

EXECUTIVE SUMMARY

Even if emissions of greenhouse gases are stabilised at a level that is consistent with the ultimate goal of the United Nations Framework Convention on Climate Change (UNFCCC), both the risks and the impacts of climate change are expected to increase significantly in coming decades. Adopting a strategic framework for adaptation—with clearer goals and targets—would help set the direction for and track progress on adaptation universally and in relation to the ongoing negotiations under the UNFCCC. In this context, adopting an adaptation gap approach with its focus on targets—as well as on the potential for, and limits to adaptation—could be useful.

This report is being published in response to requests made to the United Nations Environment Programme (UNEP) by different parties to provide a preliminary assessment of adaptation gaps to complement information presented in the emissions gap reports UNEP has been producing since 2010. The emissions gap reports analyse the estimated gap in 2020 between emission levels consistent with the goal of keeping global average temperature increase in this century below 2°C above pre-industrial levels, and projected levels if emission reduction pledges by parties are met. Parties have found the emissions gap reports useful in helping inform their discussions at the annual Conference of the Parties (COP) to the UNFCCC.

The report focuses on developing countries, where adaptation needs are anticipated to be the highest and adaptive capacity is often the lowest. The main emphasis is on the period from 2010 to 2050, as the short- to medium-term is considered the most relevant period of time for framing adaptation decisions and actions.

FRAMING THE ADAPTATION GAP

Estimating the adaptation gap is far more challenging than calculating the emissions gap, as there is no globally agreed goal or metrics for adaptation, and adaptation is a response to specific climate risks and impacts often local in nature and vary over time. Key challenges in creating a framework for identifying adaptation gaps include: (i) the framework should be applicable across the globe on different spatial scales and across many sectors and risks; (ii) it should adequately capture current gaps in adapting to existing climate conditions and variability, as well as future gaps arising from the impact of increased climate change; and (iii) it should acknowledge, and allow for, differences in societal values and preferences with regards to

determining a 'desirable' level of adaptation at local, national, regional and global levels.

The proposed framework for defining adaptation gaps facilitates the identification of **the present and future potential for, and limits to, adaptation, and the discussion of adaptation targets.**

Definition

The adaptation gap can be defined generically 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.

There are big differences in the potential for reducing the risks and impacts of climate change through additional adaptation now and in the near term. These, depend on both climate and non-climate stressors.

The 5th Assessment Report by the Intergovernmental Panel on Climate Change (IPCC) gives examples of representative key risks in different regions. These highlight that **finance, technology and knowledge** (in relation to improved management practices) are key determinants for realizing adaptation potential, making it possible to reduce risks and impacts in both the short- and long-term. They point to a significant overlap between adaptation and development issues and options, underlining the importance of adopting an integrated approach.

Finding ways of measuring the adaptation gap so that progress towards reducing it can be monitored is a major challenge. The choice of definition of the adaptation gap—and the metrics used to track progress towards closing it—will ultimately depend on the purpose for it, as societal preferences about it will vary. The latter represents an additional obstacle with regards to the measurement of a global adaptation gap. A global goal or target could be supplemented by sub-goals or targets flexible enough to be appropriate at regional, national, sector and lower levels, allowing for the consideration of multiple dimensions and objectives.

THE FUNDING GAP

There is likely to be a major adaptation funding gap after 2020 unless new and additional finance for adaptation becomes available. This conclusion is based on an analysis of existing global, sectoral and national estimates of the costs of adaptation, against an assessment of levels and trends in public adaptation finance flows. The Green Climate Fund could play a key role in bridging the adaptation funding gap.

The 5th Assessment Report by the IPCC says that **existing global estimates of the costs of adaptation in developing countries range between US\$70 billion and US\$100 billion a year globally by 2050.** The findings of this review suggest that these values are likely to be a significant underestimate, particularly in the period after 2030. **At a minimum, the costs of adaptation are likely two-to-three times higher than the estimates reported thus far,** and plausibly much higher than this towards 2050. National-level studies indicate far higher global cost figures than global-level studies: towards 2050, costs could be as much as four to five times higher than the estimates reported in global-level studies. This conclusion is also supported by a methodological review of the global-level studies, which reveals that global-level studies provide only partial coverage of sectors and impacts, do not factor in uncertainty or policy costs, and assume high levels of greenhouse gas emission reductions.

Definition

The adaptation funding gap can be defined and measured as the difference between the costs of meeting a given adaptation target and the amount of finance available to do so.

