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Chapter 2

Framing the Adaptation Gap Report

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2.1 Introduction

The 2020 edition of the Adaptation Gap Report (AGR) is the first building block of a broader series of AGRs that aims to progressively advance knowledge on adaptation progress made globally. By providing a conceptual framing to contextualize the challenges related to the assessment of adaptation progress, including current and future adaptation results, it paves the way for the AGR series as a whole. It is primarily focused on the global and national scales, with source material drawn from data, reports and scientific literature, which will be updated and refined in subsequent editions of the AGR.

This chapter highlights some of the basic elements of the longer-term approach in terms of assessing adaptation in the context of climate risks. First, climate risks are discussed in the context of the interlinkages between adaptation and mitigation, the current and future risk levels against which to assess adaptation progress, and the extent to which ambitious adaptation could reduce climate risks. Second, the process of assessing adaptation is discussed in the context of framing adaptation progress, barriers in tracking adaptation outcomes (i.e. results in terms of climate risk reduction – see box 2.1), and the scope and methodology of the report. Understanding of these two aspects – climate risk trajectory and adaptation assessment – will continually evolve over the coming AGRs as new knowledge emerges from the literature and more consistent data and information are provided by countries, donors and implementing organizations.

2.2 Framing the climate risks context

2.2.1 Climate risks in the context of adaptation and mitigation

Climate risks are rising as climate change leads to increases in global temperatures, sea level rise and many extreme events, including heatwaves, droughts and floods (Intergovernmental Panel on Climate Change [IPCC] 2014; Oppenheimer *et al.* 2019; Hurlbert *et al.* 2019). Adaptation is a process by which levels of risk are reduced at any given temperature level (figure 2.1, panel A). With increasing climate change, the efforts – and costs – required to avoid or limit the resulting impacts continue to grow, and there is residual risk, whereby some level of damages can no longer be avoided at all.

The IPCC Special Report on Global Warming of 1.5°C updated the five integrated 'reasons for concern'[1] to encompass a wider range of both natural and social systems. These all show a significant rise in impacts between current temperatures and 1.5°C above pre-industrial levels, as well as between the 1.5°C and 2°C scenarios (IPCC 2018). Warm-water corals, for example, are already at high risk and will experience very high risks at 1.5°C (IPCC 2018). It is expected that 99 per cent of warm-water corals will be destroyed if global temperature levels rise by above 2°C, with significant consequences for biodiversity, livelihoods and the natural protection that these ecosystems provide against coastal flooding and erosion (IPCC 2018; chapter 6).

If mitigation measures were implemented as planned in the nationally determined contributions (NDCs), future warming would be at least 3°C above pre-industrial levels (United Nations Environment Programme [UNEP] 2020). Strong mitigation is therefore the most effective option to avoid the severe impacts of climate change associated with the exponentially rising damages and costs expected after 2050 (IPCC 2014; IPCC 2018; Gattuso *et al.* 2018; UNEP 2020). According to Warren *et al.* (2018), the global economic damages of climate change will be lower under a trajectory that stays within 1.5°C at the end of the century as compared to one that leads to 2°C warming. Hsiang *et al.* (2017) estimate that the USA stands to lose 0.1–1.7 per cent of gross domestic product (GDP) by the end of the century for the 1.5°C scenario, compared with a median GDP loss of 4.5 per cent (uncertainty range of 2.5 per cent to 8.5 per cent) under a no-mitigation policy trajectory.

Similarly, De Cian *et al.* (2016) suggest that limiting global warming to 2°C approximately halves the economic damages to 1–1.6 per cent of global world product (GWP) compared to 2.4–2.7 per cent under the business-as-usual baseline. Adaptation can significantly reduce these damages, particularly under higher temperature changes, with GWP reductions limited to 1.5–2.1 per cent for the baseline scenario. However, these projections differ dramatically between regions. Developing countries, particularly in Africa and Asia, are expected to suffer much higher losses, further accentuating their development disadvantages and higher vulnerabilities to climate change. Using a different set of integrated assessment models, Hof, Elzen and Vuuren (2010) reach similar conclusions regarding damages and their regional distribution.

