-onset climate hazards, such as desertification, as well as rapid-onset events, such as floods. The latter can increase landslide risk, and lead to excessive nutrient and soil runoff into rivers, thus compromising water quality.

Land degradation is also a pressing issue in Central Asia, due to a combination of increasing temperatures, as well as unsustainable agricultural and irrigation methods. Nearly a quarter of the people in Kazakhstan and Uzbekistan are forced to live on degraded land. The total area of degraded land is estimated to comprise 66 per cent of Kazakhstan.⁸⁶ Significant pasture degradation due to over-grazing is present in Kyrgyzstan (30 per cent), Tajikistan (89 per cent for summer pastures and 97 per cent for winter pastures), and Turkmenistan (70 per cent). Every year, there are significant economic losses from land degradation: they make up around 10 per cent in both Tajikistan and Kyrgyzstan. The increasing probability of drought in Central Asia elevates the risk of expanding drylands and desertification in the region.

Natural capital in the form of mangroves and coral reefs along the region's coasts has also been depleted, heightening vulnerability to climate change. Between 1990 and 2020, more than 4,000 square kilometres of mangroves was lost in Asia and the Pacific. This loss accounts for nearly half of the global net loss.⁸⁷ Similarly, the region's coral reefs are under pressure, with at least 40 per cent already having disappeared.⁸⁸ The overall result is a loss of terrestrial and marine biodiversity, and of vital support systems for coastal communities that rely on mangroves and coral reefs for their livelihoods and as a protection from coastal flooding. Indigenous people in Small island developing States are particularly exposed to the consequences of the depletion of this type of natural capital. To illustrate, people living on the islands of Palau, Micronesia and Kiribati

Figure 12: Selected pressures and trends on natural capital assets in the Asia-Pacific region and related impact on vulnerability to climate change



Source: Authors based on ESCAP (2022).⁹⁰

consume more coral reef fish per person than anywhere else. Other areas with high per-capita consumption of local fish are South-East Asia and the Bay of Bengal.⁸⁹

Forests play a key role in confronting the challenges of climate change, food shortages, and bolstering livelihoods of a growing population. However, between 1990 and 2020, some 25.5 million hectares of natural forest were lost in the region mainly to agricultural uses. The loss accounts for 8.5 per cent of the world's total natural forest loss during the period.⁹¹ South-East Asia is a hotspot of tropical deforestation for agriculture.⁹² To be sure, deforestation can temporarily reduce poverty. Over time, however, forest losses have long-term socioeconomic and environmental impacts that push communities further into poverty, including changes to the regional and global climate, changes in the water balance, and other important ecosystem services. Deforestation and habitat fragmentation can also increase pandemic risks. This is because they lead to more direct encounters between virus-carrying animals and humans, in turn increasing the chances of viruses crossing from animals to human. In addition, deforestation leads to biodiversity loss.⁹³

Evidence from Asia and the Pacific suggests that sustainable forest use can contribute to reductions in deforestation and poverty. In Nepal, for example, a long-term policy to promote community-based forest management has led to a slowing of deforestation and reduced poverty in target areas.⁹⁴

Groundwater acts like nature's insurance against drought: it protects food security and boosts resilient economic growth. Access to groundwater for irrigation helps reduce poverty, as it allows farmers to grow more food, boost their incomes and create jobs in the farming and associated sectors.⁹⁵ However, in many countries an uncontrolled expansion of the use of groundwater is depleting this crucial natural capital. Cheap and subsidized electricity has made groundwater pumping an attractive irrigation option for millions of farmers across the region.⁹⁶ Although this has in many instances increased food security and

reduced poverty, it has also led to widespread groundwater depletion. India, China, Pakistan, Iran, and Bangladesh account for over half of global groundwater withdrawals.⁹⁷ The Indian subcontinent faces the biggest crisis in this regard, as at least half of its groundwater is being extracted at a rate that exceeds replenishment.⁹⁸ In short, addressing the region's groundwater crisis is crucial for safeguarding the sustainability of irrigation and food security, and better prepare rural and urban communities against climate-related shocks.

1.2.2. Labour market structures and vulnerability to climate impacts

Across the region, every second job is classified as 'vulnerable'.⁹⁹ Women are overrepresented in the most vulnerable forms of employment, characterized by job insecurity and low wages.¹⁰⁰ Vulnerable employment includes own-account workers or unpaid family workers. At 83 per cent of its workforce, Lao People's Democratic Republic has the largest share of vulnerable workers, most likely due to its strong reliance on agriculture. Other countries in the region with over 70 per cent of their workforce classified as vulnerable include India, Nepal, Papua New Guinea, and Vanuatu (Figure 13).¹⁰¹ Because of the informal nature of their jobs, vulnerable workers are more likely to be affected by climate-related shocks. They are also more likely to be affected by regional and global decarbonization efforts, with knock on effects for labour markets in some countries in the region. As countries phase out fossil fuels or crack down on illegal deforestation, workers in these sectors will need to find new jobs.

Agricultural labour is especially vulnerable to climate-related shocks, notably drought and extreme heat. In countries with high drought risk and a high share of jobs in agriculture, this climate-agricultural labour nexus is particularly concerning (Figure 14). Agricultural jobs accounts for some 26 per cent of employment in the region. Countries in South Asia are particularly exposed to drought risk with a large share of the population working in agriculture, as observed for Nepal (62 per cent), India (44 per cent), and Bangladesh (37 per cent). Other

countries in the region with a high share of agricultural workers vulnerable to drought are Timor-Leste (42 per cent) and Afghanistan (46 per cent).

This vulnerability is a major challenge, especially for the poorest farmers, who cannot adapt easily, for example, through use of groundwater pumps, or finding less risky, better-paying non-farm jobs. Evidence from India shows that women are more at risk of losing their job because of drought.¹⁰² Their relative lack of assets, including control over land, and often informal employment status, makes many women in the region working in agriculture ill-equipped to adapt to climate change and related crises.¹⁰³

1.2.3. A vicious cycle of conflict, food insecurity and poverty intensifies the impacts of climate change

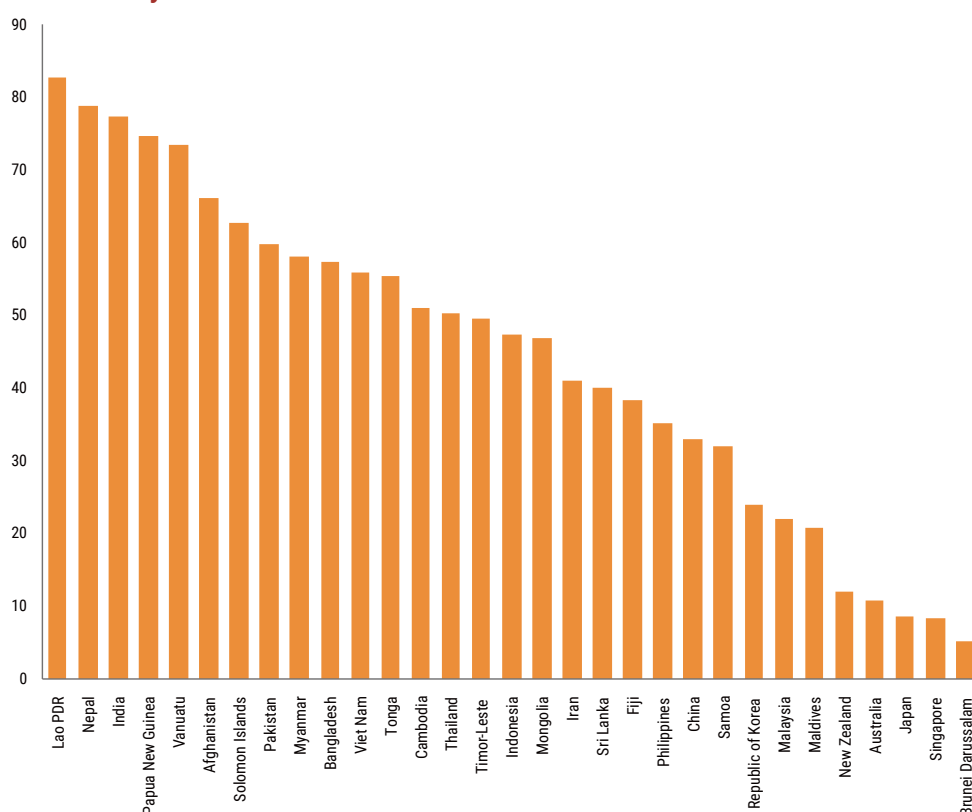
The fragility of countries and conflict aggravate climate-related impacts on food insecurity and poverty. Conflicts in food-producing

regions can have severe impacts on global food prices — as observed following the Russian invasion of Ukraine. According to the World Food Programme (WFP), seven million more people in Asia and the Pacific became acutely food-insecure in 2022 because of the military conflict.¹⁰⁴ Conflict, violence and state fragility remain the main driver of hunger in the region's food crises.¹⁰⁵

Food insecurity and poverty can also intensify climate change impacts, pandemics, or forced displacement, as well as undermine human development and economic opportunities. Their impact is uneven, with people in conflict-affected areas suffering the most.¹⁰⁶

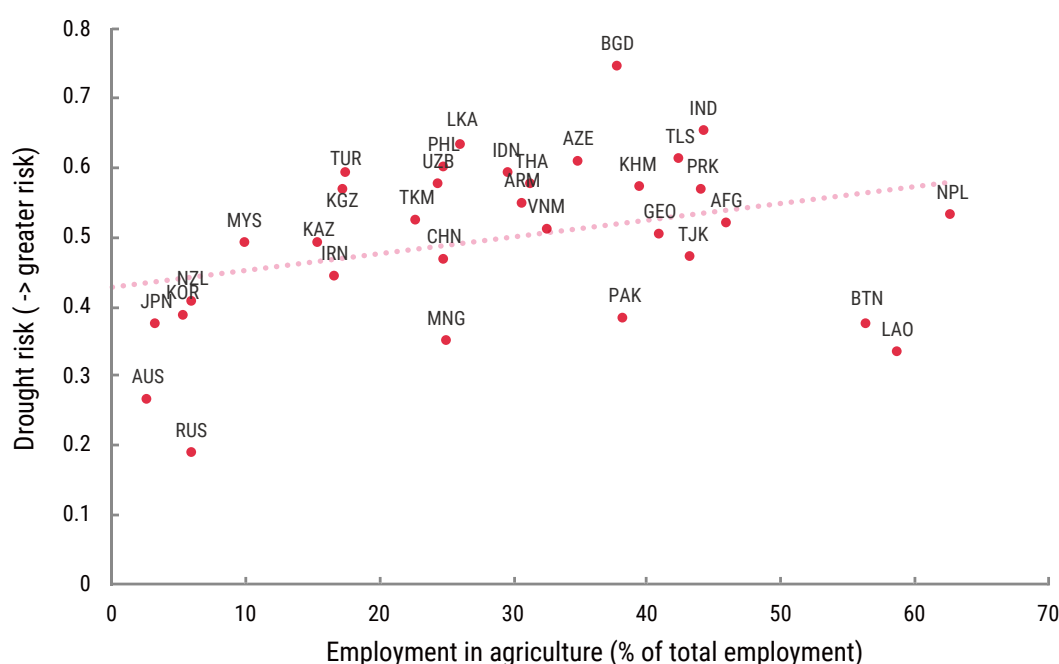
The interplay of two factors contributes to this vicious cycle of fragility, food insecurity and poverty. First, fragility, conflict and violence, low state capacity, high levels of displacement and damaged social networks, tend to intensify the impacts of climate change on food insecurity and poverty.¹⁰⁷ Figure 15 shows that the most fragile societies in the region are also more exposed to climate-related and non-climate

Figure 13: Vulnerable employment rate for select countries in Asia and the Pacific, latest available year



Source: International Labour Organisation, ILOSTAT (accessed on 20 December 2023).

Figure 14: Comparison of drought risk and share of employment in agriculture in 2022



Source: Authors using World Bank data on agricultural employment (modelled ILO estimates) and AQUEDUCT data on drought risk (accessed on 20 December 2023).

Note: Agricultural labour markets in countries with high drought risk and high share of employment in agriculture are particularly vulnerable to climate change. See Explanatory Notes page for the full country names.

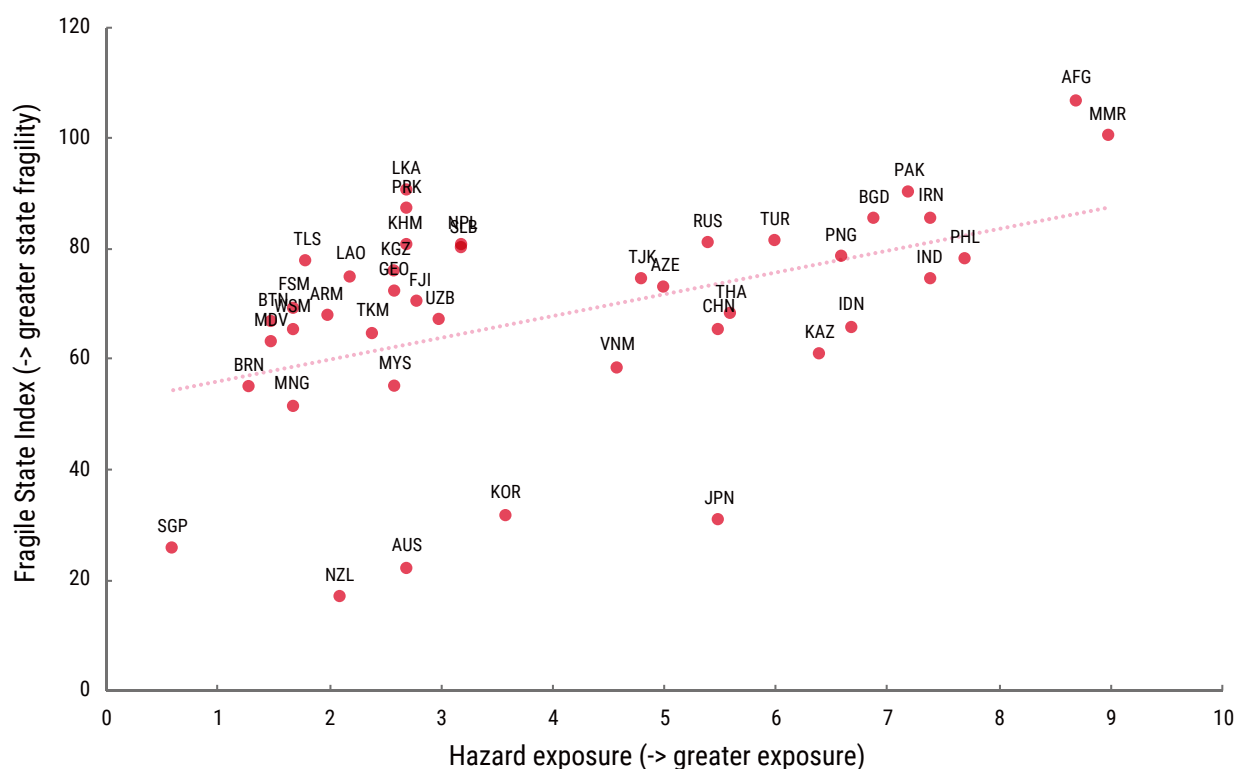
shocks. Second, the livelihoods of food insecure and poor people are typically climate-sensitive (for example, agriculture and livestock). This combination of fragile formal government institutions and people's greater livelihood and economic sensitivity to climate change undermines the ability of many countries to respond to climate change. The result is often a harmful cycle where inadequate climate responses amplify adverse impacts, that in turn intensify poverty, food insecurity and fragility.

1.3 Limitations of current climate change policies and responses

The 2030 Agenda and the Paris Agreement provide an institutional and policy framework to address the climate challenges. Under the Paris Agreement, countries must submit a Nationally Determined Contribution (NDC), or non-binding national climate pledges, every five years. This chapter finds that while climate priorities and actions in the updated NDCs of many countries are focused on poverty, social protection and food insecurity challenges, they can be integrated better (Table 2). The

updated NDCs of some countries address aspects of SDG 1, notably the resilience of poor households to climate events, and of SDG 2, notably the need to ensure sustainable agricultural practices. This notwithstanding, opportunities for better integration of climate and sustainable development action remain. This finding is in line with an assessment by NDC-SDG Connections, a joint initiative of the German Institute of Development and Sustainability (IDOS) and the Stockholm Environment Institute (SEI), which has identified opportunities for strengthening the links between NDCs and sustainable development priorities.¹⁰⁹

Overall, opportunities for integration of climate action and sustainable development still need to be captured more effectively. The most recent NDCs show that energy remains a dominant priority, with far fewer actions dedicated to adaptation, including social protection, food security and poverty. Across Asia and the Pacific, some NDCs contain actions to address SDG 2, particularly target 2.4 ("Sustainable food production and resilient agricultural practices"). They focus

Figure 15: Fragile societies have greater exposure to climate-related and other shocks

Source: Authors using data from IMF INFORM database and the 2023 Fragile State Index from the Fund for peace (accessed on 20 December 2023).¹⁰⁸

Note: Hazard exposure is a composite indicator developed by the IMF INFORM Risk platform. See Explanatory Notes page for the full country names.

in the main on the need to reduce emissions from food production, and less on actions aimed at building the resilience of agricultural systems to climate-related shocks. An analysis by the FAO of the updated NDCs in Asia and the Pacific suggests that NDCs for selected countries also contain actions on SDG target 2.3 (Assure agricultural productivity for productivity for marginalised people), target 1.4 (Equal access of vulnerable to all type of resources) and target 1.5 (Resilience of poor people to climate events).^{110, 111}

Unless policymakers grasp the opportunities to integrate climate and sustainable development action, synergies may be missed and forces that need to be mitigated to protect the most vulnerable groups not recognised. Chapter 2 provides an analysis of pathways to identify and operationalise these synergies.

