The Gathering Storm

Adapting to climate change in a post-pandemic world

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WASP WORLD ADAPTATION SCIENCE PROGRAMME

Adaptation Gap Report 2021

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Adaptation Gap Report 2021

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Sign post where the Pasterzen Glacier once lay, Grossglockner, Austria.
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Glossary

The entries in this glossary are primarily taken or modified from definitions provided by reports published by the Intergovernmental Panel on Climate Change (IPCC).

Adaptation: The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects. (IPCC, 2014[1]).

Adaptive capacity: The ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences (IPCC, 2014[1]).

Adaptation costs: Costs of planning, preparing for, facilitating, and implementing adaptation measures, including transaction costs (IPCC, 2007[2]).

Baseline: The state against which change is measured. It might be a current baseline, in which case it represents observable, present-day conditions. It might also be a 'future baseline', which is a projected future set of conditions excluding the driving factor of interest. Alternative interpretations of the reference conditions can give rise to multiple baselines (IPCC, 2007[2]).

Exposure: The presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected (IPCC, 2014[1]).

Hazard: The potential occurrence of a natural or human induced physical event or trend that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources (IPCC, 2014[1]).

Impacts: The consequences of realized risks on natural and human systems, where risks result from the interactions of climate-related hazards (including extreme weather and climate events), exposure, and vulnerability. Impacts generally refer to effects on lives; livelihoods; health and well-being; ecosystems and species; economic, social and cultural assets; services (including ecosystem services); and infrastructure. Impacts may be referred to as consequences or outcomes, and can be adverse or beneficial (IPCC, 2018[3]).

Limits to adaptation: The point at which an actor's objectives (or system needs) cannot be secured from intolerable risks through adaptive actions.

- *Hard adaptation limit:* No adaptive actions are possible to avoid intolerable risks.
- *Soft adaptation limit:* Options are currently not available to avoid intolerable risks through adaptive action (IPCC, 2014[1]).

Maladaptation: Actions that may lead to increased risk of adverse climate-related outcomes, including via increased greenhouse gas (GHG) emissions, increased vulnerability to climate change, or diminished welfare, now or in the future. Maladaptation is usually an unintended consequence (IPCC, 2018[3]).

Mitigation (of climate change): A human intervention to reduce the sources or enhance the sinks of greenhouse gases (IPCC, 2014[1]).

Representative Concentration Pathways (RCPs): [Climate change] Scenarios that include time series of emissions and concentrations of the full suite of greenhouse gases (GHGs) and aerosols and chemically active gases, as well as land use/land cover. The word representative signifies that each RCP provides only one of many possible scenarios that would lead to the specific radiative forcing characteristics. The term pathway emphasizes the fact that not only the long-term concentration levels but also the trajectory taken over time to reach that outcome (IPCC, 2014[1]).

Resilience: The capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation, learning and transformation (IPCC, 2014[1]).

Risk: The potential for consequences where something of value is at stake and where the outcome is uncertain, recognizing the diversity of values. Risk is often represented as probability of occurrence of hazardous events or trends multiplied by the impacts if these events or trends occur. Risk results from the interaction of vulnerability, exposure, and hazard (IPCC, 2014[1]).

Vulnerability: The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt (IPCC, 2014[1]).

1 https://archive.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-AnnexII_FINAL.pdf.

2 https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg2-app-1.pdf.

3 https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_AnnexI_Glossary.pdf.

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Foreword

2021 was the year in which climate impacts hit developed and developing countries with a new ferocity. The Intergovernmental Panel on Climate Change, meanwhile, warned we have at best a 50 per cent chance of limiting global warming to a 1.5°C temperature rise this century.

So, even as we look to step up efforts to cut greenhouse gas emissions – efforts that are still not anywhere strong enough – we must dramatically up our game to adapt. This is because the sixth edition of the UNEP Adaptation Gap Report finds that climate impacts continue to outpace our attempts to adapt to them.

Adaptation financing is a major concern. The gap between what we need to spend to adapt and what we are actually spending is widening. Estimated costs of adaptation continue to rise and could reach US$ 280-500 billion per year by 2050 for developing countries alone. Meanwhile, international public adaptation finance has increased more than 50 per cent between 2017–2018 and 2019–2020 but still remains far too low.

COVID-19 recovery stimulus packages are a window of opportunity for green and resilient recoveries that is being lost. US$ 16.7 trillion of fiscal stimulus has been deployed, but only a small portion of this funding has gone towards adaptation. Less than one-third of 66 countries studied explicitly funded COVID-19 measures to address climate risks up to January 2021. Moreover, the heightened cost of servicing debt, combined with decreased government revenues, may hamper future government spending on adaptation, particularly in developing countries.

At the same time, the report also points to a number of encouraging developments. Implementation of adaptation actions did grow, backed by the Adaptation Fund, the Green Climate Fund, the Global Environment Facility and bilateral public funding. Information from the Organisation for Economic Co-operation and Development shows that the top 10 donors funded more than 2,600 projects with a principal focus on adaptation between 2010 and 2019. The report also finds that climate change adaptation is increasingly being embedded in policy and planning across the world. Around 79 per cent of all countries have now adopted at least one national-level adaptation planning instrument, an increase of 7 per cent since 2020.

However, we are just not doing enough. We need to scale up and further increase public adaptation finance, including by overcoming barriers for private sector engagement.

As implementation at current rates may not keep pace with increasing levels of climate change, we need to turn the growth in policy and planning into real and rapid implementation and financial support.

Even if we were to turn off the tap on greenhouse gas emissions today, the impacts of climate change would be with us for decades to come. This report clearly shows that we need a step change in adaptation ambition for funding and implementation to significantly reduce damages and losses from climate change. And we need it now.

Inger Andersen

Executive Director
United Nations Environment Programme

Executive summary

Context and framing of the UNEP Adaptation Gap Report 2021

The sixth edition of the UNEP Adaptation Gap Report (AGR2021) has been produced in the second year of the global COVID-19 pandemic. While encouraging trends in tackling the pandemic are emerging, including the unprecedented development and roll-out of highly effective vaccines in many industrialized countries, the COVID-19 crisis continues to create severe human health challenges, economic turmoil and recurring restrictions on daily life in most parts of the world. The pandemic's impact on global climate change adaptation processes is increasingly visible through direct effects on adaptation planning and constraints on available finance. Climate impacts also tend to be more severe in vulnerable developing economies, many of which are also among the worst affected by COVID-19. At the same time, rescue and recovery initiatives designed to kick start economies in the wake of the pandemic offer a unique opportunity to secure a green recovery by mainstreaming adaptation into public financing streams worth trillions of dollars, dwarfing the sums otherwise dedicated to adaptation. Furthermore, climate change and the pandemic share some striking similarities: like the pandemic, the climate change crisis is a systemic problem that requires coordinated global, national and local responses. Many of the lessons learned from handling the pandemic have the potential to serve as examples of how to improve climate adaptation planning and financing.

Meanwhile, climate change continues its unrelenting path towards a warmer future. As the Sixth Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC), released in August 2021, starkly documents, some impacts are now irreversible. Many parts of the world have experienced unprecedented climate impacts this year, such as the heat dome and rampant wildfires in the Pacific Northwest of the United States of America and Canada; severe flooding in Western Europe, eastern parts of the United States of America, the province of Henan in China, and the state of Maharashtra in India; and imminent hunger after continued droughts in Madagascar. The assessment report also documents how, even under the most optimistic emissions mitigation scenarios where net-zero is reached by around 2050, global warming will continue in the short to medium term, potentially levelling off at 1.5°C above pre-industrial levels. All this makes adaptation an increasingly urgent global imperative.

At the political level, international climate efforts under the United Nations Framework Convention on Climate Change (UNFCCC) continue, despite the postponement of the twenty-sixth session of the Conference of the Parties to the UNFCCC (COP 26), which was put back from November 2020 to November 2021. COP 26 will have a strong focus on adaptation issues and will see consultations and work proceed towards the first Global Stocktake in 2023, including the submission of new and updated Nationally Determined Contributions (NDCs).

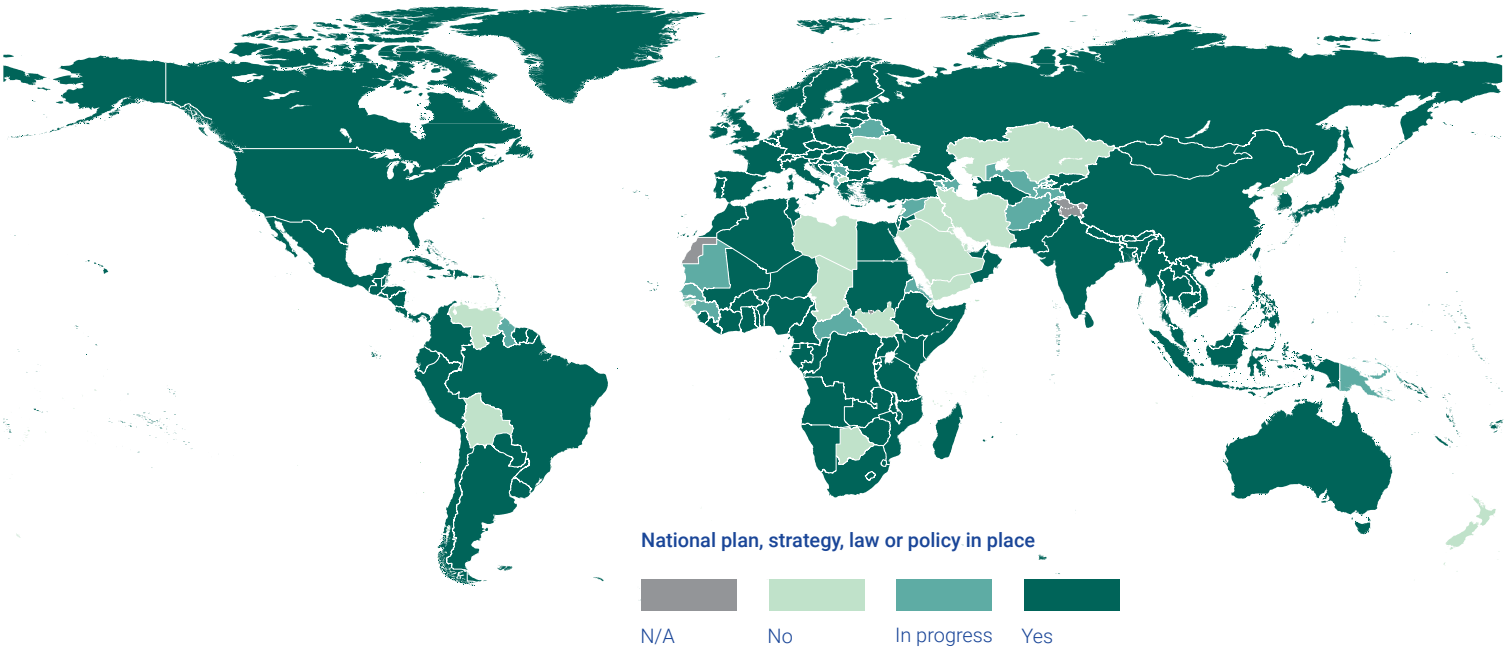
AGR2021 provides an update on current actions and the emerging results of regional-level to national-level adaptation planning, finance and implementation worldwide (figure ES.1). All three elements are critical for tracking and assessing progress towards the global goal on adaptation. AGR2021 also expands and strengthens the assessment of future adaptation outcomes, in particular through the inclusion of qualitative expert judgements. In view of the ongoing pandemic, the report provides an in-depth assessment of the emerging consequences of COVID-19 in relation to adaptation planning and finance and highlights the lessons and opportunities for future adaptation efforts through economic growth and climate resilience as part of a green recovery.

Status and progress of global adaptation planning, finance and implementation

PLANNING

Despite the COVID-19 pandemic, climate change adaptation is becoming increasingly embedded in policy and planning across the world. National-level adaptation planning processes remain a critical element in the global response to the impacts of climate change, as underscored by the Paris Agreement. While early evidence suggests that some National Adaptation Plan (NAP) development processes have been delayed by the COVID-19 pandemic, particularly among least developed countries, progress is still being made on national adaptation planning agendas. Around 79 per cent of all countries have now adopted at least one national-level adaptation planning instrument (for example, a plan, strategy, policy or law). This is an increase of 7 per cent since 2020 (figure ES.1). Furthermore, 9 per cent of countries that do not currently have such an instrument in place are in the process of developing one (no change since 2020). At least 65 per cent of countries have one or more sectoral plans in place and at least 26 per cent have one or more subnational planning instruments.

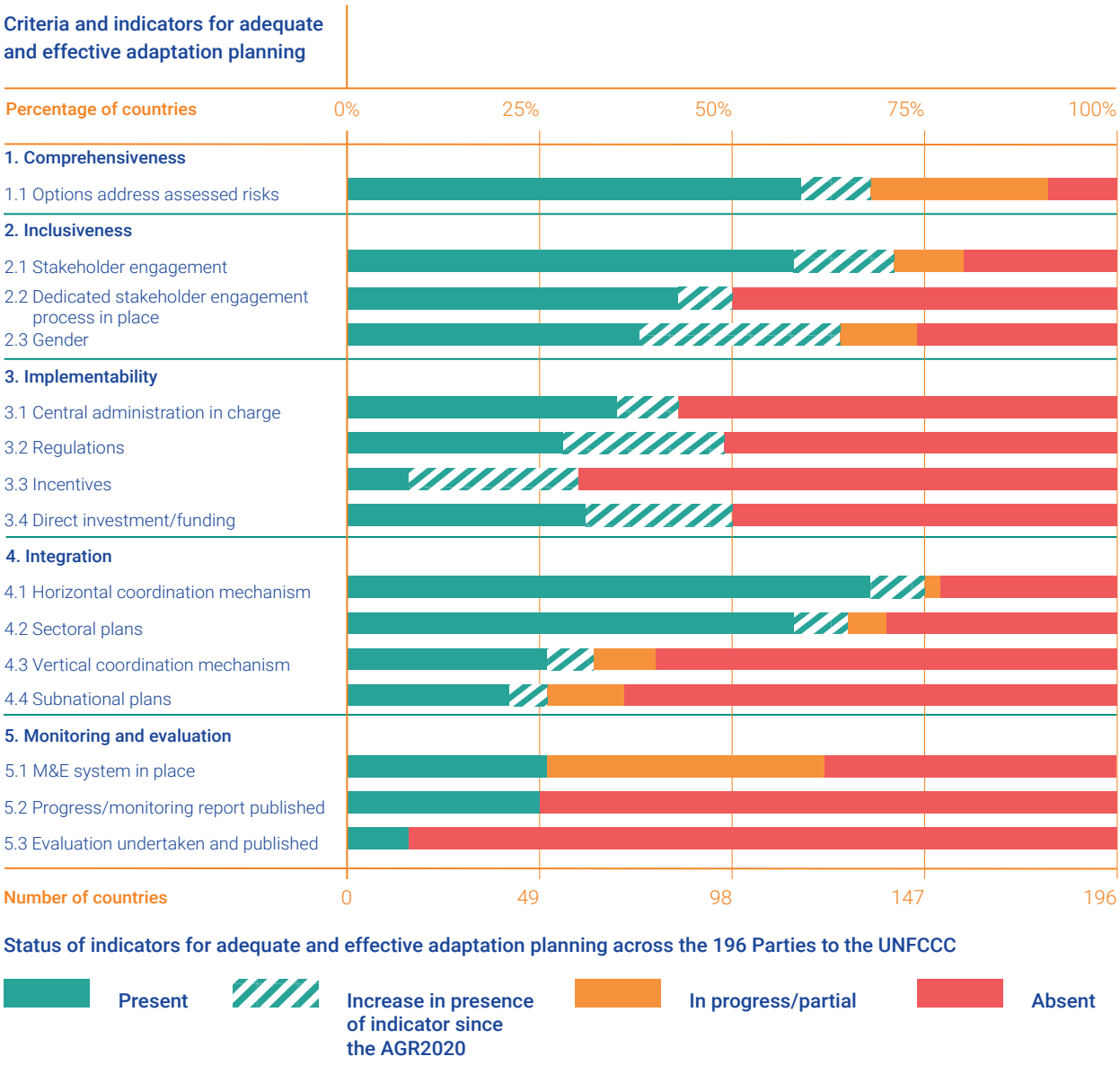
Figure ES.1 Status of adaptation planning worldwide, as at 5 August 2021



Note: Territories marked as N/A are those which are recognized as disputed by the United Nations or whose status has not yet been agreed upon.

Indicators of adequacy and effectiveness of adaptation planning show positive trends compared to 2020. While it is currently not possible to directly assess the adequacy and effectiveness of adaptation planning due to a lack of consensus on definitions and approaches to their assessment, it is possible to analyse relevant elements indirectly by examining the comprehensiveness, inclusiveness, implementability, integration, and monitoring and evaluation (M&E) of planning instruments. Compared to a similar analysis presented in the 2020 edition of the Adaptation Gap Report (AGR2020), this year's report – based on an updated analysis reflecting new submissions of NDCs, NAPs and Adaptation Communications – shows that countries have made consistent progress in developing adaptation planning instruments and across almost all indicators of adequate and effective adaptation planning. This progress is largely incremental (within 10 per cent of the previous score), with the exception of areas such as stakeholder engagement, gender considerations and the use of policy instruments, which saw larger increases (figure ES.2). Regarding inclusiveness, more countries now demonstrate stakeholder engagement (an increase from 43 per cent to 70 per cent between 2020 and 2021) and gender considerations (an increase from 52 per cent to 73 per cent between 2020 and 2021). There was also a significant increase in the application of policy instruments deemed to enhance the implementability of adaptation plans through provisions for investments (50 per cent in 2021 compared to 31 per cent in 2020), regulations (49 per cent in 2021 compared to 28 per cent in 2020) and incentives (30 per cent in 2021 compared to 8 per cent in 2020). Likewise, over two-thirds of all countries (9 per cent more than in 2020) are now targeting priority sectors with their planning instruments. Progress is also being made on integration: 75 per cent of countries now have horizontal coordination mechanisms (compared to 68 per cent in 2020) and 32 per cent have vertical coordination mechanisms (compared to 26 per cent in 2020). On the other hand, progress is mixed for M&E: while 26 per cent of countries have M&E systems in place and another 36 per cent are in the process of developing a system, only 8 per cent of countries have evaluated their adaptation plans. This is frequently attributed to the lack of financial, human and technical resources.

Figure ES.2 Assessing the adequacy and effectiveness of adaptation planning worldwide

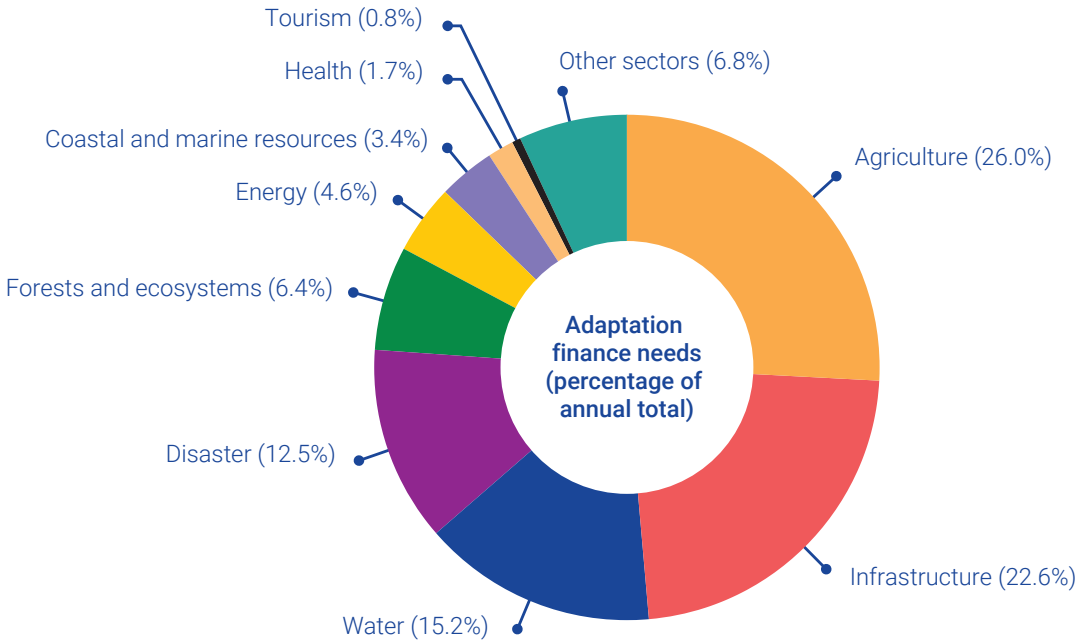


Note: The changes in the M&E indicators (5.1–5.3) are not shown because the scoring methodology has changed since 2020.

FINANCING

New estimates of the costs of adaptation and the estimated financial needs for adaptation from developing countries indicate higher values than previously reported. The review of the most recent adaptation cost estimates from the literature and the finance needs expressed by countries' submissions to the UNFCCC resulted in a number of major findings. First, estimates of the economic costs of climate change in developing countries are now generally higher than indicated in earlier studies. This is true both later in the century, under higher warming scenarios, but crucially also over the next two decades even under ambitious mitigation scenarios. Second, the estimated annual adaptation costs in the literature are now also generally in the upper range of the 2016 estimate of the Adaptation Gap Report of US$ 140–300 billion by 2030 and US$ 280–500 billion by 2050. Third, a review of updated NDCs and NAPs indicates that estimates of adaptation financing needs are increasing in many countries, often due to the incorporation of more sectors. A sectoral analysis of submissions reveals that the four sectors of agriculture, infrastructure, water and disaster risk management make up three-quarters of quantified adaptation finance needs so far (figure ES.3). Taken together, these findings suggest increasing costs of adaptation compared to previous AGR assessments, particularly in the event of failing to meet the Paris Agreement goal of keeping the increase in the global average temperature well below 2°C above pre-industrial levels. This new emerging evidence means a more detailed and systemic stocktake of the costs of adaptation and finance needs is required.

Figure ES.3 Adaptation finance needs by sectors based on 26 developing countries' NDCs and NAPs



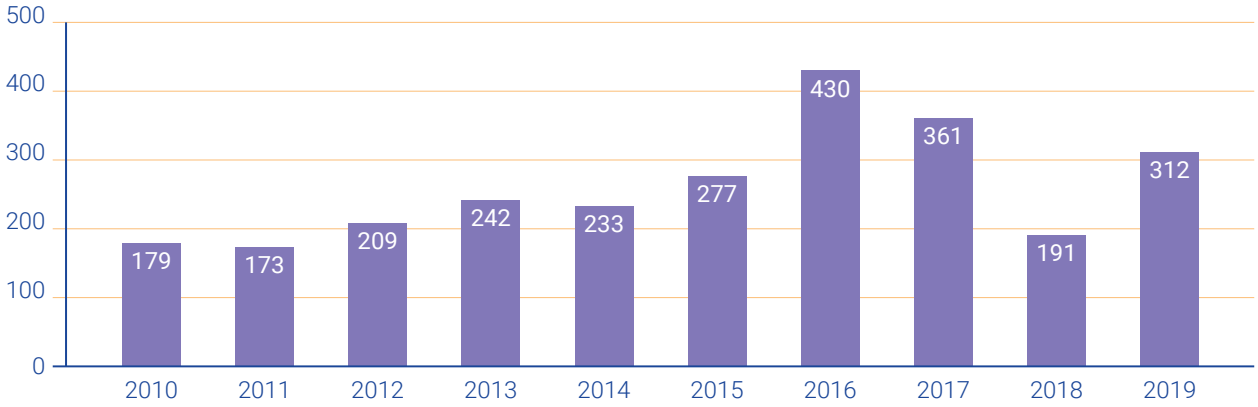
The evidence suggests that the adaptation finance gap is larger than indicated in 2020 and widening. Despite a recent trend of gradually increasing international public adaptation finance for developing countries up to 2019, adaptation finance flows are projected to stabilize or possibly even decline as a result of the COVID-19 pandemic. This is due to financial institutions and governments – including those in advanced economies, which provide the majority of dedicated international adaptation funding – needing to prioritize limited resources to meet the urgent health and financial needs caused by COVID-19. While conclusive data is still pending, the most recent analysis indicates that climate finance flows to developing countries (for both mitigation and adaptation) reached US$ 79.6 billion in 2019. In the absence of a significant increase of around US$ 20 billion (26 per cent) in 2020, the US$ 100 billion mobilization goal for 2020 will not have been met. Despite the limitations of the available evidence, estimated adaptation costs and likely adaptation financing needs in developing countries are five to ten times greater than current international public adaptation finance flows. Evidence suggests that the gap is larger than indicated in the previous AGR (2020) and is widening, due to adaptation costs and finance needs being higher and funding flows remaining stable or decreasing.

There is an urgent need to scale up and further increase public adaptation finance both for direct investment and for overcoming barriers to private-sector adaptation. New instruments, actors and approaches to scale up adaptation finance are emerging, including private-sector adaptation financing. These offer opportunities to raise adaptation finance (for example, resilience bonds) and to use public adaptation finance to leverage private investment (for example, using blended finance to de-risk investments). However, due to the barriers to private finance (including around information, positive externalities and low revenues) and the public interventions or finance needed to overcome these, the rate of uptake and the scaling up of these new instruments remains slow. Furthermore, private investment will gravitate to opportunities where revenues are highest and risks are lowest. It is unlikely to target the most vulnerable in least developed countries or non-market sectors. This underscores the continued importance of international public support and the requirement to further increase ambition.

IMPLEMENTATION

Implementation of adaptation actions is continuing to grow slowly worldwide, despite uncertainty about future trajectories. Although there has been increased variability in the number of new projects over the last four years, the implementation of adaptation initiatives approved under the three multilateral funds serving the Paris Agreement through the provision of funding for adaptation (the Adaptation Fund, the Green Climate Fund and the Global Environment Facility) has risen slowly but steadily. The tendency for larger projects (more than US$ 10 million) also remains intact. Information from the Organisation for Economic Co-operation and Development shows that the top 10 donors funded more than 2,600 projects between 2010 and 2019 with a principal focus on adaptation. This highlights the important role of bilateral support for adaptation (figure ES.4). About 20 per cent of the projects primarily address the agricultural sector and 20 per cent focus on ecosystems. Almost 30 per cent are multi-sectoral projects, while approximately two in 10 projects were directed towards either water or

Figure ES.4 Number of new principal adaptation projects started per year with funding from the top 10 bilateral adaptation donors



Note: The term 'principal adaptation project' refers to projects for which adaptation is "fundamental in the design of, or the motivation for, the activity" (OECD).

infrastructure. The sectoral priorities align with four of the top five adaptation priorities mentioned in countries' most recently submitted NDCs. However, health, the third most frequently mentioned priority, is seldom the primary focus, confirming the findings of the previous two reports. Regional disaggregation shows that adaptation initiatives are concentrated in eastern, southern and western Africa, South and Southeast Asia and parts of South America (figure ES.5).

Implementation levels must be further scaled up to avoid falling behind with managing climate risks, particularly in developing countries. The limited data on the effectiveness of adaptation activities for reducing climate risk, combined with the escalating impacts documented in the most recent IPCC assessment report, implies that current implementation rates may not keep pace with increasing levels of climate change. The design of adaptation interventions needs to consider factors identified as making effective risk reduction more likely, including a thorough understanding of climate risks and their interaction with local contexts, inclusion of the target population in project design, joint agreement on objectives and ways of achieving them, and avoidance of potential and actual negative effects of adaptation actions (maladaptation). To avoid falling further behind, it is essential to enhance the implementation of adaptation actions and ensure more effective mainstreaming of climate risks into decision-making processes, including the COVID-19 recovery. Adaptation planning and implementation must also consider higher-end climate scenarios and impacts projected by the most recent IPCC Sixth Assessment Report 2021 to prepare for more intense risks than those already observed.

EMERGING CONSEQUENCES OF THE COVID-19 PANDEMIC

The COVID-19 pandemic and climate change have created compound risks that negatively affect the adaptive capacity of governments, communities and societies, particularly in developing countries. The pandemic and associated responses by societies may be compounding risks by affecting our ability to respond to climate change. For example, during the Pacific cyclones in 2020, COVID-19 restrictions impeded disaster-response efforts through the quarantining of supplies and aid workers. The indirect effects of the pandemic also have the potential to severely reduce adaptive capacity. For instance, the negative economic consequences, such as the slow-down in some economic sectors, job losses and increased poverty (an additional 97 million people fell into poverty in 2020) tend to disproportionally affect vulnerable groups and further reduce their capacity to adapt to extreme climate events. Governments and businesses – particularly small and medium-sized enterprises in developing countries – have also drawn on financial reserves and some/many have issued new debts to deal with the pandemic, making them vulnerable to future economic shocks, including from extreme climate events.

While the stimulus packages for the COVID-19 recovery present a window of opportunity for green and resilient recoveries, these opportunities are not currently being seized. In response to the current pandemic, US$ 16.7 trillion of fiscal stimulus was deployed by governments. However, only a small proportion of this funding appears to have gone towards adaptation. Less than one-third of 66 countries that were studied explicitly funded specific measures to address physical climate risks in their announced investment priorities up to January 2021 (figure ES.6). Moreover, the costs of servicing the debt raised to respond to the pandemic, combined with lower government revenues due to the economic impacts of COVID-19, may also hamper future government spending on adaptation, particularly in developing countries.

The COVID-19 crisis also provides lessons to improve climate adaptation planning and financing, as well as opportunities to secure a green recovery. The pandemic highlights the importance of governments addressing

Figure ES.5 Geographic distribution of principal adaptation projects funded by the top 10 bilateral donors

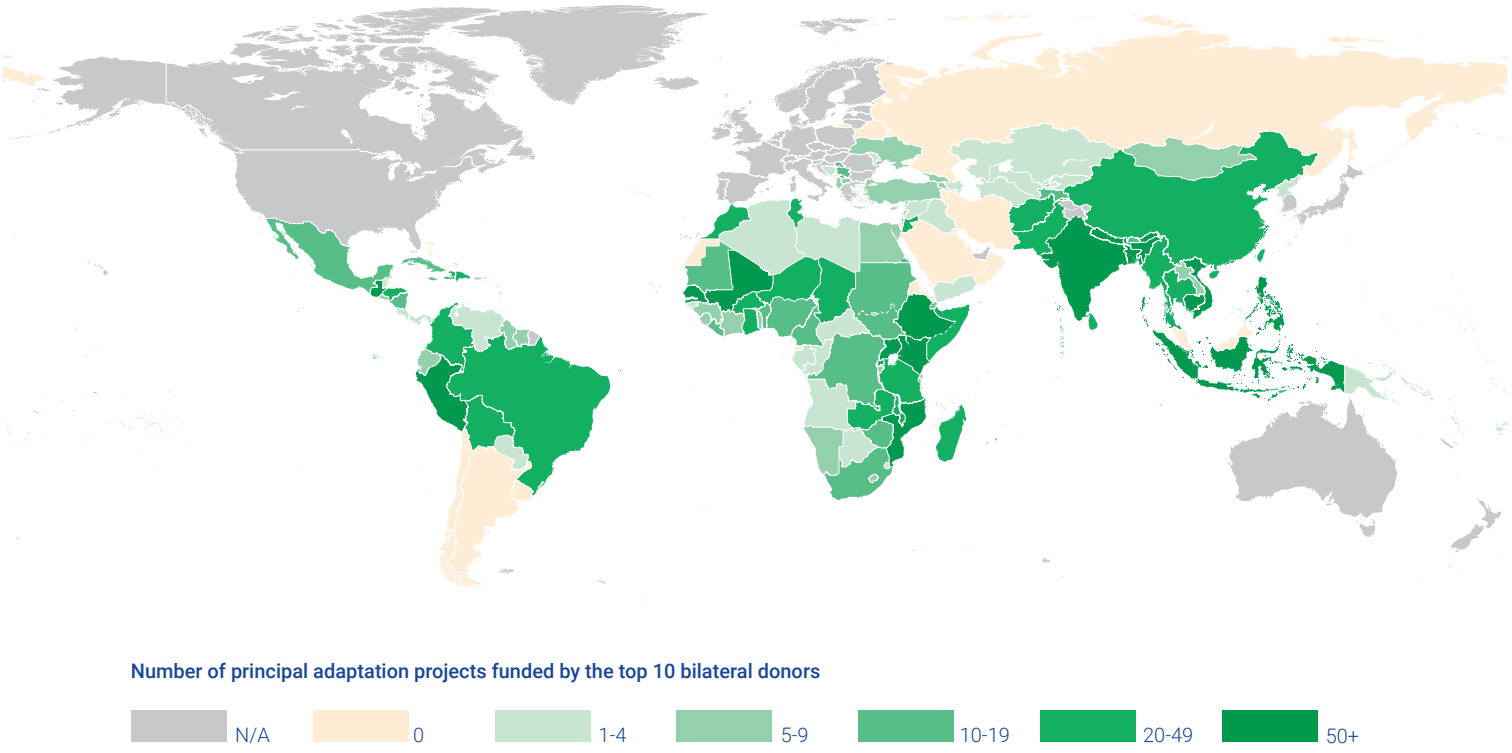
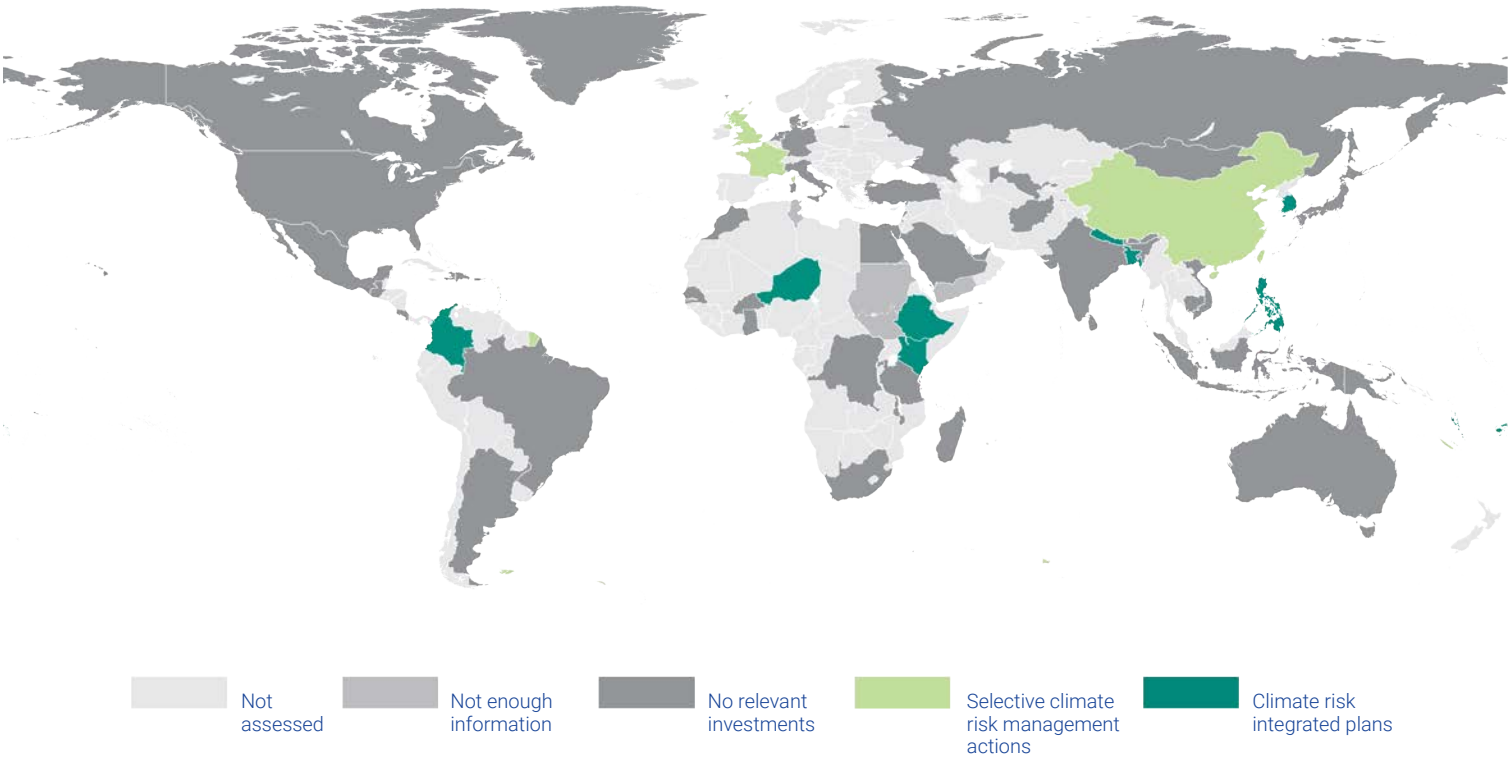


Figure ES.6 Countries including selected adaptation interventions in stimulus packages, as at 31 January 2021



compound risks through integrated risk management approaches, bringing together a set of cross-cutting risk management and adaptation objectives. For example, in many cases country-specific risk assessments of vulnerable groups, which are applied in adaptation planning processes like NAPs, can be used in broader risk management, including for the impacts of the pandemic. In terms of adaptation finance, the pandemic has created the conditions for extensive fiscal spending. It is critical that governments seize this opportunity to identify and prioritize interventions that achieve both economic growth and climate change resilience through a green recovery. Particularly in developing countries, governments can also increase the resilience of fiscal frameworks to deal with compound risks by establishing flexible disaster finance frameworks. These could be configured to ensure that predictable, timely and cost-effective finance is available to respond immediately to any emergency with the potential for systemic shocks, such as the pandemic or an extreme climate event. Finally, advanced economies have a clear role to play in helping developing countries that are both vulnerable to climate change and have suffered the economic consequences of the pandemic to free up fiscal space for green and resilient national COVID-19 recovery efforts through concessional finance and substantive debt relief to "build forward better".