Box 2.1. Defining adaptation outputs and outcomes

- Adaptation **outputs** refer to the sum of activities engaged on the ground and address the question: what are we doing today to adapt?
- Adaptation **outcomes** refer to the results of those activities in terms of reducing risk today (observed outcomes) and in the future (expected outcomes).

1 Risks to unique and threatened systems, risks associated with extreme weather events, risks associated with uneven distribution of impacts, risks associated with global aggregate impacts, and risks associated with large-scale singular events

2.2.2 Against which current and future risk levels should adaptation progress be assessed?

Assessing progress made to reduce current and future risks implies consideration of a broader spectrum of risks than only under a 1.5–2°C warming. Although it is widely acknowledged that the nature and level of climate risks is highly context-specific, some global-scale assessments have emerged in recent decades to allow for cross-scale framing. These assessments could lay some foundations for the AGR series.

The IPCC Fifth Assessment Report (AR5; Oppenheimer *et al.* 2014; O'Neill *et al.* 2017) developed a climate risk framework (Box 2.2) and an assessment of eight key risks that are considered representative of the range of critical climate risks to global society, across all latitudes, levels of development and types of climate hazards. These risks refer to important dimensions for sustainable life, livelihoods and settlements: risk to lives, land-based food security, ocean-based food security, water security, urban systems, critical infrastructure and networks, terrestrial biodiversity and ocean biodiversity. Such a generic list of climate risks could be useful in framing future AGR reports.

The three recent IPCC Special Reports (on Global Warming of 1.5°C, Climate Change and Land (SRCCL) and the Ocean and Cryosphere in a Changing Climate (SROCC)) further expanded risk characterizations for a range of ecosystems, sectors and human systems. Some of these assessments will be updated in the IPCC Sixth Assessment Report (AR6). Other sources (such as the WorldRiskReport[2] and the Global Risk Report[3]) will also contribute to the knowledge base on future risk levels against which adaptation outcomes, and therefore progress or gaps, can be assessed in the context of the AGR series (Magnan and Chalastani 2019).

Furthermore, comparing risk levels under a range of global warming scenarios could help in defining some risk reduction targets – for example, around bridging the gap between impacts under low-end (such as Representative Concentration Pathway (RCP) 2.6) and high-end (such as RCP8.5) global warming scenarios. This could contribute to refining, even qualitatively, the global goal on adaptation and set the scene for better tracking of global adaptation progress. Risk comparison across global warming levels represents another important framing element for future reports in the AGR series.

2.2.3 To what extent could ambitious adaptation reduce risk?

In addition to the assessment of risk levels, the other critical information needed to understand adaptation progress relates to the actual future benefits, in terms of risk reduction, to be expected from ambitious adaptation over this century (see figure 2.1). This, however, constitutes a significant knowledge gap and, to date, only emerging insights are available in the scientific literature (for example, Melvin *et al.* 2016; De Cian *et al.* 2016), as well as in the recent IPCC Special Reports on Climate Change and Land, and the Ocean and the Cryosphere (Hurlbert *et al.* 2019; Oppenheimer *et al.* 2019). This explains why the outcome dimension of adaptation progress cannot be fully considered in this edition of the AGR.

Improving the evaluation of adaptation outcomes in future AGRs relies on a better understanding of the potential effectiveness of a wide range of adaptation plans, policies and measures. Much work is required to define the degree to which these instruments individually and collectively fulfil specific goals relating to risk reduction now (observed outcomes) and in the future (expected outcomes). This calls for an assessment framework to be developed that will capture adaptation effectiveness as a whole, including multiple dimensions. These dimensions include, for example, potential outcomes of adaptation-labelled policies and measures; readiness in terms of implementation; lead time until full benefits are achieved; lifespan of their benefits; undesirable side effects; and barriers to implementation (Gattuso *et al.* 2018; Magnan *et al.* 2020). Overall, such a framework could help improve the assessment of adaptation outcomes and, by extension, the tracking of adaptation progress in a consistent way throughout subsequent AGRs.