The transboundary nature of most climate-related shocks requires regional actions. This includes developing or updating cooperative

frameworks to manage the impacts of climate change on rivers and aquifers that cross international boundaries and whose freshwater resources support food and energy security, and healthy ecosystems in many parts of the region. For example, the six Lancang-Mekong countries — China, Cambodia, Lao People's Democratic Republic, Myanmar, Thailand, Viet Nam — agreed to share near real-time data on water storage levels and hydropower operations throughout the river basin to help downstream communities prepare for and adapt to changes.¹¹² The 1960 Indus water treaty between Pakistan and India is another example of a regional cooperation framework. While the treaty has guided cooperation on the shared waters of the Indus River, it needs to be adapted in light of climate change and rising water stresses. Additional cross-border risks that require cooperation include ocean acidification and disease risk. Despite these risks, most NDCs do not directly identify transboundary climate-related shocks and opportunities for regional and global cooperation.

Table 2: SDG 1 and 2 targets addressed in updated Nationally Determined Contributions (NDCs) submissions for selected countries in Asia and the Pacific

		High Priority	Average Priority	Low priority	
	SDG 1: No poverty				
Country	Target 1.1: Eradicate absolute poverty	Target 1.2: Reduce relative poverty	Target 1.3: Social protection systems	Target 1.4: Equal access (of vulnerable) to all type of resources	Target 1.5: Resilience of poor people and vulnerable (to climate events)
Armenia					
Bhutan					
Cambodia					
China					
Georgia					
Indonesia					
Japan					
Kazakhstan					
Malaysia					
Maldives					
Mongolia					
Pakistan					
Republic of Korea					
Thailand					
Timor-Leste					
Uzbekistan					
Vanuatu					
Viet Nam					

Source: Authors based on German Institute of Development and Sustainability and Stockholm Environment Institute.¹¹³

Note: 41 countries and territories in the region are not shown because their updated NDCs do not identify specific actions to address SDG 1 and 2.

	High Priority	Average Priority	Low priority		
SDG 2: Zero hunger					
Target 2.1: Universal access to safe and nutritious food	Target 2.2: End all forms of malnutrition	Target 2.3: Double the productivity and incomes of small-scale food producers	Target 2.4: Sustainable food production and resilient agricultural practices	Target 2.5: Maintain the genetic diversity in food production	Country
					Armenia
					Bhutan
					Cambodia
					China
					Georgia
					Indonesia
					Japan
					Kazakhstan
					Malaysia
					Maldives
					Mongolia
					Pakistan
					Republic of Korea
					Thailand
					Timor-Leste
					Uzbekistan
					Vanuatu
					Viet Nam



Climate Change Solutions to Combat Poverty and Hunger

CHAPTER

2

The preceding chapter showed how climate change is aggravating poverty and hunger in Asia and the Pacific, especially when compounded with other crises and underlying factors—and how deepening climate impacts will hinder achieving SDGs 1, 2 and 13 in the region. It also highlighted the close interlinkages between food systems and livelihoods and their fragility in the face of intensifying climate hazards.

Public policy needs to consider these dynamics. Integrating climate action, poverty and hunger alleviation activities can unlock synergies, help navigate policy trade-offs and enable transformative change. The most recent United Nations SDG Summit, held in New York in September 2023, identified transition points that can act as catalysts for achieving the Goals.¹¹⁴ The six transition points are: food systems; energy access and affordability; digital connectivity; education; jobs and social protection; and climate change, biodiversity loss and pollution.

This chapter presents innovative solutions and responses from across the region. They include good practices in the areas of partnerships, policy, business models, uses of technology and data and finance. The examples are tailored to impart knowledge and provide inspiration for stepped up climate action across the region that also tackles the challenges of poverty and hunger alleviation. The responses presented in this chapter centre on three of the transition points – food systems; jobs and social protection; and climate change, biodiversity loss and pollution. They are organised under three focus areas:

- i) Sustainable agricultural practices and food systems approaches to ensure food security, nutrition and livelihoods
- ii) Decent work and just transition in the context of climate change and climate action, and
- iii) Climate-resilient and adaptive social protection systems.

These areas align with key targets under the three SDGs that are the focus of this report:

- **SDG 1:** Target 1.3 on appropriate social protection systems and measures
- **SDG 2:** Target 2.3 on agricultural productivity and incomes especially for smallholder farmers, and Target 2.4 on sustainable food production systems
- **SDG 13:** Target 13.1 on strengthened resilience and adaptive capacity, Target 13.2 on integrating climate change measures into policies, strategies and planning, and Target 13.3 on improved education, awareness and institutional capacity for climate change mitigation, adaptation and early warning systems.¹¹⁵

2.1 Sustainable agricultural practices and food systems approaches

Global food systems face a triple challenge. They must ensure food security and adequate nutrition for a growing population, support the livelihoods of millions of farmers and producers, and do so in an environmentally sustainable way.¹¹⁶ An integrated food systems approach acknowledges the trade-offs and synergies that arise when addressing these challenges. When a food system approach strengthens the resilience to various risks and hazards, it can alleviate hunger and poverty and, at the same time, help communities and countries adapt to climate change.¹¹⁷ Nature positive strategies and advancing ecosystem services are central to these approaches. They are the most cost-effective and efficient for poor and farming households because they help reduce the pressure on limited resources, thus increasing resilience to climate shocks. The key role of food systems in achieving the SDGs is well established. It was underlined at the first UN Food Systems Summit in 2021 and, more recently, put centre stage at COP28 with the Declaration on Agriculture, Food Systems and Climate Action.¹¹⁸

Food systems are shaped by various factors – the physical environment, social, economic, and political factors as well as demographics, new technologies and investment. As outlined in Chapter 1, the food system shapes nutritional and health outcomes, and broader social,

economic, and environmental conditions. Figure 16 depicts a stylised food system and its components.

Food systems are complex and fragile, with the various sub-systems (e.g., farming, waste management, and input supply) interacting with other systems (e.g., energy, trade, and health). Structural changes in the food system can be triggered by changes in seemingly distinct areas. For instance, the promotion of biofuel use in the energy system can have significant ramifications for the food system by providing incentives to produce crops for energy use rather than for food consumption.

2.1.1 Deploying sustainable agriculture practices for increased productivity and farmer income, and lower emissions

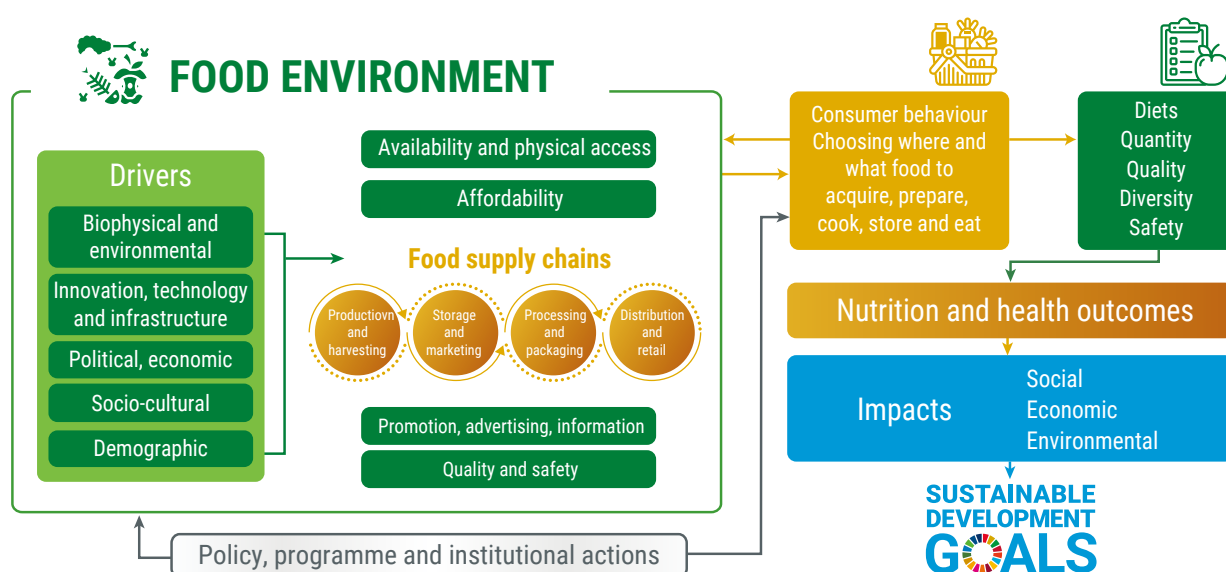
One way to transform food systems and make them fit for the future is to implement sustainable agricultural practices, which boost agricultural productivity and incomes, and reduce the adverse environmental and climate impacts. This approach addresses, among others, SDG 2 target 2.3 (to double productivity and incomes of small-scale food producers), target 2.4 (on sustainable food

production and resilient agricultural practices), and target 2.5 (maintaining genetic diversity in food production).

There are many options for sustainably increasing agricultural production and reducing carbon emissions. One group of sustainable activities is climate smart agriculture (CSA). CSA approaches integrate agricultural strategies that target ensuring food security and addressing climate change. Central to the approaches are three pillars: (i) sustainably increasing agricultural productivity and incomes; (ii) adapting and building resilience to climate change; and (iii) reducing and/or removing greenhouse gas emissions, where possible.¹²⁰ CSA includes on- and off-farm actions, such as the improved management of farms, crops, livestock, aquaculture and fishery (especially water and fertilisers), ecosystem and landscape management to conserve ecosystem services that can contribute to resilience and resource efficiency; as well as services for farmers and land managers that help them to adopt these new practices.¹²¹

Examples of climate smart agriculture include promoting the use of crop residues (for example, through the use of on-site microbial degradation), utilizing mechanical rice-straw baling machines to prepare for the next crop

Figure 16: The food system



Source: ESCAP (2021).¹¹⁹

cycle and to supplement income from selling the bales, and developing markets for off-site use of crop residues and renewable energy (for example, biogas for households or power generation, mushroom farming, brick production, and animal beddings). Other CSA activities encompass the use of renewable energy sources, reducing methane emissions from rice cultivation, and better managing manure to reduce carbon emissions.

Agroecology approaches, or sustainable farming approaches that works with nature, are also highly relevant. The High-level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security describes agroecology as a “unifying framework for food systems transformation.”¹²² The approach is centred on local farming practices that support more holistic food systems. At its heart is a focus on equitable outcomes for producers and consumers, and ecological farming techniques.

A focus on soil health and empowering farmers can contribute to climate mitigation, make crops more nutritious, and strengthen the resilience of farming communities. Agroecology-based approaches have been found to be as productive as conventional agriculture. The “4 per 1,000 Initiatives on soil carbon,” introduced in 2015 at COP21, is closely aligned with climate-smart agriculture and agroecology, aiming to address both climate change and food security. The initiative proposes a 0.4 per cent annual increase in global soil organic carbon stocks to offset greenhouse gas emissions. While its primary focus is on mitigation, it concurrently provides adaptation advantages, as increased soil carbon enhances organic matter, making the soil more adaptable to climate events.¹²³

The following sections provide an overview and examples of CSA and agroecological approaches from across the region.

Conservation agriculture (CA) is an approach to sustainable agricultural production, which combines reduced tillage with permanent soil cover and crop diversification. As a result, soil absorbs more carbon and retains more water, resulting in improved soil quality. Seeds are

planted directly through stubble and require less fertilizer or use livestock manure and cover crops for soil enrichment, leading to lower costs. The uptake of the technique has been mainly driven by farmers. However, at just 4 per cent of total agriculture, the practice is not widespread in the Asia-Pacific region (the global average stands at 8-10 per cent).¹²⁴ CA brings adaptation co-benefits such as greater resilience to extreme weather events like drought, heavy rainfall, and heat waves. Some farmer networks in the region implement the practice, raising awareness of methods, as well as highlighting the negative impacts of burning on soil and crop yield (for example, erosion and greater need for fertilizers). The Conservation Agriculture and Sustainable Intensification Consortium (CASIC) in Cambodia is a multi-stakeholder platform for networks of farming organizations that supports conservation agriculture and agroecology approaches. The consortium focusses on knowledge management, networking and coordination, promotion and research, and has a high uptake of sustainable practices among members. Box 4 shows how agricultural extension services and social networks are boosting the uptake of CA in China’s Shaanxi Province.

Site-specific nutrient management develops and implements the optimal use of soil nutrients, reducing the need for extra nutrients, thereby bringing down costs and environmental degradation of soil from fertiliser overuse. Nutrient management comprises techniques ranging from soil and optical sensors to simple leaf charts, which measure leaf greenness by visually comparing light reflection from the surface of leaves of the crop. Tests in South Asia on irrigated rice systems show that site-specific nutrient management lowered the use of fertilisers by 5-15 per cent, and by even greater margins for wheat (10-30 per cent) and maize (20-40 per cent).¹²⁹

Laser land levelling (LLL) is an agricultural technique that uses a laser beam to precisely level farmland. This levelling can markedly reduce seed and water losses and the need for fertiliser and pesticides. Field trials in Cambodia, the Philippines, Thailand, Viet Nam and India show that LLL can boost the efficiency of land use by 3-6 per cent and improve the

Box 4: Using peer learning to build capacity for CA in Shaanxi Province, China

The North China Plain in Shaanxi Province is a vital commercial grain-producing area in North-West China. It accounts for 65 per cent and 45 per cent, respectively, of the national wheat and maize production. As a dryland plain, drought and water shortages have become major challenges for the area's continued agricultural development. In a bid to increase agricultural productivity and meet rising domestic food demand, farmers have been using intensive farming practices such as excessive irrigation, fertilization and tillage. The negative environmental consequences, especially increased land and soil degradation, have been severe. It is against this background that CA techniques, with the capacity of increasing climate resilience, have emerged as an important feature in the province. By 2018 some 8.24 million hectares were classified as CA in China, with a policy goal of achieving 9.33 million hectares as CA by 2025 which translates to 70 per cent of arable land in the North East of China. Research shows that CA techniques can boost yields and farm income, while reducing soil erosion and the use of chemical agricultural inputs.¹²⁵

The Ministry of Agriculture initially promoted CA techniques as part of a broader effort to rein in serious air pollution resulting from farmers burning agricultural stubble and straw. The government demonstrated the new techniques in the province for two years and offered subsidies for CA machinery. A well-established system of Agricultural Extension Services was used to build capacity among farmers, with knowledge and technology from the central agricultural ministry transferred to local governments and grassroots actors such as agricultural retailers in villages. A system of so-called 'model farmers', selected community representatives trained with new knowledge and equipment, also helped diffuse new practices. Social media also played an important role: local farmers used social media of neighbours and local retailers to find out about the new practices, and this helped the adoption of new CA techniques. Technological advances have added to traditional means of knowledge exchange and further boosted the uptake of CA techniques – via WeChat, webpages, and mobile software applications for farmers, customised by geography and local conditions, and options for one-to-one exchanges with online experts.⁸ The example shows the vital importance of understanding rapidly evolving means of communication and search modes for diffusing knowledge and implementing new practices.

Sources: Jin He and Shangchuan Jiang (2023).¹²⁶ Liangxin Fan, Yuhang Ge and Haipeng Niu (2022).¹²⁷ Huayan Zhang and others (2022).¹²⁸

efficiency of irrigation and fertiliser by 12-40 per cent and 10-13 per cent, respectively.¹³⁰ At the same time, average rice yields were found to have increased 5-15 per cent and methane emissions from rice fields fell by one fifth. In Uzbekistan, the government promotes LLL as part of its national multi-sectoral water strategy to foster water security and climate resilience.