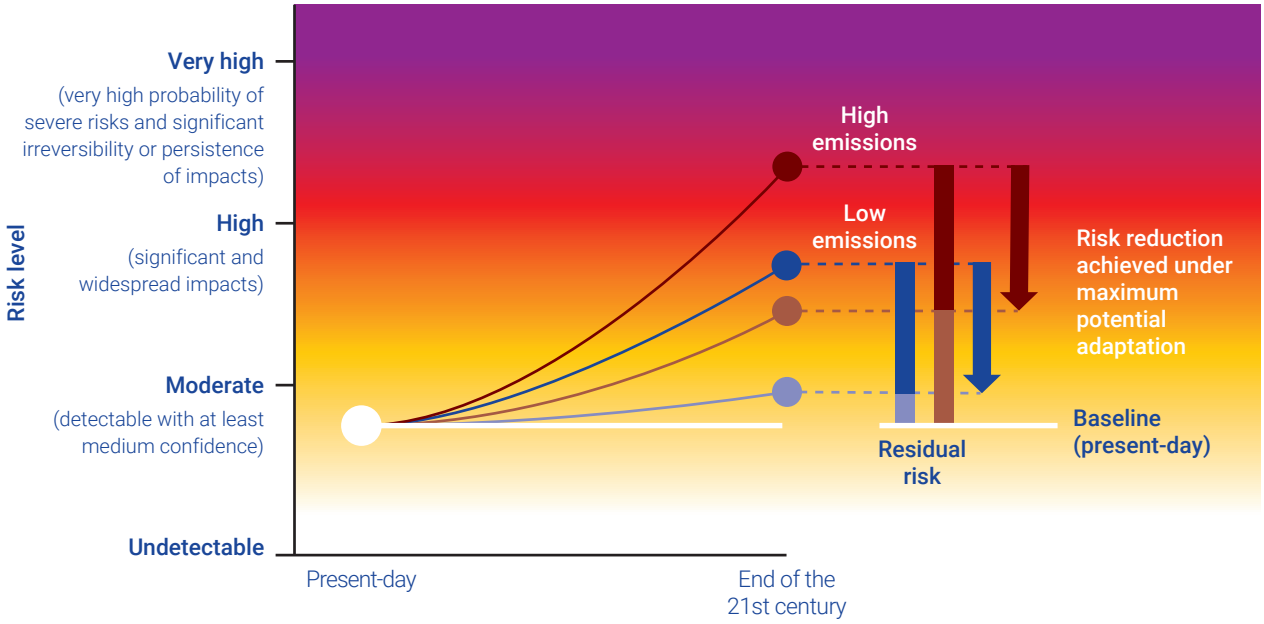
OUTLOOK ON THE GLOBAL PROGRESS OF ADAPTATION

Overall, progress in national-level adaptation planning, finance and implementation worldwide generally continues to grow and may be partially accelerating, but further ambition is needed. The importance of adaptation at the national and international levels as a means to galvanize the response to climate risks is now widely accepted and mainstreaming continues to increase. New planning instruments have been released at increasing rates over the past decade and there is evidence of growing maturity in their design, potentially indicating early signs of acceleration. The implementation of new initiatives with a principal focus on adaptation has generally risen since 2010, albeit without indications of acceleration. Moreover, increased variability in the number of new initiatives over the last four years makes projections into the future more difficult. Finance for adaptation also continues to grow globally. However, this may not be the case everywhere, particularly in developing countries that are among the most vulnerable to climate impacts. Nonetheless, there are signs that a more climate-resilient financial system is evolving through increased mainstreaming of climate risks and the emergence of new instruments, actors and approaches, even though acceleration is not yet visible.

Despite encouraging trends, the rate and scale of adaptation progress at the national level is not enough to keep up with growing needs and tracking progress remains a challenge. Adaptation costs appear to be rising faster than adaptation finance, potentially leading to a widening of the adaptation finance gap. Moreover, finance flows seem to be levelling off, whereas the uptake and scaling up of innovative finance vehicles is still too low to catch up with growing adaptation needs. While the level of adaptation implementation is rising, there is still scarce evidence of climate risk reduction as a result of adaptation actions. Although planning instruments are maturing, several indicators of effectiveness and adequacy, such as for vertical integration and incentives for increasing implementability, are mixed. The continued low rate of setting up M&E systems is also of major concern, although there are encouraging signs of improvement as one-third of all countries are now in the process of developing a system. This limits the ability to track progress in adaptation, particularly in relation to the implementation of adaptation actions. In addition to making the availability of M&E systems more widespread, there must also be greater focus on assessing effectiveness and adequacy of adaptation interventions limiting climate risks rather than simply measuring outputs.

Growing climate risks require a step change in adaptation ambition. Over the past two decades, climate risk warnings discussed in IPCC reports have continually risen due to increasingly stronger signals of reasons for concern. The most recent IPCC assessment report now concludes that some impacts of climate change are irreversible, even under highly ambitious mitigation regimes. Adaptation can significantly reduce loss and damage, particularly in the second half of the century, when climate impacts will accelerate (figure ES.7). While strong mitigation is the way to minimize impacts and long-term costs, increased ambition in terms of adaptation, particularly for finance and implementation, is critical to prevent existing gaps widening.

Figure ES.7 Adaptation outcomes based on information published in the IPCC AR6 cycle special reports on land and ocean–cryosphere



Note: Present-day refers to reference periods used in the underlying IPCC Assessments (2006-2015 in the Land Special report, Hulbert *et al.* 2019; 1986-2005 in the SROCC, Oppenheimer *et al.* 2019).
Source: Adapted from Hurlbert *et al.* (2019); Oppenheimer *et al.* (2019); and Magnan *et al.* (2021).

1

Chapter 1

Setting the scene

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Firefighters put out flames while fighting a wildfire in Hidden Valley, California.

Photo: © Mel Melcon/AP Photo Los Angeles Times

1.1 Context

In 2021, the global COVID-19 pandemic entered its second year. While encouraging trends are emerging, including the unprecedented development and roll-out of vaccines in most industrialized countries, the pandemic continues to pose severe challenges to human health, create economic turmoil and impose rolling restrictions on daily life in most parts of the world. Climate change, in the meantime, continues its unrelenting progress towards a warmer, more unpredictable future, riven by extreme events and trends, as starkly documented in the recent Sixth Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC), released in August 2021 (IPCC 2021). The situation is also reflected in the ever-increasing risks of floods, droughts, storms and heat waves. Recent examples include the heat dome in the Pacific northwest of the United States of America and Canada towards the end of June 2021, which saw the latter break its national temperature record three days in a row and by a total of 4.6°C (World Meteorological Organization 2021), and the severe flooding events in western Europe and the Province of Henan in China in July 2021. The recent AR6 report also showed that even under the most optimistic emissions scenarios that deliver net-zero by around 2050, global warming will continue in the short to medium term, peaking above 1.5°C, compared to pre-industrial levels. All this makes the global imperative of adaptation more urgent than ever before.

At the global level, international climate efforts under the United Nations Framework Convention on Climate Change (UNFCCC) continue, despite the postponement of the twenty-sixth session of the Conference of the Parties to the UNFCCC (COP 26), which was put back from November 2020 to November 2021. Consultations and work are proceeding ahead of the first Global Stocktake in 2023,[1] including a political push to further define and operationalize the global goal on adaptation.[2] To facilitate these discussions the UNFCCC Adaptation Committee also recently published a technical report on approaches to reviewing overall progress towards this goal (UNFCCC Adaptation Committee 2021). However, while promising, such developments have not yet been able to ensure real progress on adaptation tracking methodologies. Nor have they been able to resolve the associated and persistent difference of opinions, with some Parties maintaining that global indicators are necessary and others stating that they will never adequately capture the full variety and breadth of adaptation across countries (UNFCCC 2021; Beauchamp, da Silva Bernardo and Bueno 2021).

In response to the need for science-based and policy-relevant global perspectives on adaptation, the United Nations Environment Programme (UNEP) has produced the Adaptation Gap Report (AGR) since 2014, making this 2021 report the sixth edition. From the outset, the report has pursued two main goals: firstly, to provide negotiators of Parties to the UNFCCC, the broader UNFCCC constituency and civil society with robust assessments of global adaptation gaps; and secondly to provide information on the status and results of global adaptation efforts under way (box 1.1). As such, while it remains an independent assessment, the objective of the AGR is closely aligned with that of the UNFCCC Global Stocktake.

1.2 The sixth Adaptation Gap Report

The Adaptation Gap Report 2021 – its sixth edition – is part of a new set of reports launched in 2020 in the run up to the 2023 Global Stocktake. It is structured in three parts:

- **Part I** (chapters 3 to 5) assesses national and global progress on adaptation, covering three central elements of the adaptation process: planning, financing[3] and implementation. This part has formed part of each AGR edition and indicates the status and trends of the global adaptation process. Over time, the reports will provide a cumulative record of progress.
- **Part II** (chapter 6) presents a deep dive into the three elements of part I but focuses on a particular theme or sector of society. The purpose of this deep dive is twofold: first, it provides a more detailed picture of progress in a selected focus area; second, it adds additional perspectives, nuance and detail to the overall assessment of progress contained in the report. The theme or sector is decided by the report's steering committee,[4] taking into account global developments, international priorities and the needs of the UNFCCC and other global agreements.

1 The Paris Agreement Global Stocktake is a process for taking stock of the implementation of the Paris Agreement with the aim of assessing the world's collective progress towards delivering on the agreement and its long-term goals. The first Global Stocktake will take place from 2021 to 2023 and the process will be repeated every five years.

2 The global goal on adaptation is defined in the Paris Agreement: "enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to contributing to sustainable development and ensuring an adequate response in the context of the temperature goal referred to in Article 2". The temperature goal in question means "holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels" (UNFCCC 2021).

3 Under the UNFCCC, finance is one element of the "means of implementation" (finance, technology and capacity-building). In the context of this report, however, capacity-building and technology transfer are considered to be elements of "implementation" more broadly.

4 A steering committee, chaired by UNEP, guides the production of the report, including its thematic content and overall strategic direction, the selection of lead authors, and the review and sign-off of the report's content. The committee includes representatives from UNFCCC, IPCC and WASP, as well as a representative from the upcoming COP host.

Box 1.1 Overview of past Adaptation Gap Reports[a]

UNEP, in partnership with sponsoring bodies and other partners, including the World Adaptation Science Programme (WASP),[b] produced its first AGR (UNEP 2014) for COP20 in Lima, Peru, in 2014. The report arose in response to requests from UNFCCC Parties for an assessment on adaptation that would complement the annual UNEP Emissions Gap Report (see, for example, UNEP 2020). In particular, the report aimed to provide an independent assessment of the "adaptation gap" to help inform UNFCCC discussions on adaptation ahead of COP21 in Paris in 2015. From the first AGR, it was clear that assessing the adaptation gap was going to be very different and methodologically much more challenging than evaluating the annual emissions gap.

The first AGR proposed defining the adaptation gap as "the difference between actually implemented adaptation and a societally set goal, determined largely by preferences related to tolerated climate change impacts, and reflecting resource limitations and competing priorities" (UNEP 2014). It also provided a preliminary framework for assessing adaptation gaps and proposed three dimensions: the funding gap, the technology gap and the knowledge gap.

The second AGR was produced in 2016, providing an in-depth assessment of the adaptation finance gap, looking at both estimates of the costs of adaptation and the availability of bilateral, multilateral and private sector financing.

The third AGR was released in 2017 and did not assess a thematic gap. Instead, it focused on the methodological issues involved in assessing global progress on adaptation.

In 2018, the fourth AGR introduced a thematic topic alongside the assessment of adaptation progress in terms of enabling environments, adaptive capacity and finance. The focus was on the adaptation gap in the health sector.

The fifth AGR, which was published in 2020, introduced a framing focused on assessing progress by aiming to answer three important questions: What are we doing today to adapt? To what extent are we currently reducing climate risks? To what extent will our adaptation trajectory help us reduce future climate risks? The report also included a deep dive into the answers to these questions, focusing on Nature-based Solutions.

a All the Adaptation Gap Reports are available at: https://www.unep.org/explore-topics/climate-change/what-we-do/climate-adaptation/world-adaptation-science-programme-5.

b See www.wasp-adaptation.org and www.unep.org/explore-topics/climate-change/what-we-do/climate-adaptation/world-adaptation-science-programme for more information.

- **Part III** (covered in chapters 2 and 7) introduces a framework for understanding global progress on adaptation, thus guiding the reader through the analysis of the report, and synthesizes the findings described in Parts I and II to provide an overview of global progress on adaptation. Chapter 7 also provides an overview of future developments and outlines the challenges ahead and intended future work towards improving the assessment of global adaptation.

The topic for Part II of the 2021 Adaptation Gap Report focuses on the **emerging impact of COVID-19 on global adaptation processes**. The reasons for selecting this topic are twofold. Firstly, COVID-19 continues to exert a major influence on the social and economic contexts underpinning adaptation processes, which represents a major challenge in developing countries. Secondly, COVID-19 has led to record levels of financial credit provision and fiscal spending by governments as part of their national recovery plans. Despite the serious fiscal constraints inherent to this approach, such unprecedented levels of public spending also present great opportunities for scaling up and mainstreaming climate risk considerations for a greener and more resilient recovery from the COVID-19 crisis.

This year's AGR updates and expands the analysis begun in the 2020 edition of the report by providing information of direct relevance to the UNFCCC Global Stocktake:

- **Consolidated criteria for assessment of adaptation progress, gaps and contextual elements.** Building on the work initiated in 2020, this year's report consolidates a methodological framework for assessing progress, gaps and contextual elements in global adaptation. It also expands and strengthens its approach to the assessment of adaptation outcomes, notably through the inclusion of qualitative expert assessments of future outcomes

(a topic with only very limited coverage in the 2020 AGR). These advances represent work in progress and are expected to serve as the first step in a steadily improving and expanding methodology for outcome assessment in the context of the AGR reports.

- **Updated and expanded assessment of progress in adaptation planning.** The analysis in the planning chapter (chapter 3) is updated based on 107 new or updated Nationally Determined Contributions (NDCs), 14 National Communications and three National Adaptation Plans (NAPs), which have been submitted since October 2020. This provides a more comprehensive picture of global progress in adaptation planning. It also sheds light on innovative adaptation laws and policies, including evidence for risk reduction from adaptation planning, as well as aspects related to COVID-19.

- **Updated assessments of financial needs for adaptation.** Many countries have updated their adaptation priorities and associated financing needs in recent NDCs submitted to the UNFCCC Secretariat. This enables the 2021 AGR report to provide an updated view on adaptation financing from the perspectives of individual countries. It provides key information on how such estimates have changed over time.

- **Expanded data sets for assessing progress in the implementation of adaptation.** The data sources of implemented adaptation measures have seen a major expansion to include data from major bilateral donors and recent findings on the extent of adaptation measures, their geographic distribution and the potential for transformative change, as assessed by the Global Adaptation Mapping Initiative.[5]

- **A first look at how the COVID-19 pandemic is affecting the global adaptation process.** The 2021 edition of the report provides a first assessment of the impact of the pandemic on the national adaptation planning process and the availability of financing for adaptation. It also points to some important lessons from fighting the COVID-19 pandemic that can be applied to improve future climate adaptation planning and financing processes and steps.

5 The Global Adaptation Mapping Initiative (GAMI) is a collective global effort to systematically gather and synthesize literature on climate change adaptation. The initiative was developed to provide synthesis results to inform the ongoing Intergovernmental Panel on Climate Change (IPCC) 6th Assessment Report (AR6). It seeks to answer the question "are we adapting?" The initiative has come together with no funding and no formal institutional mechanisms. More information can be found at https://globaladaptation.github.io/.

In Albania, UNEP is working with the Ministry of Tourism and Environment to improve the capacity of the Kune-Vaini lagoon ecosystem to adapt to climate change and provide vital goods and services to local communities. Learn more about this project here.
Photo: © UNEP

2

Chapter 2

Framing the Adaptation Gap Report

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Flooding in Cap Haïtien, Haiti. After days of continuous rains in 2014, parts of Haiti's north suffered serious flooding, leaving more than a dozen dead and thousands homeless.

2.1 Introduction

The Adaptation Gap Report AGR2021 builds on the framing first introduced in the 2020 edition of the report to further advance knowledge on adaptation progress around the world. It focuses on adaptation progress at the global and national scales, relying primarily on publications from national governments (for example, documents submitted under the United Nations Framework Convention on Climate Change [UNFCCC] process). It has also expanded the sources of information to include recent peer-reviewed scientific literature and reports by multilateral organizations and think tanks. This chapter frames the report both in terms of the climate risk context within which adaptation is taking place (section 2.2) and the conceptual and methodological approach used to understand adaptation progress (section 2.3).

2.2 The climate risk context

Climate risk is a function of exposure and vulnerability to climate hazards. Current and future climate risks will not only be determined by changes in global temperature levels and associated hazards at the local scale, they will ultimately result from the combination of these hazards with the affected systems' exposure and vulnerability. Due to interactions between affected systems, there are cascading and often reinforcing consequences of climate-driven hazards on natural systems and human systems and sectors. As a result, only a combination of adaptation – the purpose of which is primarily to minimize exposure and vulnerability to a changing climate – and ambitious mitigation actions can reduce climate risks over different timescales and in the various ecological and societal systems around the world. Accordingly, adaptation must be considered a priority not only at the national and local levels but also as an issue of high global concern. This means there is an urgent need to track global progress on adaptation and identify gaps.

2.2.1 Appraisal of climate risk is changing over time

Our appraisal of climate risk has evolved as we learn more about the interactions between rising temperatures and climate impacts. Since the Intergovernmental Panel on Climate Change (IPCC) Third Assessment Report (Smith *et al.* 2001) this relationship has been expressed as "reasons for concern" and presented in the iconic "burning embers" diagram shown in figure 2.1 (Zommers *et al.* 2020). The evolution of this framework and associated conclusions across the IPCC assessment cycles show that risk levels at a given temperature have generally increased from one IPCC report to the next, particularly for higher levels of greenhouse gas emissions. Accordingly, climate impacts are likely to be larger than previously projected and the related cost of adaptation and residual losses and damages will also be higher. In turn, this means it will be necessary to be more ambitious and act sooner than anticipated to avoid high risks through mitigation and adaptation. Assessments also show that moderate levels of risk across all "burning embers" are virtually unavoidable, even if the global temperature rise is kept to 1.5°C above pre-industrial levels through ambitious climate change mitigation (Hoegh-Guldberg *et al.* 2018; Magnan *et al.* 2021). Similarly, this is a strong call to ramp up adaptation planning, finance and implementation to reduce residual climate impacts on people, society and nature.

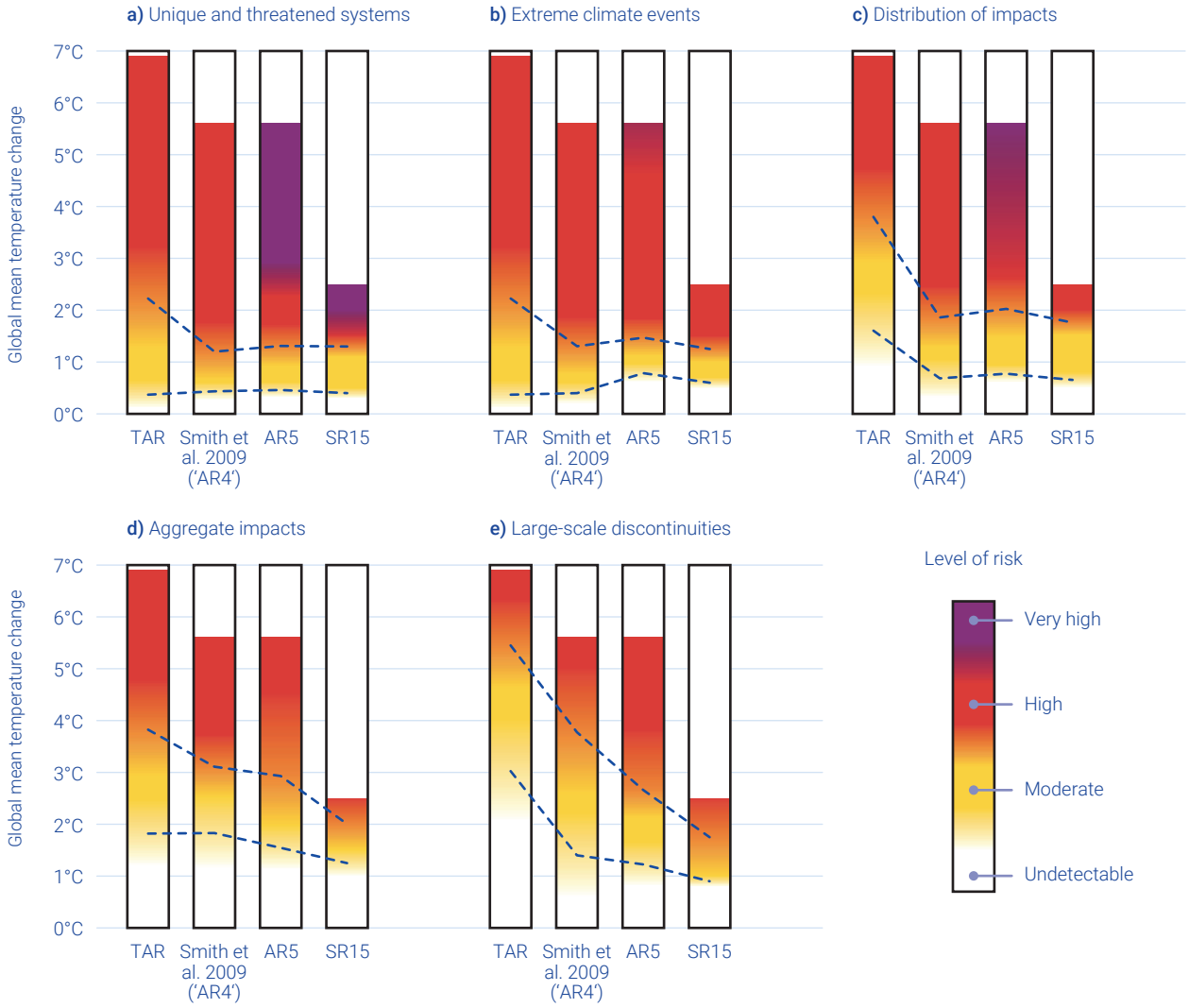
2.2.2 Estimating global climate risk

The NDCs of the Parties do not currently reflect the level of ambition required for mitigation that would avoid locking in temperature changes that will result in high risks to essentially all of the "reasons for concern" (UNFCCC 2021). Average global temperatures are projected to reach 3°C above pre-industrial levels at the end of this century, a point at which many fragile and unique systems, for example, will have been heavily deteriorated or even lost (IPCC 2021). The IPCC estimates that temperatures will likely be above rather than below the 1.5°C threshold in the near term (2021–2040) even under a very low greenhouse gas emissions scenario, and will very likely cross this marker without strong mitigation action (IPCC 2021).

The three recent special reports of the IPCC on the 1.5°C threshold, land and ocean–cryosphere, respectively (IPCC 2018; IPCC 2019a; IPCC 2019b), provide more details of the risks to natural and human systems, allowing a better understanding of "global climate risk". A synthesis study using a composite risk index shows firstly that climate change impacts are expected to substantially increase over the course of this century, probably in an accelerated way; and secondly, while different societies and social groups around the globe will be affected differently in the coming decades, climate impacts will affect us all (Magnan *et al.* 2021). The IPCC special reports on ocean–cryosphere and land (Hurlbert *et al.* 2019; Oppenheimer *et al.* 2019) assessed climate risk levels under contrasting mitigation-adaptation scenarios in contexts including representative low-lying coastal settlements (atoll islands, deltas, megacities, arctic communities), food insecurity, land degradation and desertification. The combined results illustrate the potential outcomes of different societal adaptation at the global level (figure 2.2), with the potential to reduce today's global climate risk level by almost a half by the end of this century under both low and high mitigation scenarios (Magnan *et al.* 2021). However, even ambitious adaptation will not eliminate all future climate risks. Residual risks will rise in the second half of the century, albeit at much lower levels than under less ambitious adaptation.

The continuous rise in climate impacts means that adaptation costs and the costs of residual losses and damages will invariably continue to rise as the century progresses. Impacts will be felt much more strongly in many developing countries, however, strong mitigation action would avoid many of these costs, particularly in

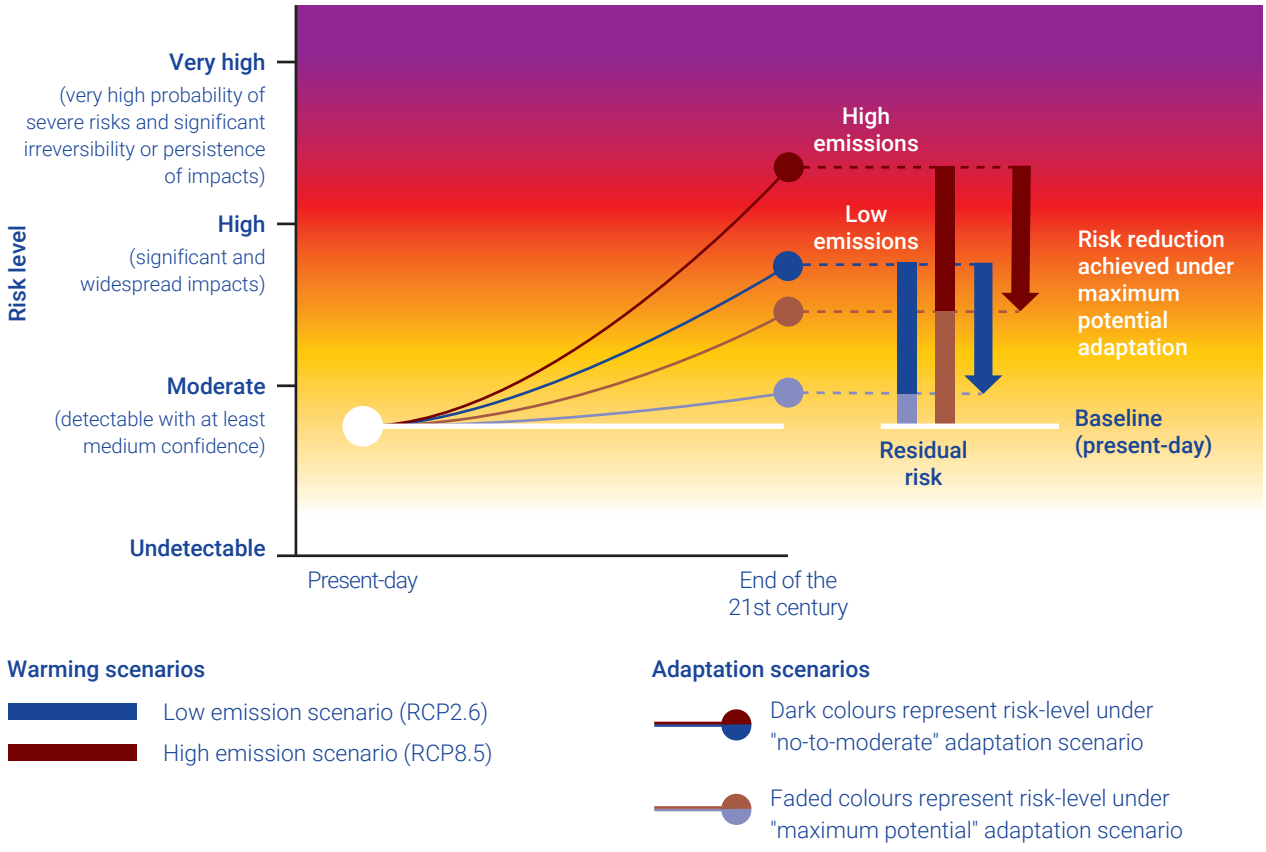
Figure 2.1 Comparison of risk thresholds across IPCC assessments



Note: Burning embers link the global mean surface temperature increase to estimates of risk to unique and threatened ecosystems (**panel a**), extreme climate or weather events (**panel b**), distribution of impacts (**panel c**), aggregate impacts (**panel d**) and large-scale discontinuities (called large-scale singular events in the IPCC Fifth Assessment Report [AR5] and the Special Report on Global Warming of 1.5 Degrees [SR15] (**panel e**). All burning embers are presented with the same colour and temperature scale, removing technical details that varied between the original publications. White areas at the top of each column correspond to temperatures above the assessed range in the corresponding report. Dashed lines connect the midpoints between undetectable and moderate risk, and moderate and high risk. Risk transitions have generally shifted towards lower temperatures with updated scientific understanding.
Source: Zommers *et al.* (2020).

the second half of the century (Admiraal *et al.* 2016; De Cian *et al.* 2016; UNEP 2016; Hoegh-Guldberg *et al.* 2018; UNEP 2021; Chapagain *et al.* 2020). Strong mitigation action will impose earlier costs, but climate change cannot be seen as an optimization problem in which estimated mitigation costs are simply compared against the estimated costs of adaptation and damage. Such an approach disregards the significant uncertainties surrounding all cost estimates. For instance, despite improving to better reflect observations (Ueckerdt *et al.* 2019), the top-down damage functions used in integrated assessment models are rather simplistic and do not take into account ethical considerations or non-monetary loss and damage (Walsh, Hormio and Purves (eds.) 2016; García 2020; Hattori 2021). Moreover, they disregard the possibility of large-scale discontinuities with catastrophic consequences (IPCC 2018; Dietz *et al.* 2021). As such, considering the uncertainties, the IPCC special report on 1.5°C estimates that limiting global warming to 1.5°C instead of 2°C would avoid economic damage of 22 per cent (10–26 per cent) (Hoegh-Guldberg *et al.* 2018).

