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Underfinanced. Underprepared.

Inadequate investment and planning on climate adaptation leaves world exposed

Online Annexes

Adaptation Gap Report 2023

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Adaptation Gap Report 2023

Annex 2.A: Detailed methodology underlying the analysis presented in chapter 2

To provide an updated assessment of global progress in adaptation planning, this chapter reapplies the assessment framework used in the Adaptation Gap Report 2021 (AGR 2021). As with previous years, this analysis focuses on adaptation planning being undertaken by national governments and not that being undertaken by subnational governments, households or the private sector.

The assessment presented in chapter 2 can be divided into two distinct parts, which are presented in sections 2.2 and 2.3 respectively. The methodology underlying each section is described as follows.

Methodology underlying section 2.2

Section 2.2 provides a global overview of adaptation planning at the national level by looking at the overall number of national adaptation plans, strategies, policies and laws.

Purpose

The analysis in this section updates analysis conducted in the AGR 2020, AGR 2021 and AGR 2022. It seeks to demonstrate the progress that countries are making in putting in place national plans, strategies, policies and laws that guide, facilitate or mandate adaptation.

This year, the chapter provides greater nuance in the overview it delivers by distinguishing between legal instruments (e.g. laws and acts) that legally require national governments to adapt to climate change, and national planning instruments (e.g. policies, strategies and plans) that aim to guide/facilitate medium- to long-term adaptation planning. This differentiation was made to recognize that legal instruments and planning instruments play different roles in the national adaptation planning process.

Methodological approach

Legal and national planning instruments were identified through a desk review of publicly accessible databases that have global coverage. These included:

- Party submissions to the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat – namely, nationally determined contributions (NDCs),[1] adaptation communications,[2] national communications[3] and national adaptation plans (NAPs)(from the UNFCCC's repository of NAPs, NAP Central)[4]
- the Grantham Research Institute's Climate Change Laws of the World database (CCLW database).[5]

The cut-off for the analysis of the various documents and databases was 5 August 2023.

Definitions of legal and planning instruments that constitute the criteria for being counted in this analysis are provided in box 2.A.1.

1 More information available at https://unfccc.int/NDCREG.
2 More information available at www.unfccc.int/topics/adaptation-and-resilience/workstreams/adaptation-communications.
3 Annex I (www.unfccc.int/NC7) and non-Annex I (www.unfccc.int/non-annex-I-NCs).
4 More information is available at https://www4.unfccc.int/sites/NAPC/Pages/national-adaptation-plans.aspx.
5 See https://climate-laws.org/.

Box 2.A.1 Definitions applied in this analysis

Planning instruments

Planning instruments relevant to this analysis include (among others) national policies, strategies and plans that are designed to guide/lead to adaptation action. These instruments can be exclusively adaptation-focused, or cross-cutting across adaptation and mitigation. When instruments are cross-cutting, they must contain specific, time-bound policies and tools that are focused on adaptation (and not merely recommendations) in order to be counted.

To be included in this analysis, planning instruments need to have a cross-sectoral purview (i.e. instruments that focus on single or specific groups of sectors will not be counted). Furthermore, they also need to have a medium- to long-term outlook. This means that the analysis does not count national adaptation programmes of actions (NAPAs) or similar adaptation programmes that are one-off and/or short-term in nature.

Legal instruments

Legal instruments relevant to this analysis are those that create a legal mandate for national government to prepare national adaptation planning instruments. This includes legal instruments that have a broader focus (e.g. climate change, development, environmental sustainability), as long as it is clear that the mandate for action they establish includes adaptation (e.g. laws that clearly only have a mitigation focus are not counted).

Legal instruments that legally mandate the national government to engage in adaptation action for specific sectors – including in highly-related sectors such as disaster risk reduction, coastal regions and nature conservation – are not counted in this analysis. The same applies to legal instruments that exclusively establish institutional arrangements designed to facilitate adaptation planning (e.g. climate change committees, departments), even if planning adaptation is explicitly cited as the responsibility of these institutional arrangements.

Data processing

Once individual planning and legal instruments were identified, the data for each country were reviewed to identify cases where individual planning instruments were direct subcomponents of other planning instruments, and could thus be considered as part of the same 'policy package'. In cases where individual planning instruments were considered to be part of the same policy package, the data points were merged so they counted as only one instrument.

This process of normalizing the data set was required because countries publish adaptation planning instruments in different ways, with some countries publishing single instruments that contain a policy, strategy and action plan (i.e. publishing what could be regarded as multiple instruments as one instrument) while others publish policies, strategies and action plans as separate documents, despite the policy, strategy and/or action plan being directly connected (i.e. part of the same policy package). Thus, grouping instruments together in this manner was required to enhance data comparability between different countries.

In cases where insufficient evidence was available to confidently establish that two policies were part of the same policy package, they were counted as two separate instruments.

Limitations

The methodology applied during this assessment has a number of material limitations that should be taken into consideration when assessing the trends described in chapter 2. These are as follows:

The timing of the assessment means data for 2023 are incomplete.