Alternate wetting and drying (AWD) is a water management technique to cultivate rice with less water than continuous standing water irrigation techniques. It has been tested by farmers in Bangladesh, Indonesia, Lao People's Democratic Republic, Myanmar, the Philippines and Viet Nam and achieved water savings of 15-25 per cent with no drop in yields. The cost savings from using less fuel for water pumps

have been estimated at \$67 to \$97 per hectare. AWD can also reduce methane emissions from rice paddies by 30 to 70 per cent, depending on the mode of water usage and management of rice stubble.¹³¹ In Hunan, China's largest rice production, the World Bank is funding a \$255 million project to improve low-methane, water-saving rice production.¹³²

Agroforestry systems are traditional land use practices that centre on linking trees, crops, and livestock in an integrated agroecological manner. Nature and sustainably managed forests provide livelihoods, energy and food to many people, especially poor communities and those living in rural areas. The presence of trees, alongside farmland, can further climate change mitigation adaptation benefits, including carbon sequestration, biodiversity conservation, and enhanced adaptive capacity for farmers, alongside increased agricultural productivity. Though limited data are available, the uptake of the practice in the Asia-Pacific region is likely significant considering that over 10 per cent of the region's agricultural land has tree cover.¹³³ Studies show that carbon benefits are highest in tropical climates and payments for ecosystem services in the form of carbon sequestration could further improve the viability of this land management technique, though it would require better data on carbon stocks.¹³⁴

Improving livestock and manure management. Livestock ownership is a powerful way of avoiding poverty. In poor households, livestock provide a valuable and expanding source of income, as demand for livestock products continues to rise across the region. Livestock management is affected by climate change via heat stress and extreme weather events such as droughts that reduce feed and water supply.¹³⁵ Livestock is also a contributor to climate change, mainly through emissions from animals and the production of animal feed. Climate-smart livestock management techniques can help reduce emissions by improving the quality of animal diet, using natural resources better, improving pasture management, and capturing carbon. Integrating livestock into the circular bioeconomy through better manure management and using crop residues as

animal feed inputs has similar benefits.¹³⁶ In Thailand, the Manure Knowledge Kiosk, a one-stop-shop for information and resources on manure management, has been helping farmers create an integrated system that use pig manure as an input for crop production and aquaculture.¹³⁷

2.1.2 Accessing credit and finance for investment in sustainable agriculture

Farmers around the world face a big challenge in accessing adequate finance for sustainable agricultural techniques and new technologies. According to the Food and Agricultural Organization (FAO), over 80 per cent of farmers in developing countries have difficulty accessing suitable forms of credit. This is mainly because most farmers lack formal land tenure and sufficient financial records, which lenders typically require. The resulting credit gap has far-reaching consequences. It curtails agricultural productivity, limits the adoption of new technologies, and weighs on farm incomes. However, the gap can be closed, at least partially, by using technology to simplify keeping financial records of farms, verifying them, and assessing how the funds are being used (see Box 5).

Other financial innovations can be employed in connection with ecosystem services that farmers provide through sustainable land management practices. For example, deforestation and land-use changes from forests to agricultural land is a major source of carbon emissions, as is environmental degradation in the areas of soil, water, and biodiversity. Yet forests play a key role in productive agriculture, especially in securing and regulating water supplies, and pollination. Three quarters of the 115 leading food crops globally are thought to benefit from pollination by animals that live in forests (including insects, birds, and bats).¹⁴⁰ A greater recognition of these critical forest ecosystems services will make it easier to integrate trees and forests into local agriculture. Tree collateral or plantation management certificates in Thailand (see Box 6), Indonesia and Lao People's Democratic Republic are good examples of successful practices in the region.

Box 5: Geospatial datasets support farmers' decision-making in India

New technology and applications that combine Geographic Information System (GIS) mapping and remote sensing functions help Indian farmers make decisions about their farms with customised weather forecasts, satellite imagery, soil analysis and real-time commodity price data. One such spatial analytics application is Agri-GIS. It provides farmers via a smartphone app or text messages with daily weather forecasts, satellite imagery-based real-time crop and water assessments, recommendations regarding crop suitability based on soil types, market and price analytics, details about agricultural facilities and government programs, and alerts for natural hazards. The app is also capable of providing customised assessments of farm operations. It does this by considering the value of the land, households' social and family characteristics, and their current and aspirational economic status. Other factors that are taken into account are non-cropping activities such as poultry farming, animal husbandry, beekeeping, and farm labour; and earnings from other activities such as dairy and poultry farming or participation in off-farm work.

This information can then be used to improve farm management processes, strategic planning and credit applications. UNDP and the Indian National Bank of Agriculture and Rural development (NABARD) are exploring how such co-created data and technology innovations for climate-smart agriculture can better support the livelihoods of smallholder farmers. Good data governance and equitable data access, and the integration of public information and investments are key for these technologies to be inclusive and help build secure livelihoods for all farmers, including rural and women farmers.

Sources: Mukund Kadursrinivas Rao (2021).¹³⁸ UNDP (2023).¹³⁹

Box 6: Thailand's tree banks support forestation

In Thailand, some species of trees can be used as collateral for loans with financial institutions, or so-called "tree banks". The species include Teak, Tamarind, Ebony, Burmese Ebony, Durian and Jackfruit. The program is supported by the Business Development Department, a government agency, which also educates people in rural communities on the benefits of mature trees and the value of planting trees.

As of May 2022, some 146,000 trees had been registered as collateral for loans worth 137 million baht (\$4 million). Legally and institutionally the tree banks are enabled through changes to the Business Security Act (2015), revised in 2018 to allow the use of perennial plants as assets in business transaction. Tree loans are not without risk for the tree-owner as land collateral is needed alongside the trees, which can make loans less accessible for people without land tenure (typically the poorest and most vulnerable). The tree banks provide a raft of other non-monetary benefits, including building financial, entrepreneurial and forest management skills for smallholders. For the tree banks, there remain a number of challenges, particularly the valuation of trees in a complex and changing regulatory environment.

Sources: The Nation (2022)¹⁴¹ Marcel Starfinger (2021).¹⁴²

2.1.3 Creating climate resilience in food systems

Diversification is key to creating climate-resilient food systems. This involves diversifying crops, produce and cropping systems. Together, these steps can augment the adaptive capacity to climate hazards and extreme weather events. In practice, this is achieved through diversifying farm income, spreading cash crops over the year, or adding, where possible, extra types of food production such as aquaculture.

Diversification and enhancing the biodiversity of the farm ecosystem can also boost the performance of individual crops. In Thailand, the government scaled up a model of sustainable agriculture, the Khok Nong Na Model project,

as part of its COVID-19 recovery response. The project provides public money, technical advice and support for farmers and communities to increase the diversity of farms. It is aimed at securing diverse local food supplies and giving farmers the opportunity to add value to their products at the food processing stage (see Box 7).

Agricultural activities at local and landscape scale contribute to conserving and regenerating biodiversity of surrounding ecosystems and policymakers need to consider them carefully. Sound policies that support landscape-scale management and regeneration of ecosystems, across landowners, tenure types and partnership models, are critical to creating more climate-resilient food systems.

Box 7: The Khok Nong Na Model in Thailand

The *Khok Nong Na* Model is a sustainable agriculture scheme first initiated in 1997. Its aim is to develop an integrated farming system, similar to permaculture design and agroforestry in its focus on resource conservation and water management that also emphasises local community development. Under the scheme, farmers are asked to allocate land for four different uses: 30 per cent for rice fields (for staple food production), 30 per cent for growing fruit and vegetables, 30 per cent for ponds or water storage (for irrigation and fish farming), and 10 per cent for housing and livestock.

The name *Khok Nong Na* mirrors the three main components of land use. “Khok”, or mound, refers to areas for cultivating plants (for example, vegetables, fruits, and coffee). “Nong”, or marsh, provides for the excavation of swamps, canals, or ditches for fisheries or aquaculture activities. “Na”, or rice paddies, refers to a farm for cultivating organic rice.

The Khok Nong Na Model project has helped bolster food security by ensuring that diverse types of food are produced and traded at the local level. It also gives people the opportunity to earn additional income through food processing and sales and learn skills in community-based learning centres. Communities are eligible to join the scheme if their farmland is affected by climate impacts and environmental degradation such as frequent flooding or droughts. Participating farmers must sign a five-year contract during which the government helps them design farming operations and run the farm. The understanding is that at the end of the contract farmers operate the farmland without any public assistance. The model’s success in stimulating local community development and fostering food security led the government to allocate significant extra funding for the model as part of the government’s pandemic-related fiscal stimulus.

Sources: Phramaha Hansa Dhammahaso and others (2022).¹⁴³ PAGE (2023).¹⁴⁴ ADB (2021).¹⁴⁵

2.1.4 Integration of food systems and food security into disaster risk reduction

A resilient food system has the ability to anticipate and absorb adverse shocks and bounce back from them. Shocks can include climate change impacts, COVID-19 pandemic-related supply chain disruptions, and, most recently, high inflation caused by recent spikes in food and energy prices.¹⁴⁶ A resilient food system also has adaptive capabilities. In practice, this means that the system is capable of incorporating lessons from past shocks into future planning and adaptation.

It is when disasters hit that the resilience of food systems is tested. The Sendai Framework for Disaster Risk Reduction, a global pact on disaster-risk management, takes a broad view of risk that goes beyond hazard response and includes vulnerability, exposure, and the ability to cope. The framework highlights the risk and fragility of current food systems. Shocks, particularly to food production, can severely disrupt food supply and hence people's livelihoods and well-being. These shocks are naturally more severe when multiple events trigger a ripple effect of consequences. The evidence suggests that this trend is already taking hold. In low- and middle-income countries agriculture accounts for most of the damages and losses from natural hazards.¹⁴⁷ Acknowledging these dynamics, some

countries in the region, such as the Philippines and Myanmar, are taking steps to include agriculture in their disaster risk reduction (DRR) plans.¹⁴⁸

Multi-sectoral and multi-hazard DRR can make food systems less vulnerable. The approach prepares systems for cascading and cross-sectoral impacts and takes into account non-climate related hazards. Recognising the centrality of food systems is key to reducing social vulnerability and preventing shocks to the food system from spilling over to other economic sectors. The Pakistan Floods Response Plan, drawn up after the loss of 900,000 hectares of cropland in 2022, is a good example of a multi-sectoral approach focusing on food security and agriculture.¹⁴⁹

Other activities, such as improving access to disaster-related information and early warning systems for farmers and communities, also helps build food system resilience. Improved access to seasonal climate forecasting has put farmers already in a position to make better decisions when managing their land. When such information on climate and extreme weather events is used to offer farmers affordable climate-risk related insurance, the resilience of farm operations is much enhanced. Box 8 highlights recent efforts in Cambodia, Lao People's Democratic Republic, Myanmar, and Viet Nam to develop long-range seasonal climate forecasts.

Box 8: Using seasonal climate forecasting to de-risk decision-making for smallholders

The ability to forecast extreme and unusual climate conditions is an important advance in the environmental sciences. Using this knowledge helps smallholders make better decisions, prepare for shocks, and thus strengthens the overall climate resilience of the agricultural sector. The DE-Risk South-East Asia project, implemented by the World Meteorological Organisation and others, is developing seasonal and sub-seasonal climate forecasting in Cambodia, Lao People's Democratic Republic, Myanmar and Viet Nam. It maps ways for smallholders to use this information in on-farm planning. The project also works with companies in the insurance sector and government agencies to develop climate-related data sets and modelling. The overarching aim is to enable smallholders to make use of up-to-date information from climate models and create conditions for new insurance products.

Sources: De-Risk Asia (2023).¹⁵⁰

2.1.5 Enhancing the food value chain provides opportunities for better livelihoods and decent work

Transforming food value chains can improve food access, boost agricultural incomes, cut emissions and promote decent work. The transformation can be achieved, among others, by reducing food loss and re-purposing waste along the supply chain, improving access for people to local and online markets, and upgrading rural-urban linkages and infrastructure such as cold chain and value-added processing equipment (see Box 9).

Raising the awareness of customers and firms can shift demand to sustainably produced food products and unlock economic benefits. Box 10 highlights the transformative effect that making the food value chain more transparent can have on food quality, incomes and decent work. The European Union's Geographical Indication (GI) certification for Sri Lankan cinnamon

has helped boost local farmers' incomes and increased value-added for producers and other suppliers. The certification's emphasis on transparency means that decent work conditions are mandated. The GI has proved key for attracting buyers who must comply with sustainability reporting requirements. It also encourages local firms to develop sustainable social and environmental practices that allow them to better compete on quality in the global market.

2.1.6 Supporting innovation and knowledge diffusion in sustainable food systems

Transforming food systems is a complex task. It involves unleashing innovation in areas as varied as technology and finance and the environment, social and economic institutions. A broad-based and inclusive approach is vital, as is collaboration of all stakeholders, and the use of scientific, traditional, or indigenous approaches.¹⁵³

Box 9: Sustainable packaging - Free the Seed

Free the Seed, a Malaysia-based start-up, manufactures sustainable packaging from plant-waste cellulosic fibrous materials. The company uses a patented biotechnology process to convert waste biomass materials, such as rice straw and husks, into biodegradable packaging products. The product has two key advantages. First, it brings to market an innovative product that biodegrades after six months, thus

reducing the need for plastic packaging, which pollutes rivers and oceans. Second, sustainable packaging provides farmers with an extra income. The seasonal burning of rice crop waste is an enormous environmental problem. In Malaysia, over 240,000 tonnes of paddy straw are burnt every year, emitting CO₂, and contributing to toxic air pollution. Free the Seed works with over 1,200 farmers to reprocess paddy waste, reducing carbon emissions by an estimated 6,000 tonnes per year.

Source: Free the Seed (n.d.).¹⁵¹

Image source: UNIDO.



Box 10: Improving the sustainability and profitability of the value chain in Sri Lanka



Sri Lanka's agricultural sector is facing many challenges. They include low productivity, an overreliance on rice production, a low value-added supply chain, labour shortages, and environmental degradation and climate change impacts. Other barriers to a more prospering agricultural sector are limited agricultural research and development, food safety and quality issues and the dominant role

of state-owned companies. The granting of a protected Geographical Indication (GI) for Ceylon cinnamon in 2022 by the European Union, a first for Sri Lanka, highlights the transformative impact of investing in the food value chain for sustainable livelihoods, decent work, and climate resilience. GI certification is available for specific products, for which an intrinsic link exists between product qualities and geographical origin. Producers must be able to prove quality and traceability of their products throughout the supply chain. Competing in global export markets also forces buyers to consider other aspects of product quality, including sustainable production practices.

The Ceylon Cinnamon GI certification has several social and economic advantages. It contributes to poverty alleviation, allows producers to charge more for their products, and, as a result of the mandatory transparency, reduces informal work. The certification process involves training for workers, gives incentives for farmers to take on value adding activities and promises to draw in private investment in the cinnamon and other sectors (such as food and beverage, cosmetics and tourism). The approach is being expanded to the agri-food sector under a EU/UNIDO-backed project. Its aim is to create a more productive, sustainable, and diversified agri-food sector, with investments in organic agriculture, higher quality value chains, and better food standards and cold chain infrastructure.

Source: UNIDO (2022).¹⁵²

Image source: UNIDO.

In this way, innovations can be made fit-for-purpose and easily adopted, even if this means changing established practices (see Box 11).

Some food system solutions may be new and innovative, while others may involve scaling up and adapting existing technology. Research can help identify the key conditions for scaling up or replicating innovations at the local, regional and global level. The solutions should be designed in a way that they favour

upscaling. An example of a scalable innovation is the case of Oz Harvest in Australia, a not-for-profit organisation, which collects food that would otherwise go to landfill from restaurants and supermarkets. The organisation uses the food to provide relief to people in need, including meals for the homeless.

Digitalization can also transform value chains in ways that make food systems more efficient and climate-smart and capable of

Box 11: Solar fish-drying technology has the potential to transform Cambodia's fisheries



Dried fish is a common ingredient in Cambodian diets. Local fish processors, fishmongers or ordinary people dry fish from the Mekong or other rivers and lakes to conserve them. Fish is usually dried in the sun, or by using firewood or coal. These traditional drying methods are often inefficient, unhygienic, and unsustainable. It can take a long time to dry fish in the open air and

it may dry unevenly, or go bad because it is exposed to bacteria, dirt, insects, or animal droppings. In addition, methods that use firewood, coal, or fossil fuels can pose a health risk, emit carbon dioxide and contribute to habitat loss.

The solar dryer dome has the potential to change these practices.¹⁵⁴ The device is a lightweight structure with a steel frame and a translucent white polycarbonate dome that allows sunlight into dry fish, which is laid out on adjustable trays. A solar-powered ventilator keeps the dome at the optimum temperature for drying. While traditional drying methods take three to seven days and heavily depend on the weather, drying fish with the solar dryer dome takes about 8-12 hours and is far less susceptible to weather fluctuations.

The technique could revolutionise post-harvest fisheries in Cambodia by making them more productive and sustainable. With more and better-quality fish, the country's post-harvest fisheries are better able to compete with fish imports, as well export to markets in Asia, Europe, and beyond. A seemingly small change can thus make a vital contribution to raising household incomes, creating more jobs and attracting more investment.