2.3 Understanding progress in adaptation

Understanding adaptation progress means asking three intertwined overarching questions: what are we doing today to adapt? To what extent are we currently reducing climate risks? And will our adaptation trajectory help us reduce future climate risks? This 2020 AGR edition responds to the first question by discussing current adaptation outputs observed at the national and international levels, thereby paving the way for upcoming AGRs to effectively address the other two questions. Answering the first question, however, raises its own important methodological and data challenges, as highlighted in the next chapters on planning, financing and implementing.

2.3.1 Framing adaptation progress

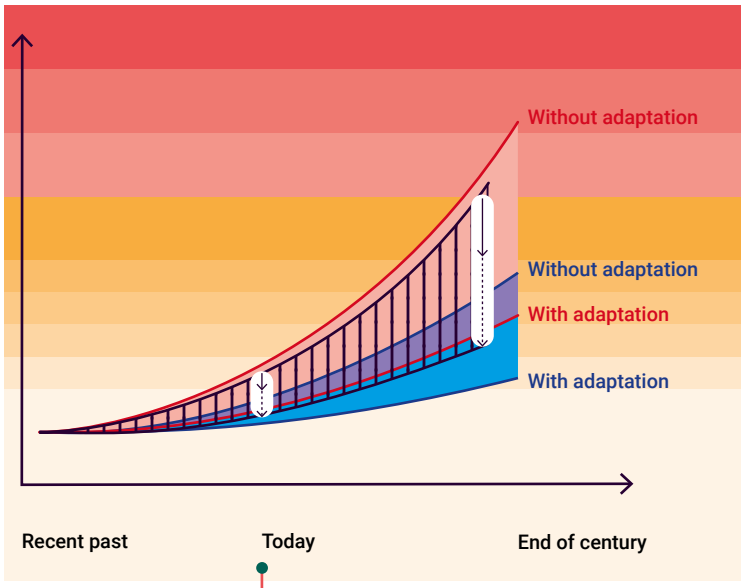
'Adaptation progress' is understood here at two distinct levels of analysis and builds on the 2017 edition of the AGR (UNEP 2017). First, progress can be considered in the context of outputs from the adaptation process. The adaptation process is the sum of targeted activities engaged in to help achieve adaptation objectives, for example the global goal on adaptation or national-level objectives. The adaptation process necessarily covers a broad range of activities, including early awareness and assessment of specific climate risks at global

2 Available at https://reliefweb.int/report/world/worldriskreport-2020-focus-forced-displacement-and-migration.

3 Available at https://www.weforum.org/reports/the-global-risks-report-2020.

Figure 2.1. Progress in adaptation under different climate risk scenarios

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 policy importance of adaptation** in order to galvanize action at the international and national levels
- **Maturity** in the way adaptation is either mainstreamed into existing policies or considered as an overarching policy area in its own right
- **Actionable policies** refer to the extent to which multi- and bilateral cooperation and national policies provide clear guidance on how to operationalize adaptation on the ground (i.e. beyond only providing strategic guidance)
- **Early signs of further progress** highlight emerging experience and knowledge, which indicates that more progress is to be expected in the near to long-term future

Identification of gaps

- **Adaptation finance** represents an important aspect of international cooperation towards adaptation and is a key prerequisite to its implementation
- **Monitoring and evaluation** is a key prerequisite for planning to remain adequate and effective over time
- **Knock-on effects** refer to how progress made at a given level (e.g. national) has a subsequent effect on progress at lower levels (e.g. local)
- **Effectiveness in terms of climate risk reduction** is key to understanding whether existing or planned policies and actions (outputs) lead to effective adaptation (outcomes)
- **Gender** and broader concerns around equity and justice