Figure 2.2 Adaptation outcomes based on information published in the IPCC AR6 cycle special reports on land and ocean–cryosphere



Note: Present-day refers to reference periods used in the underlying IPCC Assessments (2006-2015 in the Land Special report, Hulbert *et al.* 2019; 1986-2005 in the SROCC, Oppenheimer *et al.* 2019).
Source: Adapted from Hurlbert *et al.* (2019); Oppenheimer *et al.* (2019); and Magnan *et al.* (2021).

2.3 Framing of the adaptation assessment presented in the AGR2021

Understanding adaptation progress essentially means asking three intertwined questions:

- What are we doing today to adapt?
- To what extent are we currently reducing climate risks?
- Depending on our mitigation trajectory, will our adaptation trajectory help us reduce future climate risks?

Establishing a clear framing (section 2.3.1) and providing guidance (section 2.3.2) is a critical part of assessing global adaptation progress, even though answering these questions still raises important methodological issues and data challenges.

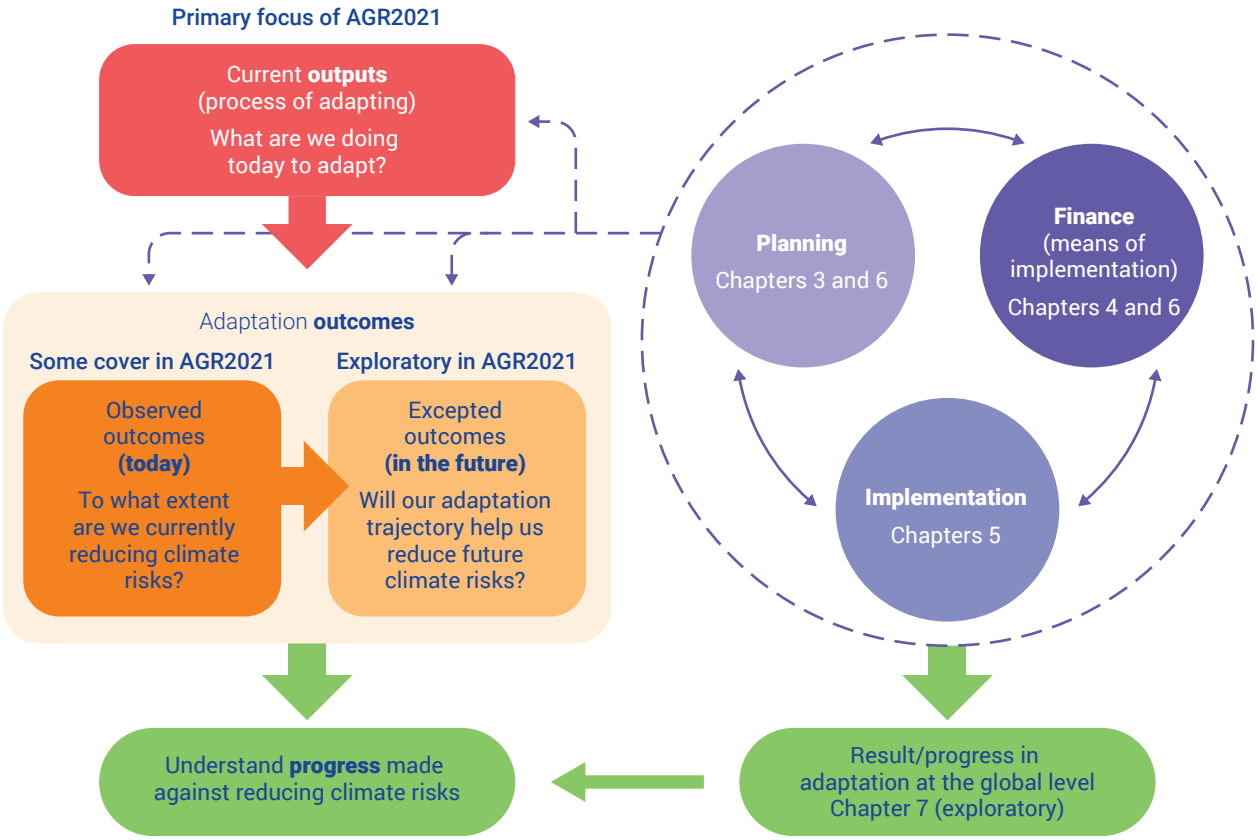
2.3.1. The overarching framing

This report builds on previous AGRs (UNEP 2017; UNEP 2021) to address "adaptation progress" in three distinct ways (figure 2.3).

First, adaptation actions and **outputs** relate to the question: what has been done until today to adapt? Outputs are assessed in the AGR in both quantitative terms (for example, the number of plans, the amount of financing committed, and the type and scale of implementation activities) and qualitative terms (for example, how actionable plans are and how they address climate risks, and the types and targets of action). This provides an overview of global progress on adaptation planning, finance and implementation.

Second, it is also key to understand the adaptation **outcomes** that have already been achieved in order to determine the extent to which we have actually reduced climate risk levels. Assessing outcomes is considerably harder than

Figure 2.3 Conceptual framework and structure of the UNEP Adaptation Gap Report (AGR) series on assessing global progress on adaptation



Note: The panel on the left describes the conceptual framing of the AGR series (starting from AGR2020), while the panel on the right illustrates the structure of this report and how it relates to the conceptual framing on outputs, outcomes and progress.

tracking outputs, for example, due to a gap in understanding the effects of adaptation on current climate risk levels (UNEP 2021), as well as because of the value judgements associated with making statements on the results of actions (UNEP 2017).

Third, **expected outcomes** refer to the question of the extent to which our adaptation trajectory (and in relation with our mitigation trajectory) will help us reduce future climate risks. Comprehensively assessing adaptation progress in terms of future climate risks requires the combined appraisal of both observed and expected adaptation outcomes. In addition to the aforementioned challenges associated with assessing current outcomes, there are large uncertainties around the ways in which climate change will affect future climate risks (IPCC 2021), as well as the definition of "(un)acceptable" levels of risk from one society to another (Handmer and Nalau 2019). This means that caution should be exercised in our understanding of assessments of future outcomes.

2.3.2. Criteria to assess adaptation progress in the AGR series

The AGR2020 introduced a number of categories in order to consistently assess adaptation planning, finance and implementation (table 2.1). Information on progress, gaps and factors constraining the interpretation of findings provided in the chapters of the report form the basis for the synthesis in chapter 7. This report presents a first attempt at informing expected outcomes of adaptation in the absence of robust information about future trends in planning, financing and implementation. This is based on forward-looking expert judgement and involved a survey to gather additional insights into future trends for the various assessment criteria based on the expertise of the chapter authors, grounded in scientific evidence and deep knowledge.

Table 2.1 Overarching criteria used to synthesize findings across adaptation planning, finance and implementation

	Progress	Gaps	Factors that constrain the interpretation of findings
Actionable policies refer to the extent to which multilateral and bilateral cooperation and national policies provide clear guidance on how to implement adaptation on the ground	■		
Adaptation finance illustrates an important aspect of international cooperation for planning and implementation of adaptation	■	■	■
Adaptation goal(s) refer to the destination we want to achieve in a changing climate, globally and nationally			■
Connection to climate risk reduction is key to understand if existing or planned policies and actions (outputs) lead to effective adaptation (outcomes)		■	■
Early signs of further progress highlight emerging experiences and knowledge showing that more progress is to be expected in the near to long term	■		
Inclusiveness illustrates broader concerns around equity and justice, such as gender and disadvantaged groups		■	
Information availability on both outputs (what are we doing to adapt?) and outcomes (to what extend does it allow us to reduce risks?) is key to ensure confidence in judging whether we face more progress or bigger gaps			■
Knock-on effects refer to the way progress at a given level (for example, national) influences progress at smaller and larger scales and potentially stimulates groups of actors (for example, youth)	■	■	
Maturity is the way adaptation is either mainstreamed into existing policies or considered as an overarching policy dimension	■		
Monitoring and evaluation is key to allow for planning and implementation to remain adequate and effective over time	■	■	
Recognition of the policy relevance of adaptation to galvanize action at the international and national levels	■		
Uncertainty around the enabling conditions for adaptation describes the external, non-climate-related factors that can influence vulnerabilities and adaptive capacities and therefore make adaptation easier or harder to achieve			■

Note: Grey cells indicate the primary focus applied in AGR2021, based on information from the core chapters 3–6 and as reported in chapter 7 (section 7.1 and figure 7.1).

People living around one the community-protected areas make roof fronds out of leaves, toothpicks and sticks as part of a project supported by UNEP and partners to help people build alternative livelihoods and decrease logging in Cambodia. Learn more about this project here.

Photo: © UNEP

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VISIÓN 2030
LEYENDA
Bosque
Café
Granos básicos
Banano sombra de café
Frutales
Fuentes de agua
Aves de corral
Escuela Primaria
Oratorio
Salón Comunal
Vivienda
Letrina
Carreteras de terracería

Chapter 3

Global progress on adaptation planning

Lead authors: Annett Moehner (Secretariat of the United Nations Framework Convention on Climate Change), Maryam Navi (Secretariat of the United Nations Framework Convention on Climate Change), Fatin Tawfig (Secretariat of the United Nations Framework Convention on Climate Change), Motsomi Maletjane (Secretariat of the United Nations Framework Convention on Climate Change), Michal Nachmany (Climate Policy Radar).

Photo: © CCAFS/J.L.Urrea

Key messages

- Countries have made consistent progress in developing adaptation planning instruments and across almost all indicators of adequate and effective adaptation planning. This progress is mostly incremental (within 10 per cent of scores from the 2020 analysis), with the exception of stakeholder engagement, gender and the use of policy instruments, which saw greater improvements.
- At present, 79 per cent of countries have at least one national-level adaptation planning instrument in place, up from 72 per cent in 2020.
- In terms of the adequacy and effectiveness of those plans, there has been a significant increase in inclusive adaptation planning and the application of policy instruments deemed to enhance the implementability of adaptation plans, including regulations and provisions for investment and incentives. Countries also progressed in terms of the comprehensiveness of their adaptation planning.
- There is evidence of steady progress on the integration of adaptation across sectors and levels, although results remain mixed, with three-quarters having horizontal coordination mechanisms in place, compared to just around one-third with vertical coordination mechanisms. Furthermore, at least 65 per cent of countries have at least one sectoral plan in place and at least 26 per cent have at least one subnational planning instrument.
- Only around a quarter of countries have a monitoring and evaluation framework in place, reflecting the difficulty of designing and implementing such frameworks.

3.1 Introduction

In 2021, the Intergovernmental Panel on Climate Change (IPCC) concluded that anthropogenic climate change is already affecting weather and climate extremes across the world and that the scale of recent changes across the climate system, as well as the current state of many of its aspects, are unprecedented (IPCC 2021). At the same time, in 2021 the United Nations Framework Convention on Climate Change (UNFCCC) found that emissions reductions that were estimated based on targets communicated through countries' new or updated nationally determined contributions (NDCs) "fall far short of what is required" to limit global warming to 1.5°C or even 2.0°C above pre-industrial levels (UNFCCC 2021a). These findings underscore the urgency of developing – and subsequently implementing – adequate and effective adaptation plans to reduce vulnerability and build resilience to withstand the current and future impacts of climate change.

All Parties to the Paris Agreement (UNFCCC 2016) commit to engage in adaptation planning processes and the implementation of actions, including the development or enhancement of relevant plans (article 7.9), with a view to contributing to the global goal on adaptation of enhancing adaptive capacity, strengthening resilience and reducing vulnerability (article 7.1). The Agreement also stresses that adaptation should follow a gender-responsive and participatory approach, with a view to integrating adaptation into relevant socioeconomic and environmental policies and actions (article 7.5). As part of the Global Stocktake under the UNFCCC process, Parties will review the adequacy and effectiveness of adaptation and progress towards the global goal on adaptation (articles 7.14 and 14).

The Adaptation Gap Report 2020 (AGR2020) assessed the global status of adaptation planning by examining the number of adaptation plans and strategies produced by 196 Parties to the UNFCCC and the extent to which these plans and strategies are effective and adequate (UNEP 2021).[1] This chapter provides an update on the previous analysis, providing both a more advanced snapshot of adaptation planning worldwide and a sense of how this compares to the 2020 assessment.

3.2 Methodology

Applying the same methodology as the AGR2020, this chapter looks at the overall number of national, subnational and sectoral adaptation strategies, plans and laws. Five

1 As at 5 August 2021, 191 of the Parties were also Parties to the Paris Agreement. Given the focus on analysis at the national level, the European Union, which is also a Party to the UNFCCC and the Paris Agreement, is excluded from the analysis.

Table 3.1 Overview of criteria used to assess adaptation planning (including their underlying rationale) and associated indicators

Rationale	Indicators
1. Comprehensiveness	
Identifying climate risks and hazards and assessing vulnerability to existing and future climate hazards and impacts constitute foundational steps of the adaptation planning process. Countries can then use this information to prioritize sectors for adaptation measures and develop a comprehensive adaptation plan by identifying adaptation options that align with these priorities and respond to the risks, hazards and vulnerabilities they face.	• Adaptation options comprehensively address assessed risks, impacts, hazards or vulnerabilities
2. Inclusiveness	
For adaptation planning to adequately reflect existing and forthcoming risks and vulnerabilities and to effectively enhance the ownership of any implementation, emphasizing the engagement of all relevant stakeholders and gender considerations.	• Dedicated stakeholder engagement process in place • Consideration of gender
3. Implementability	
Planning can be assumed to be effective if it leads to real implementation by public and private actors. As such, planning can benefit from a central administrative body that is officially in charge of adaptation policymaking and a variety of policy instruments, including investment, incentives and regulations that lead to the desired outcomes.	Presence of: • a central administrative body • regulations • investments • incentives
4. Integration	
Integrating or mainstreaming adaptation planning and action horizontally (across sectors) and vertically (across levels of administration) is increasingly recognized as an important component of effective adaptation planning. This helps ensure that adaptation planning is comprehensive, avoids the duplication of effort or maladaptation, and enhances synergies.	Presence of: • sectoral adaptation plans and coordination mechanisms • subnational adaptation plans and coordination mechanisms
5. Monitoring and evaluation (M&E)[a]	
For planning to remain adequate and effective, it must be periodically monitored and evaluated.	• M&E system in place • Monitoring/Progress report published • Evaluation undertaken and report published

a Taking into account Leiter (2021), the 2020 indicators were slightly revised to focus more on what has been achieved to date rather than what has been planned.

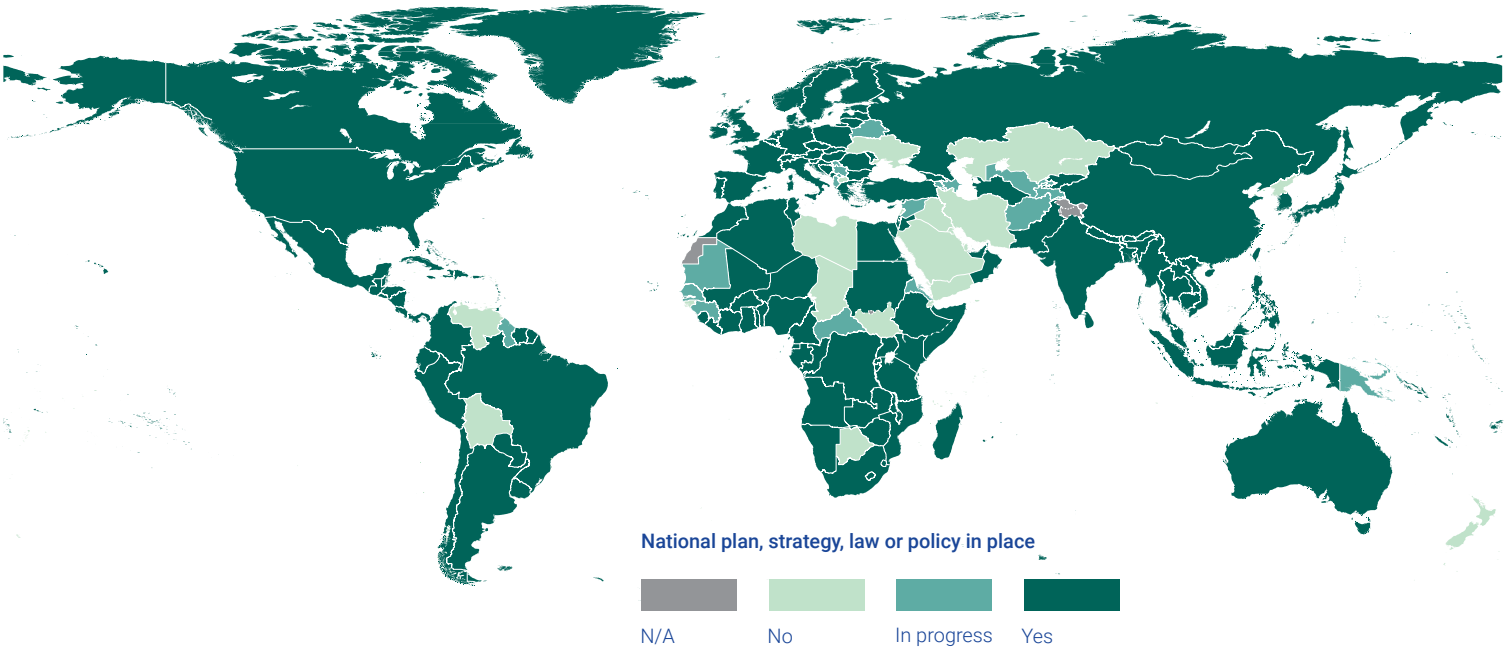
criteria are used to shed light on the extent to which the outputs of national adaptation planning can reasonably be assumed to be adequate (sufficient) and effective (successful) in achieving the stated adaptation targets and objectives (reducing climate risks and enhancing resilience). The five criteria are detailed in table 3.1.

These criteria and associated indicators were chosen as they respond to the provisions of the Paris Agreement setting out the commitments of the Parties (articles 7.5 and 7.9). They have also been included in relevant global guidance documents on adaptation planning[2] or in previous global or regional assessments of adaptation planning.[3]

2 For example, the 2012 UNFCCC Least Developed Countries Expert Group (LEG) technical guidelines for the NAP process (UNFCCC LEG 2012), the 2015 PEG M&E tool for the LEG (UNFCCC LEG 2015) and the 2016 Guidance on vertical integration (Dazé *et al.* 2016).

3 For example, the 2018 Evaluation of the European Union Strategy on adaptation to climate change (European Commission 2018) and the 2019 global review of national laws and policies on climate change adaptation (Nachmany *et al.* 2019).

Figure 3.1 Status of adaptation planning worldwide, as at 5 August 2021



Note: Territories marked as N/A are those which are recognized as disputed by the United Nations or whose status has not yet been agreed upon.

As part of a desk review by the authors,[4] 24 National Adaptation Plans (NAPs),[5] 18 Adaptation Communications[6] and 151 Nationally Determined Contributions (NDCs) with adaptation components[7] were analysed for evidence of the chosen indicators. Where none of these documents was available for a country, National Communications were consulted.[8] Data on national laws and policy instruments was also drawn from, cross checked with and complemented by Grantham Research Institute Climate Change Laws of the World Database.[9]

Data limitations include the lack of rigorous standards regarding the accuracy and completeness of reporting by countries. As with the initial analysis, the aim is to assess as many countries as possible, with all indicators are scored as present, absent or in progress/partial. While this allows for the construction of a broad global picture of adaptation planning, it hides important nuances and significant differences between countries.

It is also critical to acknowledge that planning (even good planning) is only a precursor to the implementation of adaptation measures. This chapter stops short of assessing whether plans have actually had an impact and have been followed through at the national, subnational and sectoral levels.

3.3 Progress in adaptation planning

3.3.1 Status of adaptation planning

Globally, 79 per cent of countries have addressed adaptation at the national level through a plan, strategy, policy or law. This is an increase over the analysis from 2020, when 72 per cent of countries had a national adaptation instrument in place. A further 9 per cent of countries are in the process of developing their first national instrument (figure 3.1).[10]

4 The cut-off for the analysis of the various documents and databases was 5 August 2021.

5 NAPs here refer exclusively to the plans submitted to the UNFCCC NAP Central. More information is available at www4.unfccc.int/sites/NAPC/News/Pages/national_adaptation_plans.aspx.

6 More information available at www.unfccc.int/topics/adaptation-and-resilience/workstreams/adaptation-communications.

7 More information available at www4.unfccc.int/sites/ndcstaging/Pages/Home.aspx.

8 Annex I (www.unfccc.int/NC7) and Non-Annex I (www.unfccc.int/non-annex-I-NCs).

9 https://climate-laws.org.

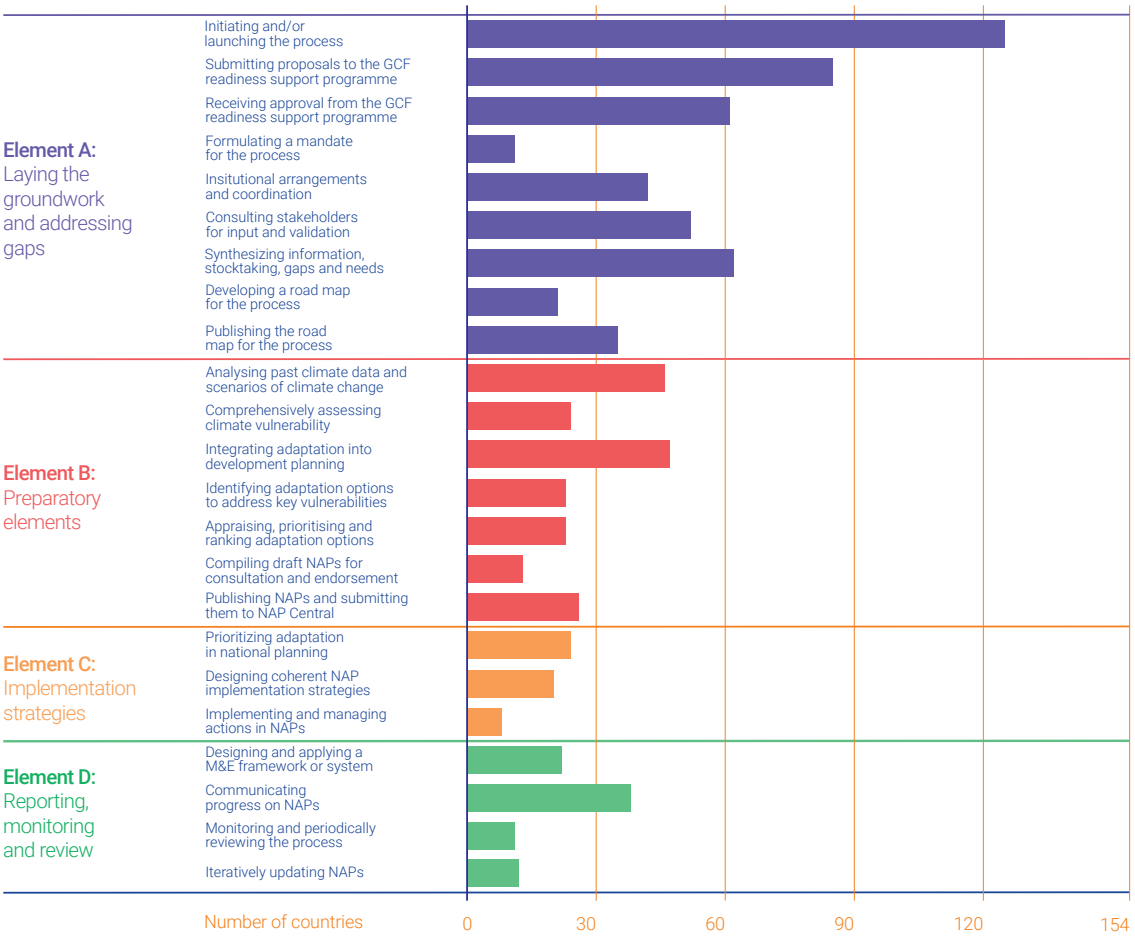
10 This includes national plans, strategies, policies or laws explicitly and primarily focused on adaptation or focused on climate change more broadly, with a significant adaptation component. National adaptation programmes of action were not included in the tally due to their unique role as a tool for LDCs to identify and act on urgent priority adaptation activities, rather than as an instrument to facilitate an overarching or holistic adaptation response.

Box 3.1 Progress by developing countries in formulating and implementing NAPs

Developing countries have made gradual progress in formulating and implementing NAPs since the process was established in 2010. However, progress has accelerated since 2015. As at September 2021, at least 125 of the 154 developing countries had undertaken activities related to the process to formulate and implement NAPs. Some countries had developed and submitted sectoral and thematic strategies and other relevant outputs. Twenty-two countries had put in place or were working on their M&E frameworks or systems for the NAPs.

A detailed set of measures is shown in figure 3.2 below. Fourteen countries had also submitted at least one project concept note to the Green Climate Fund (GCF) for implementing priority actions associated with their NAPs. A further, eight countries had received approval for funding from the Least Developed Countries Fund for activities related to the process to formulate and implement NAPs. Technical support is provided by the Least Developed Countries Expert Group, other constituted bodies under the UNFCCC, United Nations organizations, specialized agencies and other relevant organizations, as well as by bilateral and multilateral agencies, including through support programmes.

Figure 3.2 Aggregate progress in the process for formulating and implementing NAPs



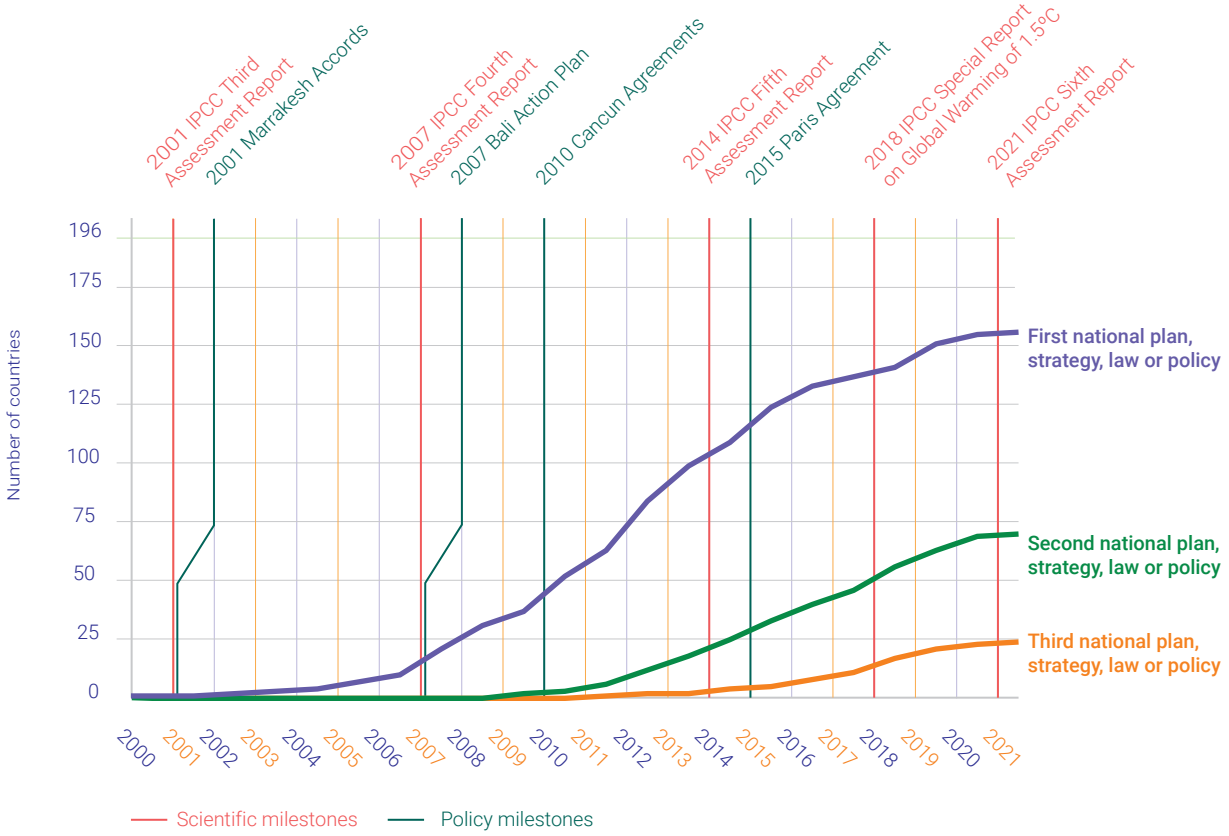
Source: Information updated by the authors from UNFCCC (2020).

Under UNFCCC, the process of formulating and implementing NAPs remains a cornerstone of adaptation planning efforts, particularly for developing countries (UNFCCC 2020). Indeed, many of these countries already have one or more national adaptation instruments in place and are simultaneously in the process of formulating a NAP, highlighting the added value of this instrument over and above other national plans, policies, laws and frameworks for adaptation. Box 3.1 provides an overview of NAP progress to date.

Since the first national-level adaptation instrument identified in this analysis was established in 2000, the pace of adaptation planning around the world has accelerated considerably. Furthermore, almost half of the countries with a national instrument in place have developed at least one further national-level instrument, which serves to replace, update or complement the initial adaptation plan, policy, strategy or law. In some cases, this may reflect progress in iterative adaptation planning (see, for example, UNFCCC Adaptation Committee 2019b; Mimura *et al.* 2014; UNFCCC 2019), wherein countries are building and improving on their initial plans and other instruments. The growth in adaptation planning throughout the world has taken place alongside increasingly dire warnings from the scientific community – particularly the IPCC – about the need for adaptation, alongside an expansion of institutions under the UNFCCC to support the adaptation efforts of countries (figure 3.3; see also UNFCCC Adaptation Committee 2019a).

Looking ahead, the presence of clearly defined national adaptation goals and quantitative and qualitative adaptation targets could be an important way of gauging where adaptation planning has now become outcome-oriented and is measurable. Indeed, new and updated NDCs suggest that countries are already moving in this direction by including more quantitative and time-bound targets as part of their adaptation contributions (box 3.2 provides a snapshot of recent developments; see also UNFCCC 2021).

Figure 3.3 Progression of global adaptation planning since 2000



Note: Data for the period 2000–2019 has been updated since the 2020 analysis, based on new documents submitted by Parties to the UNFCCC, which, in some cases, reported on adaptation planning instruments established from 2000 to 2019 that had not been reflected in the 2020 edition of the AGR.

Box 3.2 National laws and policies

National legislative and executive actions (laws, policies, strategies, plans, etc.) are essential to translate adaptation planning into action. Setting clear targets, defining clear governance and accountability mechanisms, securing implementation budgets and tying policy into broader societal frameworks and processes are all critical aspects for success.

During 2020 and 2021, several national laws and policies focusing on adaptation or disaster risk management were adopted or amended significantly. For example, the Russian Federation has published its first National Adaptation Action Plan; Spain and South Africa have published new adaptation policies that significantly update older ones (from 2006 and 2011, respectively); Japan has updated its Basic Disaster Prevention Plan to include disease prevention; and South Korea has amended its National Strategic Plan for Climate Adaptation (2021–2025).

Similarly, Dominica published its Climate Resilience and Recovery Plan, which is a requirement of the Climate Resilience Act 2018 and is aligned with the country's National Resilience Development Strategy developed in 2018. The plan sets targets, defines initiatives and outlines the resources required to implement resilience measures. It also sets clear and quantifiable targets for 2030, including zero fatalities from extreme weather events, 90 per cent of housing stock built or retrofitted to meet resilient building codes and 100 per cent resettlement of individuals living in physically vulnerable locations. Lastly, it includes time-sensitive targets for access to infrastructure and resources during and after extreme weather events (including critical government and emergency services, water, local and international transport, power, schools, health services and telecommunications).

3.3.2 Adequacy and effectiveness of adaptation planning

The results of the assessment of the adequacy and effectiveness of adaptation planning are discussed below. Table 3.2 provides an overview of the results for all 196 Parties. Furthermore, given the acute vulnerability of Least Developed Countries (LDCs) and Small Island Developing States (SIDS) to the impacts of climate change, the table also disaggregates the results for these groups. Figure 3.4 provides a comparison with the situation in 2020.

COMPREHENSIVENESS

More than two-thirds of countries identified a set of adaptation options within their identified priority sectors, a 15 per cent increase on the 2020 analysis. The analysis of available reporting has shown that 23 per cent have adaptation measures that partially matched their identified priority sectors.[11] A total of 9 per cent of countries either did not address adaptation options that link to key priorities within their assessments or did not address any adaptation options in the documents reviewed. This is a 15 per cent reduction on the 2020 analysis.

INCLUSIVENESS

Compared to 2020, the number of countries addressing stakeholder engagement in their reports has increased by 22 per cent. As of 5 August 2021, about 70 per cent of countries have developed their adaptation plans through consultations with a broad range of stakeholders. The stakeholders involved included different government levels, non-governmental and sectoral organizations, research institutes and the private sector. Out of 70 per cent of countries identified as developing adaptation plans through stakeholder consultations, 71 per cent (50 per cent of all countries) provided details on their stakeholder consultation process, which included aspects such as identifying and informing relevant stakeholders in all key sectors, organizing participatory stakeholder workshops or elaborating on the process to involve different relevant stakeholders through a coordinating body.

In terms of gender considerations in adaptation planning, the growth rate is even higher (40 per cent). This is mainly due to the considerable number of new and updated NDCs submitted to the UNFCCC Secretariat since October 2020. According to the documents reviewed, 73 per cent of countries highlighted the importance of integrating gender considerations into adaptation planning. This represents a significant increase from the previous analysis, which found that 52 per cent of countries were integrating gender considerations into their planning, suggesting that they are taking swift action on the imperative of following a gender-responsive approach. The way countries report on gender considerations continues to vary considerably, from generally emphasizing the imperative of enhancing gender equality in their adaptation planning to aligning their approaches to gender responsiveness with the relevant provisions of the enhanced gender action plan (box 3.3).

11 A partial match refers to plans that identified adaptation measures for some or the majority of vulnerable/priority sectors but not for all within the document reviewed.