Source: Seetharama Shetty Thombathu and Samruol Im (2023).¹⁵⁵

Image source: UNIDO.

producing more healthy and nutritious food. This includes innovations that improve the transparency of the "last mile" and equitable access to food through use of information exchanges and data collection. Coordination across the food system is also key to ensure that policy, incentives, financial and de-risking tools, innovation ecoservices are aligned. An example of a new market opportunity is an app used by the rapidly growing Samoan diaspora. The Maua App, a digital online application, links the diaspora with food producers in their local villages. The app enables people living away from home to buy food from their local

communities, directly supporting them, and maintaining cultural and community links through food. Women farmers in rural areas and persons with disabilities were given priority access to the online platform. This allowed them to sell their products and receive payments remotely via their mobile phones, without having to pay bus fares or market fees or spending the day at local markets.³⁸

Food systems are complex and have context-specific needs. These can differ greatly depending on the location. The growing interconnectedness of global markets means

that food systems, while providing for local needs, must also increasingly serve markets across regions. A network of Food Innovation Hubs that are currently being developed aims to address this challenge (see Box 12).

2.1.7 Building global, regional and national capacity for food system transformation

Globally, opportunities to make food systems more climate-resilient are being identified through multi-stakeholder and multi-sectoral dialogue and planning. The One Planet Sustainable Food Systems Programme, which focuses on making food systems more sustainable, is one example of such a dialogue. The programme aims to bring about change through developing and communicating a shared vision of inclusive, resilient, and sustainable food systems. To achieve this, it coordinates on-the-ground activities and

supports research and advocacy efforts aimed at devising more coherent policies to address food systems challenges.

At the national level, too, governments are taking steps to transform their food systems. Nepal has launched a national multi-stakeholder process (see Box 13). In several other countries in the region, food system transformation is supported by national strategies and action plans. In the Philippines, long-term industrialization and modernization plans are in place for smallholders and people working in fisheries. Samoa has established a long-term food system transformation plan. Timor-Leste is developing a national food fortification law, while Thailand is working with stakeholders to better understand how best to transform its food system. In Uzbekistan, a new initiative connects agricultural research, education, and best practices that promote innovation, while encouraging youth to work in agriculture.

Box 12: Supporting scalable innovation with Food Innovation Hubs in India and Viet Nam

Food Innovation Hubs, an initiative co-led by the World Economic Forum and various public, private and civil society actors, aims to create and disperse scalable innovations that support sustainable food systems globally. It focuses on three activities:

- Accelerating emerging innovations in digital and data-driven solutions such as blockchain, food sensing, storage and plant-based proteins,
- Supporting public-private multi-stakeholder partnerships for co-investment and delivery,
- De-risking early-stage investment through creating scalable pathways for innovations.

Hubs in South America, Asia, Africa and Europe focus on strengthening innovation at national and regional levels. In India, for example, the local hub is facilitating technology adoption in the agricultural sector through a public-private partnership. Thirty automatic weather stations are being built in the state of Madhya Pradesh to support weather and financial advisory services for local farmers.

The hub in Viet Nam is scaling innovation in value-added, sustainable and low emissions agri-food products. The initiative is a collaboration between the Ministry of Agriculture and Rural Development of Viet Nam, UNIDO, Grow Asia and the Partnership for Sustainable Agriculture in Viet Nam.

Source: World Economic Forum (2023).¹⁵⁶

Box 13: Building capacity for developing national Food Systems Transformation Pathways in Nepal

A key outcome of the UN Food Systems Summit, held during the United Nations General Assembly in New York in September 2021, was the development of national food systems transformation pathways. The pathways set out country-specific food system priorities. In Nepal, the National Planning Commission developed a Food Systems Transformation Strategic Plan (2022-2030), which aims to transform local food systems. The commission established a Food Systems Steering Committee composed of representatives from ministries, local governments, development partners, the private sector, and civil society organizations.

The strategic plan has six action areas:

1. **Ensuring safe and nutritious food for all** – increasing agricultural productivity and developing sustainable food chains to ensure safe, health and nutritious diets, by ensuring policy coherence (in the areas of agriculture, food security, education, and health) and good food governance.
2. **Shifting to sustainable consumption patterns** – focusing on food loss and waste, transitioning to a circular economy, investigating nutrient profile-based taxation on food, marketing/advertising control for unhealthy foods, school nutrition programs, and guidelines to reduce post-harvest losses.
3. **Boosting nature positive production** – sustainably managing existing food production systems and restoring degraded ecosystems and soil, including a focus on indigenous food systems.
4. **Advancing equitable livelihoods** – ensuring food systems are inclusive and contribute to poverty alleviation through decent jobs, income security and increasing value distribution, includes land tenure policies, formalisation of work and pay rates in the agricultural sector, and capacity building to foster the use of IT on and off farm.
5. **Building resilience to vulnerabilities, shocks and stresses** – including long-term investments in new crop and soil management techniques, multi-sectoral approaches to supply chain development, mainstreaming preparedness planning and responses including insurance.
6. **Right to Food and Food Sovereignty Act** – a legal framework for sustainable food systems with a rights-based approach for ending hunger and malnutrition and coordination of food systems action at all levels of government.

Source: Government of Nepal (2021)¹⁵⁷

The outlined experiences from Asia and the Pacific show that it is possible to better integrate agricultural policies with climate action. To broaden these efforts, countries need to embed their sustainable food system strategies in their NDCs. In Indonesia's NDC, for example, sustainable land management practices (such as strengthening of sustainable

forest management and effective land use and spatial planning) are expected to cut emissions and improve livelihoods and food security.¹⁵⁸ In the Republic of Korea, actions set out in the NDC that support low-carbon rice farming through improved irrigation techniques and low-input farming are also expected to bolster food security.

2.2 Decent work and a just transition in the context of climate change and climate action

People's ability to find productive employment and decent work can be key for alleviating poverty and hunger. Climate mitigation and adaptation actions are creating new jobs and economic activities. However, raising the quality of these jobs is necessary if they are to contribute to achieving SDG 1 and 2 (especially target 1.2 and 1.4). The ILO definition of green jobs — decent jobs that contribute to preserving or restoring the environment — puts emphasis on the quality of employment.¹⁵⁹ The term “decent” implies that the job is productive, delivers a fair income, offers workplace security, equal treatment of men and women and allows workers to organise and participate in the decisions that affect their work lives.¹⁶⁰

Green jobs can be found in agriculture, manufacturing, and construction, or in new, emerging sectors such as renewable and sustainable energy or climate adaptation, such as nature-based solutions. The ILO estimates that some 24 million net green jobs can be created in the Asia-Pacific region by 2030.¹⁶¹ The demand for these new jobs will arise in many areas of the economy, and cover forest and conservation workers, agricultural and fisheries workers, construction, metal and machinery workers, plant operators, electricians, and electrical trade workers.¹⁶² The ILO estimates that most of the new jobs will be for medium skilled workers. Building the skills required for these new “green jobs” will be critical to ensuring that people currently working in the informal sector can access them.

At the same time, climate action, specifically the decarbonisation of economies, will lead to job losses as employment in carbon-intensive sectors is phased down. The impacts of climate change and climate action on the labour market will be multidimensional and the gains and losses will be spread unevenly across countries and the region. These social and economic dynamics have galvanised efforts to ensure a so-called “just transition”, namely a transition

to an ecologically sustainable economy that is as fair and inclusive as possible, creates decent work opportunities, and leaves no one behind.¹⁶³

2.2.1 Youth and gender dimensions of decent work and a just transition

Conditions that ensure decent work and a just transition can alleviate poverty and hunger. This occurs when inclusive pathways to new jobs and sectors are opened up, while ensuring that the jobs are decent and provide protections for people who are hit by adverse climate impacts.

Young people are among the most vulnerable to climate change impacts. They tend to be more economically insecure, have lower incomes and capital, and limited work experience or established social networks. A recent ILO study modelled the impact on jobs of green policies focused on improving energy efficiency in buildings and appliances, energy transition and expanding the use of electric vehicles and the associated charging infrastructure. It found that, compared with a business-as-usual scenario, the set of green policies had the potential to create 5.8 million jobs for people aged 15–29 years in the region.¹⁶⁴

Supporting young people to become entrepreneurs and youth-led business solutions are vital for creating green jobs for youth. In the Philippines, for instance, a young female entrepreneur founded AGREA, a social enterprise that supplies households with fruit and vegetables (see Box 14).

As outlined in Chapter 1, climate change affects women more than men, due to existing gender inequalities and power structures. This difference is evident in women's unequal access to decent work. A recent project by the ILO highlights the adverse consequences of decent work deficits and climate change on over 35 million women workers in the textile and garment sector across Asia and the Pacific. The project also designed a toolkit that can help stakeholders in the sector plan for a just transition.¹⁶⁶

Box 14: The AGREA Foundation: a grassroots agricultural organisation

The AGREA Agricultural Communities International (AGREA) Foundation aims to eradicate poverty in farming and fishing families, alleviate climate change impacts, and make people in the Philippines more food secure. AGREA is also a women food producer network focussed on the goals of zero hunger, zero waste, and zero insufficiency. In 2014, the foundation started working with a small urban farm on the Island Province of Marinduque. Its reach has grown rapidly since. Accredited as a learning site for diversified integrated farming systems by the Department of Agriculture in 2015, AGREA now has sites across the country, including a certified AGREA Estate Farm school, a centre for agricultural technical vocational skills development and an agri-tourism farm.

The focus on providing education and imparting sustainable agricultural skills contributes to decent work in the food producing sector in the Philippines. It also ensures that the next young farmers and food producers have the skills to shape future food systems transformations.

Source: AGREA Foundation (2022)¹⁶⁵

Another area where climate impacts affect men and women differently is heat stress in the workplace. Many workplaces in the region need to be adapted to deal with the impacts of heat stress and pollution. According to the ILO, heat stress could result in the loss of 2.2 per cent of total working time, or 80 million full-time jobs, by 2030.¹⁶⁹ Furthermore, air pollution has a big impact on workers and labour productivity, with the severity depending on, among others, gender, age, and the type of work. Research in Cambodia, Lao People's Democratic Republic, Thailand, and Viet Nam has found that informal workers, such as street vendors, delivery drivers and people doing home-based work, were the least protected and most affected by air pollution.¹⁷⁰

Women make up the majority of Asia's 86 million home-based workers.¹⁷¹ Heat stress from rising temperatures and heatwaves put workers in the home at risk. Research on home-based-workers working in garment and food manufacturing in Bangladesh, India and Nepal highlights the impact of heat. Often heat exposure results in a rise in unpaid work (of up to 2 hours per day) because people have to care for sick family members or spend time gathering extra water and food supplies.¹⁷² This dynamic weighs on household incomes

and productivity. Nearly half of the participants in the research said that they changed their homes or livelihoods to cope with the heat.¹⁷³ Some non-governmental organization-run programs in the region show how inexpensive modifications to housing of poor households can provide relief from extreme heat for women home-based workers.

2.2.2 Creating and sustaining employment in nature-dependent sectors

Climate adaptation activities will be an important source of new employment, particularly in ecosystems-based sectors, and in areas where livelihoods are dependent on natural ecosystems. The ILO estimates that around 40 per cent of global employment directly depends on ecosystem services, with most of these jobs in Asia and the Pacific and Africa.¹⁷⁴ As Chapter 1 highlights, climate change deeply impacts these ecosystems and hence the jobs that depend on them.

New jobs in adaptation-related activities are emerging in a variety of economic sectors. They include reforestation, biodiversity conservation, and disaster risk reduction. Some of the jobs are tied to the rising need of securing key

Box 15: Just transition toolkit for the garment sector

Over the last 30 years, the textile and garment sector has created millions of jobs, mostly for women and in the formal economy in countries with limited social safety. However, there are well-documented decent work deficits for women workers in the garment sector, including low pay and gender pay gaps, long working hours, systemic discrimination



(including on the grounds of pregnancy), a lack of policies and programmes to adequately address the double burden of paid, and unpaid work. Vast numbers of workers in the sector are in “working poverty”, that is, they cannot earn enough money to pay for basic household needs. The environmental impacts of the sector are considerable though not widely known: the sector accounts for about 10 per cent of annual global carbon emissions. The garment sector is resource intensive – in energy, land, water and chemicals – and creates major waste streams – with wastewater, toxic waste associated with chemical processes and the growing issue of post-consumer garment waste, including micro-plastics from synthetic garments.

Decarbonisation efforts and rising demands for greater sustainability will impact millions of women workers in the garment sector. Over time, the sector is likely to become more capital intensive, with increased use of machinery, lowering the demand for labour per unit of production. These impacts will be distributed unevenly, but concentrated in “hotspots”, many of which are in the Asia-Pacific region. The scale and pace of system-wide change in textile and garment manufacturing make effective just transition planning essential to unlock synergies that can help achieve SDG 1, 2 and 13.

To support a just transition in the sector and unleash potential synergies in addressing environmental and decent work issues, including gender equality, the ILO produced the Just Transition Toolkit for the Textile and Garment Sector. The toolkit comprises reports, briefs, structured stakeholder consultations, videos and infographics to help establish sustainable behaviours and practices throughout the textile and garment supply chain in Asia. It provides advice on how to shape a just transition in the garment sector for social partners and industry stakeholders, including governments and policymakers, firms and workers. In Bangladesh, Cambodia, Indonesia and Viet Nam, the toolkit has already been used to start just transition planning. The ILO project also developed a regional roadmap for achieving gender equality as part of a just transition.

Source: ILO (2022).¹⁶⁷ ILO (2019).¹⁶⁸

Image source: ILO

infrastructure, such as roads, through green-grey, and agro-ecological approaches.¹⁷⁵ Nature-based projects can be a vital source of local employment. Nature-based solutions refer to actions to protect, sustainably manage, and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.¹⁷⁶ As these projects are located in areas where people are poor and food insecure and their livelihoods depend on natural ecosystems, they can be especially effective in tackling the challenges at

the heart of the climate-poverty-hunger nexus. Globally, an estimated 75 million people work in nature-based-solutions activities; some 96 per cent of them live in the Asia-Pacific region.¹⁷⁷ Figure 17 provides an overview of employment in nature-based activities. A practical example is the Ten Billion Tree Tsunami Programme in Pakistan (see Box 16).

There are, however, big gaps in our understanding of how nature-based solutions create jobs and to what extent they can count as decent work. New 'green' jobs are likely to

Box 16: The Ten Billion Tree Tsunami Programme – developing employment and adaptive capacity

Pakistan's Ten Billion Tree Tsunami Programme (TBTTP) was launched in 2019 with the goal of supporting the country's transition towards climate resilience by mainstreaming adaptation and mitigation through ecologically targeted initiatives. Under the four-year programme, 3.3 billion trees would be planted by 2023, with a budget of around 125 billion Pakistani rupees (\$562 million).



The TBTTP was designed to address the impact of rising temperatures, floods, droughts and other extreme weather events, while providing jobs for people affected by the COVID-19 pandemic. The Ministry of Climate Change, with its partners, implement the nationwide programme. At the request of the ministry, a consortium that comprises IUCN, FAO and WWF-Pakistan, is tasked with monitoring and evaluating the programme. To date, TBTTP has created some 1.42 million jobs for men and women. About 800,000 of them are long-term jobs; the remainder short-term. Through its support for climate change mitigation and adaptation, the programme has benefited many more people.

The key benefits of the TBTTP include enhanced forest cover, new tree nurseries, natural forest rehabilitation, improved watershed and rangeland management, and the strengthening of the environmental and other relevant institutions. Furthermore, the management of protected areas, including biosphere reserves and national parks, with a focus on ecotourism, will enhance wildlife protection and benefit local communities.