Elements that constrain the interpretaion of findings

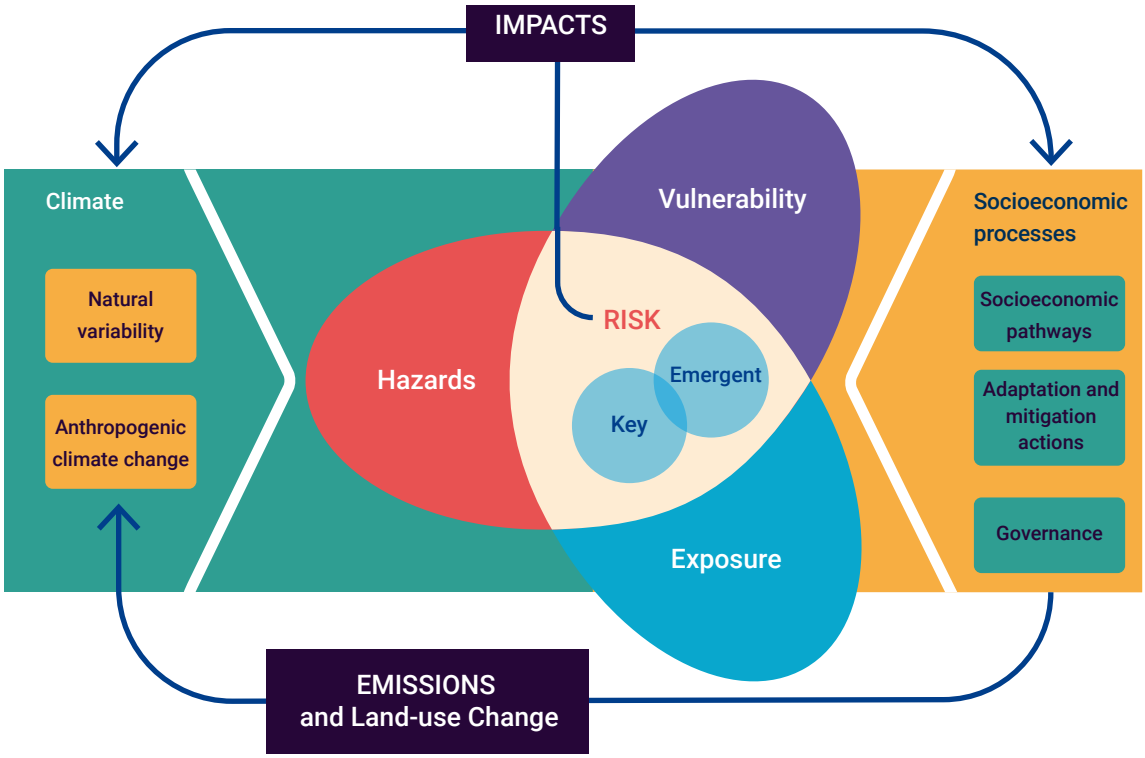
- **Adaptation goals** refer to the scenario that we want to achieve in the context of a changing climate, either at the global level or the national-level
- **Availability of information** on both outputs (what are we doing to adapt?) and outcomes (to what extent does this reduce climate risks?) is key to building confidence in whether we are achieving the progress desired or whether we are falling short (i.e. there is an adaptation gap)
- **Uncertainty around the enabling conditions for adaptation** describes the external, non-climate-related factors that can influence vulnerability and adaptive capacity, and can therefore make achieving adaptation goals easier or harder

Note: This figure is inspired by the 2014 AGR (UNEP 2014) and recent IPCC Special Reports (Oppenheimer *et al.* 2019; Hurlbert *et al.* 2019). In **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). 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 boxes 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. While the solid arrows illustrate the progress that can be assessed and reported based on evidence – for example, in the AGRs –, the dotted arrows reflect knowledge gaps and therefore potential adaptation gaps. Together, the two arrows within the same box help us understand the balance between what we know has been achieved, and what we are uncertain about because of a lack of information, thus helping balance progress and potential gaps. **Panel B** describes the general framing used in this report to analyse progress and gaps, as well as to consider the contextual elements that constrain the interpretation of the findings (for example, related to the influence of the COVID-19 crisis on adaptation efforts globally). This framing has been used to structure the cross-chapter synthesis provided in chapter 7 (see figure 7.1).