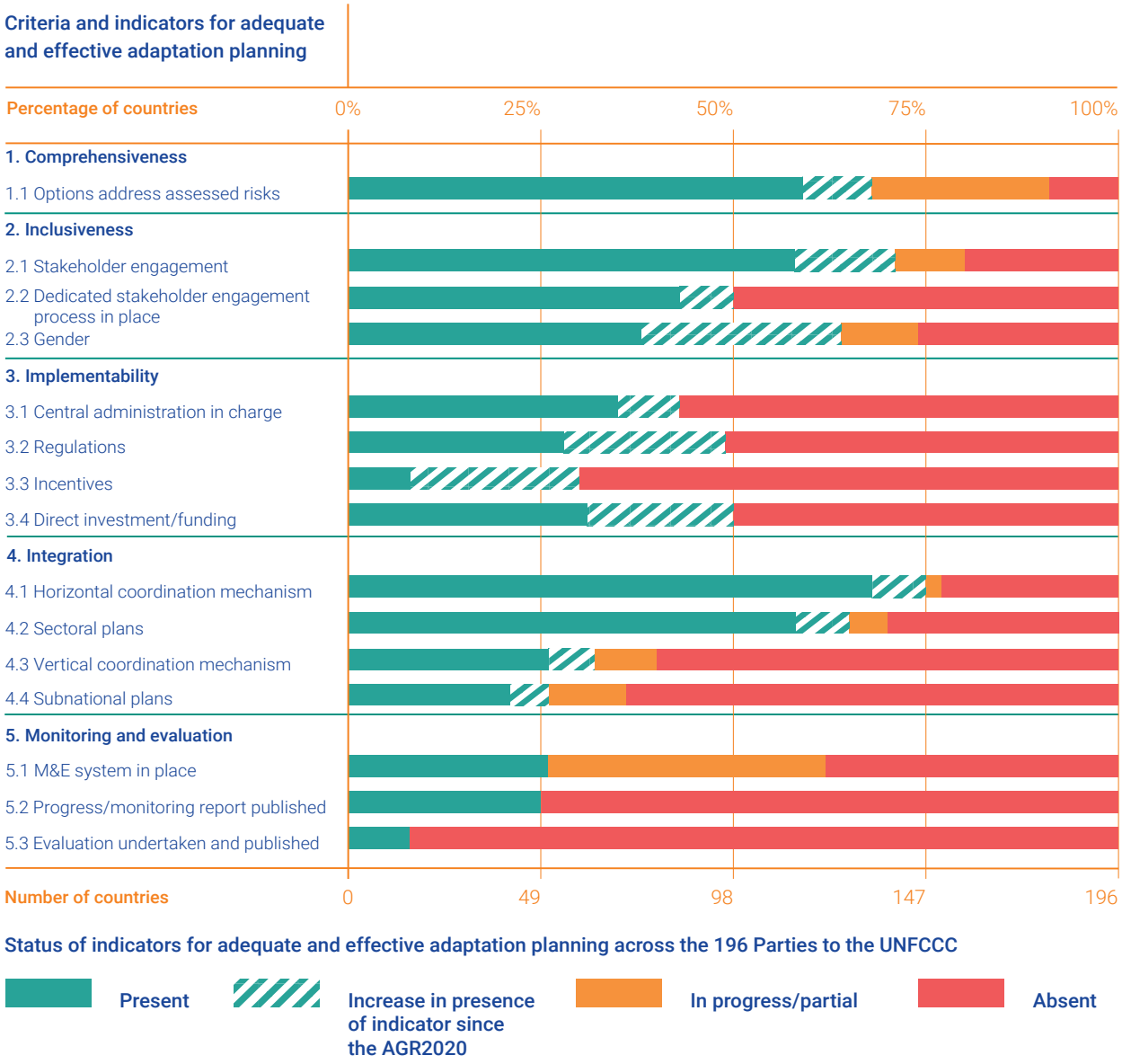
Table 3.2 Adequacy and effectiveness of adaptation planning globally and in LDCs and SIDS[a]

		Percentage of all 196 Parties		Percentage of LDCs		Percentage of SIDS	
		2021	2020	2021	2020	2021	2020
National plans/strategies	In place (in progress)	79% (9%)	72% (9%)	72% (15%)	64% (11%)	82% (8%)	80% (5%)
Planning is adequate due to:							
Addressing climate risks	Comprehensively (partially)	68% (23%)	59% (22%)	59% (28%)	62% (21%)	74% (23%)	75% (22%)
Inclusively engaging stakeholders and incorporating gender considerations	Engaging stakeholders (in progress)	70% (9%)	43% (15%)	67% (11%)	36% (13%)	79% (10%)	40% (15%)
	Incorporating gender considerations	73%	52%	78%	74%	79%	65%
Planning is effective due to:							
Catalysing implementation through institutions and policy instruments	Central administrative body in place	43%	35%	41%	32%	29%	18%
	At least one policy instrument in place	71%	48%	57%	43%	61%	47%
Integrating adaptation across sectors/levels	Sectoral plans in place (in progress)	65% (5%)	58% (6%)	67% (4%)	57% (9%)	61% (5%)	55% (5%)
	Horizontal coordination in place (in progress)	75% (2%)	68% (4%)	80% (0%)	72% (0%)	71% (5%)	65% (5%)
	Subnational plans in place (in progress)	26% (10%)	21% (9%)	13% (6%)	11% (4%)	3% (11%)	0% (5%)
	Vertical coordination in place (in progress)	32% (8%)	26% (8%)	30% (4%)	23% (2%)	13% (8%)	10% (5%)
Featuring a framework for monitoring and evaluation (M&E)	M&E framework in place (under development)[b]	26% (36%)	33% (11%)	15% (46%)	30% (13%)	16% (37%)	23% (10%)

a The LDC and SIDS categories are not mutually exclusive: some countries form part of both groups. In 2020, there were 47 LDCs. In December 2020, Vanuatu graduated from the category, reducing the number to 46 in 2021 (United Nations 2020). There are 38 SIDS.

b The methodology for scoring this indicator has changed since 2020. As such, direct comparisons should be avoided.

Figure 3.4 Adequacy and effectiveness of adaptation planning in 2021



Note: The changes in the M&E indicators (5.1–5.3) are not shown because the scoring methodology has changed since 2020.

In some cases, countries also describe efforts to engage particular groups of stakeholders in their adaptation planning, including indigenous peoples and local communities. This follows from the acknowledgement of the Parties, in article 7.5 of the Paris Agreement, that adaptation action should be based on and guided by aspects such as traditional knowledge, the knowledge of indigenous peoples and local knowledge systems. In addition to consulting indigenous peoples and local communities while producing their plans and commitments, there are also examples of countries making reference to supporting indigenous-led solutions and better reflecting that leadership in climate plans, as well as strengthening the capacity of institutions to integrate indigenous and local knowledge in vulnerability and adaptation assessments.

IMPLEMENTABILITY

A total of 43 per cent of countries report having put in place a central administrative body to oversee adaptation policymaking and implementation, while the remainder have not done so. This represents a slight increase from the previous analysis in 2020, which reported that only 35 per cent of countries have such a body in place. Common institutional barriers and enablers related to adaptation planning and implementation for both developed and developing countries include institutional coordination and key actors, advocates and champions, initiating mainstreaming and sustaining momentum for adaptation. A central administrative body that is primarily responsible for adaptation can therefore help bolster the effectiveness and continuity of adaptation planning.

Box 3.3 UNFCCC Gender Action Plan

At COP 25 in 2019, the Parties agreed a five-year enhanced Lima work programme on gender and its gender action plan to promote gender equality and enhance the implementation of gender-related decisions and mandates in the UNFCCC process. Parties were invited to submit information on efforts to implement the gender action plan in their national reporting under the UNFCCC process.

Countries are increasingly integrating gender-responsive approaches into adaptation planning by using gender-disaggregated data and gender analysis to identify gaps and needs, as well as developing targets and measures to enhance gender equality and monitoring progress in gender-responsive budgeting, planning and implementation. Examples include:

- The updated NDC of Cabo Verde contains additional detail on measures for climate-empowering women and reducing their vulnerabilities, such as setting a target of increasing the female employment rate to at least 40 per cent in the marine and coastal sector by 2030 (Cabo Verde 2021).
- Canada continues to advance gender equality and gender-responsive climate policy development and action at the national and multilateral levels. Its latest climate plan included a gender analysis to ensure gender equality in existing policies and programmes and the development of new ones (Canada 2021a; Canada 2021b).
- The Marshall Islands committed to include enhanced gender-responsive actions and investments in its NAP (Marshall Islands 2020).

Since 2020, there has been a notable increase in the application of the various instruments to ensure the effectiveness of the different adaptation plans and policies. Almost 100 countries have added at least one policy instrument compared to 2020. Half the countries have set aside financial resources to support their identified adaptation options, including through direct funding or budget allocations, a significant increase from the 31 per cent mentioned in the 2020 edition of the AGR. Countries are continuing to make progress in costing their adaptation options, including as part of the development of NDCs and NAPs, and investing domestic resources in adaptation, though there continues to be significant needs for international support in the form of finance, technology transfer and capacity-building, as the most recent NDCs submitted by Parties to the UNFCCC have made clear (UNFCCC 2021).

Around half of countries are now making use of regulatory instruments such as standards and obligations, building codes, zoning/spatial planning and disclosure obligations. Moreover, almost a third include incentives such as taxes or subsidies to encourage adaptation action. Yet, around a quarter of countries do not apply any of those instruments to enhance the implementability of their adaptation plans.

INTEGRATION

Currently, 75 per cent of countries report having horizontal coordination mechanisms in place, such as, interministerial committees. This is an 11 per cent increase in established mechanisms, compared to the 2020 analysis. Additionally, 32 per cent have vertical coordination mechanisms in place, such as a national committee, working group or other body related to adaptation, with representatives from different governance levels. This is 22 per cent higher than found in the previous analysis. Lastly, at least 8 per cent of countries are in the process of establishing vertical coordination mechanisms.

Countries are also advancing horizontal and vertical integration through sectoral and subnational plans. Around 65 per cent of countries have one or more stand-alone sectoral plans in place that address climate change adaptation,[12] while at least 5 per cent of countries are developing such plans. While these figures are limited to stand-alone plans, in many cases countries have also embedded sectoral plans within overarching national-level ones. Furthermore, 26 per cent of countries mention at least one subnational plan in place[13] and an additional 10 per cent of countries noted that such plans are in progress.

MONITORING AND EVALUATION

Some 26 per cent of countries have dedicated monitoring and evaluation (M&E) systems for adaptation in place, with a further 36 per cent in the process of developing such a system.[14] A quarter of countries have published an M&E-related progress report while only 8 per cent of countries have already undertaken an evaluation of their adaptation plans. This limits opportunities for learning and revising adaptation planning to make it more adequate and effective.

12 This includes adaptation plans devised for a given sector, but also other sectoral plans that countries reference as contributing to their adaptation goals and objectives.

13 Subnational refers to any jurisdiction below the national level, encompassing states and provinces but also cities. However, the figure only captures plans referenced in national reports and thus underestimates the true scale of subnational planning, which is also being advanced through networks such as C40 Cities, 100 Resilient Cities and the Global Covenant of Mayors.

14 The methodology for scoring this indicator has changed since 2020, meaning direct comparisons should be avoided.

Photo: © CCAFS

This is among the lowest scores in the analysis, which is likely due to the various challenges associated with designing and implementing M&E systems for adaptation, such as a lack of standard best practice methodologies and the difficulty of attributing outcomes to specific adaptation interventions (Christiansen *et al.* 2016; Bours, McGinn and Pringle 2014). Indeed, as with the 2020 analysis, countries continue to reference these challenges and stress that additional resources and capacity-building are required to overcome them and develop effective and sustainable M&E systems.

ADAPTATION PLANNING IN LDCS AND SIDS

The Paris Agreement recognizes that LDCs and SIDS are particularly vulnerable to the adverse effects of climate change and have significant capacity constraints (articles 9.4 and 11.10). To understand how these countries are progressing with adaptation planning in the face of these challenges, the analyses mentioned above have been disaggregated into SIDS and LDCs (table 3.2). These results show that, while SIDS and LDCs are performing on par with the global average in most areas, in other areas (for example, subnational plans, M&E, policy instruments and – in the case of SIDS, vertical coordination and central administrative bodies as well), they are lagging behind by 10 per cent or more. In some cases – such as subnational plans and vertical coordination – these indicators may be of slightly less importance in smaller countries like SIDS. Stakeholder engagement is the one area in which SIDS significantly outperform the global average. Overall, however, it is clear that SIDS and LDCs continue to require support to advance their adaptation planning.

3.4 Conclusion and outlook

Around the world, countries continue to make progress in establishing adaptation plans, strategies and laws at the national, subnational and sectoral levels, and in taking steps to bolster the quality of these instruments. While the widespread disruption caused by the COVID-19 pandemic may have weakened this progress in some cases (chapter 6 provides an analysis on the emerging consequences of the pandemic on national adaptation planning), it is not yet possible to draw decisive conclusions regarding its impact on global adaptation planning.

Nonetheless, it is clear that countries remain committed to developing new adaptation plans, strategies and policies to meet their evolving needs, and to improving these instruments so that they are better equipped to enhance their adaptive capacity, strengthen their resilience and reduce their vulnerability to the impacts of climate change. Indeed, as compared with the baseline analysis in AGR2020, this chapter shows progress both in terms of the number of plans and their adequacy and effectiveness. With the exception of M&E, for which a direct comparison is not possible due to the change in scoring methodology, this analysis reflects progress in all indicators on both the status of adaptation planning and its adequacy and effectiveness. While, in most cases, this progress has been incremental, there are areas, such as the field of gender, where there has been a large boost in progress.

At the same time, significant gaps remain with respect to vertical coordination mechanisms, subnational plans, central administrative bodies for adaptation and M&E. Countries and other stakeholders should therefore redouble their efforts in these areas, including support in particularly challenging areas, such as M&E, in order to put themselves and the world on a path towards adequate and effective adaptation planning. However, the ultimate test of this adequacy and effectiveness will be whether these plans are implemented and, in turn, whether this implementation reduces risk and vulnerability and bolsters resilience and adaptive capacity (chapter 5 discusses implementation in further detail).


4

Chapter 4

Global progress on adaptation finance

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Key messages

- Since the 2020 edition of the Adaptation Gap Report (AGR), there have been some new estimates of the costs of adaptation for developing countries, reporting higher figures than earlier studies. There are also new estimates of adaptation finance needs from some updated Nationally Determined Contributions and National Adaptation Plans, which report higher estimates for many countries.
- This new evidence indicates potentially higher adaptation costs and financing needs than indicated in previous AGRs. This emerging evidence requires a detailed updated stocktake of the costs of adaptation and finance needs.
- The costs of adaptation, and thus adaptation finance needs, will be much lower if the goals of Paris Agreement are met.
- While there has been a trend of gradually increasing international public adaptation finance to developing countries in recent years (up to 2019), adaptation finance flows are projected to decline as a result of the COVID-19 pandemic.
- Although final data still need to be prepared and analysed for 2020, unless it shows an increase in climate finance of 26 per cent between 2019 and 2020 (compared to just 2 per cent between 2018 and 2019), the US$ 100 billion target for 2020 will not have been met.
- There have been positive trends in the emergence of new instruments, actors and approaches to scale up adaptation, including in the private sector. These include opportunities to leverage private-sector investment with public finance. However, due to the barriers to private finance and the public intervention or finance needed to overcome these, the rate of upscaling remains slow. Furthermore, private-sector investment will be uneven across countries and sectors and is unlikely to target the most vulnerable.
- The available evidence has limitations but suggests that estimated adaptation costs, and likely adaptation financing needs in developing countries, are five to ten times greater than current international public adaptation finance flows.
- The evidence suggests that the gap is larger than indicated in the AGR2020 and is widening for two reasons. First, new bottom-up evidence indicates higher estimated adaptation costs/needs. Second, known finance flows seem broadly stable or may even be decreasing.
- There remains an urgent need to scale up and further increase international public adaptation finance, for both direct investment and for overcoming barriers to private-sector adaptation.

4.1 Introduction

The adaptation finance gap has been defined as the difference between the estimated costs of meeting a given adaptation target and the amount of finance available to do so (UNEP 2014). In practice, this is a simplification: estimating the finance gap is challenging, both in conceptual and quantitative terms (UNEP 2016a). Furthermore, while a common monetary metric helps to define the adaptation finance gap, it is important to note that finance is a means rather than an end: the availability of funds does not guarantee that they will be used efficiently and effectively.

This chapter provides an update on the adaptation finance gap for developing countries (defined as the non-Annex I countries under the United Nations Framework Convention on Climate Change [UNFCCC][1]), as reported in previous

1 This refers to countries that have ratified or acceded to the UNFCCC that are not included in Annex I to the Convention. The industrialized countries listed in Annex I to the Convention includes the 24 original Organisation for Economic Co-operation and Development (OECD) members, the European Union and 14 countries with economies in transition. The List of Parties to the Convention is available at www.unfccc.int/process/parties-non-party-stakeholders/parties-convention-and-observer-states.

Adaptation Gap Reports (AGRs) (UNEP 2014; UNEP 2016a; UNEP 2016b; UNEP 2018; UNEP 2021). It has reviewed the evidence base on the estimated costs of adaptation, including recent studies, and also considered the emerging estimates of country adaptation needs from National Adaptation Plans (NAPs) and Nationally Determined Contributions (NDCs). This provides an updated view on the potential costs of adaptation. It has also reviewed the latest data on global adaptation finance flows. This allows, in theory, a comparison of finance flows against the estimated adaptation costs, and thus makes it possible to determine the potential size of the adaptation finance gap (and whether this is changing) in developing countries. However, the analysis of both adaptation costs and finance flows is very challenging (UNEP 2016a; UNEP 2021). In this respect, this chapter provides insights rather than new numbers. Finally, it provides an update on the opportunities and progress to bridge the gap and discusses new insights since the 2020 edition of the AGR (UNEP 2021).

4.2 The costs of adaptation and adaptation finance needs

Previous AGRs have reviewed the evidence base for the costs of adaptation in developing countries, concluding that there is no definitive estimate for the (global) costs of adaptation, not least because there is no agreed (quantitative) adaptation target. The wide range of cost estimates in the literature reflects major differences in targets, future scenarios, methods, assumptions, coverage (sectors and impacts), investment periods, uncertainty and the costs of implementation.

A key challenge is uncertainty. Future climate change varies with future emissions scenarios (for example, a global temperature rise of 2°C or 4°C by end of century, relative to pre-industrial levels) and the uncertainty around climate model outputs for a given scenario (for example, wetter or drier climate projections). Different scenarios and models lead to different impacts of climate change, and thus different adaptation costs. This leads to a large possible range of values, making proactive and planned adaptation difficult in practice, since it requires decision-making under conditions of uncertainty and changes the options and costs compared to analyses of adaptation for a single, precisely defined future. The amount of adaptation needed (and thus its total cost) also depends on the level of benefits that adaptation delivers (that is, its effectiveness), which also varies with the objectives.

A further issue is whether countries' existing adaptation deficits are included in the estimated cost of adaptation. This deficit is defined as the adverse impacts of natural (that is, non-human-induced) climate variability and extremes (for example, from periodic floods that already happen, rather than those arising due to human-induced climate change). This deficit is often large in developing countries. While the existing adaptation deficit is not primarily caused by climate change, future adaptation will be less effective and will involve higher costs if it is not addressed first. There are also issues regarding whether these deficits are included in country estimates of adaptation finance needs.

4.2.1 Global costs of adaptation in developing countries

The AGR2016 (UNEP 2016a; UNEP 2016b) estimated that the annual costs of adaptation in developing countries could be between US$ 140 billion and US$ 300 billion by 2030. Moreover, with increasing levels of climate change, the annual cost was projected to increase to between US$ 280 billion and US$ 500 billion by 2050.[2] The figures reflect low and high future emissions scenarios (approximately 2°C and 4°C pathways by the end of the century, relative to pre-industrial levels), therefore, the costs of adaptation are projected to be much lower if the Paris Agreement goals are met. These estimates were compiled from a combination of global integrated, global sectoral, and national studies and must only be considered as indicative (discussion on the challenges of estimation is included in Annex 4.A [online]). This range of estimates was reported in subsequent AGRs (UNEP 2018; UNEP 2021).

Since the AGR2016, which had a special focus on finance, there have not been any major new global assessments nor re-analysis and synthesis of the evidence on the global costs of adaptation in developing countries. There are, however, some new studies that shed new light on the previous AGR estimates. This section summarizes the findings of a rapid review of new estimates. Additional details and references are provided in Annex 4.A (online) of this chapter.

A first key insight is that recent estimates of the economic impacts of climate change are generally higher than reported in earlier studies, both in the near-term under ambitious mitigation scenarios and later in the century under higher warming scenarios. This includes updated values from existing integrated assessment models, which indicate substantially higher impacts (for example, Nordhaus 2017; Chen *et al.* 2020). It also includes estimates from other modelling methods, including from computable general equilibrium models (for example, Kompas, Pham and Che 2018; Bosello *et al.* 2021), and econometric-based studies (Burke, Hsiang and Miguel 2015; Burke, Davis and Diffenbaugh 2018). The latter report much higher values because of the consideration of climate change impacts on growth rates as well as output. Implicitly, if the economic impacts of climate change are higher than previously anticipated, all other things being equal, the costs of adaptation are also likely be higher (or otherwise there will be higher residual damage

2 Note that updating to current (2020) prices, these values are now equivalent to between US$ 155 billion and US$ 330 billion annually by 2030, rising due to between US$ 310 billion and US$ 555 billion by 2050.

after adaptation). To illustrate this, the higher sea-level rise projected in the recent Intergovernmental Panel on Climate Change (IPCC) AR6 report (IPCC 2021) would be expected to lead to increased costs of sea defences (to maintain similar levels of protection or to deliver the optimal level of adaptation), although the economic benefits of adaptation would also be higher. It also highlights that strong mitigation action is indispensable to reduce adaptation costs and residual damage in the long term (Chapagain *et al.* 2020; Estrada and Botzen 2021; Iizumi *et al.* 2020; Markandya and González-Eguino 2019).

A second insight is that the estimated costs of adaptation in many national and sector studies are also increasing, as compared to earlier studies. For example, a recent estimate of the global costs of adaptation for developing countries, based on a compilation of national studies using a similar approach to the AGR2016 (UNEP 2016b), indicates costs in a similar range to those found in this report but with higher adaptation costs in high-emissions scenarios after 2030 (Chapagain *et al.* 2020). Similarly, a study using global integrated assessment models estimated adaptation costs in line with the upper estimates in previous AGRs (Markandya and González-Eguino 2019). Findings from sectoral studies also indicate similar trends. There have been several studies of the global costs of coastal adaptation (Nicholls *et al.* 2019; Schinko *et al.* 2020; Tiggeloven *et al.* 2020; Brown *et al.* 2021; Tamura *et al.* 2019). These studies report costs that are significantly higher than earlier estimates, even when using the same models. This is due to rising sea level projections and higher estimated costs from maintenance but also updated socioeconomic change scenarios. Similar findings emerge for other sectors, for example for river flood adaptation (Ward *et al.* 2017), the water sector (Straatsma *et al.* 2020) and the agricultural sector, (Iizumi *et al.* 2020; Baldos, Fuglie and Hertel 2020). This new evidence reinforces the AGR reported range of estimated adaptation costs and plausibly suggests a higher upper estimate, although more detailed systematic analysis is needed to confirm this.

On the other hand, there is growing evidence – at least in the short-term – that there are many low-cost adaptation interventions – so called no-regret and low-regret options (Global Commission on Adaptation 2019) – with high benefit-to-cost ratios. These include, for example, weather and climate services, sustainable soil and land management options, water efficiency and capacity-building. This highlights the incentives to act early and start scaling up adaptation, while recognizing that more major investment will be needed in the medium term and beyond, as these low-regret actions do not deliver more transformational adaptation. This early action is particularly important because the lags in the climate system mean that the largest benefits of mitigation will be from 2040 (Estrada and Botzen 2021) and most of the impacts projected for the next two decades can only be reduced by adaptation.

Overall, the new evidence reinforces the estimates presented in the AGR2016 but indicates that these could be towards the higher end of the ranges, especially if the Paris Goals are not met. Given the new evidence that is emerging, a more detailed stocktake of the costs of adaptation is now required and it is thus recommended that a more comprehensive cost assessment is undertaken in line with the approach from the AGR2016.

4.2.2 Adaptation finance needs in developing countries

A further indication of the costs of adaptation for developing countries is provided by the costs/finance needs reported in countries' domestic adaptation ambitions, submitted to the UNFCCC in the form of NDCs and NAPs. The submission of updated NDCs means this is a rapidly evolving area and this chapter has reviewed updates submitted up to the end of July 2021.

The review found that 58 developing countries (specifically non-Annex I countries, the focus of this chapter) include estimates of adaptation financing needs in their latest NDCs and NAPs. These are generally not based on detailed technical analyses and use a range of methods, making them difficult to aggregate or compare, both with each other and against the costs of adaptation reported above. The costs indicated in these political documents should be interpreted with care for various reasons: (i) their level of precision varies considerably; (ii) NDC implementation periods vary; (iii) estimates are partial (covering only limited numbers of sectors); and (iv) there is no clear differentiation of the adaptation deficit versus the adaptation gap (Pauw *et al.* 2020). As a result, there is a large variation in estimated costs among countries. Nevertheless, these cost estimates are relevant to the international community because many developing countries make their NDC implementation conditional on international support (ibid.). There may be benefits to encouraging a more rigorous analysis of adaptation finance needs in NDCs. This will help recognize the issues above and help convert the estimates into bankable projects and pipelines that consider potential financing, including from public, private and public–private partnerships.

The indicative financing needs for these 58 countries total around US$ 70 billion per year for 2020–2030. Extrapolation of these NDC and NAP estimates using per capita costs and population estimates (demand-side adaptation finance needs) to all developing countries – while being highly indicative – would increase the estimate to US$ 250 billion per year by 2030 (Chapagain *et al.* 2020). This is at the upper range of the costs of adaptation from modelling studies reported in previous AGRs (US$ 140 billion to US$ 300 billion per year by 2030) but many NDCs do not clearly separate financing the adaptation deficit from future climate change.

Some countries have updated their adaptation finance needs in their updated NDC submissions. A comparison of original and updated NDCs indicates that adaptation finance

needs for these countries have increased. For example, the Dominican Republic, Cambodia, Guinea and Mongolia revised their NDCs and report significantly higher adaptation financing needs compared to their initial submission. A clear reason for this increase is the incorporation of more sectors in the adaptation plan.

The sectoral distribution of adaptation finance needs is shown in figure 4.1. The figure is based on a subset of 26 NDCs and NAPs that provide sectoral estimates. These needs are from studies that use different approaches and methods (as discussed above) but that nonetheless provide useful information. The analysis shows that the reported needs are highest in the agriculture and infrastructure sectors, followed by water, and then disaster risk management. These four sectors cover over 75 per cent of adaptation finance needs that have been communicated. However, this sectoral distribution may be influenced by a larger proportion of African countries in the sample, where economies are highly dependent on natural resources.

Further estimates of adaptation finance needs for developing countries will be published later in 2021, by the UNFCCC Standing Committee on Finance in its first report on the needs of developing-country Parties related to implementing the UNFCCC and the Paris Agreement. These estimates were not available in time for inclusion in this edition of the AGR.

Aligned with the recommendation above, it would also be useful to consider the new evidence on adaptation finance needs as part of a more detailed stocktake on the costs of adaptation. This should also assess why needs are increasing, and whether this is due to higher costs, greater coverage or improved assessment methods.

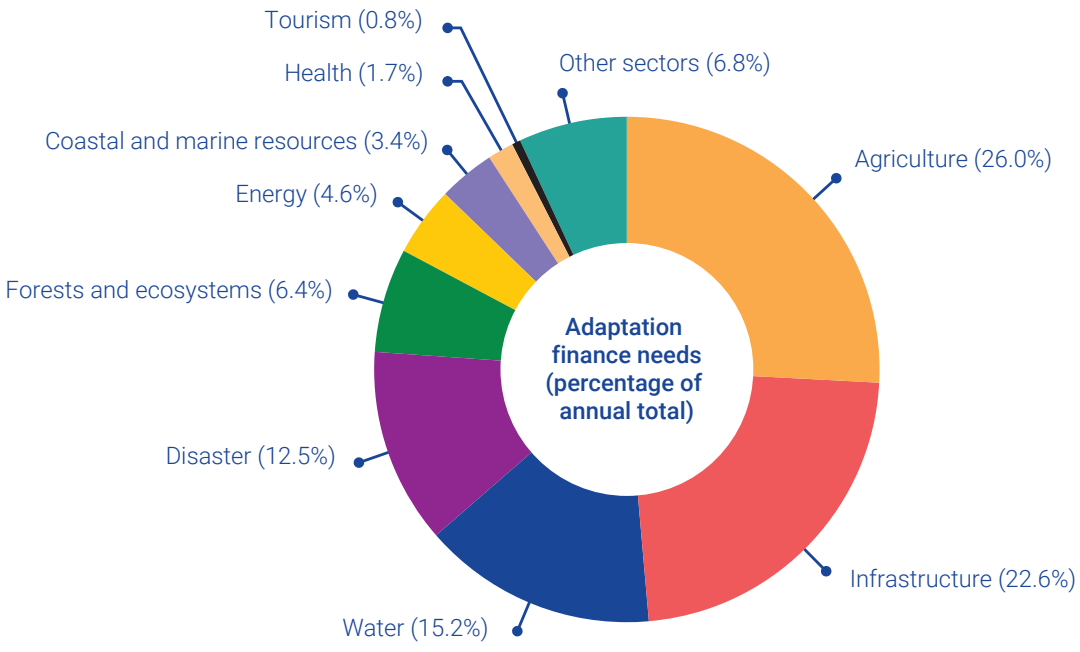
4.3 Financing adaptation: status and progress in adaptation finance flows

This section considers the main channels of adaptation finance for developing countries and how they have evolved over time. It starts with the global estimates and then provides a breakdown by bilateral, multilateral, domestic and private sources. The understanding of adaptation finance flows is heavily constrained by data availability and limitations (see Annex 4.B [online]). There are a number of significant challenges in tracking adaptation finance, including definitions, accounting issues, confidentiality restrictions and a lack of universally accepted impact metrics (UNFCCC 2018; UNEP 2016b; Climate Policy Initiative [CPI] 2020; see also Annex 4.B [online]). These challenges vary depending on the source of finance. International public bilateral and multilateral finance flows are well documented by the Development Assistance Committee (DAC) database of the Organisation for Economic Co-operation and Development (OECD). However, much less data exist on domestic public sector finance and private-sector investments in adaptation (UNEP 2021; UNFCCC Standing Committee on Finance 2018; Weikmans and Roberts 2019; Pauw *et al.* 2016). Details of the specific data sources considered for the assessments used in this chapter are included in the following sections, with more information in Annex 4.B (online).

4.3.1 Global climate-related finance

According to the CPI Global Landscape of Climate Finance 2021 (CPI 2021), global climate finance flows – including public and private flows of both domestic and international origin – were tracked at US$ 632 billion per year for 2019–2020. These global figures do not only concern flows to UNFCCC developing-country Parties (see next section)

Figure 4.1 Adaptation finance needs by sector based on 26 developing countries' NDCs and NAPs with sectoral disaggregation



and they include finance for both mitigation and adaptation. This means they are not comparable with the goal of mobilizing US$ 100 billion by 2020.

The vast majority (US$ 571 billion) of tracked finance flowed to mitigation, with US$ 46 billion for adaptation and US$ 15 billion to cross-cutting themes that include both mitigation and adaptation (ibid.). Adaptation finance gained momentum in 2019–2020, increasing 53 per cent to an annual average of US$ 46 billion from US$ 30 billion in 2017–2018. However, the level still falls far short of estimated needs (Global Center on Adaptation [GCA] 2021) and continues to account for only a minor share of total public climate finance (14 per cent). The majority of this tracked adaptation finance comes from public finance channels (ibid.).

Data for developing countries for 2020 are still emerging. Studies undertaken at the start of the pandemic projected there might be a decrease in finance flows (see also chapter 6), with the potential for a single-digit percentage decline in adaptation finance in 2020 and a potentially larger decline in subsequent years, due to the COVID-19 pandemic (CPI 2021; GCA 2021). This prediction was based on the projected reductions in international development finance, increased debt distress, and slow vaccine roll-out in climate-vulnerable countries (CPI 2021; GCA 2021). These projections need to be compared to the actual figures for 2020 and 2021 once data are available. However, there are a number of factors pointing in the direction of positive long-term growth in adaptation finance, including the increase of adaptation finance over time prior to 2020, the potential for funding towards addressing COVID-19 to include adaptation co-benefits (see chapter 6) and the potential that increasing climate risk disclosure and strengthened accounting frameworks may drive an increase in adaptation finance flows and the capacity to accurately track them.

Data on climate-related finance to developing nations shows an increasing trend in finance flows over time, reaching US$ 79.6 billion in 2019, a 2 per cent increase compared to 2018. However, this falls some US$ 20 billion short of the US$ 100 billion target for 2020 (OECD 2021a). To meet the target, the current trend in climate finance would therefore need to increase from 2 per cent (between 2018 and 2019) to 26 per cent (between 2019 and 2020).

4.3.2 Adaptation finance to support developing countries

Under the UNFCCC, Annex II Parties[3] are required to report on the climate finance that they provide to developing countries. Annex II Parties use various methodologies to track adaptation finance (see Annex 4.B [online]) and some countries have also changed the way they report. This makes it very difficult to compare data over time (Weikmans and Roberts 2019). However, it is clear that the adaptation component of such self-reported finance under the UNFCCC has been growing in recent years, at least before the COVID-19 pandemic.