Source: ILO and UNEP IUCN (2022).¹⁷⁸

Image source: IUCN

be decent only when they are actively made so. This is because many actions in the areas of mitigation and adaptation, unless well considered, can lead to unequal or unjust outcomes. It is important that the most climate-vulnerable groups, which are at heightened risk because of pre-existing inequalities and limited access to resources, are considered when designing adaptation policies. Into the category of people at risk fall women, children, persons with disabilities, indigenous peoples and ethnic minorities, migrant workers, displaced persons, sexual and gender minorities, older persons, and other socially marginalized groups.¹⁷⁹

Women play a key role in climate adaptation activities, especially in agriculture, but they tend to have more limited access than men to climate-smart technology, market information and finance. Dedicated policies and measures are needed to remedy this and ensure equal access to new green jobs for women.¹⁸⁰

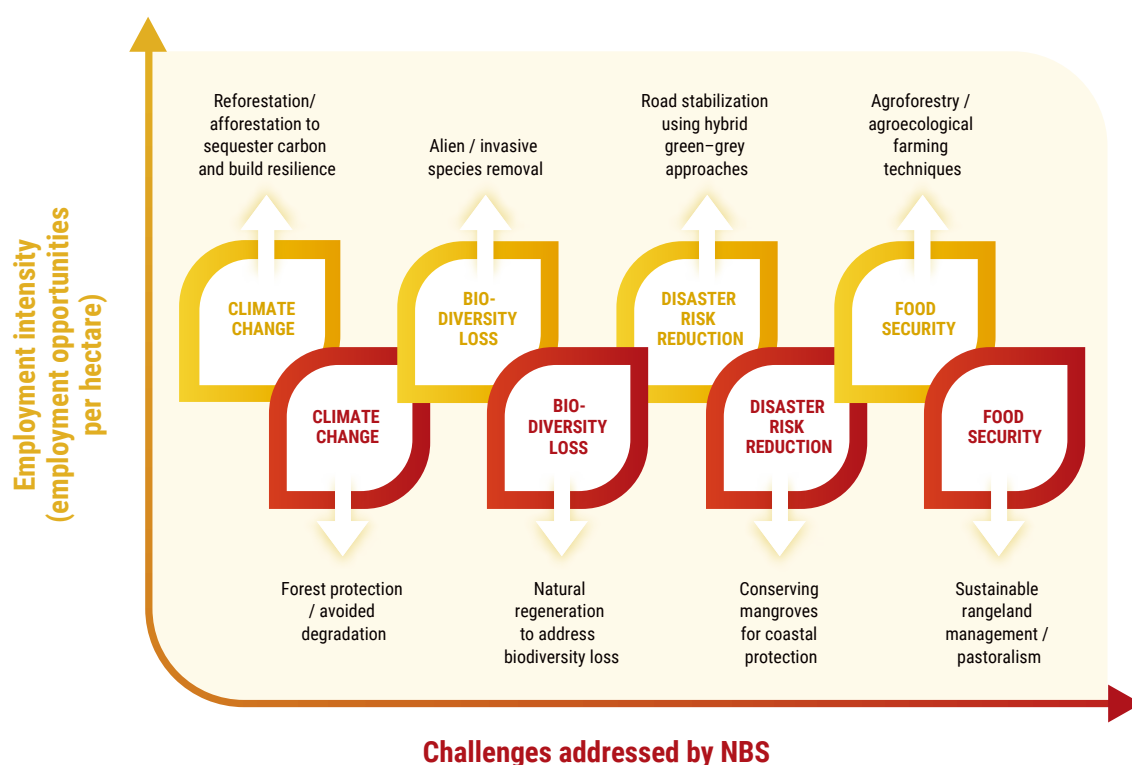
In ecosystems where people's livelihoods depend heavily on food and income from natural resources, nature-based solutions are critical to preserving the viability of existing

employment (such as fishing) as well as developing other sustainable livelihoods and employment in these communities.¹⁸¹ Box 17 provides an example of how rebuilding mangroves in fishing communities in Indonesia helps fishing to remain viable by restoring fish habitats, and provides co-benefits in climate adaptation and project-based employment.

Projects that centre on nature-based solutions must develop business and governance models and impart skills to local communities. Furthermore, financing, and monitoring and evaluation programs that measure the impact on the ecosystem, are needed. Rangeland restoration in Mongolia highlights the need for supportive policies (see Box 18).

Nature-based solutions are also relevant in urban areas. Examples of projects that contribute to sustainable and inclusive urban development include mitigating flooding in cities, reducing urban heat island effects, and rejuvenating urban waterways. Improving drainage and urban heat island effects benefit residents and workers in urban areas, particularly the urban poor and street vendors.

Figure 17: Employment intensity of different nature-based solutions



Source: ILO, UNEP and IUCN (2022).¹⁸²

Box 17: Mangrove protection against rising sea levels

The Indonesian village of Demak, on the north coast of the island of Java, is using a nature-based solution of restoring a protective belt of mangroves to curb erosion and the impacts of sea level rise that have seen large areas of the land disappear. Among the main causes of erosion have been the removal of mangrove belts for aquaculture use, the construction of coastal infrastructure that disturbs the build-up of sediments, and intense extraction of groundwater, which cause land subsidence and river canalisation.



Efforts to restore mangroves on this coastline have been ongoing since the 1990s. The current project has employed villagers and contractors to build some 3.4 kilometres of wave-calming structures in the shallows along a 20-kilometre-long stretch of the coast. Instead of washing away precious soil, the tides now deposit part of their sediment load, creating the right conditions for mangroves to re-grow. Bamboo poles and nets are used to trap the sediments, and when enough of it accumulates, mangrove seeds can naturally settle and grow.

Local farmers have agreed to let mangroves grow on their land after learning about how the mangrove trees not only protect against erosion but also improve conditions in their aquaculture ponds. Nearly 300 farmers have been educated in sustainable aquaculture techniques, including how to produce and use organic fertilizer, which has helped boost yields, at times by up to 200 per cent.

The program was implemented by Wetlands International, an NGO, the government and technical organisations and the local community. Since 2015, some 120 hectares of mangroves have been restored. More than 300 hectares of aquaculture ponds are being managed with sustainable techniques. The project provides jobs for local people during planting, and some in maintenance and monitoring, and helps make fishing and aquaculture livelihoods more viable. Some 70,000 people stand to benefit from increased resilience to climate change. The model is replicable and other communities in Indonesia are considering following its example.

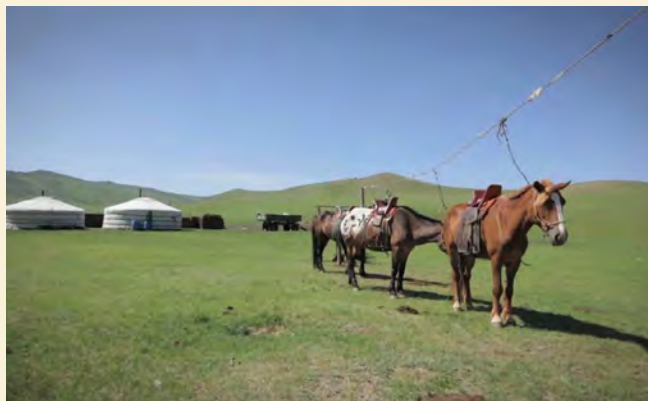
Source: Ekaningrum Damastuti and others (2022).¹⁸³ UNEP (2023).¹⁸⁴
Image source: UNEP

2.2.3 Labour mobility providing opportunities for income diversification

Moving jobs or migrating for work is an important livelihood strategy in the Asia-Pacific region. Migration and economic development

are closely linked, and the benefits of labour migration are shared across migrant, origin and destination locations. For migrants, the main benefits are a secure income, building skills and gaining work experience. Origin locations benefit from the remittances workers send home. And for destination locations, migrants help meet

Box 18: Rangeland restoration in Mongolia



Rangelands, or open country used for grazing or hunting animals, are a vital ecosystem for Mongolia. Pastoralism has been a key livelihood in the country for thousands of years. However, climate change impacts and growing environmental degradation, caused by unsustainable use of grasslands, increasingly threaten these livelihoods.

Almost 60 per cent of Mongolia's poor are herders, and one fourth of the overall population is food insecure. The rangelands cover more than two thirds of the country and are the backbone of the rural economy, traditionally providing food security for the entire nation. However, according to the Ministry of Nature, Environment and Tourism, more than 70 per cent of these rangelands are moderately or heavily degraded.

A major challenge in promoting sustainable rangelands and drylands is the lack of governance systems and information about the highly variable ecosystem conditions. The Green Gold Rangeland ecosystem management program has introduced a territory-based, herder-centred approach by forming so-called Pasture User Groups (PUGs). The members of these groups define the boundaries of grazing areas and agree on how to regulate their use through a common plan. The plans are then formalised into Rangeland Use Agreements (RUAs) with the local governments. They provide a clear record of stakeholders' respective rights and responsibilities. PUGs also offer a platform for sharing knowledge and collective action.

The program has also introduced a Responsible Nomads livestock traceability system, which provides loans and financial incentives for herders to take part in sustainable land and livestock management. The system also offers certification and verification for sustainably produced products such as milk, meat, and cashmere wool products. In this way, herders can signal their quality products and achieve higher prices, thereby make nomadic farming more viable. The traceability system operates through a mobile phone application.

The program has had a markedly positive impact on the environment. In line with user agreements with local governments, herders have rested some 18 per cent of targeted degraded rangelands for 2-5 years in the past five years. In February 2021, the Mongolian Agency for Standardization and Metrology approved a Responsible Nomads code of practices as a national standard for nomadic livestock production. Overall, the project has helped improve herders' livelihoods, with sustainable herd management leading to better quality fibre and meat, higher prices and more stable incomes due to more secure access to pastures.

Source: Burmaa Dashbal and others (2023).¹⁸⁵ National Federation of Pasture Users (n.d.).¹⁸⁶

Image source: UNEP

labour demand during peak periods, such as seasonal harvests or construction projects.

The patterns of labour migration differ markedly by gender. Most men are migrating for work in the construction, agricultural and fishing sectors, while most women seek jobs in domestic work, healthcare, garment, and hospitality sectors. Traditional gender roles can limit women's opportunities to migrate, and when they do, they often do not receive the same benefits and recognition as men.¹⁸⁷

Climate change impacts are already speeding up human mobility, especially in climate-vulnerable countries. To be sure, they are only one of many reasons why people move.¹⁸⁸ But a changing climate is increasingly shaping mobility patterns in the region and the demand for domestic and cross-border migration, regular and irregular, is likely to increase.¹⁸⁹ Climate change, including the impacts of sudden onset events, spurs irregular migration and can make human trafficking more common and risky.¹⁹⁰

Over the past decade, researchers and policymakers have begun to view labour migration as an adaptive strategy to deal with climate change impacts. However, the success of such adaptation depends on the context in the origin and destination locations, as well as the socio-economic characteristics of migrants and their families. Without sufficient protections and regular migration pathways migration can make people more vulnerable.¹⁹¹ For labour mobility and migration to be safe, established pathways and decent work protections must be in place. Such protections include access to formal jobs, as well as health, housing, and social services in migration destination countries. Reliable information in destination and origin areas is also vital so that workers and employers can make informed decisions.

The small island developing States are using labour mobility as a means of climate adaptation. Various formal labour mobility schemes, with permanent and temporary migration options, exist across the Pacific, including with Australia, New Zealand, and the United States. The temporary options are

mostly run by employers, who hire migrants for work and provide them with housing and other services. These schemes have been activated or extended in the wake of disasters, such as Cyclone Pam in Vanuatu in 2015 and Cyclone Gita in Tonga in 2018.¹⁹²

Access to schemes, as well as opportunities for skill acquisition and recognition, vary across the Pacific Islands. Recent changes to seasonal migration schemes aim to harmonise access and rights across Pacific Islands (see Box 19). In the origin countries in the Pacific, labour migration can also lead to skilled labour shortages. Over the longer term, however, as migrants return, they bring skills and experience with them that benefits their home countries.

2.2.4 Decent work and a just energy transition

The energy transition – the rapid deployment of renewable energy technologies and phase out of coal-based electricity generation – will have major socio-economic consequences across the region. The impacts will vary greatly. Countries with ample renewable energy resources and low dependence on fossil fuels may be able to undergo the energy transition without major job losses. For countries such as Indonesia, however, which has some of the most coal-dependent communities globally, the impacts will be immense.¹⁹⁶

At the macroeconomic level, many of the impacts are positive. Constructing and maintaining renewable energy generation capacity, transmission, and associated grid infrastructure will create new jobs. These additional jobs are expected to outweigh job losses associated with the phase out of fossil fuels with some 14 million jobs created on the back of building up clean energy supply and 16 million from installing efficient appliances, electric and fuel cell vehicles, and building retrofits and energy-efficient construction.¹⁹⁷ These employment gains compare with the 5 million jobs losses expected from the decline in the use of fossil fuels. As one half of the world's jobs in the energy sector are located in Asia and the Pacific and so, too, is likely to be the net employment growth in the energy

Box 19: The Pacific Mobility Framework

Labour mobility is a common livelihood strategy of small island developing States in the Pacific. This labour mobility is increasingly a function of climate change adaptation. Climate risks vary greatly across the Pacific, with some of the larger islands not as affected by climate change impacts as the small atoll countries like Kiribati, Marshall Islands and Tuvalu, where the coastal environment is fragile and highly vulnerable to rising sea levels. Consequently, climate-related labour mobility differs, too.

Under the Pacific Climate Change Migration and Human Security Programme (PCCMHS), implemented by the International Organisation for Migration (IOM) as the lead agency, Pacific island States developed the Pacific Regional Framework on Climate Mobility. Pacific leaders endorsed the framework in November 2023. The first of its kind in the region, it provides guidance for governments on legal, policy and practical issues that arise from increasing climate mobility (the issues range from displacement and planned relocations to stranded migrants). The framework design draws on the lived experiences of women, youth, persons with disabilities, marginalized groups and all communities affected by climate mobility and made use of the guidance of Pacific governments, civil society and academia. It took three years to design it, and the process was led by the Joint-Working Group on Climate Mobility, co-chaired by the governments of Tuvalu and Fiji and supported by PCCMHS.

The key objective of the framework on climate mobility is to ensure provisions for safe labour migration as an adaptation strategy for impacted Pacific islanders. These provisions include training and skills development to support more skilled labour migration, pre-departure orientation for migrants, as well as capacity building.

Source: IOM and ILO (2022).¹⁹³ IOM (2023).¹⁹⁴ IOM, ESCAP and ILO (2022).¹⁹⁵

transition.¹⁹⁸ New jobs will not only be created in the production of renewable energy but also in ancillary industries, such as manufacturing of components, installation services and engineering consulting.

The new jobs will require all levels of skill. ADB research shows that most of the new employment will be in mid-skilled occupations. The three occupation groups in greatest demand by 2030 are expected to be building and related trade workers, elementary labourers in manufacturing, construction, and transport, and skilled agricultural workers.¹⁹⁹

The job losses that will occur as a result of decarbonisation efforts will mostly affect workers in the traditional energy sectors, particularly in the coal and fossil fuel

industries, or in communities that depend on these industries. These losses will be highly concentrated in a few countries. According to an ILO analysis of coal phase-out in Indonesia, the Philippines and Viet Nam, the impact will be the most severe in Indonesia.²⁰⁰ However, with adequate planning and investments in social protection and retraining, the impacts on workers and communities can be mitigated. Box 20 shows how the ADB's Energy Transition Mechanisms aims to facilitate a just transition away from coal.

Women workers are under-represented in jobs in the formal energy sector, and over-represented in the related, ancillary goods and service activities that make up the value chain that surrounds the formal energy sector work and communities. This work is often informal

Box 20: The ADB's Energy Transition Mechanism supporting just transition in early coal retirement

The Energy Transition Mechanism (ETM), launched by ADB in 2021, is a financing mechanism that uses concessional and commercial capital to accelerate the retirement or repurposing of fossil fuel power plants and replace them with clean energy alternatives. It is currently being piloted in Indonesia, Viet Nam, the Philippines, Kazakhstan and Pakistan.



The mechanism is in the early stages of implementation with Indonesia the most advanced pilot country. A non-binding framework agreement was announced at COP28 to speed up the closure of the 660-megawatt Cirebon-1 coal fired power plant under the ETM on the Indonesian island of Java, almost 7 years earlier than scheduled.²⁰⁰ The framework agreement includes environmental, social, and just transition planning for impacted workers and communities based on the Just Transition High-Level Principles of Multilateral Development Banks (MDBs). The principles focus on the delivery of climate objectives alongside socio-economic outcomes for affected communities and regions, including access to sustainable, inclusive and resilient livelihoods, support for equal access to the new opportunities, jobs and markets associated with transition, through a gender-lens and integrated territorial development approaches.²⁰²

The ETM aims to be a scalable model for energy transition in the region. It seeks to retire half of the entire coal fleet, with a combined capacity of 30 gigawatts, in Indonesia, the Philippines and Viet Nam in the next 10 to 15 years.²⁰³ The mechanism will also help mainstream just transition planning and social safeguards to ensure an inclusive transition.

Source: ADB (2023).²⁰⁴ ADB (2021).²⁰⁵ MDB Group (2021).²⁰⁶

Image source: ADB

and poorly paid. Women also tend to do most of the caring and community work for households and communities.²⁰¹ A just energy transition needs to recognise that energy systems and policies will affect women and men differently, as a result of historical imbalances in power, resources and labour.

People and communities living in poverty are likely to be most affected by the energy transition, because they tend to depend more on coal, work in fossil fuel-related services,

or because of changes in energy supply and prices (see Box 21). The economic sector with highest proportion of female workers remains agriculture, on which most of the region's poor depend for their livelihoods.²⁰⁸ Under ambitious energy transition policies, which envisage bioenergy with carbon capture and the expansion of forests, some 22 per cent of the land used for cereal crops in developing Asia could be converted to energy crops and forests by 2070 as part of decarbonization efforts.²⁰⁹ Such a transformation could make

Box 21: Sharing the benefits of solar parks in India

For many poor and landless workers in India, wage labour in the agricultural or construction sector is the main source of income. These landless workers tend to depend on common land, and less often privately owned land, to graze their livestock. In regions where solar parks have been constructed on agricultural land, this has at times significantly limited access of landless workers to pastures, with adverse impacts on incomes and livelihoods.