Box 2.2. What is climate risk?

Risk is the probability or likelihood of occurrence of hazardous events or trends multiplied by the impacts if these events or trends occur. Risk framing focuses on the potential for consequences where something of value is at stake and where the outcome is uncertain, recognizing the diversity of values. As is illustrated in figure 2.2 below, risks from climate change impacts arise from the interaction between hazard (triggered by an event or trend related to climate change), vulnerability (susceptibility to harm) and exposure (people, assets or ecosystems at risk). Hazards include processes that range from brief events, such as severe storms, to slow trends, such as multi-decade droughts or multi-century sea level rise. Vulnerability and exposure are both sensitive to a wide range of social and economic processes, with possible increases or decreases depending on development pathways (IPCC, 2014).

Figure 2.2. Schematic of the interaction among the physical climate system, exposure, and vulnerability producing risk



Source: Figure 19-1 from Oppenheimer *et al. (2014)*

to local scales, as well as planning, providing adequate means of implementation (finance, technology and capacity-building) and implementing concrete adaptation measures on the ground. The outputs of the adaptation process refer to the question: what are we doing today to adapt?

National-level adaptation or multi-/bilateral cooperation on adaptation can be assessed in quantitative terms (for example, number of plans, amount of financing committed, and type and scale of implementation activities) or qualitative terms (responding to questions such as: are plans covering all identified risks? Is finance mainly provided on concessional or market terms? Is implementation country-owned?).

Second, as outputs only provide part of the progress information, it is key to also understand the results of the adaptation process in order to answer the question: to what extent are we actually reducing climate risk levels today and in the future?

This is essentially the question raised by the global goal on adaptation and is intended to be answered by the Global Stocktake on adaptation, which will take place in 2023. Progress here would be in the form of outcomes and future impacts of the global adaptation process.[4] Assessing progress on outcomes is generally more difficult to do than tracking outputs, for many reasons including the lack of

4 The terms 'results' and 'outcomes' are being used interchangeably in this report.

scientific understanding of the effects of adaptation-related responses on risk levels, and the absence of a clear singular metric for adaptation. These issues mean that assessing outcomes will, by necessity, have to be rather qualitative.

While outputs are intended to lead to outcomes, in reality it is often difficult to attribute results (such as increased resilience to climate hazards) to individual actions. This is because the process involves multiple actors and a range of factors beyond the direct level of influence of any given initiative. A further complication associated with the 'missing link' between outputs and outcomes is that adaptation outputs, while intended to reduce exposure and/or vulnerability, can, if not properly anticipated, have few effects or may even lead to negative outcomes.

Figure 2.3 brings these dimensions together and includes the temporal dimension to show that adaptation outcomes can be further subdivided into observed and expected outcomes of adaptation. Observed adaptation outcomes refer to an *ex-post* assessment, i.e. the level of current climate risk reduction that has been achieved so far. Expected adaptation outcomes refer to an *ex-ante* assessment, i.e. the outcomes that are expected from planned or ongoing adaptation efforts in the future. To comprehensively assess adaptation progress in terms of future climate risks thus requires the combined appraisal of both observed and expected adaptation outcomes. This appraisal would need to take into account different levels of risk aversion or tolerance, i.e. the level (or range) of climate risks and associated impacts that a given society considers acceptable. Risk aversion is, however, highly context- and culture-specific and thus difficult to aggregate to a global level.

2.3.2 Barriers in tracking adaptation outcomes

There are three major constraints to assessing adaptation outcomes globally (see also panel B of figure 2.1).

First, contrary to mitigation where there is a specific target of limiting temperature increases to "well below" +2°C and thus an associated target of critical carbon emission/concentration (based on available warming scenarios), no single, straightforward and quantifiable metric (or even set of metrics) exists that could be used to convert the global goal on adaptation into a measurable target (and baseline) at the global level. Despite progress made on framing adaptation globally within the Cancun Adaptation Framework and the Paris Agreement, it thus remains difficult to quantify global progress on adaptation outcomes.