Some non-Annex II countries also report their adaptation-related finance contributions to the OECD DAC on a voluntary basis. The OECD also tracks multilateral adaptation finance committed by multilateral development banks (MDBs), multilateral climate funds and other international institutions (see Annex 4.C [online]). This mainly includes grants and loans of varying levels of concessionality, equivalent to Official Development Assistance (ODA) and Other Official Flows (OOF), as defined by the OECD (see Annex 4.C [online]).

The Rio Marker and Climate Components methodologies are currently used across the landscape of bilateral and multilateral funders to track and report climate change finance. Except for MDBs, which use Climate Components, all funders use Rio Marker, although both use compatible definitions of climate mitigation and adaptation (OECD 2018). According to the Rio Marker methodology, adaptation and mitigation can be targeted as a "principal" objective (where mitigation or adaptation "is explicitly stated but is not the fundamental driver or motivation for undertaking the activity") or is not be "targeted" at all (OECD 2011). MDBs track and report data on their climate-related contributions following their own Climate Components methodology (European Bank for Reconstruction and Development 2019). Based on this approach, MDBs determine the specific components of a transaction that directly contribute to mitigation, adaptation or both simultaneously.

Self-reporting comes with some limitations. The attribution of financial support is subjective because the judgement and reporting is made by the funders and is not independently verified. The definition of adaptation used by both methodologies leaves room for interpretation and the accounting methods differ (see Annex 4.C [online]). Several studies claim that the self-reporting of donors and the lack of independent quality control result in low data reliability and sometimes substantial overestimations of finance flows (Junghans and Harmeling 2012; Weikmans *et al.* 2017), especially for activities tagged as "significant" (Weiler, Klöck and Dornan 2018). Finally, historical data of loan amounts are reported by the funders at face value, instead of using the grant-equivalent amounts, resulting in overestimates of loan amounts (Oxfam International 2020; Roberts *et al.* 2021). Moreover, financial flows reported include the administrative costs of donors, which in some cases can be high (Atteridge and Savvidou 2020). Regarding gender considerations around equity and justice, although gender-

3 Under the UNFCCC, Annex I Parties include the industrialized countries that were members of the OECD in 1992, plus countries with economies in transition. Annex II Parties (considered here as developed countries) are Annex I Parties that are obliged to provide support to non-Annex I Parties (considered here as developing countries).

responsive public finance is thought to be more effective and efficient (UNDP 2018), funders do not systematically report data on gender. Furthermore, not all financial transactions in the OECD DAC databases are screened against the Rio marker for adaptation, so there may be adaptation-related finance flows that are not captured (Savvidou *et al.* 2021).

Despite the limitations mentioned above, the OECD DAC data provides the most comprehensive and comparable picture on international development finance for climate change (Weiler and Sanubi 2019; Doshi and Garschagen 2020). While it is important to acknowledge that tracking the provision and reporting of finance does not provide much information about efficient or effective use of funds (UNEP 2021), it is necessary for examining the effectiveness of financial contributions (Savvidou *et al.* 2021).

BILATERAL PUBLIC FLOWS

Overall, bilateral flows to developing countries reported to the OECD DAC have increased between 2011 and 2019 (figure 4.2, Panel A). There are substantially higher allocations tagged as significant as compared to principal. Contributions tagged as "principally" targeting adaptation were lower in 2018 and 2019 than in 2017. Although there is no firm evidence on these trends, it could reflect efforts by countries to make their finance flows consistent with climate-resilient development pathways (article 2.1(c) of the Paris Agreement) as part of mainstreaming, which integrates climate adaptation in existing policies, programmes and plans. However, some analyses prior to 2015 did identify over-reporting of adaptation-related finance due to ambiguous definitions (Republic of India 2015) and political motives in reporting by funder institutions (Junghans and

Figure 4.2 Panel A: Adaptation-related bilateral flows to developing countries between 2011 and 2019
Panel B: Share of financial instruments used per year for principal and significant markers

Note: Data represent donor commitments and are in constant US$. Data include both adaptation and cross-cutting finance (22 per cent for activities targeting both adaptation and mitigation). Loans are presented at face value. Data include both Annex II and non-Annex II countries. A full list of funders is provided in Annex 4.C [online]. The contribution of Annex II is over 97 per cent of the totals shown for both the "principal" and "significant" markers.
Source: OECD DAC 2021.

Harmeling 2012, Adaptation Watch 2015). This means that some caution is needed in interpreting the data and trends.

Increased finance for climate change adaptation is a central issue for climate justice (Heffron and McCauley 2018). There is a growing body of evidence indicating that funders are not strategically targeting their adaptation support towards those countries with the greatest vulnerability and needs (Savvidou *et al.* 2021; Weiler and Sanubi 2019; Doshi and Garschagen 2020; Alcayna 2020). The share of total adaptation-related finance committed to the Least Developed Countries (LDCs) for 2011–2019 was 23 per cent for principal and 28 per cent for significant. The Rio Marker methodology allows analysis of the extent to which adaptation finance is gender responsive. Around 60 per cent of bilateral ODA from OECD DAC contributors marked as relevant to adaptation was also marked as supporting gender equality for 2018–2019. Most of this adaptation-related finance (86 per cent) has a significant objective for the gender marker, compared to just 14 per cent for principal (see Annex 4.D [online] for more on gender in adaptation finance). This is despite the approval of the UNFCCC Gender Action Plan at COP23, which includes the use of gender-responsive finance as a core tool for implementation (UNFCCC 2017) and despite the fact that funded programmes taking into account gender dynamics have been found to be more effective and efficient (UNDP 2018).

Most of the finance was earmarked as grants (64 per cent for principal and 73 per cent for significant), with loans being the second-most used instrument (at face value) (figure 4.2, Panel B). Three sectors – agriculture, water supply and sanitation, and general environment protection – received well above 50 per cent of the total finance throughout the period for both "principal" and "significant" markers. To some extent, this aligns with the adaptation finance needs expressed in the NDCs and NAPs of developing countries (figure 4.1). However, basic development sectors such as health, education and others such as disaster prevention and preparedness, and other social infrastructure and services, received negligible amounts of adaptation spending, despite the needs expressed by countries in their development plans (section 4.2.2) as well as their importance in building long-term resilience and adaptive capacity (Atteridge, Verkuijl and Dzebo 2019).

MULTILATERAL PUBLIC FLOWS

Adaptation-related financial flows to developing countries by MDBs exhibited a strong uptrend through to 2019 (figure 4.3, Panel A). Support for adaptation as a share of overall MDB climate finance rose from 10 per cent in 2011 to 39 per cent in 2019 (including 4 per cent for activities targeting both adaptation and mitigation). During the same period, a total of 26 per cent of adaptation-related MDB finance went to LDCs. The two sectors of agriculture, on the one hand, and water supply and sanitation, on the other, account for 36 per cent of finance contributions to adaptation.

The bulk of the increase of commitments to adaptation from MDBs comes from debt instruments, which make up 92 per cent of total commitments for 2015–2019, with just 6 per cent delivered as grants and 2 per cent as equity and shares in collective investment vehicles or unspecified financial instruments (figure 4.3, Panel B).

Adaptation finance flows from multilateral climate funds are also presented in figure 4.3 (Panel B). Multilateral climate funds have a critical role to play in the adaptation-related finance landscape, given their exclusive focus on supporting climate change objectives. In contrast to MDBs, multilateral climate funds use a higher proportion of grants than loans. The total share of grants was 85 per cent for contributions classed as principal and 74 per cent for significant. Notably, from 2011 to 2019, the share of principal contributions to least developed countries from multilateral climate funds increased substantially, from 26 per cent to 63 per cent (figure 4.3, Panel B). The largest proportion of principal adaptation-related finance from multilateral climate funds is for the general environment protection sector (29 per cent for both principal and significant), followed by water supply and sanitation (14 per cent for principal and 17 per cent for significant).

PRIVATE FLOWS

So far, few biennial reports by Annex II Parties have reported on the private climate finance that they mobilized through public interventions. The UNFCCC Standing Committee on Finance and OECD data show that mobilized private-sector finance has varied between 17 and 27 per cent of all climate finance for developing countries (Bhattacharya *et al.* 2020). The total amount of mobilized private finance has been relatively stable from 2017 to 2019, with an annual average of US$ 14.4 billion (OECD 2021b). However, the majority of private finance mobilized by public climate finance in developed countries benefits mitigation activities (93 per cent for 2016–2018) (OECD 2020). However, the OECD has observed that there is room for improvement in identifying adaptation-relevant activities within mobilized private finance data sets. Tracking mobilized private adaptation finance is expected to remain challenging.

Despite private-sector flows to adaptation remaining limited and being challenging to track, there is considerable innovation in this area, increasing the potential for private-sector finance to play a larger role in closing the adaptation finance gap. In summary (Annex 4.E [online] provides a review of new developments), there are now examples of the use of private investors and financial markets to raise adaptation finance, for example, with green and resilience bonds (debt instruments). There is also growing involvement of the private sector in developing and delivering adaptation and a range of new instruments and approaches have been developed to encourage this, incentivized by blending public finance to address barriers and de-risk private investment (for example, seed funding, concessional lending, guarantees and equity). Nonetheless, barriers to private investment in adaptation (information

Figure 4.3 **Panel A:** Adaptation-related multilateral flows to developing countries between 2011 and 2019
Panel B: Share of financial instruments used per year for climate funds (principal and significant markers) and multilateral development banks

Note: Data represent donor commitments and are in constant US$. Data include both adaptation and cross-cutting finance (targeting adaptation and mitigation at the same time). Amounts are presented at face value. Data providers use different methods: MDBs use Climate Components; multilateral climate funds use Rio Marker (Annex 4.C [online]). Multilateral climate funds are the Adaptation Fund, Climate Investment Funds (Strategic Climate Fund), the Global Environment Facility (Least Developed Countries Fund, Special Climate Changes Trust Fund, General Trust Fund), the Green Climate Fund. MDBs included in this data are the African Development Bank, the Asian Development Bank, the Asian Infrastructure Investment Bank, the Caribbean Development Bank, the Development Bank of Latin America, the European Bank for Reconstruction and Development, the European Investment Bank, the Islamic Development Bank, the International Finance Corporation, the Inter-American Development Bank Group, and the World Bank Group.
Source: OECD DAC 2021.

gaps and uncertainty, positive externalities, lack of or low revenues) and the public interventions or finance needed to overcome these mean the uptake and scaling-up of these new instruments remains slow. Furthermore, private-sector investment will gravitate to opportunities where revenues are highest and risks are lowest, meaning it is unlikely to target the most vulnerable in LDCs or non-market sectors. More work is needed to identify where public finance is most needed and most effective in leveraging private finance, as well as where private finance is unlikely to fill the gap.

DOMESTIC FINANCE FLOWS

Domestic budgets are an underexamined but vitally important source of adaptation finance and current data are largely based on case studies. Allan *et al.* (2019) report that for many countries, domestic public finance for climate change (mitigation and adaptation) has in the past exceeded that of international sources. For example, in Ghana, for adaptation, 2 per cent of the total annual budget was climate-relevant between 2014 and 2017. This compares to 3 per cent in Antigua and Barbuda and 8 per cent in both Kenya and Pakistan (Watson *et al.* 2020).

Similarly, 5 per cent of the budget of Nepal is considered as being "highly relevant" to climate change (Nepal 2021). However, countries apply their own definitions and methods and transparency is often low (Watson *et al.* 2020). Furthermore, other aspects of countries' budgets can counteract domestic finance for adaptation by increasing emissions or vulnerability (ibid.).

There is growing recognition of the role fiscal policy can play in building resilience to climate change. This includes taxes, price supports, revenue and expenditure measures that work to reduce, retain or transfer climate-related risks and help build resilience to shocks (International Monetary Fund 2019; World Bank 2019). This is in line with article 2.1(c) of the Paris Agreement, which states that all countries need to make their finance flows consistent with low-carbon and climate-resilient development pathways (Zamarioli *et al.* 2021). However, emerging evidence shows that the COVID-19 pandemic led to tax revenue reductions in many countries. In combination with the needs of governments to reallocate resources towards health or social services, this could cause countries to cut domestic climate finance flows (Caldwell, Alayza and Larsen 2021).

4.4 Progress, outlook and recommendations

This chapter has provided an update on the adaptation finance gap in developing countries. Estimating this gap is challenging but the evidence suggests that the costs of adaptation and reported needs from updated NDCs and NAPs are higher than in previous AGRs. At the same time, this review has found that public finance flows for adaptation have remained broadly stable in recent years and may even have decreased slightly since the COVID-19 pandemic. These two findings suggest that not only is the gap larger than indicated in the AGR2020 but it is also widening. Taken together, the evidence indicates that estimated adaptation costs, and similarly likely adaptation finance needs in developing countries are five to ten times greater than current international public adaptation finance flows, a sizeable finance gap.

While there is some promising innovation to incentivize private-sector and domestic adaptation financing, data on such flows are scarce and there is little evidence to suggest such finance will bridge the adaptation finance gap. Related to this, while there is an upward trend in climate finance, based on current projections (OECD 2021b; Bhattacharya *et al.* 2020), it seems unlikely that the US$ 100 billion target for 2020 has been met, particularly the inferred adaptation component of this target.

The review in this AGR has also found that there is now more evidence on the costs of adaptation, on adaptation finance needs and on finance flows. This makes it timely to undertake a more detailed stocktake and it is recommended that a more comprehensive cost assessment is undertaken in line with the AGR2016. Moreover, there is also more evidence on the benefits of adaptation and its effectiveness, which warrants consideration in such a stocktake, including a more detailed analysis of the potential roles and complementarity of public and private adaptation. Such information would also provide important insights needed for UNFCCC negotiations on future climate finance targets.

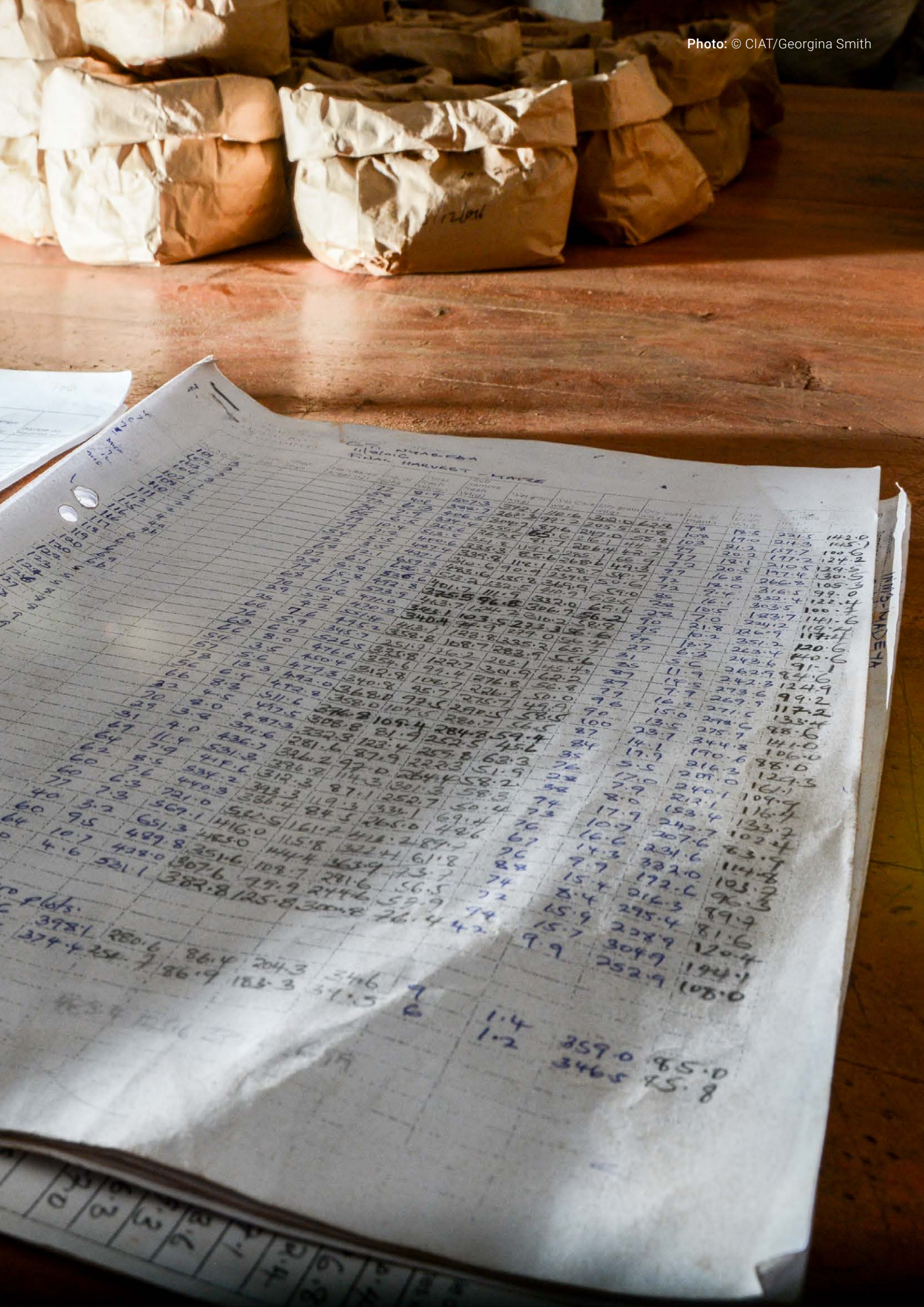


Photo: © CIAT/Georgina Smith


5
BASSE METEOROLOGICAL STATION
U. R. R
LATITUDE 13°32°N
LONGITUDE 14°22°W

Chapter 5

Global progress on adaptation implementation

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A meteorologist at the Basse field station in the Upper River Region of The Gambia, one of nine stations that have been upgraded to become automatic and provide reliable and timely climate information thanks to a project supported by UNEP and its partners. Learn more about this project here.

Photo: © UNEP

Key messages

- In the period between 2010 and 2019, more than 2,600 principal adaptation projects have been funded by the top 10 bilateral donors on adaptation, underscoring the significance of bilateral finance as a driver of adaptation. Furthermore, the number of new principal adaptation projects that started during the latter half of this period is 50 per cent higher than the total number for the preceding five years, illustrating a strong acceleration in adaptation implemented with bilateral support since the adoption of the Paris Agreement in 2015.
- The number of activities marked as principal adaptation by the top 10 donors in the Organisation for Economic Co-operation and Development (OECD) Creditor Reporting System is actually significantly higher than 2,600. However, more than one-third of these activities were not found to meet the OECD criteria for principal adaptation, meaning principal adaptation is being over-reported. This analysis confirms similar findings by civil society organizations and academia.
- Under multilateral adaptation finance, between 1 December 2020 and 30 September 2021, 39 new principal adaptation projects funded by the Adaptation Fund, the Green Climate Fund and the Global Environment Facility were started – an increase of 10 per cent compared with the 397 projects started between 2006 and 2020 (assessed in the 2020 Adaptation Gap Report).
- The sectors prioritized across countries' most recent Nationally Determined Contributions closely match the primary sectors being addressed by projects supported with bilateral and multilateral adaptation funding, with agriculture, water, ecosystems and infrastructure featuring in the top five sectors in each list.
- Evidence assessed in this chapter suggests that implementation of adaptation is unevenly distributed, with certain regions having relatively little evidence to suggest that adaptation is taking place, particularly North Africa, Eastern Europe, Central Asia, the Middle East and parts of South America.
- Data on adaptation outcomes and evidence of risk reduction remains scarce. Less than 2 per cent of the 1,682 scientific journal articles that document implemented adaptation provide primary evidence of risk reduction.
- Poor understanding of contextual drivers of vulnerability, top-down design, limited consideration of future climate risks and unclear success criteria reduce the likelihood of adaptation projects achieving risk reduction. More attention is therefore needed on inclusive project design and implementation to better elaborate the intended adaptation process and prevent maladaptation.

5.1 Introduction

The objective of this chapter is to provide a global assessment of the implementation of adaptation, with a particular focus on developing countries. It provides essential information that would not be apparent from solely focusing on the amount of finance and/or the extent and quality of planning, namely whether adaptation is actually taking place, and where and in which sectors it is happening. In addition, this chapter assesses the available data on results and risk reduction achieved and concludes with recommendations for the design and assessment of adaptation actions.

The assessment of global implementation of adaptation in the 2020 edition of the Adaptation Gap Report (AGR2020) was based on an analysis of project documents from the three funds that serve the Paris Agreement (UNEP 2021a), and on the initial results from the Global Adaptation Mapping Initiative (GAMI), a research initiative that systematically assessed documented adaptation in the scientific literature (Berrang-Ford *et al.* 2021). This year's AGR updates and expands the 2020 analysis by assessing data from the top 10 bilateral adaptation donors over the 10-year period from 2010 to 2019. While it does not capture adaptation being implemented by all actors and has limited coverage of actions in developed countries, this combination of data sources provides one of the most comprehensive global assessments of the extent, location and focus of adaptation actions globally available to date. As such, its findings are directly relevant for the Global Stocktake.

The scope and content of this chapter are complementary to Working Group II (WGII) of the Sixth Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC),[1] which will be published in February 2022. The WGII AR6 will go into detail on key sectors and all geographic regions.

5.2 Scope and data sources

Adaptation actions are undertaken from the local to international level and are carried out by a variety of different actors. At the national level, countries are only just beginning to report on the implementation of their national adaptation plans (Leiter 2021). Consequently, country submissions to the UN Framework Convention on Climate Change (UNFCCC) presently do not provide a sufficient basis for determining the level of implementation worldwide. This chapter therefore uses three comprehensive data sources to obtain an indication of adaptation actions globally:

1. project documents from three funds serving the Paris Agreement (Adaptation Fund [AF], Green Climate Fund [GCF] and Global Environment Facility [GEF]; all adaptation projects until 30 September 2021);

2. Organisation for Economic Co-operation and Development (OECD) statistics on aid activities targeting adaptation to climate change (available for 2010-2019, covering all recipient countries of development aid);

3. implemented adaptation as documented in scientific journals (global coverage, journals indexed in Web of Science, Scopus or Medline, publications between January 2013 and December 2019).

These data sources complement each other and, combined, are able to provide unique insights into the extent and status of implemented adaptation actions globally. However, they do not provide a representative overview of adaptation being implemented across all scales and by all actor groups. Data from the three funds serving the Paris Agreement and OECD statistics, for example, both exclusively provide information about adaptation projects funded by international finance flows and therefore do not capture actions implemented with finance from other sources. As a result, adaptation implemented by actors more likely to operate without this funding (e.g. local or international non-governmental organizations [NGOs], community groups, the private sector and the national governments of developed countries) are likely to be underrepresented. To a certain extent, these actions could be captured by GAMI. However, this would require them to be documented in scientific articles, which is likely to be the exception rather than the rule. Nevertheless, the three data sources used provide longitudinal coverage over 15, 10 and 8 years, respectively, which enables the identification of trends and new developments over time.

Further information about the analysis conducted for this chapter is described in Annex 5.A (online).

5.3 Implemented adaptation actions

5.3.1 Internationally funded adaptation actions

The AGR2020 identified 397 projects primarily aimed at adaptation that were started between 2006 and 2020, funded by the three funds serving the Paris Agreement (AF, GCF and GEF from its Least Developed Countries Fund [GEF-LDCF] and Special Climate Change Fund [GEF-SCCF]). Seven more adaptation projects were started in 2020, and 34 between January and September 2021, giving a total of 437 supported principal adaptation projects. This is an increase of almost 10 per cent since the AGR2020, despite the pandemic. Since 2015, a quarter of new principal adaptation projects have grant volumes above US$ 10 million (table 5.1 and figure 5.1[2]). The number of new adaptation projects that were started in 2020 and 2021 is similar to the number of newly started projects per year in the period from 2015 to 2019. However, this number could have been higher had the pandemic not occurred.

As a new data source, this year's implementation chapter also includes bilaterally funded adaptation projects. Between 2010 and 2019, the top 10 bilateral adaptation donors[3] funded 2,607 principal adaptation projects. Table 5.2 shows the number of newly started projects per year per donor and figure 5.2 shows the development of the total number of projects throughout the decade. The overall trend has been upward except for 2018, when the number of projects funded by the US fell substantially due to the previous administration's position on climate change.[4] This fall was partially offset in 2019 by a strong increase in the number of projects supported by France, Germany and the UK (table 5.2). Despite the drop in 2018, the combined number of new projects started in the last five years of the decade (2015-2019) was 50 per cent higher than for the first five years, which illustrates the strong acceleration in the implementation of principal adaptation projects since the adoption of the Paris Agreement.

1 WGII of the IPCC will prepare the "Impacts, Adaptation and Vulnerability" section of the overall IPCC AR6.

2 The 41 projects include seven projects that were started in 2020, five after the cut-off date of the AGR2020 and two that had not previously been identified.

3 In the order of adaptation finance reported to the OECD, starting with the highest contributors: Japan, Germany, European Union (EU) institutions, France, Netherlands, United States, United Kingdom, Sweden, Switzerland and Korea.

4 The US rejoined the Paris Agreement on 19 February 2021 and the current administration has pledged to quadruple US climate finance compared to its 2013-2016 levels, to over 11 billion per year.

Table 5.1 Number of AF, GCF and GEF principal adaptation projects started since 2006, and number of principal adaptation projects started in 2020 and 2021, as at 30 September 2021

	Total	New in 2020	New in 2021
AF	98	15	6
GCF	68	18	13
GEF-LDCF	172	1	9
GEF-SCCF	76	1	1
GEF – Strategic Priority on Adaptation (SPA) (2004-2010)	22	N/A	N/A
Total	**436**	**35**	**29**

Figure 5.1 Number of new principal adaptation projects per year and size of grant (excluding co-financing) funded by the AF, GCF and GEC-LDCF/SCCF, as at 30 September 2021

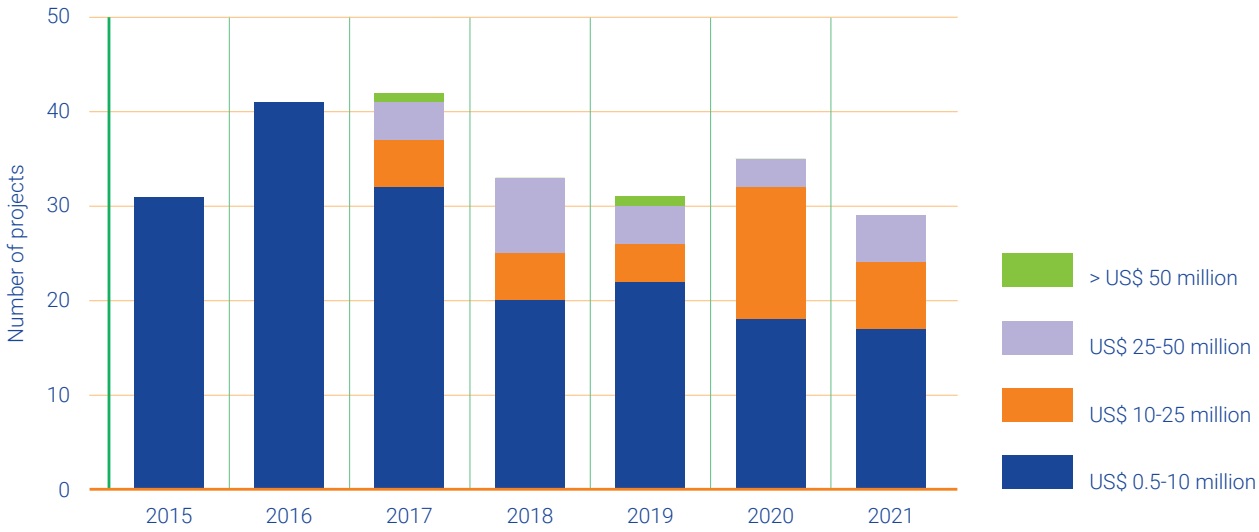
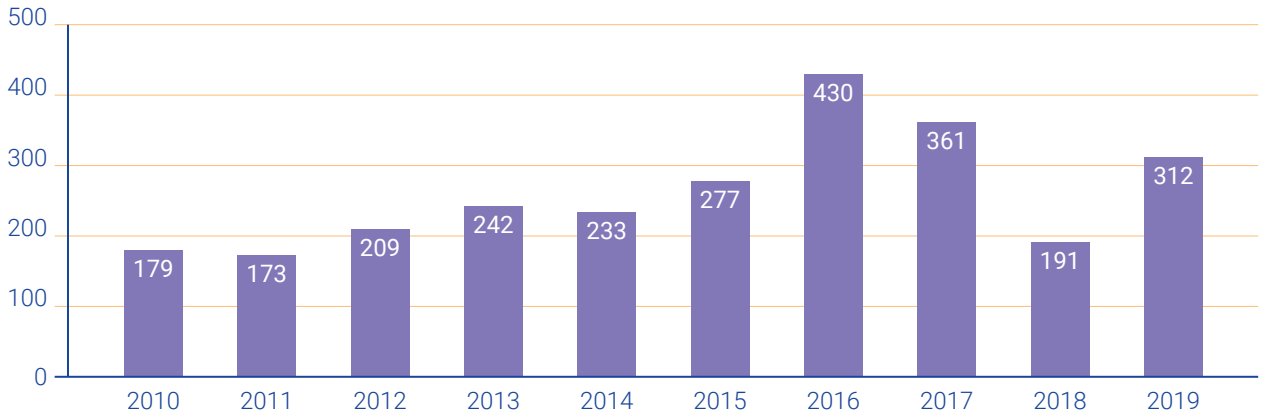


Table 5.2 Number of new principal adaptation projects started per year with funding from the top 10 adaptation donors

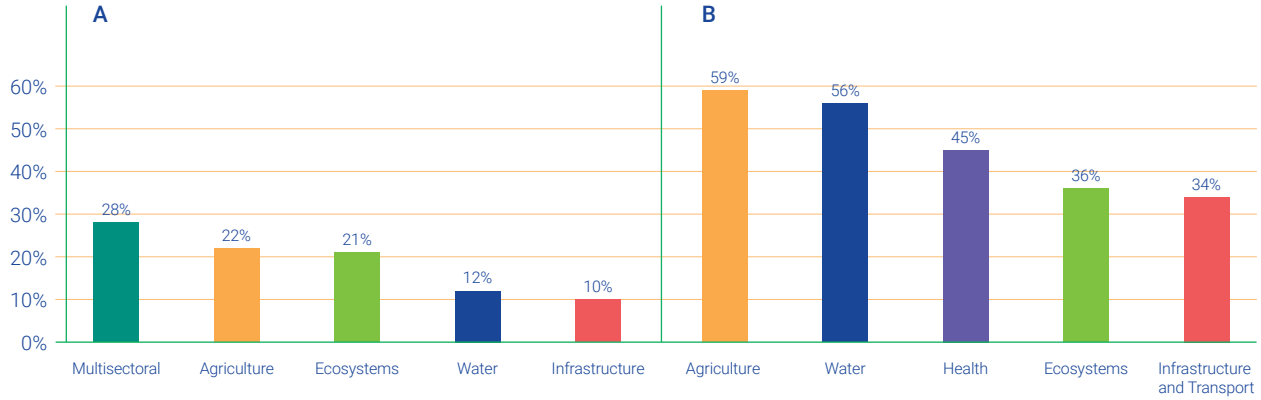
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total per donor
EU institutions	7	15	12	17	3	14	22	29	47	54	220
France	28	14	10	24	27	27	27	30	4	49	240
Germany	5	31	37	41	47	49	55	58	50	91	464
Japan	48	24	26	44	34	29	23	14	9	8	259
Republic of Korea	8	0	3	10	4	4	3	7	12	15	66
Netherlands	2	1	9	2	2	2	5	6	9	11	49
Sweden	6	11	21	2	12	5	21	11	22	5	116
Switzerland	12	15	15	2	12	17	9	10	17	11	120
United Kingdom	25	10	8	29	14	50	20	15	5	53	229
United States	38	52	68	71	78	80	245	181	16	15	844
Total per year	**179**	**173**	**209**	**242**	**233**	**277**	**430**	**361**	**191**	**312**	**2607**

Figure 5.2 Number of new principal adaptation projects started per year with funding from the top 10 bilateral adaptation donors



Note: The term 'principal adaptation project' refers to projects for which adaptation is "fundamental in the design of, or the motivation for, the activity" (OECD 2016).

Figure 5.3 **Panel A:** Primary sectors addressed by bilaterally funded principal adaptation projects between 2010 and 2019
Panel B: Sectors identified as adaptation priorities in countries' most recent NDCs



Note: Sectors are marked in the same colour in both panels to facilitate comparison. The bars in **Panel A** add up to 100 per cent because each project was assigned to just one primary sector. The bars in **Panel B** do not add up to 100 per cent because each NDC mentions multiple sectors. In **Panel B**, each bar shows the percentage of NDCs mentioning a particular sector out of all NDCs (counting the most recent one per country).
Source: Data for Panel B was sourced from Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ 2021).

The number of activities marked as principal adaptation by the top 10 donors in the OECD Creditor Reporting System is actually significantly higher than 2,607. However, more than one-third of the activities were not found to meet the OECD criteria for principal adaptation, which the OECD defines as adaptation being "fundamental in the design of, or the motivation for, the activity" (OECD 2016). This means that principal adaptation is being over-reported, which confirms similar findings by civil society organizations and academia. The numbers reported in table 5.2 are the result of manual screening of the information provided in the OECD database, and therefore do not include projects that were not found to meet the OECD criteria for principal adaptation (see Annex 5.A [online]).

Almost one-third of the bilaterally funded principal adaptation projects address multiple sectors, while 21 per cent focus primarily on agriculture and 20 per cent on ecosystems (figure 5.3, Panel A). A comparison with the priority sectors mentioned in the most recent Nationally Determined Contribution (NDC) of each country (see Panel B) shows a close match, with agriculture, water, ecosystems and infrastructure occupying four of the top five positions each. NDCs mentioning health as a priority sector for adaptation increased in frequency, from 25 per cent of all NDCs with an adaptation component in the first round of (intended) NDCs to 45 per cent of each country's most recent NDC, up to August 2021. This increase is likely due to the increase in awareness of health-related matters caused by COVID-19.