Adaptation costs and finance needs are emissions-dependent and will rise more quickly under higher emission scenarios—that is, under a 4°C rather than a 2°C pathway. Indicative modelling results highlight that compared to a 2°C pathway costs under a 4°C pathway could potentially double around mid-century. This is because the sooner the 2°C threshold is exceeded, the higher the rate of climate change, and the greater the levels of anticipatory adaptation.

Adaptation needs are not equally distributed. In relative terms, **least developed countries (LDCs) and small island developing states (SIDS) are likely to have much**

higher adaptation needs, and the failure to implement early adaptation in these regions will have a disproportionate impact, thus widening the current adaptation gap.

The amount of public finance committed to activities with explicit adaptation objectives ranged between US\$23 billion and US\$26 billion in 2012–2013, of which 90 per cent was invested in developing countries.

These estimates are a combination of Official Development Assistance (ODA) and non-ODA finance by governments; Climate Funds earmarked for adaptation; and commitments by Development Finance Institutions. The latter contributed US\$22 billion, or 88 per cent, of the total; bilateral adaptation-related aid commitments by government members of the Organization for Economic Co-operation and Development (OECD) provided 9 per cent; the remaining 2 per cent came from adaptation dedicated Climate Funds.

There is evidence that **financial commitments to adaptation objectives have increased in recent years across all sources of finance but, even so, scaling up adaptation finance flows remains a pressing priority.** There has been a significant increase in adaptation dedicated Climate Funds since 2003. Bilateral adaptation-related aid commitments by members of the OECD Development Assistance Committee (DAC) furthermore indicate that adaptation is **increasingly mainstreamed** in development cooperation activities. Nonetheless, the analysis underscores the need for new, predictable and additional sources of funding to bridge the adaptation gap. Building on the work of the United Nations Secretary General's high level Advisory Group on Climate Change Financing, the report underlines the potential for innovative sources in mobilizing funding for adaptation in developing countries.

The funding gap analysis **underestimates the total adaptation finance flows** as data limitations and methodological challenges that prevent the inclusion of the **contribution of the private sector and domestic public budgets in developing countries** directly carrying out and supplying adaptation measures in response to the early risks and impacts of climate change. Furthermore, no attempt has been made at indicating the share of the adaptation funding gap to be covered through international and domestic finance flows or to make a distinction between funding for development gaps and funding for adaptation gaps.

THE TECHNOLOGY GAP

It is difficult to define and measure the adaptation technology gap separately from the adaptation gap because of the considerable overlap between the definition of technologies for adaptation and the definition of adaptation. However, we can **identify perceived gaps by the countries based on available technology needs assessments**, and requests to technology support mechanisms. These gaps are identified both in terms of technological maturity (traditional, modern, high technology) and in terms of area of effort (transfer, diffusion, innovation).

Experience with technologies for adaptation has shown that the most **successful efforts at promoting the transfer and diffusion of adaptation technologies are those that meet a number of human needs in addition to providing climate benefits**. Moreover, they are firmly grounded in the broader socio-cultural, economic, political and institutional contexts of the location where the technology is used. Simply stated, the best technology may be that which serves a variety of purposes above and beyond the climate-related. Not least, all evidence highlights that adaptation technologies are needed across all socio-economic sectors. At present, the development and transfer of adaptation technologies occurs mainly in the context of the implementation of adaptation projects and programmes, and the main sources of financing are expected to come from adaptation funding sources, such as the Green Climate Fund.

Definition

The adaptation technology gap can be defined in terms of perceived gaps by countries, based on available technology needs assessments and requests made to technology support mechanisms.

Most technologies for adaptation needed in the short- to near-term already exist and are often available within a country, but major barriers to their further uptake remain. Additional efforts have to be made to accelerate the diffusion and uptake of critical technologies. An analysis of recent Technology Needs Assessments and Technology Action Plans indicates that, in the area of adaptation today, technology transfer as such is not the key obstacle for closing the adaptation technology gap—rather dissemination and uptake pose more important obstacles. Governments can facilitate the flow of technologies within countries through incentives, regulations and the strengthening of institutions.

International technology transfer for adaptation is also critical. Areas where the international transfer of technologies is particularly important include improved crop varieties, water use efficiency techniques, and monitoring systems.

Research and development have a significant role to play in helping adjust existing technologies to local conditions, not least through innovation in areas where existing technologies—such as insurance solutions, high yielding crop varieties, or water use efficiency appliances—are insufficient to meet fundamental adaptation challenges. Sharing experiences between countries could contribute substantially to closing the adaptation technology gap in regions facing similar challenges.