The problem highlights the need for energy transition projects to consider a broad range of stakeholders and ensure that renewable energy projects alleviate poverty, and do not worsen it. A key lesson learned from the case in India is to encourage solar park owners to consider co-uses for land and raising the height of solar panels to allow for grazing livestock around solar panels, which can provide shade for animals at the same time. Also, the configuration, location and height of panels can be designed so that crops can still be cultivated. Other measures include identifying alternative secure jobs for affected workers, in the renewable energy sector or other sectors, through skilling and re-skilling, especially for women.

Source: Vishwajeet Poojary, Ashwini Hingne and Ulka Kelkar (2023).²¹⁴

Image source: ADB

food less affordable for poor people, pushing around 60 million people into hunger by 2050, and aggravate gender inequality.^{210, 211} For these reasons, safeguarding agriculture and the people who depend on it, should be an integral part of any just energy transition. Equipping the agricultural sector to deal with the pressures of climate change mitigation policies and climate change impacts will be critical for protecting the livelihoods of many of Asia's poor.²¹² When designing climate action policies, all groups must be considered, especially poor and vulnerable groups most at risk in terms of loss of life and livelihood impacts from climate-related disaster events. It is key that just transition planning extends to these communities and does not confine itself to directly affected workers in coal mines and power plants. Planning thus must include training and reskilling programs for people affected by the low-carbon transition.

Additionally, labour market measures through public services, labour mobility reforms, and social protection should be implemented to prevent skill mismatches and coverage gaps.²¹³

2.3 Developing climate-resilient social protection systems

The third set of opportunities in the climate-poverty-hunger nexus that this report explores are social protection systems, which are an important safety net for vulnerable people that can be responsive, adaptive, and deployed in times of climate-induced crises.

There are two types of social protection. The first is broad-based social protection, which includes contributory instruments such as pensions and other work and income-related protection measures. The second type comprises non-contributory assistance

measures, such as cash transfers to poor households, households with children, and assistance that may be forthcoming at specific times. Examples of the last form of assistance are parental benefits triggered by the birth of new children, and event-specific relief, such as cash transfers, food and other relief in the aftermath of extreme weather events.

It is the second type of social protection that can be employed when shocks hit. It can provide immediate relief, and when used together with wider social protection policies, also provide adaptive social protection. This can be done by providing assistance that builds resilience to disasters and other climate change impacts at the individual, household, and community level.²¹⁵ Despite these opportunities, policymakers in the Asia-Pacific region have largely focused on social protection in the wake of shocks rather than adaptive social protection that will play an increasingly vital role in the face of climate adaptation and just transition.

In a nutshell, well-designed adaptive social protection systems can reduce poverty and enable people to deal with climate change and stressors before climate events occur, support longer term transformations and provide support in the aftermaths of shocks.²¹⁶ They can play an important part in helping societies move towards net zero.

2.3.1 The role of social protection in building adaptive capacity

Social protection can cushion poor households from the impacts of climate shocks and enable them to remain food secure and avoid detrimental adaptation actions (for example, sale of assets and indebtedness). Cash transfers and public works programmes are two ways of increasing social protection. Efforts to increase the social protection base in the Philippines (see Box 22) and India's public works programs (see Box 23) highlight the benefits of programs that guarantee work or an income. Public works programs that are integrated into disaster risk reduction and response programs can also provide social protection, jobs, and income for affected

people. The linking of social protection and disaster risk management is most effective when mature social protection programs are already in place.

Despite recent progress, significant gaps remain in the social protection systems in Asia and the Pacific. Less than half of the people living in the region are covered by at least one social protection benefit, such as unemployment benefits, disability benefits, maternity support, and aged pensions. Worryingly, this figure drops to 25 per cent for vulnerable people.²²⁴ This is because informal workers, of which there are 1.3 billion in the region, are often entirely outside social protection systems.²²⁵ Combined with the lack of redistributive social development policies, most people in the region thus find themselves without any form of social protection. Furthermore, just over half of the people in the formal workforce pay into contributory schemes.²²⁶

The COVID-19 pandemic highlighted the vulnerability of people whose livelihoods had otherwise seemed secure. On the flip side, the pandemic shone a light on the positive effects of social protection systems. Countries with strong systems were able to respond more swiftly and effectively to the COVID-19 crisis, and other crises, as seen in the next sections on social protection and disaster recovery. Across the Asia-Pacific region, countries mobilised significant resources for social protection during the pandemic. Indonesia, Malaysia and Thailand sanctioned stimulus packages each worth more than \$99 billion; the Philippines and Viet Nam over \$27 billion; and Mongolia, Lao People's Democratic Republic and Cambodia over \$4 billion. In the Pacific, including Papua New Guinea and Fiji, stimulus packages were worth between \$0.6 and \$1.6 billion.²²⁷

Some 70 per cent of the social protection measures implemented in the region during the COVID-19 pandemic were new protection policies. This high percentage largely owed to the fact that many countries did not have mature social protection systems when the pandemic hit.²²⁸ Their experience is instructive and can inform national and regional efforts to strengthen social protection policy development and implementation.

Box 22: Increasing social protection in the Philippines

The Philippines has been making rapid progress in broadening social protection systems since 2009. The government's own Social Protection Indicator²¹⁷ score rose from 2.1 in 2015 to 3 in 2018 with both increases in social assistance²¹⁸ and social insurance²¹⁹ contributing to this increased performance. The social assistance improvement was driven by a major expansion of the *Pantawid Pamilyang Pilipino Program*,



a conditional cash transfer program targeting chronically poor households with children aged 0-14 years in the poorest areas of the country (the initial program was partially supported by ADB and the World Bank). Under the program, beneficiaries receive monthly cash-transfers of between \$11 and \$32 on the condition that they undergo health and medical checks, and children attend school. The expansion of health coverage from the Philippine Health Insurance Corporation (Phil Health) through the Universal Health Care Act of 2019 also contributed to gains in social protection.

The public programs, especially the *Pantawid Pamilyang Pilipino Program*, enabled an effective scaled-up response to Super Typhoon Haiyan, with emergency assistance delivered through the existing program channels. International Organisations, such as WFP and UNICEF, also used the program to deliver assistance.

Source: Sources: ADB (2022).²²⁰ World Bank (2011).²²¹ Stephane Hallegatte and others (2016).²²²

Image source: ADB

2.3.2 Integrating social protection and disaster recovery

Relief-focused social protection, such as cash transfers and other support, can deliver speedy help for people whose lives have been uprooted by extreme weather events, such as storms, droughts and floods. This kind of disaster-related protection helps vulnerable people already in poverty and reduces the risk of other people and households falling into poverty. To illustrate, in the Philippines, recovery and reconstruction public works programs are well-integrated into disaster response measures. These measures may take the form of providing short-term jobs in infrastructure and other projects, namely clearing debris, rebuilding roads and shelters, reforestation, coastal resource management. After Typhoon Haiyan hit the Philippines in

2013, nearly 80,000 people received immediate relief and were enrolled in the national health and employment injury insurance schemes.²²⁹

Similarly, an existing social protection system was activated to make payments to people in the wake of Tropical Cyclone Winston in Fiji. The government disbursed money irrespective of whether or not they were directly impacted by the cyclone. In this way, it was able to deliver quick and broad-based disaster relief (see Box 24).

2.3.3 Climate related insurance helps build adaptive capacity at individual, community and national level

Climate-related insurance is an effective way to mitigate the economic effects of disasters and help poor households recover faster. Climate

Box 23: Public works programs provide social protection and foster climate adaptation in India

The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is the world's largest labour guarantee scheme. It offers 100 days of paid labour to every rural household in India. It is one of the world's largest Public Work Programs (PWP), or state-backed employment programs where labour is exchanged for wages or food. PWPs can reduce poverty by providing decent work and paying a wage to beneficiaries, but also through the public work itself. In the case of the MGNREGA, projects include the restoring and conserving of the natural resources base in rural areas such as watersheds and forests, as well as those focusing on building and maintaining agriculture, livestock and aquaculture infrastructure, and improving water and food supply.

The projects have raised incomes, enhanced food security and improved the livelihood of many of the eligible workers and communities. Food security has benefited as a result of projects that focus on the planting of fruit trees such as mango, jamun, litchi, guava and gooseberry, and trees with medicinal applications (like neem) or trees that produce hard wood like teak and mahogany. Roadside tree planting is common in some MGNREGA projects. Women have equal access to work and wages, and in some cases childcare facilities are included on project worksites.

Evaluations of MGNREGA have found notable environmental benefits, including reforestation and afforestation, improved water security and carbon abatement. This notwithstanding, there have been calls to reform or scale down the scheme. Program allocations in the federal budget have declined in recent years, amid concerns that the projects are not providing enough work opportunities.

Source: Juliet Angom and P. K. Viswanathan (2022).²²³

risk insurance can provide countries and people (for example, farmers, pastoralists) with swift cash and disaster-related skills and knowledge that help cope with disaster impacts. The insurance tools may also help people to decide whether to stay or leave their homes, and, in doing so, reduce displacement risks.

Parametric insurance pays out when a pre-defined triggering event occurs, like a certain amount of rainfall, wind speed in a storm, or temperatures that last for a specific number of hours or days. This contrasts with indemnity insurance, which guarantees compensation based on the assessed value of actual losses. As insurance companies do not have to assess damage after the event, parametric insurance tends to be more affordable.²³³ An example at the personal or household level of parametric

insurance is the Extreme Heat Income Insurance set up by the Self Employed Women's Association (SEWA) in India (see Box 25).

These insurance products can also be designed for cooperatives and groups of organisations. For example, the CLIMBS Enhanced Weather Protection Insurance in the Philippines, which includes local and global insurers, is aimed at agricultural cooperatives who take out insurance for their members. In addition to the insurance protection, the product provides advice on when to plant crops in changing weather and climatic conditions.²³⁴ Increasing knowledge and understanding of insurance products, greater inclusivity of policies (such as for landless farmers), and considering gaps in digital access and literacy as well as gender equity will make these products more widespread and attractive over time.²³⁵

Box 24: Social protection as disaster relief – Fiji and Cyclone Winston



In 2016, Tropical Cyclone Winston hit Fiji, causing economic losses equivalent to one fifth of Fiji's GDP at the time. Around 60 per cent of the people living on the island were affected, with some 40,000 people requiring immediate assistance. The private and public losses as a result of destroyed physical assets and infrastructure has been put at \$900,000 million. Many livelihoods were adversely affected, with severe disruptions to agriculture and fisheries.

The government expanded social protection, by temporarily increasing the value and duration of existing interventions to meet emergency needs. In practice, this meant that the beneficiaries of the poverty benefits scheme, social pension scheme, and care and protection allowance received extra payments. In addition to the usual benefits, cash transfers were paid out alongside housing vouchers as part of a housing reconstruction scheme. As a result, dwellings were repaired quickly. According to a World Bank study the response reduced the adverse impact of the cyclone on the poorest Fijians by over 30 per cent. The cost-benefit ratio, a measure of the relative costs and benefits of an intervention expressed in monetary terms, was above four, meaning that the intervention was highly effective.

In sum, the Fijian social protection system provided an effective way to respond to Cyclone Winston and channel public and other organisations' cash and non-cash humanitarian relief to those in need. The broader evidence is clear. Evaluations show that expanding broad-based social protection to cover youth and people of working age, as well as developing public works programs and finding ways to include near-poor households, makes social protection systems more effective as a tool in disaster risk reduction and recovery.²³⁰

Source: ESCAP and the Ministry of Natural Resources and Environment (MNRE) of Samoa (2020).²³¹ Aisha Mansur, Jesse Doyle, and Oleksiy Ivaschenko (2017).²³²

Image source: UNICEF/Hing

National and global systems for a better understanding and managing risk will be vital as climate change impacts and other shocks continue to manifest. WFP has started to design products that provide food assistance or agricultural inputs in countries with high inflation to help stabilize the value of insurance claims. The Pacific islands of Fiji and Vanuatu have recently developed similar mechanisms (see Box 26).

Despite these innovations, the current model under which society manages catastrophic risks is unsustainable.²⁴⁴ Financing options will have to change along with the type of climate impacts (low frequency and high impact, or high frequency and low impact) and their severity. Policymakers need to prepare for low frequency and high impact events that might overwhelm their responsive capacity. An example of such an event may be

Box 25: Extreme heat income insurance for self-employed women in India

Extreme heat can cause income losses and significant health impacts for self-employed women, especially those working as street vendors, waste pickers or in the home. The Extreme Heat Income Insurance was developed by the Ahmedabad-based Self-Employed Women's Association (SEWA) and insurance technology firm Blue Marble with support from the Adrienne Arsht-Rockefeller Foundation. The parametric insurance, trialled with 500 women in five districts in the Indian state of Gujarat state, pays out compensation when temperatures, gauged by satellite, exceed a certain level.²³⁶ The current pay-out is \$3 per day (multiple pay-outs per season are allowed). During the pilot, the philanthropic program pays the insurance premium in line with terms of the policy drawn up by a local insurance company.²³⁷ The objective of the pilot is to understand how parametric insurance products can be scaled up among SEWA's 21,000 members.



Source: Aditi Desai (2023).²³⁸ Rockefeller Foundation (2023)²³⁹

Image source: ADB

large-scale climate catastrophe that affects an entire country or region). Strengthening the responsive capacity is best achieved through traditional risk reduction investments in infrastructure, institutions, information systems and social protection mechanisms.²⁴⁵

To respond to catastrophes, for which traditional risk reduction measures are not viable because they are too expensive, policymakers need to devise contingency, preparedness and post-recovery community plans and set-up national funds (or tap into international loss and damage funds) to aid affected populations. The assistance might take the form of compensation funds or programs that support alternative livelihoods or relocation.

Recognizing the limits to adaptation and residual risks is key to the loss and damage agenda, especially for the region's small island developing States. Millions of people in these climate-vulnerable countries are already

approaching the limits of adaptation and are at risk of losing their livelihoods due to sea-level rise or salinity intrusion. The financing framework in Figure 18 outlines the adaptation tools at the local, national, and international level, as well as financing options in case the limits to adaptation are breached.

2.3.4 Gender lens on social protection systems

When designing and rolling out social protection systems policymakers must consider gender aspects. Existing gender norms may exacerbate women's vulnerabilities when disasters strike, or climate change impacts a community. It is well-documented that disasters put women and girls at elevated risk of sexual assault, intimate partner violence, child marriage, trafficking, and sexual exploitation.²⁴⁶ These same vulnerabilities also limit women and girl's ability to pre-empt these risks. Women in Asia and the Pacific also make

Box 26: Climate risk insurance for the Pacific



Although many Pacific Small Island countries have developed Disaster Risk Management (DRM) plans at the national and sub-national level, only a few have an integrated Climate Disaster Risk Financing (CDRF) strategy to manage economic losses after a disaster. For example, together with World Bank and UNDP, Tonga has developed a disaster risk financing strategy. With the emergence of innovative CDRF instruments, there is an opportunity to introduce, test and scale up their use in the Pacific

islands, including parametric insurance for vulnerable and low-income populations.²⁴⁰

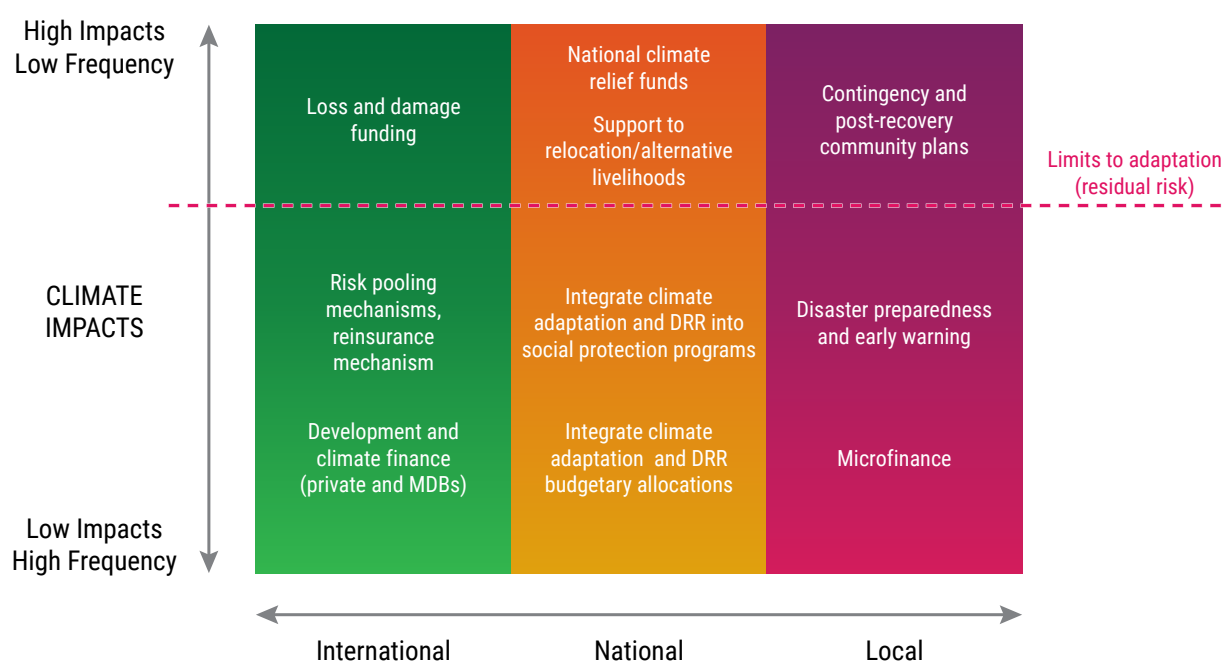
Currently, most Pacific countries have limited financial tools, such as a contingency reserves, when managing risks and recovery from extreme weather events. Oftentimes, in case of emergencies, financial instruments and tools are only developed after the event has already taken place. This usually happens through external and internal borrowing, the reallocation of public funds, or donor assistance and international humanitarian aid. However, the emergence of new financial instruments is contributing to strengthening the climate resilience of these island countries. For example, under the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI), the Pacific Island countries have added contingency reserves with a parametric insurance facility – the PCRAFI Facility enabled catastrophic risk insurance on competitive terms for six Pacific islands States (Fiji, Cook Islands, Marshall Islands, Tonga, Samoa and Vanuatu).²⁴¹

The Pacific Insurance and Climate Adaptation Programme (PICAP), a multi-year programme implemented by three UN agencies including the United Nations Capital Development Fund (UNCDF), aims to improve the financial preparedness and resilience of Pacific governments and communities against climate change and natural hazards. This is achieved through the development and implementation of innovative and inclusive CDRF and Insurance (CDRFI) instruments for countries and individual businesses.