Over the 10-year period, the composition of primary sectors addressed by new principal adaptation projects has remained relatively constant. Agriculture is an exception to this, having increased significantly to an average of almost 25 per cent over the last five years compared to 16 per cent for the period 2010-2014 (figure 5.4). Water as the primary

Figure 5.4 Composition of primary sectors addressed by new principal adaptation projects per year

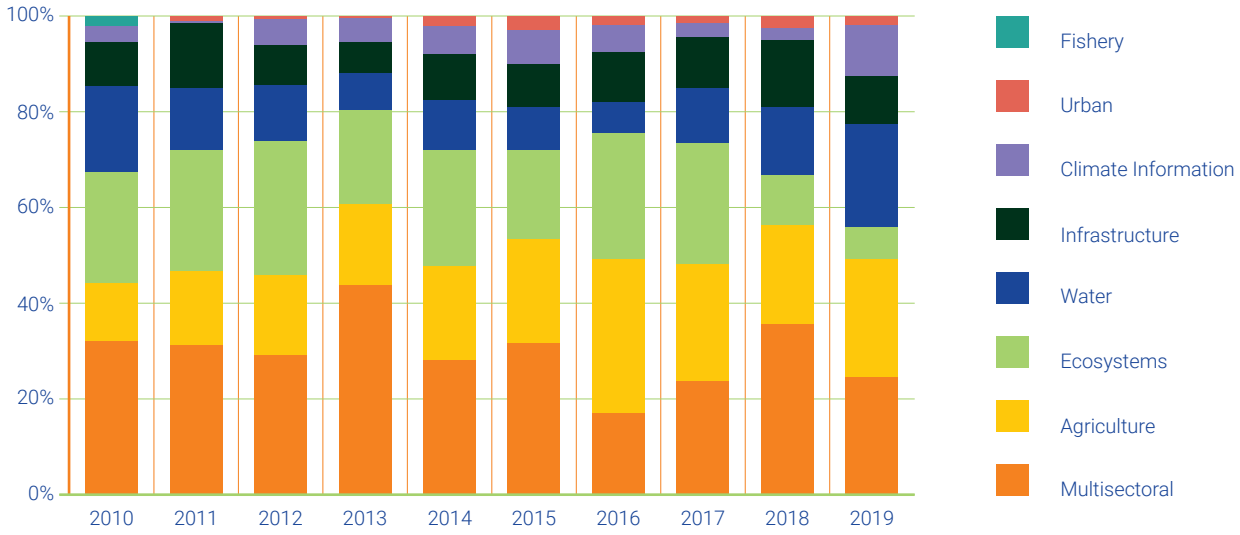
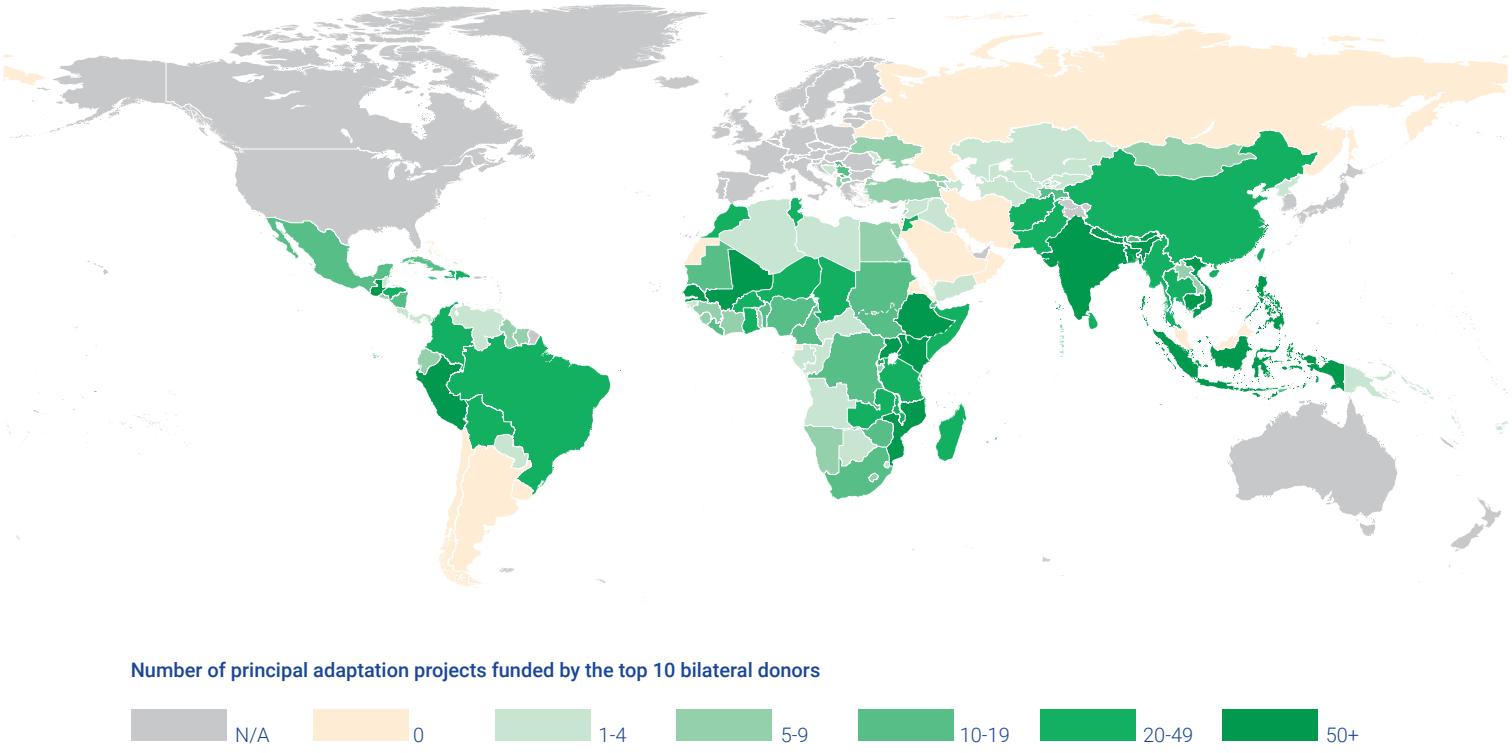
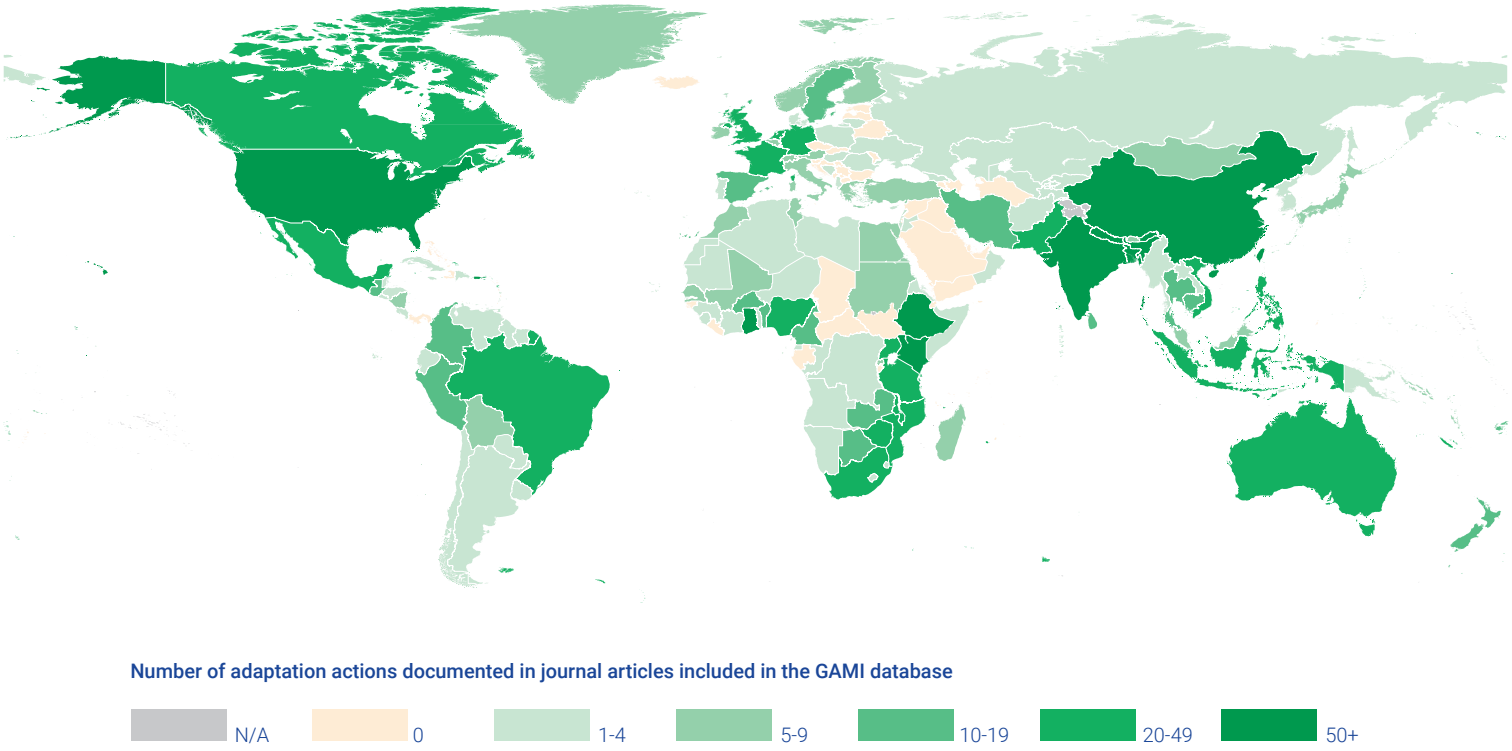


Figure 5.5 Geographic distribution of principal adaptation projects funded by the top 10 bilateral donors



Note: Countries and territories marked as N/A are either a) countries that have reported the provision of adaptation support to the OECD as part of Official Development Assistance, and thus are highly unlikely to be recipients of bilateral support for adaptation; or b) territories that are recognized as disputed by the United Nations or whose status has not yet been agreed upon.

Figure 5.6 Geographic distribution of implemented adaptation actions documented in scientific journal articles



Note: Territories marked as N/A are those that are recognized as disputed by the United Nations or whose status has not yet been agreed upon.
Source: Data provided by GAMI (Berrang-Ford *et al.* 2021).

sector accounted for less than 10 per cent of new adaptation projects in 2013, 2015 and 2016, but has steadily increased since then and reached 21 per cent in 2019. Ecosystems as the primary sector accounted for 18-25 per cent of new adaptation projects over most of the period 2010-2019, but saw a strong decrease in 2018 and 2019 to 11 per cent and 7 per cent, respectively.

Of the 2,607 principal adaptation projects, 133 projects (~5 per cent) were identified as aiming to enhance the generation and utilization of climate information as a primary objective. This is lower than was indicated in the AGR2020, which determined that 12 per cent of the 397 adaptation projects funded by the three funds serving the Paris Agreement focused on climate information. However, the AGR2020 applied a broader definition that also counted projects that had a single component related to climate information. Regarding the extent to which bilaterally funded adaptation projects promote gender equality, approximately 4 per cent of all projects in the OECD Creditor Reporting System marked as having adaptation as a principal objective are also marked as having gender equality as a principal objective. This rate is slightly lower than that found in projects of the funds serving the Paris Agreement, which the AGR2020 determined to be around 6 per cent.

Figure 5.5 shows the number of principal adaptation projects per country. The figure shows that bilaterally funded adaptation projects are unevenly distributed among countries, with the majority of projects being located in East, Southern and West Africa, South-East Asia and parts of South America. Fewer projects are found in Central Asia, the Middle East and parts of North Africa. Forty-five per cent of principal adaptation projects were located in Least Developed Countries (LDCs) while 9 per cent were located in Small Island Developing States (SIDS), demonstrating a similar – albeit slightly lower – focus on LDCs and SIDS to that found for the three funds serving the Paris Agreement by the AGR2020 (53 per cent and 14 per cent, respectively).

5.3.2 Implemented adaptation actions documented in scientific journals

GAMI identified and analysed journal articles published between January 2013 and December 2019 that describe implemented adaptation actions (Berrang-Ford *et al.* 2021). It found that only a fraction of the tens of thousands of published articles that directly address adaptation to climate change actually document implementation, a finding confirmed by another review of the adaptation literature (Sietsma *et al.* 2021). In total, GAMI identified 1,682 journal articles that describe implemented adaptation actions across the globe, although some regions and countries are associated with a far larger number of publications than others. More than 50 articles were identified for Bangladesh, China, Ethiopia, Ghana, India, Kenya, Nepal, and the United States (figure 5.6).

A comparison with the map of bilaterally funded adaptation projects (figure 5.5) shows that some areas are characterized by a low number of adaptation projects and only a few cases of implemented adaptation documented in journal articles, in particular North Africa, Eastern Europe, Central Asia, the Middle East and parts of South America. The low number of adaptation projects being documented in these regions could – in part – be exacerbated by issues such as reporting bias caused by, for example, language barriers which hinder the publication of articles in English. As a result, it cannot necessarily be concluded that adaptation actions are less frequent in these regions. However, the fact that data from both the GAMI and OECD databases provide only limited evidence that adaptation is taking place in these regions suggests that adaptation is not as common in some of these regions as elsewhere.

Further results from GAMI including sectoral composition, targeted climate hazards, targeted actors, the potential for transformative adaptation, and the methods used, are outlined in Berrang-Ford *et al.* (2021). In addition, a series of associated articles are examining various dimensions of adaptation, such as equity, health, gender and responses to specific hazards or in specific regions.[5]

5.4 Adaptation outcomes and risk reduction

The ultimate goal of adaptation is to reduce risks associated with the impacts of climate change that have not been avoided through mitigation. By reducing these risks, adaptation seeks to maintain or enhance human and ecological well-being in the face of climate change (see chapter 2).

5.4.1 Assessing adaptation performance

A review of implemented adaptation found that effectiveness is most commonly described in terms of reduced risk or vulnerability and increased well-being (Owen 2020). The framing of adaptation can influence which of these concepts (risk, vulnerability, resilience, well-being or others) are emphasized in the definition of effectiveness (Singh *et al.* 2021). Importantly, the outcomes of adaptation actions are not just either successful or unsuccessful, but can fall along a continuum from negative outcomes (referred to as "maladaptation") to effective adaptation (Schipper 2020; Tubi and Williams 2021). Figure 5.7 visualizes this continuum in general terms and by providing a tangible example of how differing adaptation outcomes could materialize in a smallholder farming context. Furthermore, adaptation outcomes are rarely consistent across different social groups, and in some cases adaptation actions can benefit certain groups while harming others (thereby leading to maladaptation). Additionally, the effectiveness of adaptation can decrease over time if climate hazards become more intense and/or more frequent.

Assessment of the extent to which adaptation interventions reduce risks associated with climate change is a critical prerequisite for continuously improving adaptation actions and avoiding maladaptation. However, a number of challenges to assessing adaptation outcomes exist, which limit its application (Bours, McGinn and Pringle 2014a). Principal among these challenges is that effectiveness is relative to the level of climate hazards (rather than an absolute value), that the composition of factors that determine risks and their relative importance can be very dynamic, and that adaptation is highly site and context specific, meaning there can be no globally standardized indicators to universally and comprehensively assess the success of adaptation interventions (Arent *et al.* 2014; Leiter and Pringle 2018). The UN Statistics Division's multi-year process[6] to identify a globally applicable and feasible set of adaptation indicators demonstrates the trade-offs, the lack of globally available data and the challenge to express local adaptation outcomes through global indicators. In addition, indicators based on national averages do not account for inequalities and differences in people's vulnerability that are crucial to determine the effectiveness and fairness of adaptation.

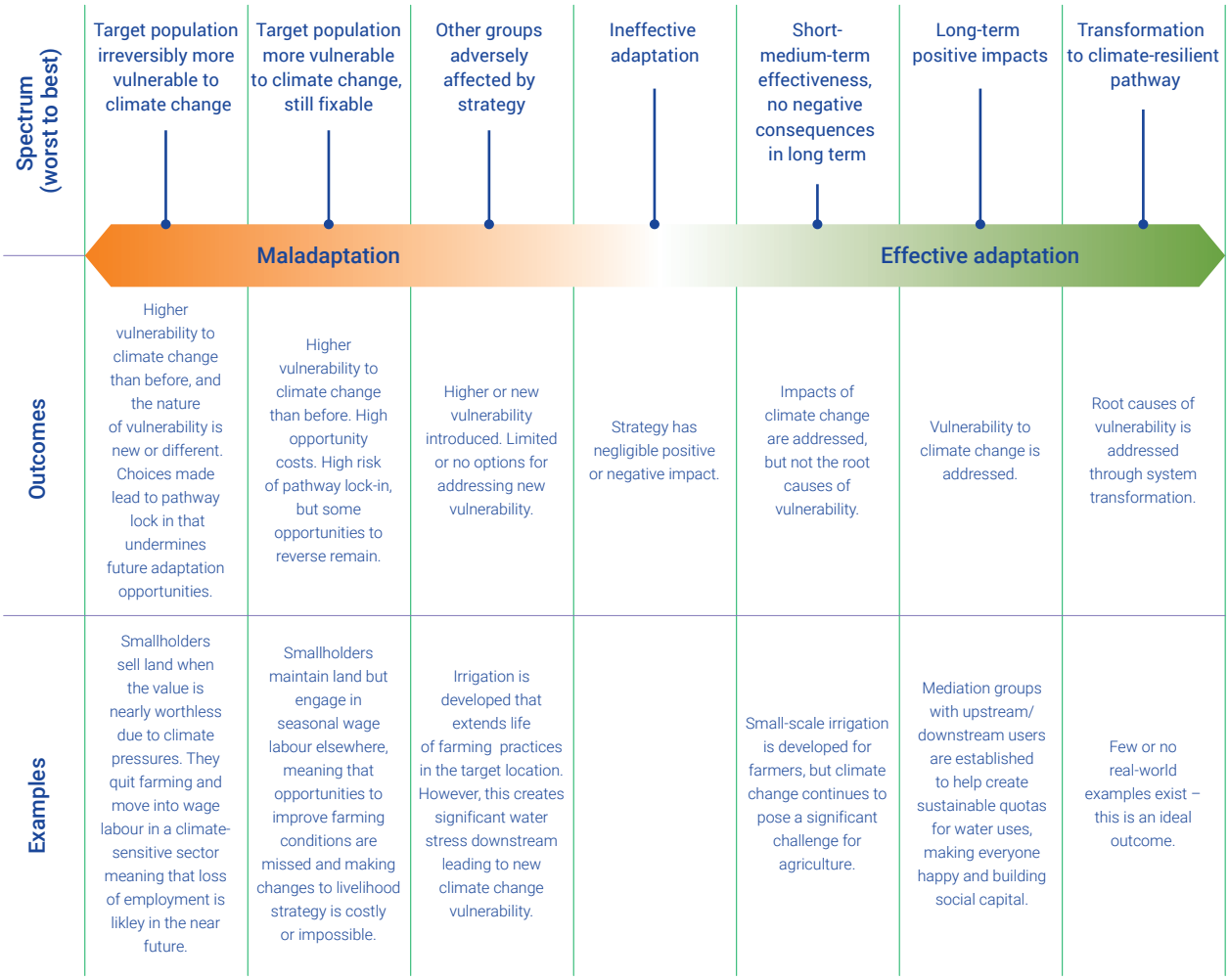
At the national and subnational level, a variety of indicators have been used to assess adaptation actions, and sector-specific assessment practices are evolving as well (Mäkinen *et al.* 2018; Leiter *et al.* 2019; Brooks *et al.* 2019; Food and Agriculture Organization [FAO] 2019; Donatti *et al.* 2020). However, adaptation indicators rely on a prior understanding of how adaptation is expected to work and what it aims to achieve. Theories of change or similar ways of outlining the intended change process from actions to outcomes can help to design adaptation interventions and to guide the formulation of suitable indicators (Bours, McGinn and Pringle 2014b; Oberlack *et al.* 2019). In this way, adaptation actions do not gain relevance through their indicators but through how they address current and future climate risks in a way that is robust and accounts for context and equity (see section 5.4.3).

To date, many monitoring and evaluation (M&E) systems of adaptation projects remain focused on easily measurable short-term outputs such as people supported, policies drafted, or assets improved, and are ill equipped to assess changes in vulnerability or risks or detect maladaptation (Eriksen *et al.* 2021). Indeed, indicators used by the three funds serving the Paris Agreement to assess portfolio-wide performance primarily measure outputs (Leiter *et al.* 2019). The way most adaptation projects and their results are currently assessed therefore limits our understanding

5 A list of associated articles is available at https://globaladaptation.github.io/results.html.

6 See https://unstats.un.org/unsd/envstats/ClimateChange_StatAndInd_global.cshtml.

Figure 5.7 A simplified continuum of adaptation outcomes, from irreversible maladaptation to transformative adaptation



Source: Adapted from Schipper (2020).

of the effectiveness of adaptation. Annex 5.B (online) discusses several approaches (from mobile-phone based household surveys and combinations of process and outcome-based data, to statistically verified resilience indicators and qualitative evaluations) that can be further explored to advance the assessment of adaptation, but there is no one-size-fits-all approach to adaptation M&E. The appropriateness of particular M&E approaches depends on the purpose of undertaking M&E and associated information needs, as well as the available resources and links to decision-making processes (Leiter 2017).

5.4.2 Global status of adaptation results

Funds serving the Paris Agreement, as well as some bilaterally supported climate funds, publish performance data that are often based on portfolio-wide standard indicators, such as the number of beneficiaries. As at June 2020, the LDCF has reached more than 16.2 million direct beneficiaries and trained 508,000 people, while the SCCF has reached over 6.4 million direct beneficiaries and trained 80,000 people (GEF 2021). As at 31 December 2020, GCF-funded adaptation projects were reported to have reached a total of 49 million direct and indirect beneficiaries (GCF 2021). Through its projects approved before 30 June 2021, AF is expecting to reach 10 million direct beneficiaries (AF 2021). While this type of data indicates a fund's reach and level of activity, it does not provide information about the actual outcomes of adaptation – i.e. to what extent the beneficiaries have become more resilient and against what level of climate risk.

Due to different calculation methods, even data using seemingly identical indicators are not currently comparable across funds (Pauw, Grüning and Menzel 2020; AF 2021). There have also been instances of double counting of beneficiaries (Binet *et al.* 2021). Furthermore, it is difficult to interpret indicators without context. For example, the indicator "Meters of coastline protected", a portfolio indicator used by AF, says little about how effective this protection is in reducing climate risk, particularly risks associated with future sea-level rise and associated hazards. Consequently,

while the data can be aggregated across projects, this does not necessarily lead to a meaningful statement about risk reduction and it leaves out who benefits. This example illustrates the limits of standard indicators, which can be useful for accountability and communication purposes, but less useful for understanding context-dependent results. A recent evaluation by the GCF Independent Evaluation Unit (IEU) (Binet *et al.* 2021) likewise found that the "depth of impact for adaptation interventions cannot be monitored with the current set of indicators". Projects could therefore employ a mix of different M&E approaches to generate multiple types of information for different target audiences and be based on theories of change developed together with stakeholders and beneficiaries (see subsection 5.4.1).

Evidence of risk reduction being achieved by adaptation actions documented in the scientific literature is also very limited. Less than 2 per cent of the articles identified by GAMI provide primary evidence of risk reduction (Berrang-Ford *et al.* 2021). It was found that many articles assumed rather than observed or empirically demonstrated risk reduction. Just 30 out of the 1,682 articles (1.8 per cent[7]) offered evidence of risk reduction, half of them through quantitative assessments, 11 through qualitative methods, and four using a combination of both methods (Berrang-Ford *et al.* 2021, Supplementary Materials 4). While this finding does not necessarily mean that the other 98 per cent did not contribute to risk reduction, it shows that quantitative or qualitative evidence of risk reduction is rare. It also highlights the limited focus given to assessing the outcomes of adaptation actions, reinforcing the need to design adaptation actions in a way that increases the chance of risk reduction being achieved, particularly for those most vulnerable to climate change.

5.4.3 Project design and factors that support or hinder risk reduction

A stakeholder-informed understanding of current and expected climate hazards and vulnerability in the respective location, how they affect the population and who is most at risk, is critically important for adaptation planning (see chapter 3). However, the 1,682 articles identified by GAMI and a meta-analysis of 34 adaptation projects show that climate risk contexts are often poorly articulated in the design of adaptation interventions (Berrang-Ford *et al.* 2021; Eriksen *et al.* 2021). Indeed, a recent evaluation of the adaptation portfolio of the GCF found that establishing the climate rationale (i.e. the explanation of a project's contribution to adaptation) is the biggest hurdle in project development (Binet *et al.* 2021). The evaluation concludes that clearer guidance is needed on what counts as adaptation and how to draft a meaningful climate rationale.

Recent research identified several factors that hinder achievement of risk reduction outcomes (Eriksen *et al.* 2021), namely:

I. poor understanding of contextual drivers of vulnerability;

II. top-down design and implementation with inadequate representation of vulnerable and marginalized groups (e.g. women and indigenous groups);

III. rebranding development activities as adaptation without considering climate risks;

IV. failing to identify criteria for adaptation success and/or allowing success to be defined implicitly by dominant groups.

The review of 34 adaptation projects found that despite intentions being stated in project documents, these often did not truly address the underlying drivers of vulnerability to climate change, particularly where these are embedded in deep-rooted economic and political structures (Eriksen *et al.* 2021). To analyse this dimension, greater attention to these drivers is essential if the positive transformation promised by many adaptation interventions is to be delivered. Furthermore, adaptation is more likely to be effective where it involves genuine and substantial participation by those it is intended to support, in planning, implementation and M&E (Buontempo *et al.* 2014; Forsyth 2018; Vincent *et al.* 2020). This finding has motivated the principles for "locally-led adaptation" spearheaded by the International Institute for Environment and Development (IIED) (Soanes *et al.* 2021). Its premise is that a participatory approach, including joint agreement on what constitutes "successful" adaptation and how it can be reached, will increase ownership and be more effective. Such "bottom-up" insights can also be combined with "top-down" climate scenarios to integrate scientific and local knowledge (Conway *et al.* 2019). Finally, progressively higher levels of warming and associated increases in climate risks also need to be considered, given that current NDCs are projected to substantially breach the temperature goals of the Paris Agreement (UNFCCC 2021).

5.5 Outlook and recommendations

Despite the growing number of adaptation projects, the lack of knowledge about their outcomes and the increasing concern over the way adaptation projects are currently planned and implemented – and the implications this has for their effectiveness – is a call for action. This section outlines the main recommendations to improve adaptation design, implementation and assessment.

7 The AGR2020 reported this figure as "less than 3.5%" (58 out of the 1,682 articles), but a re-analysis of these 58 articles in 2021 revealed that some actually did not provide sufficient evidence, leaving just 30 articles (see Berrang-Ford *et al.* 2021, Supplementary Materials 2).

Main recommendations:

1. Ensure that planning is risk focused and clearly explains how adaptation is expected to take place. A prerequisite for achieving risk reduction is that projects are grounded in an inclusive understanding of climate risks and vulnerability and that it is clearly elaborated how their activities address climate risks. As identified by the evaluation of GCF's adaptation portfolio and by the analysis of GAMI's database of 1,682 articles, there is a need to substantiate how objectives will be achieved. Rather than just adding some vague resilience targets or indicators that mostly represent business as usual, project proposals need to specify how adaptation is envisaged to achieve its objectives. To facilitate this change, better guidance is needed on how to design adaptation projects. The associated development and approval processes also need to be modified accordingly, including project templates which currently pay too little attention to adaptation mechanisms.

2. Ensure that planning is inclusive and context informed. To understand the risk context of locally implemented adaptation actions and develop an appropriate theory of change, genuine, substantial and sustained inclusion of the vulnerable and marginalized must be ensured. Such an approach can also help to prevent maladaptation since social exclusion of certain groups (e.g. women or indigenous peoples) during project development can leave important sources of risk unaddressed (Forsyth 2018). The principles for locally led adaptation can be used to support a participatory approach (Soanes *et al.* 2021).

3. Facilitate the assessment of adaptation outcomes and communicate the results. There needs to be a stronger focus on assessing whether the adaptation mechanism works as intended and whether the intended outcomes – and not just the outputs – are being achieved. This could involve applying complementary adaptation-specific assessments in addition to common project monitoring arrangements and accountability-focused indicators (Leiter 2018). This change would require commitment and adequate resourcing. The results should be made publicly available and be easily accessible. The same applies to project evaluations which often remain internal documents, thereby preventing opportunities for learning.

4. Validate outcome indicators and use multiple sources. Indicators that are chosen to represent concepts like resilience, vulnerability or adaptive capacity need to be justified on the basis of empirical evidence (i.e. how they measure the respective concept needs to be demonstrable). However, in practice they are often chosen on the basis of data availability or ease of measurement. To better measure risk reduction, indicators need to be grounded in a well informed understanding of contexts and potential future risks. Surveys and interviews with relevant actors can yield valuable insights that quantitative indicators cannot capture. This approach is also usually cheaper than gathering new quantitative data.

5. Promote reflective monitoring. Suitable approaches to monitoring, evaluation and learning need to be applied to actively support decision-making rather than simply serving as a once-a-year accountability tool. Beyond indicators, the monitoring system needs to be able to detect unintended consequences including maladaptation in order to support adjustments to actions as necessary. Monitoring should therefore take a reflective approach that involves active sharing of experiences as implementation unfolds. As such, it may include multiple types of information to meet the needs of different users (Faulkner, Ayers and Huq 2015).

6. Plan for higher-end impacts. The extreme events experienced throughout 2021, many of them record breaking, underscore the need to consider higher-end climate scenarios and to plan with sufficient safety margins (e.g. not relying on the lower bound of estimated sea-level rise). This requires enhanced adaptation ambition to address impacts that might fall outside the range of previously modelled or anticipated impacts. More than anything else, these events underscore the urgent need to decarbonize the global economy much faster than NDCs currently foresee (UNEP 2021b). This is the only way to avoid escalating climate risks and to prevent the adaptation gap from widening further.


6

Chapter 6

Emerging consequences of COVID-19 on adaptation planning and finance

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Key messages

- COVID-19 and climate change have had a compounding effect, creating significant human suffering and stretching the economic and disaster response capacity of governments around the world. The compound nature of these risks continues to impact the adaptive capacity of governments, communities, societies and social groups, particularly those that are either already vulnerable (for example, women and indigenous groups) and those in developing countries.

- The pandemic has delayed existing adaptation planning in some countries and disrupted disaster risk finances. National Adaptation Plan processes have been hampered by health restrictions, as well as by the political and budgetary focus on immediate pandemic responses. Additionally, budgets for emergency disaster risk management have been depleted, raising concerns about a reduction in adaptive capacity for subsequent health emergencies and climate shocks.

- COVID-19 has exacerbated pre-existing financial barriers to investment in adaptation. However, there is an opportunity to redress these low levels of investment by directing recovery funding into green and resilient recoveries. In response to the pandemic, as at 15 August 2021, US$ 16.7 trillion of fiscal stimulus had been announced by countries. Less than one-third of 66 studied countries had explicitly funded specific measures to address physical climate risks in their announced investment priorities up to January 2021. The costs of servicing the debt raised to respond to the pandemic, combined with decreased government revenues due to the economic impacts of COVID-19, may also hamper future government spending on adaptation, particularly in developing countries.

- COVID-19 provides lessons for improving climate adaptation planning and financing. COVID-19 highlights the importance of governments addressing compound risks through integrated risk management approaches. The pandemic also deepens the need for substantive debt relief for heavily indebted and climate-vulnerable countries and creates an opportunity to "build forward better", through investment in activities that support green economic recovery and build adaptive capacity.

6.1 Introduction

The COVID-19 pandemic has reverberated throughout the world, placing strain on many of the systems that are essential to our lives. The crisis has revealed and reinforced many of the pre-existing vulnerabilities and fault lines running across our globalized world. It has also demonstrated that the notionally distinct domains of health, economics, society and environment are in fact complex, nested, interconnected systems, which require coordinated global responses (Organisation for Economic Co-operation and Development [OECD] 2020a).

Climate change adaptation practitioners are dealing with a similarly complex problem that also crosses physical, temporal and organizational boundaries. As with COVID-19, the climate crisis acts as a threat multiplier of pre-existing vulnerabilities, impacting people, livelihoods and ecosystems. These threats are addressed by the Paris Agreement, which established the global goal on adaptation of "enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change".[1]

This chapter aims to synthesize the literature that describes how COVID-19 has impacted country-level "adaptive capacity" (see the glossary for a definition and discussion below) and identifies emerging opportunities for policymakers and decision makers to improve their responses to both the health and climate crises. For instance, the significant fiscal spending on the health emergency, welfare payments and economic recovery may make ongoing spending on measures to increase preparedness for climate hazards more challenging for some governments. However, it also presents an opportunity to invest in programmes and policies that enable governments to "build forward better".

1 In full, article 7.1 of the Paris Agreement reads "Parties hereby establish the global goal on adaptation of enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to contributing to sustainable development and ensuring an adequate adaptation response in the context of the temperature goal referred to in Article 2."

This chapter focuses on governmental – rather than societal, business or household – contributions to country-level adaptive capacity. Nonetheless, it is important to note that these dimensions are interlinked and cannot be neatly separated. The chapter also focuses primarily on the impacts of the pandemic on adaptation financing and planning, since the impacts on implementation are still emerging and are not well documented in existing studies.