Second, no universal, agreed-upon assessment framework has emerged to date (UNEP 2017). Nevertheless, there has recently been progress in defining desirable criteria for an adaptation assessment framework at the global level (aggregable, transparent, longitudinal, feasible, coherent, sensitive to national context; UNEP 2017), as well as promising work promoting "concepts that are translatable and scalable across levels of government, and that can be systematically compared between governments" (Berrang-Ford *et al.* 2019). Despite this, progress towards adaptation goals cannot readily be compared across countries or other actors (private sector, subnational level, etc.).

Third, there is a data challenge as currently no central data repository documenting delivered adaptation outputs exists. While it is comparatively easy to track large-scale projects delivered by international donors (due to centrally available data sources), as well as national-level adaptation (due to these being well captured through reporting under the United Nations Framework Convention on Climate Change (UNFCCC) enhanced transparency framework[5]), subnational, non-state actor and local (often autonomous) adaptation efforts can go largely undocumented, despite being major factors in reducing climate risks locally. The AGR 2020 chapters dealing with planning, financing and implementing adaptation, as well as this year's topical chapter on nature-based solutions, all highlight such a gap in data availability, which future AGRs will explore ways to overcome (for example, by expanding the type and range of data considered).

2.3.3 Scope and methodology of AGR 2020

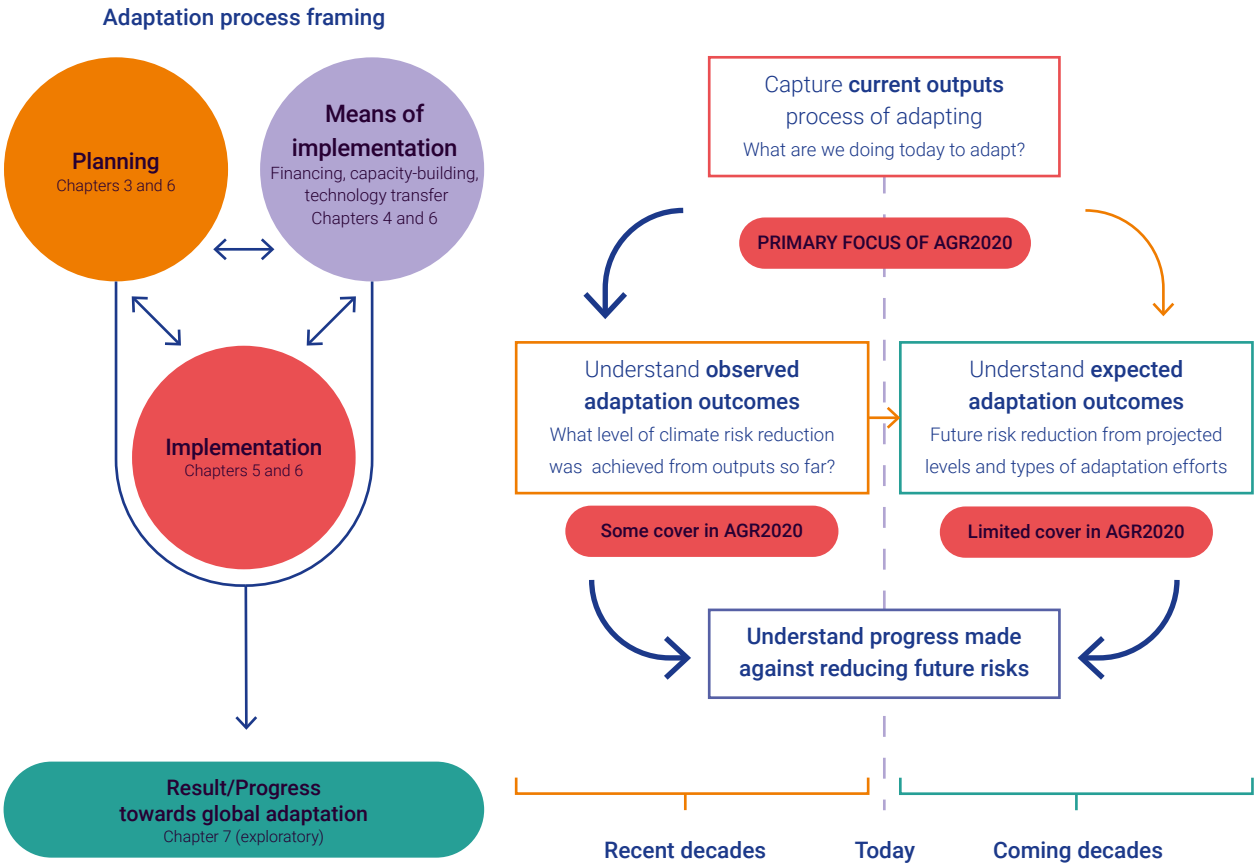
Recognizing the above barriers, the 2020 AGR analysis covers global outputs, with a focus on national adaptation actions across a broad range of sectors and multi- and bilateral cooperation, especially in terms of financing. Information is based on adaptation activities that have already begun or have been completed and focuses primarily on climate hazards and risks. The overall methodological approach is based on an assessment of the status and progress of adaptation planning, finance and implementation, and utilizes documentation from a wide range of reports, databases and scientific literature.