The programme's inception phase ended in 2021-2022, with innovative and affordable parametric insurance products having covered 2,800 smallholder farmers, fishers, market vendors and small businesses in Fiji, Tonga and Vanuatu.¹⁰⁹ Program activities also included regulatory capacity building. The Reserve Bank of Fiji, the central bank, piloted and approved the first parametric insurance product, and similar approvals were made in Vanuatu and Tonga.¹⁰⁹ The plan is to expand coverage, in a phased manner, to other countries, including Samoa, Solomon Islands, Kiribati, Timor-Leste, and Papua New Guinea.

Source: Olivier Mahul, Samantha Jane Cook and Raymond Prasad (2017).²⁴² UNCDF (2023).²⁴³

Image source: UNCDF

Figure 18: Layered options for climate risk financing for poverty and food insecurity at different scales

Source: Authors.

Note: Limit to adaptation acknowledges that there will be some climate events for which climate adaptation will be too expensive or not practical, requiring alternative policy and financing solutions and a renewed emphasis on loss and damage and climate relief.

Box 27: BRAC's Climate Bridge Fund reaches the most marginalised and vulnerable people in Bangladesh – poor women

To be effective, social protection policies and programs need to cover the most vulnerable. Often, however, designing programmes that reach them is tricky. BRAC, a Bangladeshi NGO, has a long history of working with local organisations to reach women in extreme poverty. Using a multi-step process of data collection, needs analysis, and capacity building, BRAC has been able to bring previously unreachable people into public safety nets through the Climate Bridge Fund.

BRAC established the fund in 2019 to help local non-profit organisations working in communities affected by climate change to better design climate change projects and improve access to funding. The program has two streams. The first supports climate-induced migrants from the areas of Barishal, Khulna, Rajshahi, Satkhira and Sirajganj. The second funds and helps implement locally led climate resilience projects that might otherwise be overlooked. For instance, the upgrading of infrastructure in city slums so that it can withstand storms and floods. The projects are developed from the bottom up, with local women developing innovative context-specific development solutions, such as water supply systems that use solar power and make use of rainwater harvesting. Projects are locally sourced and run in a way that they comply with local and national regulations. The projects are evaluated regularly to ensure continuous learning and developing ways of scaling up activities.

Source: BRAC (2023).²⁴⁸

up a big share of the labour force in agriculture, fisheries, forestry, energy and manufacturing. All these sectors are particularly exposed to climate change impacts and often the work is informal. Social protection systems that mitigate these risks are thus absolutely critical for women and girls.

Few social protection strategies in the region take into account the existing differences between women and men. They are thus often unable to unlock synergies through linking climate adaptation, disaster risk reduction and programmes and services that address social risks and the vulnerability of women and girls.²⁴⁷ A gender lens for developing social protection strategies would change this and ensure gender-sensitive actions throughout programme and policy cycles. Box 27 on the Climate Bridge Fund in Bangladesh outlines a social protection program for vulnerable people, especially women.

2.3.5 Social protection is key for achieving the SDGs and goals of the Paris Agreement

Integrating social protection in national climate change strategies, especially in Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs), is an important means of addressing climate-related vulnerabilities and ensuring fair and inclusive transitions. Although NDCs offer an effective starting point

to align climate actions with poverty reduction, gender equality, decent work, and inequality reduction, most countries in Asia and the Pacific fail to take advantage of this opportunity. Only a small number of NDCs in the region mention social protection to support climate mitigation and adaptation efforts.²⁴⁹

Several countries have included social protection in their NDCs. In Cambodia, gender and social inclusion have been mainstreamed into their NDC, and Indonesia has developed the concept of just transition and prioritised the creation of decent jobs with adequate social protection. Sri Lanka, Myanmar and Pakistan have made steps to integrate disaster management strategies and social protection.²⁵⁰ Only a few countries, including Bangladesh, Indonesia, Sri Lanka and Timor-Leste, have integrated social protection into their NAPs.²⁵¹ There is great potential for improvement. To ensure comprehensive, resilient, and climate-responsive protection systems, it will be vital for countries to devote more domestic resources to social protection and explore synergies with Paris-aligned investments, (i.e., investments in low-carbon climate solutions and in the energy transition). Furthermore, diversified financial strategies should aim to incorporate and better coordinate with climate and disaster financing and insurance, as well as other forms of Paris-aligned instruments such as Green Bonds and Climate Funds.

A photograph of a greenhouse interior. In the foreground, two women wearing white hijabs and patterned blue and white dresses are looking at a notebook. The woman on the right is holding a pen. They are surrounded by various green plants in pots. In the background, other people are visible, and the greenhouse structure with its glass panels and metal frame is clearly seen.

Enabling Actions for Transformative Change

CHAPTER

3

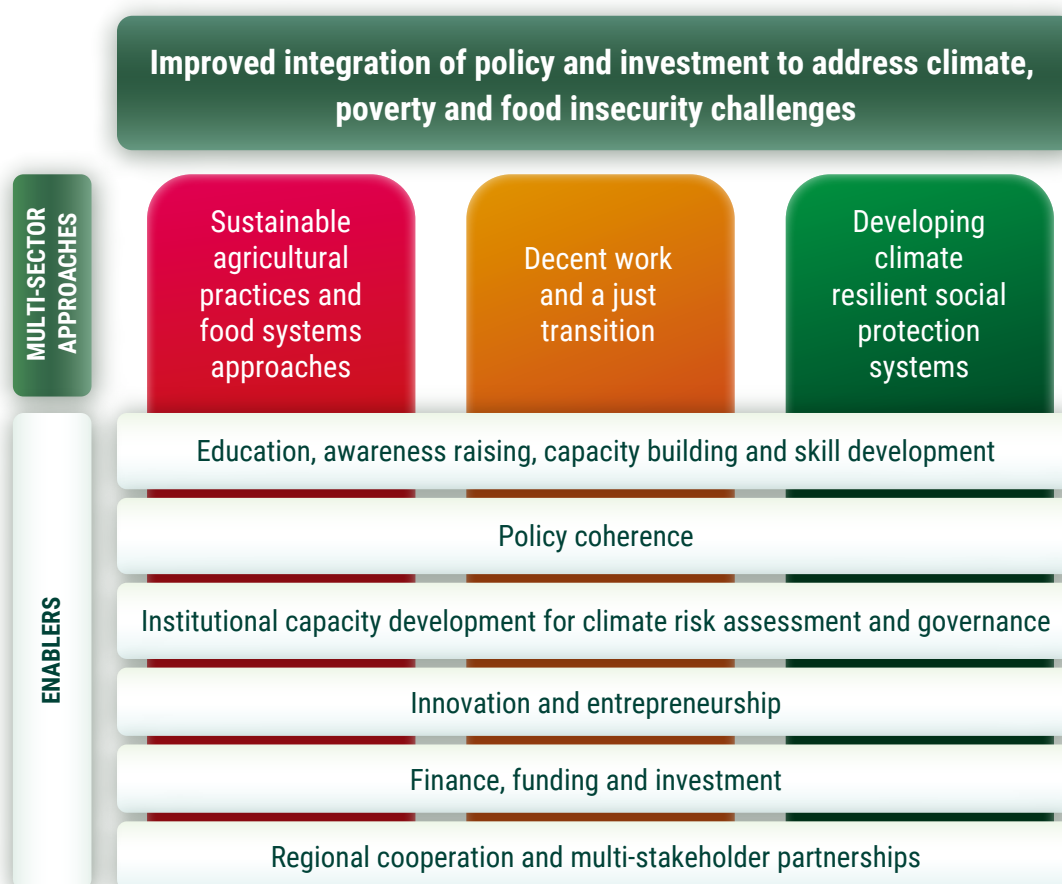
This report explores the interlinked and complex dynamics that shape how climate change is exacerbating poverty and hunger in the Asia-Pacific region. It identifies nexus approaches to sustainable development at the interface of climate-poverty-hunger at a time of stalling progress on achieving SDGs 1, 2 and 13. Numerous examples of innovations, good practices, and responses are presented to give impetus for action and kickstart renewed progress towards achieving SDGs 1, 2, and 13 in the region.

Though the responses highlighted in the report range from local to international in scope, there are a number of common key enablers of transformative change. This section looks at these enablers and how they can be used

more effectively to support accelerated action on climate, poverty and hunger, to provide clear pathways to action for the region. The enablers include:

- 1) Education, awareness raising, capacity building and skill development
- 2) Policy coherence
- 3) Institutional capacity development for climate risk assessment and governance
- 4) Innovation and entrepreneurship
- 5) Finance, funding and investment
- 6) Effective regional cooperation to strengthen transboundary policies and multi-stakeholder partnerships

Figure 19: Integrated approaches to address climate, food and poverty challenges.



Source: Authors.

3.1 Education, awareness raising, capacity building and skill development

An important starting point to tackle the challenges that arise in the context of the climate-poverty-hunger nexus is to strengthen human resource development. Better education and skills equip people and communities to tackle interconnected development challenges. In this section, the focus is on knowledge and skills development, including for effective participation, exchange of knowledge, and behavioural change at the individual level.²⁵² Institutional and systemic capacity building are covered in a later section.

Farmers, smallholders, government officials, enterprises, and civil society organizations all benefit from capacity building centred on the challenges of climate change, poverty and hunger. The list of topics that fall under “education and skill development” is long. It comprises climate change impacts, disaster planning, new farming techniques and crops, business models for ecosystem restoration and management, policymaking, and enterprise strategies for climate adaptation. A theme that runs across subjects is the need to learn how to use technology and interpret data to make better decisions in farms, in communities, at the government level or in regional and multi-stakeholder dialogues.

The demand for education and training in these areas is vast and are currently not met. A transformative shift is needed in developing and delivering climate change-relevant knowledge and skills. Education systems need to move beyond imparting narrow technical skills. The teaching of skills for transformative climate action — such as coalition-building, anticipatory thinking, and working in situations of uncertainty and complexity — must become common.

In the global stocktaking process, the United Nations Framework Convention on Climate Change (UNFCCC) Paris Committee on Capacity Building identified key gaps and capacity building needs in Least Developed Countries.²⁵³ There are gaps in accessing

financial support, accessing and using technology and new data related to climate scenarios and science, and using this information in local contexts. Additional shortcomings were found in using this information to assess risk and vulnerabilities, implement strategies and monitoring and evaluation, and communicating effectively with stakeholders and communities.

There are specific recommendations for different institutions. For instance, to ensure that capacity gaps are closed effectively, organisations that fund or deliver training and capacity building must first take stock of the capacities of potential participants and beneficiaries. Financial institutions, multilateral development banks, philanthropic and grant giving organisations need to develop funding guidelines and set out plans of how to build capacities at reasonable cost.

Capacity building must also consider technology access and deployment strategies. When governments, scientific institutions and development organisations invest in climate research and data collection, these investments must be complemented by efforts to understand how people will use the new data. For this reason, it is necessary to identify what interfaces and added learning may be required so that people can use the new data effectively to guide their decision making.

The private sector will play an important role in building this new capacity and providing context-specific, bespoke and specialized educational services. Civil society and regional organisations will also play a role as patterns of learning, especially at local and regional levels, will involve peer learning or communities of practice. An example in the Asia-Pacific region of such communities are south-south regional and bilateral cooperation agreements, namely the Regional Pacific NDC Hub, which supports 15 Pacific island States in meeting their Paris Agreement climate goals. Another case in point is the ASEAN Green Jobs Forum, a network for ASEAN member States to share experiences in implementing the 2018 ASEAN Declaration on Promoting Green Jobs for Equity and Inclusive Growth.

The UNFCCC Paris Committee on Capacity Building also highlighted the need for stable sources of funding and equitable access to capacity building across genders and social groups. As organisations and institutions responsible for capacity building activities are varied, widely recognised guidance or standard operating procedures need to be mainstreamed to ensure equal access. This guidance should include pre-assessment and/or co-creation of learning design with potential participants to ensure training meets their needs. It should also consider the language of instruction and ensure that capacity building materials are contextualised to ensure good learning outcomes. This careful targeting and development of learning materials requires time and money. Monitoring and evaluation of learning outcomes to gauge how people put their newly acquired knowledge into practice are necessary so that good techniques can be identified and replicated. Finally, when policymakers consider how learning is translated into practice, they also need to consider other enablers, for instance technology. Technology has led to a proliferation of virtual capacity building activities. However, equal access to these new capacity building tools may not be feasible if participants lack access to the required technologies or good internet connectivity.

3.2 Policy coherence

Government policy plays a crucial role in addressing the complex challenges of climate change, poverty, and hunger. Policies need to be coherent and address climate change, poverty reduction, and food security simultaneously. Governments at the community, provincial and national level need to integrate climate-related issues into development plans. They also must ensure that climate action, adaptation and disaster risk resilience planning and policies are inclusive. If these conditions are in place, synergies can be unlocked and competing goals in the climate-poverty-hunger nexus managed effectively.

To make this leap, policies should recognise at the outset the interplay between environmental, economic, social and cultural factors

on development outcomes. This greater recognition hinges in part on institutional capacity building and collaboration. With quality institutions in place, it is more likely that policies are inclusive, and proper stakeholder consultation and participation take place. International organisations, private sector and civil society actors can push for a closer integration of decision-making processes and actively participate in policy consultations. They can also promote inclusive and gender-responsive policies that reflects the needs of people disproportionately impacted by climate change. Lastly, these actors can ensure, through financial or other means, that excluded communities, especially poor people, persons with disabilities, youth, older persons, and women, have a voice in these deliberations.

Countries in the region have the valuable opportunity of strengthening linkages between actions under their NDCs and poverty and hunger alleviation by focusing public policy on social protection, agricultural sustainability, and food systems resilience. Although this is just one area where policies need to be enhanced, it is emblematic of the many actions that are needed.

International organisations, multilateral development banks, bilateral and multilateral development cooperation projects can assist in creating the necessary conditions at the national, regional and global level. The key route, at this juncture, is to provide assistance and support with the aim of making NDCs in the region more ambitious and align them with adaptation plans before the next update cycle in 2025. A better integration of NDCs with NAPs, especially in the areas of sustainable agriculture, adaptation, disaster risk reduction and social protection, is clearly needed.