To synthesize the literature, the authors conducted a rapid review of peer-reviewed literature and reports from multilateral organizations and policy institutions, published in or after 2020, on the link between COVID-19 and adaptation financing and planning.[2]

The chapter is organized as follows. Section 6.2 explores the ways in which the pandemic and climate change interact and create "compound risks", which increase the vulnerability and threaten the adaptive capacity of governments and societies. Section 6.3 sets out how COVID-19 has delayed existing adaptation planning processes in some countries, creating potential compound risks in the future. Section 6.4 analyses the emerging implications of COVID-19 for adaptation financing. As governments move from deploying "rescue" stimulus to "recovery" spending, the chapter synthesizes existing data to determine whether countries are investing in recoveries that are both economically effective and building countries' adaptive capacity to climate change. Our analysis of these fiscal flows is constrained by pre-existing difficulties inherent in classifying and tracking adaptation spending.[3] Section 6.5 outlines lessons for governments and multilateral institutions on how to address the adaptation financing and planning impacts of COVID-19, as identified above, to enable COVID-19 to act as a catalyst, rather than an impediment, to enhancing global climate adaptive capacity.

6.2 How COVID-19 has impacted adaptation planning and finance

Climate change and COVID-19 share many similarities. Like the COVID-19 crisis, the climate crisis is a systemic problem that requires coordinated global and domestic responses. Both crises are protracted, with effects that unfold over months and years, and are deeply entangled with other social, environmental and economic shocks and disruptions (Phillips *et al.* 2020). They both reveal the inequity in who experiences, and has the ability to respond to, the effects of crises (Dodds *et al.* 2020; Patel *et al.* 2020). Emerging evidence suggests that the pandemic has also impacted climate adaptation at multiple scales. This section highlights how COVID-19 has had a particularly significant impact on the "adaptive capacity" of countries (defined below), by creating or exacerbating compound risks at multiple levels.

6.2.1 COVID-19 and adaptive capacity

The emerging literature on COVID-19 and climate adaptation suggests that the pandemic impacts the Paris Agreement's goals of "enhancing adaptive capacity", "strengthening resilience" and "reducing vulnerability". As highlighted by the 2018 edition of the Adaptation Gap Report (AGR), the distinction between these terms is not well established in the literature, with many of their key constructs overlapping one another. Instead, the report suggested that it may be more helpful to draw a distinction between "adaptive capacity" on the one hand, and country exposure and sensitivity to physical climate hazards, on the other.

Adaptive capacity is a broad concept with multiple definitions. The Intergovernmental Panel on Climate Change (IPCC) has defined the concept as referring to the ability of systems, institutions and humans to adjust to potential climate damage, to take advantage of opportunities, or to respond to consequences (IPCC 2014). Academic scholarship makes the point that multiple actors work together to enable adaptive capacity, including governments, businesses and communities, and highlights the importance of the interactions between these layers. To date, the literature on the impacts of COVID-19 on adaptation has primarily focused on the way the pandemic has impacted institutions and the economy. Reflecting this emphasis in the literature, this chapter focuses primarily on the issue of the "adaptive capacity" of governments.

The literature highlights that the impact of COVID-19 on physical climate risks is uncertain. Although the government-imposed restrictions on movement and economic activity that were enacted in response to the pandemic led to a reduction in emissions within some sectors, its long-term effects on climate hazards will be contingent on the length of the pandemic and government responses to it (Forster *et al.* 2020; le Quéré *et al.* 2020; Shan *et al.* 2020). At the time of writing, the emission reductions induced by government-imposed restrictions on movement and economic activity are unlikely to meaningfully reduce climate hazards. Despite temporarily slowing the usage of the global carbon budget, they do not appear to have reduced emissions permanently, with most countries having already returned

2 This chapter is not intended to be a comprehensive catalogue of the literature. Instead, it aims to synthesize the information most relevant to government and civil-society decision-making at the point of intersection between COVID-19 and climate change adaptation. Key word searches were conducted across Google Scholar, ProQuest and Scopus. The first 100 results of each search, organised by citations and relevance, were reviewed. We selected sources which were most relevant to the key themes in the Adaptation Gap Report (AGR), namely adaptation planning, financing and implementation.

3 As chapter 4 acknowledges, difficulties with tracking adaptation finance stem from, among other things, "…definitional challenges, accounting issues, confidentiality restrictions, and a lack of universally accepted impact metrics".

Box 6.1 What is a "compounding risk"?

Compound risk is a term that is used in multiple domains, including climate science (IPCC 2012), disaster risk response and other sciences, with different meanings. The common denominator, however, is that compound risks build on each other and exacerbate hazards and other outcomes. Among others, the context-specific differences in the term's definition centre on whether the causal basis of such risks should be related and on whether social and physical interaction should be considered the same or separate (Pescaroli and Alexander 2018). In this chapter, the term is used to refer to interactions not only between physical hazards but also involving other areas, such as social and economic systems.

The concept of compound risk is widely used in relation to climate adaptation. Zscheischler *et al.* (2020) reviewed historical instances of compound events related to weather extremes and concluded that many major catastrophes bear the hallmark of being caused by compound events. For example, they noted that in 1983, the largest synchronous wheat failure in modern history was driven by a strong El Niño event, which fuelled heatwaves and droughts in crop-producing regions across multiple continents.

Maladaptation is another example of compound risk, this time inherent in adaptation projects. Maladaptation refers to adaptation projects which inadvertently increase the vulnerability of communities or specific segments of communities (for example, women and indigenous groups). Some adaptation programmes explicitly try to avoid such risk compounding.

to their pre-pandemic emission levels (IPCC 2021). However, as highlighted in the remainder of this chapter, existing research shows with greater certainty that COVID-19 and its associated policy, economic and social responses are already impacting the adaptive capacity of governments.

6.2.2 COVID-19 and climate change present "compounding risks" that impact adaptive capacity

In the literature on the COVID-19 pandemic and climate adaptation, "compound risk" (box 6.1) has been used to describe the way in which the pandemic and climate change interact.[4] On the one hand, climate change may have contributed to conditions that exacerbate the pandemic (among other health impacts; see, for example, UNEP 2018).[5] Increased risk of COVID-19 infection has been associated with exposure to higher levels of certain air pollutants (Cole, Ozgen and Strobl 2020), and some scholars have linked geographic shifts in wildlife induced by climate change and ecosystem degradation with the spread of zoonotic diseases, such as COVID-19 (Carlson *et al.* 2020; Everard *et al.* 2020; Dasgupta 2021; UNEP and International Livestock Research Institute 2020). On the other hand, the pandemic and the social responses to it may also be impacting our ability to respond to climate change (Ranger, Mahul and Monasterolo 2021). This chapter focuses primarily on the latter.

In 2020, droughts, cyclones, and floods exacerbated by climate change damaged critical infrastructure or impeded the public health responses needed to contain epidemics (Phillips *et al.* 2020). In Morocco, for example, droughts occurred in parallel to the pandemic, leading to major increases in unemployment in rural communities as farmers with lower incomes struggled to find work. Similarly, in developed economies, we have seen a compounding of the pandemic and climate risks. In the United States of America, the available evidence suggests that emergency response measures for COVID-19, coupled with responses to increased major hurricanes and wildfires, may have exacerbated staffing shortfalls at the United States Federal Emergency Management Agency in 2020 (United Sates Government Accountability Office 2020). Box 6.2 contains a case study of how the pandemic has reduced the resilience of Pacific states to cyclones.

While this chapter focuses on the government level, it is important to acknowledge that COVID-19 has also diminished adaptive capacity at other scales, making communities, organizations and households more vulnerable, which has a knock-on negative impact on country-level adaptive capacity. At the household level, the World Bank estimates that an additional 97 million people fell into poverty in 2020, driven by the economic shocks caused by the COVID-19 pandemic (World Bank 2021b). The links between poverty and climate vulnerability are well documented: poverty is both a driver and a result of vulnerability to climate change shocks and stressors (Hallegatte, Fay and Barbier 2018; Thomas *et al.* 2019). There have also been systematic reductions in adaptive capacity

4 Other terminology has been used to describe types of complex risks, such as "cascading", "interconnected" or "amplified" risks (Simpson *et al.*, 2021).

5 Studies on this subject undertaken in different regions have shown that impacts are ambiguous and diverse, indicating the need for investment in country-specific research to build understanding of the required adaptation processes.

Box 6.2 How COVID-19 reduced the adaptive capacity of Pacific States to Cyclone Harold

In April 2020, category 5 tropical cyclone Harold hit Small Island Developing States in the Pacific, including Fiji, the Solomon Islands and Vanuatu. The impact of the cyclone was catastrophic, with as many as 90 per cent of the population in Sanma, the most affected province of Vanuatu, losing their homes.

At first, response measures to the COVID-19 pandemic in the Pacific impeded the response of governments to the cyclone. In Fiji, the disaster response was constrained by COVID-19 restrictions, since the country's evacuation centres had to adhere to COVID-19 protocols, which included restrictions on capacity and social gatherings. In Vanuatu, officials banned foreign aid workers from entering the country to assist with disaster recovery, in line with strict measures to prevent the importation of COVID-19 into the country. Furthermore, aid supplies had to be quarantined for three days before disbursement to prevent the spread of the disease in a country with weak health infrastructure.

Sources: Gunia 2020; World Meteorological Organization 2020.

in business. Firms – particularly small to medium-sized enterprises in developing countries – have also experienced severe and widespread shocks, with declining sales and rising job losses (Adian *et al.* 2020; Christine *et al.* 2020). Furthermore, the COVID-19 pandemic could trigger extensive corporate debt distress, building on high pre-pandemic over-indebtedness (Liu, Garrido and Delong 2020).

Moreover, compound shocks caused by the COVID-19 pandemic have reverberated along existing lines of inequality, exacerbating existing socioeconomic inequities. The literature documents some of the many disproportionate health, economic and social impacts of COVID-19 experienced by groups already facing structural inequalities along socioeconomic, gender, class and ethnic lines (Dodds *et al.* 2020; Patel *et al.* 2020). Such inequalities, which leave many unable to take appropriate preventative measures, may also exacerbate the pandemic.

The compound nature of both climate change and the COVID-19 pandemic has significant policy implications, particularly for government adaptation planning and finance, which we discuss in the following sections.

6.3 The impact of COVID-19 on adaptation planning

COVID-19 has impacted a range of adaptation planning processes. This section focuses on the impact on national adaptation planning and disaster risk planning. Chapter 3 of this report provides further details on progress made in national adaptation planning during 2020 and 2021.

6.3.1 COVID-19 has impacted the development of National Adaptation Plans

National Adaptation Plans (NAPs) are a planning process through which countries can identify medium-term and long-term adaptation needs and bring adaptation into country-level policymaking processes. Between the creation of the process to formulate and implement NAPs in 2010 and 31 July 2021, only 24 of the 154 developing countries had so far completed and submitted their first NAPs. However, as at September 2021, at least 125 developing countries are in the process of formulating and implementing NAPs. Emerging evidence suggests that while COVID-19 has hampered some NAP processes, particularly among Least Developed Countries (LDCs), countries are working to progress their NAPs despite the constraints of the current environment (United Nationals Framework Convention on Climate Change [UNFCCC] 2021). This view is supported by qualitative evidence (box 6.3). These constraints are also likely to have been experienced across adaptation planning and implementation processes beyond NAPs, particularly in LDCs (Caldwell and Alayza 2021).

Despite constraints, direct support has continued to be provided throughout the COVID-19 pandemic, including through the Open NAP initiative and through virtual administration of support programmes, where possible. Eighteen LDCs participating in the Open NAP initiative reported progress, despite COVID-19 (UNFCCC 2021). There is also anecdotal evidence that accelerating digitalization trends, driven by COVID-19, have created new opportunities for community engagement and consultation in planning processes by increasing accessibility and inclusivity of consultations for certain groups within communities (McKinley *et al.* 2021).

6.3.2 COVID-19 has impacted contingent disaster risk finances

COVID-19 has created additional vulnerability to future climate-related shocks, since contingent funding retained for disaster relief has been redirected to address pandemic related shocks. This depletion has been partly amplified by requests from recipient countries to divert climate change adaptation and disaster risk reduction aid to COVID-19 responses (Quevedo, Peters and Cao 2020). For example, as at July 2020, India, Nepal and Pakistan had all made requests to the Global Facility for Disaster Reduction and Recovery. Many donors are accepting these requests and are providing additional flexibility to recipients in how they

Box 6.3 The impact of COVID-19 on NAP processes

For some countries, such as Ghana, COVID-19 served as a "wake up call" to instigate the NAP process (UNEP 2020b). However, the available evidence suggests that for many other governments, COVID-19 has slowed the development of NAPs in 2020 and 2021.

The NAP Global Network, which supports countries in advancing their NAP processes, carried out research with partner countries on how the pandemic impacted country NAP processes. The research, which is backed by other similar studies, found that in some cases the pandemic had "completely stalled" or "delayed" NAP processes. It cited a number of factors:

- **Cancelled meetings and consultations:** Prohibition on travel in some countries and physical distancing requirements limited the ability to carry out NAP meetings. This was particularly problematic for communities with limited or no Internet access and also had the potential to restrict the extent to which the perspectives of vulnerable groups like women and indigenous peoples are considered within NAPs.
- **Diverting political support for adaptation:** Politicians were focused on responding to short-term issues, triggered by waves of the COVID-19 pandemic. For example, the NAP of South Africa was due to be approved by the cabinet of the country's government in April 2020 but had to be put on hold because of the pandemic.
- **More competition for adaptation funding and resources:** Some countries reported facing difficulties accessing the same levels of budget support because of COVID-19. In addition, several countries reported concerns that the debt they were taking on might create future problems for adaptation funding (see further discussion on this topic below in section 6.4).

Sources: NAP Global Network 2021.

use funds and including COVID-19 in new funding calls (Cornish 2021). While this demonstrates the responsiveness of pre-allocated financing frameworks to imminent crises, as emergency funds are depleted it also indicates potential vulnerability to future compounding COVID-19 shocks or natural disasters (Mahul and Signer 2020). The extent of this vulnerability will depend on the responses of donors in addressing short-term shortfalls and longer-term funding trends.

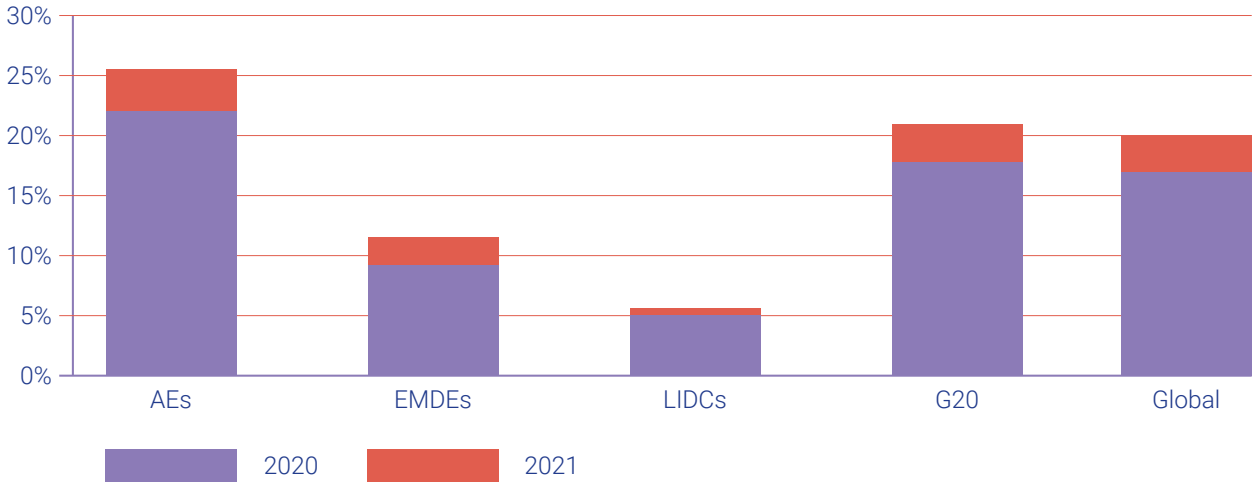
6.4 The impact of COVID-19 on adaptation financing

6.4.1 Record fiscal spending in response to COVID-19: a window of opportunity for green and resilient recoveries

In response to the immediate health crisis caused by the COVID-19 pandemic, governments have announced US$ 16.7 trillion in fiscal support as at 15 August 2021. Of this figure, 75 per cent (US$ 12.5 trillion) has been directed to immediate "rescue" initiatives designed to keep businesses and people afloat, 13 per cent (US$ 2.3 trillion) to "recovery" initiatives designed to rejuvenate economies and the remainder elsewhere (Desvars-Larrive *et al.* 2020; International Monetary Fund [IMF] 2021b; O'Callaghan *et al.* 2021). Relative to Emerging Market and Developing Economies (EMDEs), Advanced Economies (AEs) have deployed more fiscal spending, for longer. Excluding loans, equity and guarantees, between 2020 and 2022, advanced economies are expected to deploy over eight times more spending relative to Gross Domestic Product (GDP) than low-income developing countries (figure 6.1).

While countries continue to deploy rescue spending in response to outbreaks of COVID-19, the opportunities for increased adaptation support are greatest in recovery spending. As discussed in the Emissions Gap Report 2021 and the AGR2020, and as called for by world leaders and multilateral organizations, COVID-19 recovery spending presents a window of opportunity to invest in a green, resilient and inclusive economic recovery (for example, Asian Development Bank 2020; G7 2021b; O'Callaghan and Murdock 2021; OECD 2020b; UNEP 2020c). Investment in adaptation activities can generate durable economic benefits and reduce climate vulnerability. The Global Commission on Adaptation has estimated that investment in adaptation can deliver benefit–cost ratios of between 2:1 and 10:1, largely through avoiding future costs (Global Center on Adaptation 2019). Similarly, as discussed in the AGR2020, nature-based solutions are a source of investment with the potential to reduce climate risks and vulnerability, while providing economic, environmental, and social inclusion co-benefits (UNEP 2021). An IMF working paper estimated that for every dollar spent on ecosystem conservation (a form of nature-based solution), almost seven more were generated in the economy over five years (Batini *et al.* 2021).

Figure 6.1 Revenue and spending measures as a percentage of 2020 GDP for different country income groups



Note: The data for this figure and section 6.4 has been collected and analysed using IMF World Economic Outlook classifications of countries (IMF 2021c). As such, the country composition groupings used by the IMF have been applied. However, it should be noted that the groupings of Advanced Economies (AEs), Emerging Market and Developing Economies (EMDEs) and Low-Income Developing Countries (LIDCs) may not directly overlap with the groupings of "developed", "developing" and "least developed" countries discussed elsewhere in this report.

6.4.2 Emerging evidence indicates a failure to capitalize on opportunities

Initial analysis of COVID-19 stimulus packages indicates limited investment in green and resilient recoveries, with some recovery packages likely deepening climate vulnerability. However, a conclusive assessment is constrained by the lack of comprehensive, global data and analysis on COVID-19 recovery spending allocated to adaptation investments.[6] An analysis by the World Resources Institute (Krishnan and Brandon 2021) of response and recovery packages announced up to 31 January 2021 by 66 economically and geographically diverse countries, including all G20 and V20 countries,[7] found that less than one-third (just 17 countries and the EU) of the countries studied explicitly flagged or incorporated physical climate risks, adaptation or resilience in their announced investment and priorities (as defined in Caldwell and Alayza 2021). Investment was categorized as adaptation or resilience if it explicitly mentioned addressing climate hazards or risks through one of the following approaches: climate risk considerations; local decision-making; shock-responsive social safety nets, including for vulnerable populations; projects in urban areas; water resources management; food security; nature-based solutions; disaster prevention; and infrastructure (Krishnan and Brandon 2021). The study also looked at whether addressing physical climate risks was mentioned in the introductions or preambles of countries' stimulus packages.[8] For example, if a country mentioned improving water management practices to address reduced water availability or if it invested in early warning systems, then it was considered to have selective climate risk management actions. The 13 countries (18 per cent) that cited adaptation and resilience as a core objective of their recovery, alongside jobs and growth, are classified as having "climate risk integrated plans" (figure 6.2). The study found that almost all the countries that cited the need to manage climate risks are on the front-line when it comes to experiencing climate change impacts, including several of the Small Island Developing States.

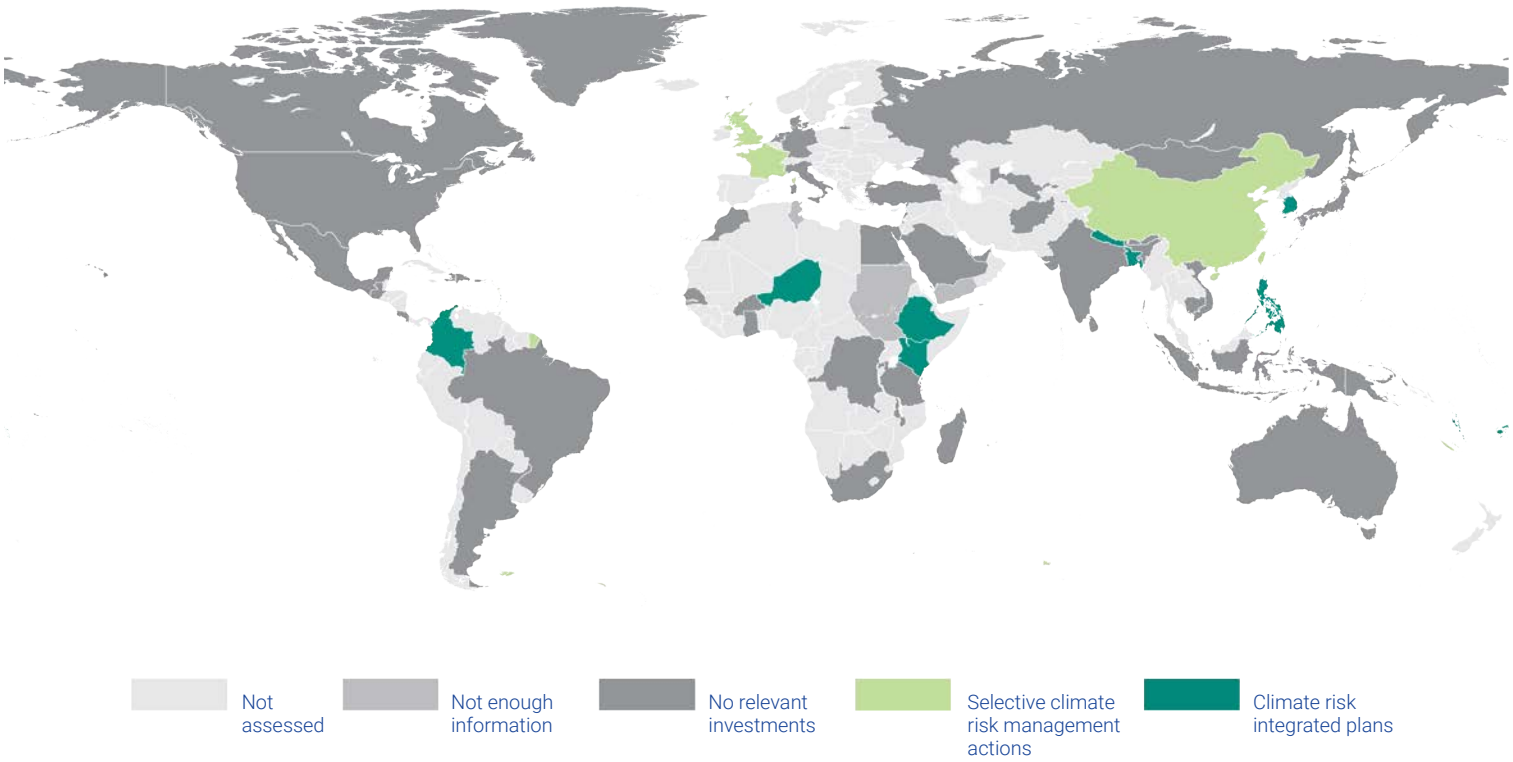
Sectoral analysis of COVID-19 pandemic stimulus packages indicates that some countries have invested more in activities that will increase climate change vulnerability than in those that will reduce it. The Vivid Economics Greenness of Stimulus Index found that, as at 1 February 2021, only US$ 141 billion of US$ 667 billion of tracked green stimulus had been directed towards "nature and biodiversity",

6 This is due to differing geographic and sectoral coverage of existing stimulus-related databases; the lack of standard definitions for adaptation; funding packages being released with varying levels of explanatory detail; difficulties distinguishing between funding that has been announced and funding that has been legally committed and deployed; and a lack of attention to adaptation-related issues within recovery packages. However, there are some high-level estimates of how adaptation has featured in recovery spending within regional and economic groupings and the impact of the pandemic on international public adaptation finance flows.

7 This includes all countries from the G20, 48 countries from the V20, the six country champions for the Adaptation and Resilience track of the United Nations Climate Action Summit 2019 and the 20 convening countries of the Global Commission on Adaptation. Taking into account overlaps, this gives a total of 72 countries, six of which were dropped from the study due to lack of primary information.

8 This study did not explicitly look for mitigation actions in stimulus packages, since others, such as those by Vivid Economics (2021a and 2021b), were comprehensively analyzing these actions.

Figure 6.2 Countries including selected adaptation interventions in stimulus packages, as at 31 January 2021



Note: The figure is based on the same sample of 72 countries described above in footnote 7. The figure only highlights measures at the national level and thus excludes measures at the European Union level. Territories recognized as disputed by the United Nations or whose status has not yet been agreed are included in the not assessed category.
Source: Adapted from Krishnan and Brandon (2021).

compared to US$ 262 billion of stimulus directly associated with pollution or activities expected to negatively impact biodiversity (Vivid Economics 2021a). Furthermore, it also found that, despite encouraging examples of green and resilient stimulus, the packages announced by 15 of the G20 nations will have a net negative environmental impact and even in the National Resilience and Recovery Plans in Europe, there is more spending that will damage nature than enhance it (Vivid Economics 2021b).

6.4.3 COVID-19 may be encouraging greater international public finance flows in the short term but this is unlikely to apply to adaptation finance

Over the last 18 months, the demands on international public finance have increased significantly. Not only are international financial institutions facing simultaneous pressures to channel resources to address the ongoing health crisis, they must also respond strategically to the economic and climate crises. Similarly, developed economies are also under domestic fiscal pressure and may be constrained in their abilities to channel additional finance to multilateral development banks (MDBs) and other countries in the medium to longer term (OECD 2020c).

Comprehensive reporting across MDBs and bilateral and other multilateral institutions on public finance (particularly climate finance), is limited. It also has a two-year time lag,[9] which makes it hard to project trends with a high degree of confidence. The analyses considered in this section all focus on 2020 flows to countries eligible to receive Official Development Assistance (ODA). Taken together, they provide some clarity on the short-term outlook.

Preliminary analysis from the OECD Development Assistance Committee (DAC) indicates that, as a whole, ODA flows from its 29 member countries and EU institutions reached their highest ever recorded level, rising by 3.5 per cent in 2020 over 2019 flows (OECD 2021). These figures demonstrated the willingness of DAC members to maintain or increase ODA budgets in 2020, likely in response to immediate needs

9 The UNFCCC biennial assessments, which are considered the most authoritative source on climate finance flows from bilateral and multilateral actors, have a two-year lag (the 2020 report will report on flows for 2017 and 2018).

related to the pandemic. It remains to be seen whether these overall ODA levels will be sustained in the medium- to long-term or will experience a delayed tightening, consistent with previous financial crises (OECD 2020d).

Drilling down more specifically into climate finance, the 2020 Joint Report on Multilateral Development Banks' Climate Finance (European Bank for Reconstruction and Development 2021), an annual report jointly published by nine MDBs, shows that while the participating MDBs' overall climate finance for developing countries fell by almost 5 per cent in 2020 (as compared to 2019), the share of adaptation finance slightly increased from 34 per cent of 2019 to 35 per cent of 2020 flows, continuing the positive trend of the last five years, albeit with a decline in absolute terms (see chapter 4 for further details).[10] This indicates that there are likely opportunities not only for MDBs, but for countries to continue to invest in adaptive capacity while advancing their recovery from the pandemic. However, this study only examines MDBs' own climate-related investment and represents a small subset of international public climate finance.

Looking forward, the Climate Policy Institute and the Global Center on Adaptation (GCA) studied the potential impact on adaptation finance flows in the post-COVID-19 world: based on interviews with representatives from development finance institutions, they projected that – due to the competing pressures on financiers – there would be a single-digit percentage decline in adaptation finance in 2020, with the potential for a larger fall in following years. The estimated decline is based on several variables, including projected reductions in international development finance, increased debt distress and slow vaccine roll-out in climate-vulnerable countries (GCA 2021).

6.4.4 COVID-19 induced debt distress and ongoing economic disruptions may constrain future climate adaptation spending

COVID-19 has exacerbated fiscal distress for many countries, particularly Emerging Market and Developing Economies. Many governments have had to increase borrowing to finance the fiscal rescue and recovery packages (among other measures). The median public debt among Low-Income Developing Economies rose from 38.7 per cent of GDP over 2010–2014 to 44.3 per cent pre-crisis, peaking at 49.5 per cent in 2020 (IMF 2019; IMF 2021b). Average public debt worldwide reached 97.3 per cent of GDP in 2020, 13 percentage points higher than the pre-pandemic projection (IMF 2021b).[11] Such additional borrowing, combined with a drop in GDP due to the economic impact of the pandemic, has led to much higher debt-to-GDP ratios worldwide. As a consequence, and in combination with falls in revenue from lower economic activity, many countries have significantly reduced fiscal space (IMF 2021c).

Fiscal space is a necessary but not sufficient condition for adaptation spending. Political or policy barriers, such as a reluctance to take on debt to invest in adaptation, could prevent spending on adaptation (Mortimer, Whelan and Lee 2020). However, limited fiscal space could exacerbate these barriers, making it harder for governments to commit funds to adaptation. The pandemic could result in downgrades to countries' credit ratings, increasing the cost of public borrowing and further constraining access to financing and the ability to invest in adaptation (OECD 2020d). Furthermore, public and private debt may not have fully priced in climate risks, leading to the potential of future repricing of such debt and possible increased debt servicing costs for nations (Climate Policy Initiative 2020; Dibley, Wetzer and Hepburn 2021; Monasterolo and Volz 2020; Klusak *et al.* 2021). As a consequence, researchers estimate that critically indebted countries are more likely to constrain spending on adaptation (Kaiser *et al.* 2021). This is reflected in qualitative evidence (see box 6.3).

The compounding of COVID-19 debt and climate risk could be a problem for adaptation spending by governments. Countries with limited fiscal space – further reduced during the COVID-19 pandemic – may lack the financing needed to implement adaptation measures, in turn leaving them more exposed to climate risk through lower preparedness and therefore also more likely to experience further increases in borrowing costs (Dibley, Wetzer and Hepburn 2021). However, this risk could be mitigated by using COVID-19 recovery spending to advance adaptation goals (as discussed in sections 6.4.1 and 6.4.2).

6.5 Emerging lessons of the COVID-19 pandemic for adaptation planning and financing

As discussed in section 6.1, there are similarities in the systemic, compounding and unequal nature of COVID-19 and climate change. The following lessons, drawn from across the literature, are intended to address this systemic and institutional nature of the challenge.

6.5.1 Lessons for adaptation planning

Governments should develop an integrated approach to the governance of risk management that is based on wide consultation. As discussed above in section 6.2, the COVID-19 pandemic compounds climate-related risks. This makes it important for governments to adopt an

10 For reference, adaptation finance made up just 20 per cent of MDB climate finance flows in 2015.

11 Advanced economies have taken on significantly more debt as a proportion of GDP during COVID-19 than LIDCs (16.3 per cent from 2019-20, compared to 5.2 per cent), reflecting the fact that they are better placed to access international capital markets and service debt in the long-term (IMF, 2021b).

Photo: © Shutterstock

integrated approach to risk management across hazards to acknowledge such risk compounding (Ranger, Mahul and Monasterolo 2021; Monasterolo and Volz 2020). The World Bank (2021a) outlines how this more comprehensive approach to risk management within public finance frameworks – incorporating climate, pandemics and other major risks – could form an important part of a wider shift towards a whole-of-government integrated approach to risk management.

Several years ago, the World Bank suggested that countries establish a national risk board to support government-wide coordination in their management of critical risks (World Bank 2013),[12] a suggestion made all the more timely by the COVID-19 pandemic. In many countries, this approach is already practised to some extent, typically with cabinet offices, ministries/departments and equivalent institutional bodies holding responsibilities for monitoring and managing national critical risks. A national risk board could bring together a set of cross-cutting risk management and adaptation objectives, a national risk assessment, a system of national financial protection planning and a much wider and integrated approach to fiscal risk management, thereby driving a whole-of-government approach.

Donors could also continue to support developing countries to better plan for compound risks, including through the establishment of flexible funding mechanisms and improving governance and accountability for cross-sectoral decision-making (Hallegatte, Rentschler and Rozenberg 2020; Kruczkiewicz *et al.* 2021).

Governments should leverage existing adaptation policy processes to manage compound risks. While COVID-19 has impeded adaptation planning processes, it has also reinforced the relevance of planning for compounding risks. To do so, governments could better leverage existing adaptation planning processes, including the climate rationales of project proposals to the Green Climate Fund and adaptation-specific sections of Nationally Determined Contributions (NDCs) and NAPs (Hammill 2020). For example, governments that have developed a NAP may have undergone rigorous, country-specific risk assessments and identified medium-term and long-term priorities for building adaptive capacity to climate change. These assessments can offer a raft of benefits during the COVID-19 pandemic, including identifying vulnerable populations (for example, women and indigenous groups) and places that are likely to be disproportionately affected during the compounding crises. This would help provide mechanisms and institutional frameworks through which to deploy immediate support and offer investment options to inform resilient stimulus packages (Hammill 2020; World Bank 2020a). Box 6.4 provides an example of how integrated planning can help respond in a practical way to compounding disasters (World Health Organization 2021).