Evidence shows that technological change is linked to institutional change. As a result, **institutional strengthening can support the innovation and adoption of advanced technologies**. Specifically, reinforcing the mandate and capacities of the relevant existing and new institutions to include the development, transfer and diffusion of adaptation technologies can help close the adaptation technology gap. To this end, more targeted evidence on the ability of technology options to reduce climate risks and associated costs is required from local to global level.

THE KNOWLEDGE GAP

The report focuses on three types of knowledge gaps that, if addressed, could make significant contributions towards reducing the overall adaptation gap, both in the short- and medium-term. They are: missing or incomplete knowledge (gaps in knowledge production); inadequate linkages between different bodies of knowledge (gaps in knowledge integration); and limited diffusion and translation of knowledge to decision makers (gaps in knowledge transfer and uptake).

Definition

Knowledge gaps can be framed in the context of bridging either the generic adaptation gap or a specific adaptation gap. While they are difficult to quantify, it is possible to set specific and measurable targets for addressing them.

There is considerable scope for using existing knowledge on adaptation more effectively. **Integrating knowledge from different sources and making it available to decision-makers at different levels is arguably the most important knowledge need.** Connecting and integrating different communities and approaches is often challenging, which explains the shortage of much-needed initiatives facilitating the bridging of knowledge systems. To make it accessible and useable for decision-makers, knowledge must also be filtered and synthesized. The successful uptake and use of knowledge requires communication and co-exploration between researchers and decision-makers, the effective tailoring of knowledge to the specific context

and constituency, and its translation into the formats or languages most suited to decision-making.

For many regions and countries, there is a lack of systematic identification and analysis of adaptation knowledge gaps, and there are few initiatives focused on addressing this. The consideration of knowledge gaps should be integrated more explicitly in project and programme framing and design, involving all stakeholders. This would help ensure that the knowledge produced responds better to user needs and identified knowledge gaps, and is relevant and usable for decision making.

Some of the most commonly cited gaps in the knowledge base that could be bridged in the short term concern the opportunities and constraints of various adaptation options and cost–benefit analysis of adaptation strategies. **In this context, additional experience with the monitoring and evaluation of adaptation actions would help improve the effectiveness of such actions.** A semi-standardized documentation of project experience to support comparison and effective linking with national plans, objectives, priorities and monitoring processes would go a long way towards meeting that. Similarly, collaborative efforts connecting researchers, practitioners and other stakeholders at different levels could greatly help bridge specific knowledge gaps.

Due to uncertainties associated with climate change and its impact, adaptation decisions will continue to be made with imperfect knowledge. **A repository of adaptation options for specific regions and on different levels that can be integrated in development decisions is currently missing and could play a pivotal role in informing development decisions.** The systematic evaluation of development efforts could help ensure that they are sustainable and do not inadvertently increase climate change risks.

SUMMING UP

It is often stated that adaptation is local, while mitigation is global. Although true in some ways, the preliminary analysis in this report highlights that adaptation challenges also require global action. It is clear that adaptation is often a response to specific climate risks at a given time and in a given context. Nonetheless, the magnitude and unequal distribution of the adaptation challenge and the similarities between the types of climate risks and the choice of adaptation responses communities, sectors, countries and

regions face, indicate the relevance of a global framework. Clearer goals, targets and metrics would help set the direction for adaptation action and would facilitate tracking progress towards meeting those goals and targets.

As illustrated in the report, the multiple dimensions of adaptation make it challenging to come up with a single goal and measure for adaptation. A plausible approach may therefore be to establish goals and targets in key areas. The Millennium Development Goals, the new Sustainable Development Goals, and the process for the development of a post-2015 framework for disaster risk reduction are examples of relevant approaches where goals and targets are set, while accommodating differences in capacity, needs and preferences.

This report focuses on finance, technology, and knowledge as key levers to address current and future adaptation gaps. Other gaps, including in capacity and governance, are equally important to consider. Moreover, there is complex interaction between various gaps. As Chapter 2 and 3 of the report underline, while increased adaptation finance flows is a prerequisite to address adaptation gaps, they may have limited effect on reducing climate risks and impacts if the absorptive capacity required for effective use of these resources is low.

The report points to a number of areas for further action and future analysis. Cross-cutting issues relate to transparency and comparability of methodologies; establishing appropriate metrics for assessing adaptation needs and gaps; comprehensive monitoring and evaluation of adaptation; and establishing a central repository of information on adaptation options and action. In addition, the chapters of the report highlight a need to address the challenges of existing estimates of the costs of adaptation; expand the information on private and domestic adaptation finance; provide more targeted analysis of the potential for technologies to reduce climate risks and impacts in various sectors; and provide systematic analysis of knowledge gaps and how to bridge them. The intention is to provide fuller analysis of some of these aspects in future reports.