More specifically, the assessment in chapter 3 on planning is primarily based on data reported in national adaptation plans (NAPs), NDCs and national communications. Data are also drawn from, cross-checked with and complemented by the Grantham Research Institute's Climate Change Laws of the World database.

In chapter 4 on finance, analysis is primarily based on data related to public finance flows, including official development assistance (ODA) flows from the Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee members and finance flows reported by countries in their UNFCCC Biennial Reports.

5 Available at https://unfccc.int/process-and-meetings/transparency-and-reporting/the-big-picture/what-is-transparency-and-reporting

Figure 2.3. Conceptual storyline of the AGR series on assessing global progress on adaptation



In chapter 5 on implementation, the two main sources of information are funded adaptation projects and scientific literature. The chapter draws on adaptation proposals from the major multilateral climate funds and on adaptation as documented in scientific literature.

The methodological approaches used in chapters 3–5 were then applied in the deep-dive chapter 6 on nature-based solutions for adaptation (NbS). Much of the information on NbS assessed is from NDCs under the Paris Agreement, NAPs, donor databases, as well as reports from major development organizations such as the World Bank and GIZ, with case examples coming from implementing organizations.

Limitations to the methods and data used in this report include a lack of rigorous standards of reporting by countries and incomplete information on domestic public sector finance and private sector investments in adaptation (see section 7.1.3 in chapter 7). A major challenge in assessing progress is that adaptation actions are often embedded within other programmes and projects with multiple objectives.

The categories presented in panel B of figure 2.1 are those that the AGR has identified as relevant to assessing the evidence presented in the planning, finance and implementation chapters of this report. These categories are used in chapter 7 to interpret the results and understand relevant aspects of adaptation progress presented in chapters 3–6. They have been foundational to figure 7.1 in chapter 7.

The primary focus of this year's AGR is on establishing a baseline for assessing progress across planning, financing and implementation, i.e., on adaptation outputs (see figure 2.3). Beyond providing a snapshot of the current status of global adaptation efforts, the report seeks to serve as an inspiring foundation for advancing knowledge on global adaptation progress and for stimulating both the policy and scientific communities.

Thus, the AGR 2020 aims to clarify the needs in the context of the UNFCCC Global Stocktake process – which type(s) and level(s) of information are really needed to assess global adaptation progress? And what information is already available? Further conceptual and methodological developments are also required to understand and measure both past and present adaptation efforts (outputs) and the related observed and expected risk reduction (outcomes). The analysis in this 2020 edition thus builds on the 2017 AGR (UNEP 2017), which started to take stock of methodological progress over recent years to assess progress towards the global goal on adaptation.