12 National risk boards perform a similar, whole-of-government role to national platforms for disaster risk reduction, as advocated under the Sendai Framework for Disaster Risk Reduction.

Box 6.4 Leveraging existing climate disaster risk response tools to manage the COVID-19 pandemic in Pakistan

The COVID-19 pandemic has highlighted how integrated risk management can offer multiple benefits. In Pakistan, as part of the country's response to the COVID-19 crisis, in 2020 it developed a Multidimensional Vulnerability Index to identify the communities most at risk from the pandemic. The Index was implemented through a map that integrated physical climate change risks as part of its assessment. It drew on tools developed for assessing flood and drought risk and created an integrated vulnerability tool, which was applied during the pandemic.

Sources: Quevedo, Peters and Cao (2020).

Planned NAP processes can be used to help countries address specific risks exposed by COVID-19, such as through support for increased food security. For example, the Government of the Dominican Republic is planning to design the country's NAP process to incorporate adaptation strategies for the water, agriculture and food security sectors that will seek to create synergies with the government's programmes to finance farmers affected by COVID-19. The projects prioritized under the NAP will include climate-resilient investment in food production.

However, the usefulness of NAPs for managing compound risks is contingent on the rigour of the assessments. For instance, few NAPs currently integrate health risks, let alone other risks, as part of an integrated risk management process (World Health Organization 2021). UNEP has developed resources to encourage governments to integrate health considerations into NAPs (UNEP 2020a). Additionally, as at July 2021, UNEP is supporting 18 national governments to advance their NAP processes, including projects that simultaneously link to the COVID-19 response and recovery (UNEP 2020c). Governments should continue to be encouraged to ensure – with support where required – that NAPs are underpinned by rigorous, forward-looking climate change risk assessments to identify medium- to long-term adaptation priorities.

6.5.2 Lessons for adaptation financing

Government and donors could increase investment to improve adaptive capacity. The COVID-19 pandemic has spurred extensive fiscal spending. Governments should ensure that recovery spending is used to build forward better by actively targeting increases in climate adaptive capacity. This suggestion is in line with the communiqué of G7 climate and environment ministers following their meeting in May 2021 (G7 2021a), which stressed the importance of increased action on adaptation (including by reaffirming their commitment to article 9.4 of the Paris Agreement, which calls for the provision of scaled-up financial resources contributing to adaptation action) and committed countries to working intensively to increase the quantity of finance for adaptation. Similar commitments have been made by the G7 world leaders, G20 energy and climate ministers and African ministers for the environment (G7 2021b; G20 2021; UNEP, African Ministerial Conference on the Environment and the African Union 2020).

When crafting stimulus packages, governments can apply emerging frameworks to identify and prioritize interventions that achieve both economic recovery and climate change resilience, such as the World Bank's Proposed Sustainability Checklist for Assessing Economic Recovery Interventions (World Bank 2020b), the World Bank Adaptation Principles (Hallegatte, Rentschler and Rozenberg, 2020) and the GCA Framework for Identifying Effective Interventions (GCA 2021). In addition, if available, countries can use existing country-specific adaptation plans and instruments as a starting point to identify stimulus measures suited to local contexts, as illustrated by the case study in box 6.5.

Governments and donors could increase the resilience of fiscal frameworks to deal with compound risks. COVID-19 has reinforced the need for governments and donors to ensure the rapid availability of finance after disasters to mitigate economic shocks and enable a swift and effective emergency and recovery response (Wahba *et al.* 2020). Such financing can reduce the financial shock of disasters on a government's balance sheet and ensure that predictable, timely and cost-effective finance is available to respond to the emergency (World Bank 2021a). In the context of the COVID-19 pandemic, countries that had pre-arranged disaster finance in place were able to respond to the pandemic swiftly. For instance, in Sierra Leone, having learned from its response to the Ebola outbreak in 2013–2014, the government was able to adjust its national social safety net programme to rapidly reach vulnerable households with donor support in its response to the pandemic (Sandford *et al.* 2020).

Despite its importance, prior to 2020 many governments' fiscal and macrofinancial frameworks did not anticipate or prepare for systemic shocks like the COVID-19 pandemic (OECD 2020a). However, some governments are now taking steps to manage systemic shocks beyond pandemics, including climate shocks (World Bank 2021a). To build resilience to compound risks, the World Bank Adaptation Principles include the recommendation that countries build flexibility, redundancy or both into budgets to account for ongoing costs that the country will face (OECD and World Bank 2019). For example, the Bhutan governmental budget process includes financial allocations for natural disasters and climate change impact risks as part of a "fiscal risk

Box 6.5 Identifying adaptation measures that meet short- and long-term goals in Fiji

Countries can increase the adaptive capacity of their recoveries by identifying fiscal stimulus priorities from within existing government resilience plans. For example, the World Bank identified interventions with the potential to reconcile the short-term economic and job creation needs of Fiji with longer-term climate change adaptation goals, by drawing on the country's existing Climate Vulnerability Assessment (CVA).

The CVA was produced in 2017 and proposed a list of 125 interventions that would be most effective in reducing the country's vulnerability to the impacts of climate change. In 2020, the World Bank screened each proposal against its Proposed Sustainability Checklist for Assessing Economic Recovery Interventions to narrow the list to 63 core interventions that could enable Fiji to "build forward better". However, the country's government will likely be operating in a fiscally constrained environment, with the economy contracting by 15.7 per cent in 2020 and the total outstanding debt of the country expected to increase from 62.3 per cent of GDP at the end of 2020 to 91.6 per cent of GDP at the end of the 2022 financial year. The analysis suggested that, if pre-existing planning instruments are sufficiently robust, governments can apply more rigorous constraints and still identify interventions that deliver co-benefits. For example, even assessing proposals against a budget cut-off of 3 per cent of GDP and solely prioritizing short-term stimulus effects resulted in a list of 10 initiatives that could contribute to resilience, long-term economic development and decarbonization.

Sources: World Bank 2020a; Asian Development Bank 2021.

allocation matrix" (Hallegatte, Rentschler and Rozenberg 2020). Taking such an approach to risk within public finance frameworks could enhance a country's adaptive capacity by enabling it to manage risks in an integrated way.

Developed economies could significantly increase direct grants, concessional finance with adaptation requirements and support for local capacity-building to help countries counter the economic pains of the COVID-19 pandemic and meet adaptation requirements. As discussed above, highly climate-vulnerable nations require better access to concessional finance, alongside substantive debt relief in order to create the fiscal space necessary to invest in adaptive capacity (Dibley, Wetzer and Hepburn 2021; Kaiser *et al.* 2021). Some governments and international financial institutions have already contributed to such causes (UNEP 2020a), while others have pledged to do more in the face of the pandemic (World Bank and IMF 2020). In this respect, the increase in Special Drawing Rights (SDRs) by the IMF in August 2021 (equivalent to US$ 650 billion) is historically significant in size (IMF 2021a). However, to meet the needs of vulnerable countries, the amount of finance provided will need to be substantially higher than current commitments (O'Callaghan and Murdock 2021; United Nations 2020).

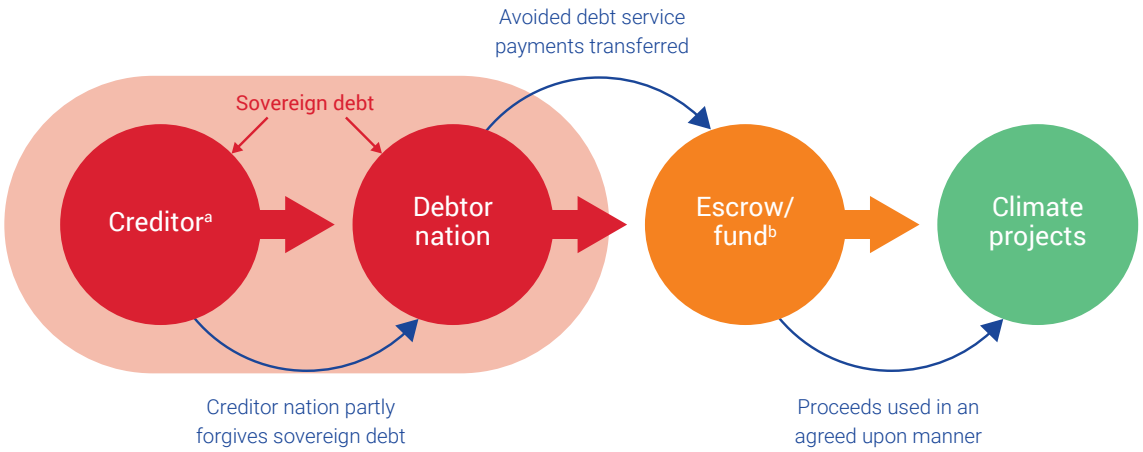
An ambitious and well-targeted package of support, with adaptation priorities, can support country-level adaptation capacity in a variety of ways, such as freeing up fiscal space for economically vulnerable countries, helping drive the recovery from the COVID-19 pandemic and ensuring the planned fiscal intervention promotes well-defined adaptation objectives (for example, UNEP 2021b). A strategy designed along these lines can take various forms, including debt relief, incentivizing greater private debt relief and private-sector investment in adaptation, or using promising debt relief mechanisms (see box 6.6; chapter 4; Khan 2020; Singh and Widge 2021; Volz *et al.* 2021).

In addition to providing support in the form of finance, governments and donors should help fund and support capacity-building for compound risk management. This could include assisting government treasuries to better evaluate climate physical and transition risks, including considering how to manage such risks in the context of the pandemic and other compounding events. Such support could also help to develop local research capabilities in this area.

Box 6.6 Debt-for-climate swaps: a promising debt relief mechanism

Debt-for-climate (DFC) swaps have been identified as a promising debt relief instrument to generate fiscal space for countries to allow green and resilient investment as part of the recovery from COVID-19. DFC swaps involve a debtor nation committing to greater climate ambition, funding or both for domestic climate activities, on terms agreed with the creditor instead of continuing to make external debt servicing payments. The types of climate actions suitable for a debtor nation depend on the specific circumstances of individual countries, including their level of vulnerability to climate change. The generic structure of a DFC swap agreement is shown in figure 6.3 below.

Figure 6.3 Generic structure of a DFC swap at the country level



[a] Creditor is likely to be another nation State, but private sector creditors are also encouraged to participate in a DFC swap.

[b] An "escrow" is a legal vehicle in which funds are held in trust — usually by a third party — and can only be released once specific conditions are met. These funds should be sufficiently transparent so the public is able to determine to where funds have been dispersed. In this example, funds might be held in an escrow/fund until a government has taken preliminary steps to implement a climate project or once the project has achieved reductions in risk or vulnerability.

Source: Singh and Widge (2021).

DFCs have three primary benefits: increased climate spending, while avoiding debt servicing payments dedicated to climate-positive activities; boosting economic recovery, with direct investment that stimulates private investment and assists economic recovery; and reduced external country debt.

DFC swaps are particularly suited to countries with high levels of bilateral public external debt with other countries and are currently not captured by the G20 Debt Service Suspension Initiative. This primarily means middle-income and some low-income countries.

Sources: Singh and Widge (2021); Volz *et al.* (2021).

7

Chapter 7

Outlook on global progress

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A woman surveys her crops in a village community garden in the increasingly dry north eastern province where UNEP and partners are helping communities adapt to climate change in Jappineh, The Gambia. Learn more about this project here.

Photo: © UNEP

This chapter synthesizes findings from chapters 3 to 6 of this report, with the aim of providing an overview of the status of global progress on adaptation (section 7.1). It also offers an outlook for future developments in terms of tracking adaptation progress globally (section 7.2).

7.1 Synthesis of results across the chapters

Building on the framing in table 2.1 (chapter 2), this section synthesizes knowledge from chapters of this Adaptation Gap Report (AGR) on progress, gaps and factors constraining the interpretation of findings related to adaptation planning, finance and implementation. It also provides insights in expected future trends, based on the chapter authors' expert judgement.

Figure 7.1 provides a contextual visualization of the results (panel A) and synthesizes them using the assessment criteria described in chapter 2 of this report (section 2.3.2 and table 2.1).

7.1.1 Progress

There is more robust evidence compared to AGR2020 that progress made worldwide over the last decade in enhancing national-level adaptation continues to accelerate. This conclusion is supported by multiple findings below.

Recognition of the policy importance of adaptation to galvanize action at the international and national levels: Climate adaptation has become an established part of climate policy action worldwide (UNEP 2021a). Nearly eight out of 10 countries have at least one national-level planning instrument in place that addresses adaptation (including regular updates and additions) and about one in 10 countries are in the process of developing a new one. Results also show some signs of acceleration: among countries with one or several national-level planning instrument(s) that address adaptation, almost one in five have introduced such an instrument in the past five years (including one country in 2021). The analysis also shows some acceleration since 2015 in terms of the number of adaptation-related projects financed through international funders (Adaptation Fund, Green Climate Fund and the Global Environment Facility). Lastly, there is qualitative information suggesting that the COVID-19 crisis has served as a "wake-up call" to instigate or accelerate adaptation processes, such as the National Adaptation Plan (NAP) development processes in some countries (for example, Ghana).

Increasing maturity in the way adaptation is considered in policies and strategies: Approaches to adaptation at the national level demonstrate varying degrees of maturity – either through adaptation-centred instruments or mainstreaming of the adaptation component into existing planning processes – depending on national circumstances and risk profiles. For example, six out of 10 countries now have one or more stand-alone sectoral planning instruments in place and at least one out of four has one or more subnational planning instrument(s). The inclusion of vertical coordination mechanisms in adaptation planning instruments, which facilitates governance across levels of administration, has also progressed since AGR2020, with a 22 per cent increase in the number of such mechanisms. Stakeholder engagement (different government levels, non-governmental and sectoral organizations, research institutes, and the private sector) in national-level processes has also increased by about 20 per cent compared to the assessment of adaptation plans in AGR2020.

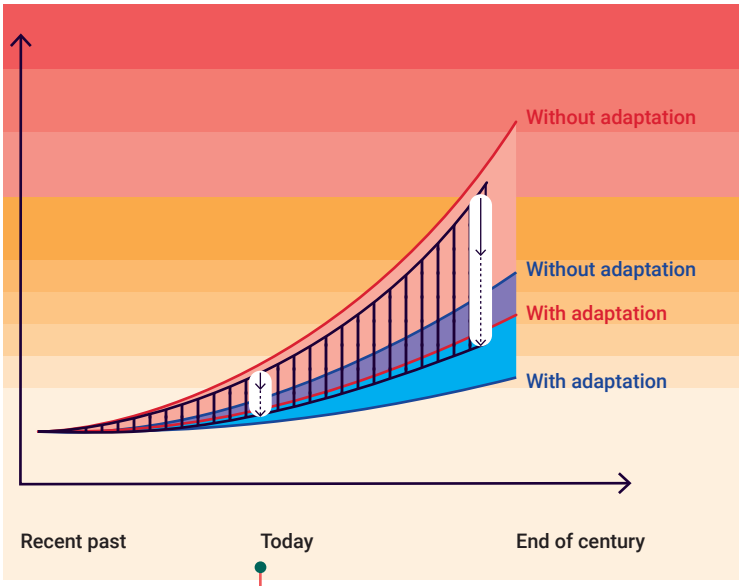
Actionable policies providing guidance on how to operationalize adaptation: The increasing levels of adaptation finance reported by multilateral and bilateral funding agencies (for example, the hundreds of projects in developing countries that have received support from multilateral climate funds since 2005) indicate that there is increasing focus on more actionable policies. The move towards more stand-alone sectoral plans is an illustration of this phenomenon: besides more integrated plans contributing to more actionable policies, more dedicated plans also indicate sector-specific approaches to the topic.

Early signs suggesting more progress in the near to long-term future: Evidence of more climate-resilient and sustainable financial systems and investments is accumulating (for example, through increasing measures addressing climate risks to components of the financial system, such as industries, corporations, enterprises and

Note for figure 7.1: Synthesis of progress and gaps in adaptation at the national-level, as reported in the corresponding chapters. This figure is based on the framing table (table 2.1 in chapter 2). **Panel A**. The background colouring illustrates the increase in climate risks for various warming scenarios (Representative Concentration Pathway [RCP]2.6 and RCP8.5) and adaptation scenarios (with/without) (Oppenheimer *et al.* 2019; Hurlbert *et al.* 2019; Magnan *et al.* 2021). The blue and light-red curved drawings represent risk scenarios under RCP2.6 and RCP8.5, respectively, while the central black drawing represents a hypothetical risk scenario under a speculative, midway warming scenario. This figure is purely illustrative and does not rely on any quantitative data. The white vertical bars show, for today (left) and by the end of this century (right), the level of risk reduction to be expected from very limited adaptation efforts (top of white boxes) to high adaptation efforts (bottom of white boxes), i.e. the "adaptation space". The downward black arrows within these white boxes provide a theoretical interpretation of observed progress and uncertainty: the solid arrows illustrate the progress that can be assessed and reported based on evidence, and the dotted arrows reflect knowledge gaps and therefore potential adaptation gaps. Together, the solid and dotted arrows within the same box help understand the balance between what we know has been achieved and what we are uncertain about because of a lack of information; they therefore help balance progress and potential gaps. **Panel B**. applies the general framing used in this report (progress, gaps, contextual factors that constrain the interpretation of the results; see table 2.1) to the findings of the main chapters (3–6).

Figure 7.1 Synthesis of progress and gaps in adaptation at the national-level, as reported in the corresponding chapters

A



Risk scenarios under RCP2.6 (blue) and RCP8.5 (red), with and without adaptation, are inspired by the recent IPCC special reports (SRCCL; SROCC). The midway risk scenario (black) is purely hypothetical and is used for illustrative purposes.

Global climate risk scenarios

- RCP8.5 (mean)
- RCP2.6 (mean)
- Hypothetical illustrative midway scenario

Adaptation progress

Full adaptation space

- Virtually certain progress
- Uncertain progress

B

Evidence of adaptation progress

- **Recognition of the importance of adaptation in policy** is on the rise in national-level policy documents across the world, as well as in climate finance
- **More maturity** in the way adaptation is either mainstreamed into existing policies or considered as an overarching policy area in its own right; however, levels of maturity vary significantly across countries
- **Actionable policies** providing guidance on how to operationalize national-level adaptation planning are increasing, as illustrated by increasing levels of adaptation finance reported by multi- and bilateral funding agencies, and the move towards more sectoral adaptation plans
- **Early signs of further progress,** such as the emergence of new instruments, actors and approaches to scale up adaptation finance, indicates that more knowledge, experience and progress, are to be expected in the near to long-term future

Identification of gaps

- In terms of **adaptation finance,** there is some indication that a sizeable adaptation finance gap remains (i.e. adaptation costs are increasing at a higher rate than adaptation-oriented financial flows)
- **Monitoring and evaluation** systems continue to be underrepresented and are only in place in about one-quarter of countries
- Evidence that present action is having the intended **knock-on effects** seems to be limited (e.g. in many countries it remains unclear whether national planning processes are actually leading to implementation at both the national and more local levels)
- In terms of **connection to climate risk reduction**, national-level data (outputs) provides very limited evidence of effective climate risk reduction today and in the future (outcomes)
- **Gender**, and, more broadly, **equity and justice** issues, remain under considered in practice, despite rising policy attention

Factors that constrain the interpretation of findings

- Vague adaptation goals at the global level do not facilitate the identification of precise global-level targets (i.e. at multiple scales, including global) or guide analysis of adaptation progress
- There is still a gap in the **availability of information** on both adaptation outputs (what has been done to adapt?) and adaptation outcomes (to what extent has this reduced climate risks?)
- **Uncertainty around the enabling conditions for adaptation** now and in the future is illustrated by the consequences of the COVID-19 pandemic (e.g. faltering of public finance flows and budget depletion more broadly; disruption of development- and disaster-related institutions and processes with implications on adaptation dynamics)

consumers). The analysis also confirms an important point made in AGR2020 on the emergence of new instruments, actors and approaches to scale up adaptation finance, including private adaptation, despite the effects of the COVID-19 crisis (section 7.1.3) (UNEP 2021a). There is widespread agreement that continued effort towards more climate-proof financial systems and investments will be important to progressively minimize and counteract cascading risks throughout societies as a whole and ensure longer-term and transformational reductions in climate vulnerability.

7.1.2 Gaps

This year's report warns that despite encouraging trends, adaptation progress made at the national level to date does not appear to be at the appropriate scale. Five aspects support this conclusion.

Adaptation finance: Estimates of adaptation costs and adaptation finance needs, as reported in updated NDCs, appear to indicate higher totals than previous AGRs, while adaptation-oriented financial flows appear to be broadly similar. This suggests that a sizeable adaptation finance gap remains in place and is likely increasing. Besides incomplete information on public flows, information on private flows also remains unclear. There have been positive trends in the emergence of new instruments, actors and approaches to scale up adaptation, including by the private sector, but the rate remains slow and is unlikely to fill the gap. Lastly, it is also unclear exactly how adaptation financing flows have been impacted by the pandemic, not least because up to mid-2021 COVID-19 stimulus packages were not very explicit about how they consider physical climate risk, adaptation or resilience dimensions in their announced investment priorities.

Monitoring and evaluation: Monitoring and evaluation (M&E) enables the adjustment of adaptation objectives, strategies and resources over time and is therefore key to ensure adequate and effective adaptation planning and implementation. While over one-third of the countries have an adaptation-dedicated M&E system under development, only about one-quarter already have one in place. In addition, there are indications that M&E approaches still strongly focus on outputs at the expense of outcomes and lack perspective on risk reduction per se, partly due to difficulties identifying how this can be measured in relation to climate hazards using climate data and scenarios. Similarly, there has been little attention on assessing the effectiveness of transformational adaptation.

Knock-on effects: This report reinforces the conclusions of the AGR2020. While in theory, national-level adaptation planning plays a substantial role in stimulating the development of subnational and sectoral adaptation strategies and plans, in practice, it remains unclear whether the planning processes in various countries lead to actual implementation at the national and subnational levels. For example, more than 60 per cent of countries with a NAP are not yet tracking its implementation (Leiter 2021). Moreover, even countries with horizontal and/or vertical coordination mechanisms in place in their planning instruments flag effective coordination as a continuing area of difficulty.

Connection to climate risk reduction: National-level data provide very limited evidence of effective climate risk reduction today and even more in the future. There is also a lack of evidence in the scientific literature: out of more than 1,680 scientific papers analysed by the Global Adaptation Mapping Initiative (GAMI),[1] less than 2 per cent contain empirical evidence of risk reduction as a result of adaptation-related interventions (Berrang-Ford *et al.* 2021). While this does not exclude the possibility of reducing climate risks, adaptation initiatives are still very much operating on the basis of the assumption that the intended results are being achieved.

Gender and equity: Despite broad recognition of gender as an important adaptation dimension, the national-level policy documents of about seven out of 10 countries tend to underscore the importance of integrating gender considerations into adaptation planning. In addition, the way in which countries report on gender considerations varied considerably, ranging from general statements through to more elaborate ways of taking gender into account in action plans.

7.1.3 Factors constraining the interpretation of the findings

There are three main **types of limitations and uncertainties** to be considered:

Lack of clarity in adaptation goals: The Global Goal on Adaptation is not specific in terms of resilience and vulnerability at the global level and on climate risk reduction now and in the future. While there are reasons that article 7 of the Paris Agreement does not provide a precise definition (such as to accommodate interpretation by a variety of Parties), this has resulted in certain limitations, such as the difficulty to infer precise global-level targets and guide the analysis of adaptation progress (Magnan and Ribera 2016). There is an expectation that with growing experience in adaptation, reporting under the United Nations Framework Convention on Climate Change (UNFCCC) will continuously converge and become more informative. Improved information across countries' reporting has the potential to advance information on some quantitative indicators (for example, the relative number of actions implemented on the ground or at-risk population groups covered by specific interventions). More qualitative goals could also emerge, for example in terms of knowledge at the local scale of risk

1 https://globaladaptation.github.io/.

reduction, the inclusion of equity dimensions or extending the timescale of planning from the short-to-medium term to the longer term. To date however, this remains largely aspirational.

Availability of information: Information levels on the three dimensions considered in the UNEP AGRs (planning, finance, implementation) have not improved since 2020. This means there are still substantial limitations and uncertainties:

- First, there are gaps in data availability. For example, it remains challenging to get a sense of the scale of private finance dedicated to adaptation because databases are mostly scattered or difficult to access. Similarly, and despite recent progress under the GAMI, there is a lack of comprehensive databases gathering information on adaptation planning and implementation in high-income countries because adaptation is frequently mainstreamed at subnational and sectoral levels. Data on project outcomes and evaluations are also often not publicly available.

- Second, there are knowledge gaps in understanding the effectiveness of a wide range of climate adaptation measures and policies in terms of the adaptation process itself (for example, the extent to which vulnerable population groups are included and equity issues are considered), but also in terms of their actual contributions to climate risk reduction now and in the future. It is therefore unclear whether current adaptation approaches contribute to long-term successful adaptation or to an increased level of maladaptation. In turn, this limits our understanding of the contribution of adaptation-related national plans, strategies, frameworks and laws to societal resilience and climate risk reduction across sectors, territories and population groups.

- Third, the lack of understanding of future risk levels under various warming and (national-level) socioeconomic scenarios prevents comparison of adaptation outputs observed today with potential outcomes in the future. There are, however, avenues for improvement. In principle, for example, it is possible to assess progress in implementation of climate-relevant interventions and compare this with levels of exposure in the future, which would give us a proxy for understanding progress or gaps.

Uncertainty around the enabling conditions for adaptation: External factors that are not climate-related have a considerable influence on vulnerability trends and the extent and time of the emergence of climate risks. This includes, for example, changes to the political economy of nations (for example, changes in the rights of women and indigenous groups), geopolitical shifts and global shocks. The COVID-19 crisis, which is expected to have increasingly profound implications for future adaptation efforts and outcomes (though not fully studied and understood), illustrates this phenomenon. For example, the global pandemic crisis appears to have halted the trend for the gradual increase in international public adaptation finance observed in recent years. There is also emerging evidence that the pandemic has disrupted existing adaptation planning and disaster risk financing. In some countries, NAP processes have been hampered by health restrictions, as well as by the focus on immediate pandemic responses at the expense of climate change adaptation. Additionally, some contingent disaster risk management budgets have been depleted, raising concerns of reduced adaptive capacity to respond to subsequent health emergencies and climate shocks. On a more positive note, the COVID-19 crisis also highlights the importance for governments to address compound risks through integrated risk management approaches and provides opportunities for governments and donors to finance activities that support economic recovery, while also building adaptive capacity.

7.1.4 Exploratory forward-looking findings

While chapters 3 to 6 are essentially backward-looking, an exploratory forward-looking approach has also been used, based on expert judgement, to complement limited data and evidence. The findings are both encouraging and worrying at the same time. Crucially, there is overall consensus among the authors of this report and in the literature that more ambitious adaptation will be critical going forward. Recent conclusions from the IPCC state that the Paris Agreement temperature goal is in peril, with the global mean surface temperature rapidly approaching 1.5°C above pre-industrial levels (IPCC 2021). Moreover, the recent NDC synthesis by the UNFCCC confirms that the world is not on a path towards 2°C (UNFCCC 2021; UNEP 2021b).

The chapters of this AGR indicate that adaptation planning and implementation are mostly incremental and still following historical and current events and trends, rather than taking a more anticipatory approach and considering unexpected factors (for example, tipping points in climate and social systems). The authors of this report also expect that adaptation costs and needs will likely continue to rise, especially if insufficient progress is made towards the temperature goal of the Paris Agreement. Public adaptation finance flows are also likely to continue to increase modestly, but will not close the finance gap, while private adaptation flows will continue to increase, but will be uneven and often not reach those in greatest need. Overall, the large adaptation finance gap is likely to remain and it is plausible that it will even grow. The COVID-19 pandemic is also expected to negatively impact adaptive capacity at multiple scales, affecting a wide range of stakeholders. For example, the economic shocks of COVID-19 have contributed to household vulnerability (with around 100 million more people falling into poverty in 2020), job losses and declining sales for businesses. The pandemic has also exacerbated high levels of existing corporate debt and the prevalence of unsustainable sovereign debt, which will

Photo: © Shutterstock

likely hamper future government spending on adaptation, particularly in developing countries. The length and depth of these consequences will vary across and within countries and will become more apparent over time but there seems to be general agreement that long-term adaptation challenges in terms of planning, finance and implementation will be substantially affected.

To summarize, the level of transformation required to address future climate risks does not yet seem to be materializing. However, this conclusion deserves some caution due to the difficulties in tracking transformational adaptation processes, partly because data collection on such future processes has not really begun in the scientific and policymaking communities. This report therefore calls for the scaling up of efforts to develop methods that combine metrics or indicators on resilience (grounded in empirical studies and recognizing the contextual nature of resilience and adaptation); adaptation performance in terms of implementation; and the effects on actual risk reduction now and in the future (in relation to measuring "successful adaptation" and the risk of maladaptation). Progress may be slow in these areas, but the authors of this report estimate that further development and promotion of robust assessment and decision-making approaches are likely as climate change impacts intensify, increasingly highlighting the need for enhanced adaptation ambitions.

7.2 The way forward

This section discusses some overarching challenges in assessing adaptation progress and outlines key takeaways for future work on tracking it globally.

7.2.1 The challenges ahead

This report raises several recurring knowledge barriers to understand adaptation, globally and across scales, aligned with those described in previous AGRs. These limitations underpin a number of key recommendations for the scientific and policymaking communities.

First, on **climate hazards**, it is crucial to better understand future climate trends and hazards at the national level, as well as at the subnational levels (for example, to highlight levels of cross-scale homogeneity/heterogeneity in terms of adaptation-related challenges). The IPCC Sixth Assessment Report (AR6) (IPCC 2021) contains ground-breaking information in this area (see the contribution of Working Group I, released in August 2021). The contribution of Working Group II, due in early 2022, will provide additional information, for example through the identification of representative key risks relevant to the interpretation of dangerous interferences with the climate system stressed by UNFCCC.

Second, **climate risk projections** need to be dramatically improved as they are key to informing the assessment of adaptation progress or gaps. Given the multidimensional nature of climate risk (hazard, exposure, vulnerability and including adaptive capacity), a hard push is especially needed to better combine climate projections with scenarios on societal exposure and vulnerability (Garschagen *et al.* 2021; Magnan *et al.* 2021), for example through a more systematic application of the Shared Socioeconomic Pathways approach to national contexts. Such combined scenarios can be highly beneficial to the policymaking community. By allowing contrasting risk levels under various warming scenarios and adaptation scenarios (for example, business-as-usual, medium ambition, high ambition), they will in turn highlight

the range of possible risk reductions (for example, business-as-usual versus high adaptation), support the identification of feasible adaptation scenarios, depending on context-specific risk tolerance patterns, and provide a sense of the residual risks expected to persist even after adaptation.

Third, there is an urgent need for science-based advances to understand the **effectiveness of adaptation responses** in terms of their ability to reduce climate risk levels, both now and in the future, and therefore support successful adaptation over the long run, while limiting the risk of maladaptation. There is emerging scientific literature on frameworks to assess effectiveness, but more is needed, especially on national-level policy analysis.

Lastly, the availability of **multiple types of data and information** needs to be substantially increased, including on private climate finance (to provide more comprehensive information on trends in adaptation finance) and adaptation plans implemented locally (to better capture the knock-on effect of national-level policies).

7.2.2 Towards the next generation of approaches for tracking adaptation progress

The UNFCCC Adaptation Committee recently prepared several technical papers, including one in 2021, to review existing approaches for adaptation progress tracking, especially from the perspective of the Global Stocktake and with a view to opening up avenues to develop further methodological guidance (UNFCCC Adaptation Committee 2021a).[2] Among several issues identified by the Adaptation Committee, two touch on critical points raised throughout the AGR series, namely the type of information needed to understand adaptation progress and the way to use/aggregate the data and information.

In addition to reinforcing caution about the overall feasibility of aggregating quantitative indicators and data, the Adaptation Committee paper argues that a standardized approach to assess progress carries the risk of masking both the sensitivities of national contexts in terms of exposure and vulnerability to climate change, and the divergence of approaches to monitor, evaluate and report on adaptation action. In line with findings from the scientific community, the paper also emphasizes that existing approaches usually rely on just a few different types of information (often just one), such as national communications or quantitative indicators/statistical data. Yet it is increasingly acknowledged that multiple sources of information (both quantitative and qualitative data, both scientifically-based and from traditional knowledge systems, etc.) provide different types of understandings that do not compete with but complement each other. For example, quantitative data sets help describe formal dimensions of vulnerability conditions but are unable to reflect more qualitative dimensions. On the other hand, traditional and indigenous knowledge or the perspectives of women and other vulnerable groups are key to reflecting such qualitative and often intuitive information on vulnerability and risk on the ground but can be hard to include in traditional scientific analysis. Lastly, the paper also warns against the risk of the dilution and loss of information throughout the complex synthesis and reporting mechanisms under the UNFCCC. The issue may not always be data itself, but rather the way information is used to inform policy and action at higher levels.

Being able to identify new approaches to allow different types of information (quantitative and qualitative, and evaluative and descriptive) to be brought together at multiple scales is an emerging challenge. For example, recent publications have used expert judgement approaches to understand future climate risk at local levels (Oppenheimer *et al.* 2019; Duvat *et al.* 2021) or support a more comprehensive assessment of adaptation (for example, the UK Climate Change Committee regular reports[3] and GAP-Track approach by IDDRI[4]). Such approaches provide promising ways forward, but still need further exploration and validation.

2 For interim guidance drafted by Adaptation Committee on Adaptation Communications, see UNFCCC Adaptation Committee (2021b).

3 See for example the 2019 Progress Report to Parliament: www.theccc.org.uk/publication/progress-in-preparing-for-climate-change-2019-progress-report-to-parliament/.

4 See for example the 2021 Methodological Report available on the project webpage: www.iddri.org/en/project/assessing-global-progress-climate-adaptation-gap-track-2021.

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Chapter 7

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