Effective policymaking requires coordination across different levels of government and must include all relevant stakeholders, including the private sector, civil society organisations, financial institutions and international organisations. Coordination helps align actions with goals, ensures that strategies do not conflict and that interventions are effective. Where coordination mechanisms with an appropriate mandate do not exist, they

must be forged. They can be created in various formats and at the national level, such as the Philippines' Climate Change Commission which coordinated climate change activity across government ministries, or Indonesia's National Plan of Action on Marine Plastic Debris (2017-2025) which provides coordination of policy action from various ministries to meet the same objectives in reducing marine plastic debris. Or they are regional, like the Regional Sustainable Consumption and Production Roadmap on Sustainable Food Systems. The ten-year programme supports regional and sub-regional policy dialogue focused on making food systems in the Asia-Pacific region more sustainable.²⁵⁴

Other areas where greater alignment between climate action and poverty and hunger alleviation objectives could achieve better development outcomes include:

- Stronger alignment between climate-smart agricultural education/awareness and microfinance programs to enable smallholders to invest in technology and insurance products to build their resilience.
- Developing and implementing natural resource management plans and funding strategies that enable ecosystem protection and provide a basis for alternative livelihood strategies in natural resource-dependent communities. This involves strengthening environmental laws and a review of harmful subsidies, and regional economic and adaptation strategies.
- Support and promotion of decent work and labour standards in new jobs created as a result of climate action and adaptation activities.
- Policies that recognise and mitigate risks associated with climate impacts in the workplace such as heat stress.
- Better alignment of broad-based and shock-responsive social protection, and steps towards integrated and adaptive social protection systems that connect climate action, adaptation, disaster risk reduction and principles of a just transition.
- Build robust evidence for a greater role of active labour market programs centred on skills development and social protection to address poverty, climate resilience and create condition for decent work.
- Enhanced disaster risk reduction preparedness, including the use of technology and data to map how to better target assistance for vulnerable people, and integrate vulnerable communities into early warning systems.
- Creating institutions that can work across government departments and focus on implementing programs that enable real-time monitoring and evaluation to scale successes and learn from failures.
- Promote nature-positive approaches and ecosystem services for poor and farming households that are more cost effective, thus reducing the pressure on their limited resources and making them more resilient to climate shocks.

Governments also need to identify activities that deter climate adaptation and transition, including harmful subsidies and siloed policymaking.

3.3 Institutional capacity development for climate risk assessment and governance

Institutional capacity development focuses on the capabilities and performance of institutions and their ability to adapt to change and to cooperate with one another.²⁵⁵ Devising policies that address challenges at the intersection of climate change, poverty and hunger requires inclusive and climate risk-informed governance. It also requires a robust integration of climate, poverty, rural development, agriculture, food systems, and social development policies. To develop and implement effective policy and climate responses, sufficient climate change knowledge and capabilities must exist within institutions at the sub-national, national and regional level.²⁵⁶ This is particularly important when considering, as seen in Box 3 in Chapter 1, that often vulnerable populations live in settlement areas at risk of natural hazards.

Capable and integrated public policy would seek to counter this trend. The example illustrates the critical need to develop within institutions is the ability to understand, interpret and assess climate-related risks and their impacts.

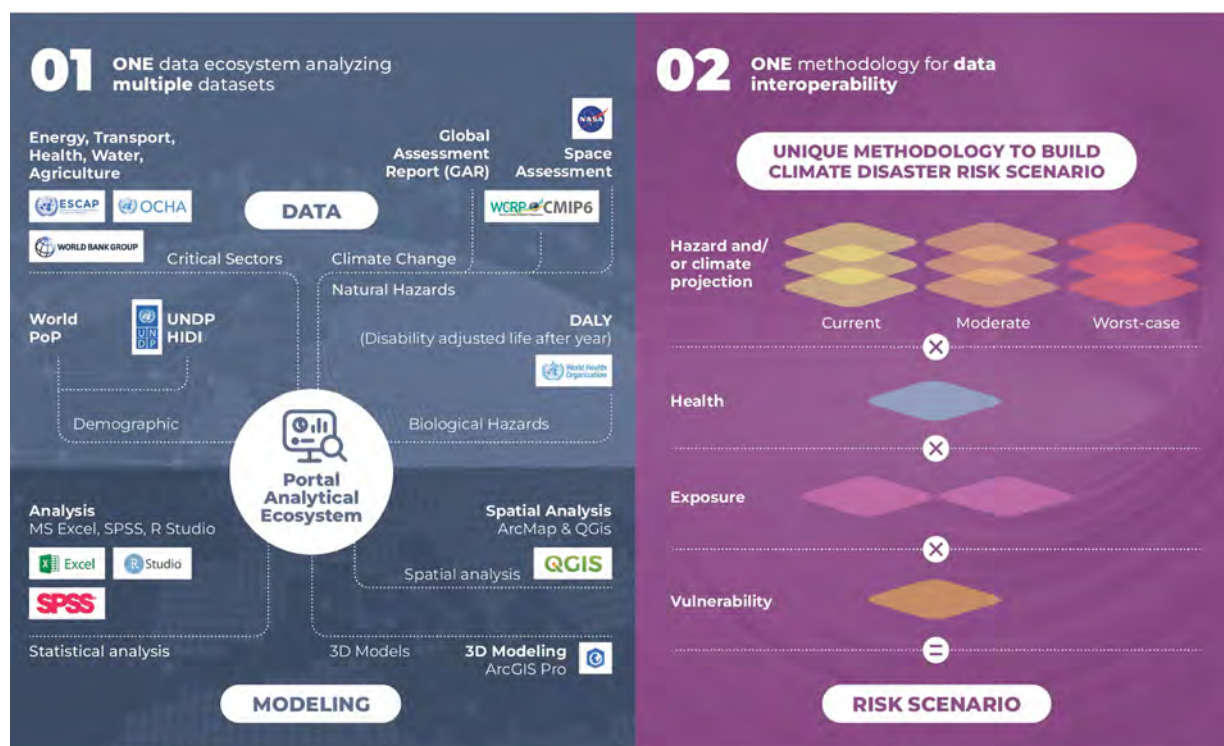
The Subsidiary Body for Implementation, a subsidiary body of the UNFCCC COP, has made recommendations for institutional capacity building that are relevant for Asia and the Pacific. They include building partnerships across local, regional and international institutions to better facilitate the development of ambitious and integrated adaptation and mitigation plans, establishing new institutions or new collaborative institutional arrangements, as well as actions focused on identifying, collecting and analysing data.²⁵⁷

Governments, international organisations, civil society organisations and other stakeholders can assist in building institutional capacity by developing key sources of data and information, and tools and mechanisms that aid the development of relevant institutional capabilities. For example, to better understand climate-related risks and scenarios for

potential adaptations, ESCAP developed the Risk and Resilience Portal. The portal uses data sets from organisations such as World Bank, NASA, and UNDP and presents them in a way that helps understanding risk and incorporate this understanding into decision making. It is a resource that allows policymakers to better understand the regional, sub-regional, and national 'riskscape' of hazard and climate risks and further the implementation of adaption measures necessary to build resilient economies and safeguard populations (see Figure 20).

Mainstreaming this institutional capacity across the public sector requires change in many areas of public policy, including macroeconomic planning, environmental and social impact assessments, budgeting, and jurisdictions responsible for land and natural resource use plans and permits, and project design. Vulnerable developing countries have only limited technical capacity to integrate climate risk considerations into their development plans and policies. Since many climate impacts are local, it is critical to ensure the capacities are being built up at

Figure 20: One data ecosystem of the ESCAP Risk and Resilience Portal



Source: ESCAP, *Asia Pacific Risk and Resilience Portal*.

the grassroots level and planning and financial resources are devolved. The biggest capacity gaps usually exist at the local level. Tailored strategies by national governments and institutions, regional cooperation and support from international organisations will be key to develop these local capabilities.

Companies around the world are taking steps to improve their planning to protect their operations and assets from climate risks. However, in the Asia-Pacific region, physical, fiscal and transition risk analysis and disclosure remain concentrated in the private and financial sectors.²⁵⁸ Both the public and private sector need to incorporate more consistently climate risk assessments and climate-related uncertainty into their decision-making and strategies.

3.4 Innovation and entrepreneurship

Innovation is a critical enabler of transformative climate action. Innovation can fast-track the spread of more effective and sustainable solutions, by empowering communities, fostering economic development, while combating climate change and alleviating poverty and hunger.

Innovation takes different forms. It can occur through the application of new business models, production and consumption practices, the way policy is implemented, or novel ways in which firms use technological advances. Science plays a big role in advancing innovation, for instance by creating new crops and farming techniques, or new climate-resilient infrastructure and circular economy solutions. The financial sector and payment systems are also changing rapidly. In many cases, innovation in one area necessitates new ways of doing things in other areas. For example, in food systems new climate-resilient crops, call for a host of complementary innovations for the crops to become viable. These can include sensor-based irrigation systems, financial innovations that allow farmers to use new equipment and services, or shared or pooled access processing facilities and refrigerated transport. Governments can provide broad encouragement for innovation ecosystems by creating an

enabling environment that connects finance, technology, business, and customers.

Some of recommendations in the Global Stocktaking Technical Synthesis report, published by the UNFCCC secretariat in 2023, are relevant for the region. One of them is the need for rapid deployment of existing clean energy technologies, including through technology transfer agreements.²⁵⁹ Multilateral and bilateral technology transfer can help countries scale up their renewable energy and associated technology supply chains. Mechanisms to facilitate the process can include joint research and development projects, or technology transfer and capacity building projects that involve research and academic institutions, companies and the public sector. International organisations and multilateral development banks are in a good position to provide technical assistance for developing clean energy supply chains, especially if the assistance is aimed at stimulating deeper innovation systems capabilities in the region. The needs for such assistance will vary, as each country and region has their own transition scenario.

This section has highlighted the need for real-time and disaggregated new data sources to help build an understanding of climate impacts, food systems and poverty. It has also underlined the need for better, data-driven responses to these impacts. Investing in data collection and associated technologies, as well as ensuring their broad diffusion, will be important and will require good governance. Local and national governments, civil society organisations need to give a voice to people who are affected by climate change, and regional cooperation and international organisations and financial institutions can play an important supportive role.

3.5 Finance, funding and investment

The Leader's Declaration on a Global Climate Finance Framework at COP28 recognises that finance and investment are key for advancing actions at the interface of climate, poverty, and hunger nexus.²⁶⁰ The framework seeks to ensure that climate action for developing countries is financed and implemented, and

that innovative ways are developed for private and public climate-resilient investment. The notion of a just transition is at the heart of framework, including the necessity for the transitions to be context- and country-specific.

Multilateral development banks (MDB) need to develop more effective ways of supporting member countries in identifying and unlocking synergies. This vital evolution of MDBs will involve using nexus approaches to guide investments and activities, building capabilities within member countries, and actively backing approaches that promise to unlock synergies. An example of this could be investments in energy transitions, with guidance and support for labour market programs and social assistance in the same local communities.²⁶¹ MDBs can also step up coordination and collaboration amongst each other, with the aim of accelerating transformational change through pooled financing. This could mean prioritising catalytic investment in key areas such as poverty reduction, food security and climate adaptation and action, rather than economy-wide investments. Furthermore, MDBs can put greater emphasis on facilitating regional and global coordination through sharing and diffusing knowledge and best practices. All these efforts can help reignite progress towards meeting the SDGs and the Paris Agreement goals.

The climate finance gap between the investment needed to meet climate action and adaptation objectives and available finance is widening.²⁶² To close the gap, greater flows of public and private finance need to be secured. The areas of investment include social protection, labour-intensive climate infrastructure, skills, and sustainable enterprise development. Climate finance also needs to be scaled up to address the needs of developing countries and emerging economies. The public sector can help unlock private capital through increased disclosure requirements and incentives. Chapter 2 highlighted some financial innovations, such as tree collateral and payments for environmental services. However, these instruments are at a nascent stage and need to be developed more fully to draw in private investment. This process will require the participation of governments,

financial regulators and banks. There is also a role for the private sector and community organisations, which are developing some of these novel projects, to work together and find solutions to adequately fund these activities.

Inter-governmental organizations back various financial initiatives aimed at scaling up investments in climate mitigation and adaptation at global, regional, national and community levels. The UNFCCC financial mechanisms, including vertical funds like the Green Climate Fund, Adaptation Fund, Least Developed Countries Fund, and Special Climate Change Fund, should be used more effectively, to support the climate-poverty-hunger nexus. The Community Resilience Financing Partnership Facility, an ADB-led initiative, explicitly aims to build the resilience of poor and vulnerable communities against the negative impacts of climate change.²⁶³ These initiatives allow governments to factor social and employment impacts into financing decisions; create structures that reward projects with social dividends; implement climate adaptation measures at all levels; and apply just transition principles across projects.

Accessing international sources of funding is a major challenge, especially for developing countries in the Asia-Pacific region.²⁶⁴ Many countries in the region do not have the specialist capacity to make successful funding applications for global climate funds such as the Green Climate Fund. Readiness programs aiming to change this being developed but, for now, compliance with technical requirements of funding proposals can be an overwhelming barrier for many governments. Increasing the number of national accredited access or implementing institutions is also critical.

3.6 Effective regional cooperation to strengthen transboundary policies and multi-stakeholder partnerships

The ability to implement nexus approaches to sustainable development rests on quality partnerships. Partnerships are key for mobilising human, social and financial capital. Multi-stakeholder partnerships and dialogues deepen

understanding of stakeholders when tackling complex problems such as responding to climate change impacts and designing climate action. They can also play in implementing transformative change. Integrated and nexus responses require especially robust partnerships and multi-stakeholder dialogue. Non-siloed approaches are needed, and rallying a broad range of stakeholders to develop and implement solutions is critical. The Asia-Pacific Climate week, held in Malaysia between 13-17 November 2023, underscored the importance of partnerships and dialogue in enabling collaboration, policy environments and peer exchanges in fostering greater climate action.²⁶⁵

Forging partnerships requires dedicated resources, including time, human and social capital, and funding. Not all partners have these resources. However, international cooperation and international organisations can support the capacity building and ensure that marginalised groups are included in the partnerships. And within countries, governments and public institutions can promote broad stakeholder engagement.

The transboundary nature of most climate hazards means that regional cooperation and coordination must be stepped up. The scale of needed climate action means that no country

can afford to go it alone. Rather, countries need to learn from each other and replicate best practices from across the region and beyond. To be sure, the impacts of climate change on poverty and hunger are context-specific, but nexus approaches in different countries will have similar core principles. These approaches to sustainable development go beyond a focus on a single sector, target climate action as well as poverty and hunger alleviation, and aim for transformative change. International and regional cooperation have a role to play in helping to diffuse knowledge and accelerate action. The private sector, civil society organisations and scientific research institutes, also have pivotal roles in facilitating knowledge exchange, and help pilot and implement climate action solutions.

Just Energy Transition Partnerships are intergovernmental arrangements that aim to accelerate the transition from fossil fuels. These include India, Indonesia, Viet Nam, is a good example of a replicable model of structured partnership and international cooperation with specific climate action goals. The partnership, which supports countries in mapping a course away from coal, includes international cooperation financing, coordinated technical assistance from international organisations, multilateral development banks, and research institutes, among others.



Conclusion:

Strengthening Commitments and Focus for Climate Action

The impacts of climate change threaten to increase hunger and poverty and are contributing to a reversal of sustainable development gains achieved by countries in the Asia-Pacific region over recent decades. The report highlights the interlinked and compounding factors through which climate change will continue to exacerbate poverty and hunger and stall progress on Goals 1, 2 and 13. Though poor and vulnerable people in the region have contributed the least to emissions, they are affected the most by climate change and are the least prepared to cope and adapt.

Transformative change is needed. Integrated approaches that unlock synergies and mitigate trade-offs in managing the ecosystem provide the best opportunities for transformative change that can advance climate action and address poverty and hunger. These approaches can leapfrog over barriers that limit progress, namely siloed actions that result in bad policy, investment gaps and an imbalance of short- and long-term benefits and costs that can impede climate action.

The Global Stocktaking Report, launched at the COP28 in the United Arab Emirates, highlights that progress in mitigation and adaptation is not moving fast enough to avoid the calamitous impacts of climate change. This report summarises three types of integrated approaches that are being pursued in the Asia-Pacific region: sustainable agricultural practices and food systems approaches, decent work and a just transition, and climate-resilient social protection systems. In each of these, critical enabling elements –including education and innovation, financing and regional cooperation – need to be made greater use of to make progress on climate

action, poverty and hunger. Governments in the region can learn from the responses and approaches outlined in this report and take steps to better integrate nexus approaches in climate policies, sustainable development strategies and climate actions.

The discussions at COP28 have reinforced the importance of many of these actions for the region. The Global Goal on Adaptation, established under the Paris Agreement, refocuses attention on the need to build adaptive capacity and reduce vulnerability to climate impacts. The solutions discussed in this report, in the areas of sustainable agriculture, food systems, decent work in nature-based solutions and adaptive social protection systems, present pathways to strengthen adaptive capacity, especially for vulnerable groups.

The ultimate move away from fossil fuels will intensify the need for a just transition, and lead to a greater attention on inclusive jobs and development as the world increasingly moves towards renewable energy systems. The COP28 Declaration on Agriculture, Food Systems and Climate Action emphasises the need for action on increasing sustainable productivity and production in agriculture, as well as identifying pathways to integrate agriculture and food systems into NAPs and climate action plans, or NDCs, ahead of the next NDC updates in 2025. The NDC update cycle offers a significant opportunity for governments in the region to better integrate responses to the triple challenges of climate, poverty and hunger in their climate action plans, and thus support the region in getting back on track on making progress towards SDGs 1, 2 and 13.

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