As the cut-off date for collecting the data assessed was 5 August 2023, the values for 2023 provided in the chapter represent just over half of the year. This means the progress visualized by figure 2.1 may be slightly underestimated.

Reliance on secondary data means that data for more recent years are under-represented.

There is an inevitable lag between a country publishing a plan, strategy or policy, or passing a law or act, and this information being either reported in its submissions to the UNFCCC or present in databases such as the CCLW database. As there are often multiple-year gaps between Party submissions to the UNFCCC, this can mean that new plans, strategies, policies and laws will not be identified through this methodology until several years later. This limitation means that the overview provided by this

assessment likely under-represents the number of new plans, strategies, policies and laws published in the last few years. Similarly, it also means that the number of plans, strategies, policies and laws published in years covered by assessments conducted in previous iterations of the AGR (i.e. 2000–2021) is liable to have increased in this year's assessment.

Focus on national-level instruments undercaptures progress being made in countries where adaptation planning primarily falls under the jurisdiction of line ministries and subnational governments.

The assessment focuses on the national level for two main reasons: (i) it is at this level that countries engage with the UNFCCC and (ii) it is at this level that reasonable data coverage exists (comprehensive records of sectoral or subnational adaptation planning are not presently available).

A result of the decision to focus on national-level planning, however, is that progress being made by countries in which adaptation is primarily under the jurisdiction of subnational levels of government (e.g. at the states level) is not being adequately captured. For example, Australia has a federal governance structure and the responsibility for adaptation is primarily under the jurisdiction of state governments. In this analysis, Australia is registered as having national planning instruments in place, but no legal instruments. In reality, however, legal instruments relevant to adaptation planning are in place at the states level; something that is not captured by this analysis.

Similarly, the approach may give the impression that countries that do not have a national-level adaptation plan, strategy, policy or law in place are making no progress in adaptation planning – which may not always be the case. For example, Belarus is registered in this analysis as having no adaptation plan, strategy, policy or law in place. However, in its most-recent national communication, the country reports that line ministries with jurisdiction over vulnerable sectors have developed adaptation strategies, meaning progress is occurring on some level (Republic of Belarus 2022). This progress, however, is not captured by this analysis.

Methodology underlying section 2.3

Section 2.3 provides an assessment of the potential adequacy and effectiveness of national adaptation planning.

Purpose

The analysis in this section updates analysis conducted in the AGR 2020 and 2021 and seeks to assess the potential adequacy and effectiveness of adaptation planning processes that are ongoing at the national level. This analysis is included in the AGR 2023 in order to assess progress made since the assessment conducted in 2021.

It is important 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.

Methodological approach

The assessment framework applied comprises five criteria that were assessed through 14 indicators. Specifically, these criteria and indicators are used to shed light on the extent to which the outputs of national adaptation planning processes can reasonably be assumed to be adequate (sufficient) and lead to effective (successful) action towards achieving the stated adaptation targets and objectives (reducing climate risks and enhancing resilience). Importantly, this analysis is ex ante and does not assess the actual ex post adequacy and effectiveness of national planning processes, nor the implementation of adaptation actions that result from planning. The five criteria and their corresponding indicators are listed in table 2.A.1.

These criteria and their associated indicators were chosen as they respond to the provisions of the Paris Agreement, including on gender and social inclusion, 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[6] or in previous global or regional assessments of adaptation planning.[7]

6 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, Price-Kelly and Rass 2016).

7 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, Byrnes and Surminski 2019).

Table 2.A.1 Overview of criteria used to assess adaptation planning (including their underlying rationale) and associated indicators

Criteria and rationale	Indicators
1. Comprehensiveness	
Identifying climate risks and hazards and assessing vulnerability to existing and future climate hazards and impacts are foundational steps in the adaptation planning process. Countries can 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.	1.1 Adaptation options address assessed risks, impacts, hazards or vulnerabilities in priority sectors
2. Inclusiveness	
For adaptation planning to adequately reflect existing and forthcoming risks and vulnerabilities and to effectively enhance the ownership of any implementation, it must emphasize the engagement of all relevant stakeholders and take gender into consideration.	Evidence that: 2.1 Stakeholders are being engaged in adaptation planning processes 2.2 Gender is considered in adaptation planning processes
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.	Evidence that countries have: 3.1 A central administrative body responsible for adaptation Evidence that countries are using the following instruments in adaptation planning: 3.2 Regulations 3.3 Incentives 3.4 Direct investment/domestic funding
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.	Evidence that countries have: 4.1 Horizontal coordination mechanisms 4.2 Sectoral adaptation plans 4.3 Vertical coordination mechanisms 4.4 Subnational adaptation plans
5. Monitoring and evaluation (M&E)	
For planning to remain adequate and effective, it must be periodically monitored and evaluated.	Evidence that countries have: 5.1 M&E systems for adaptation 5.2 A published monitoring/progress report 5.3 A published evaluation report

The indicators were collected from Party submissions to the UNFCCC via a desk review. Documents assessed during this review were: NDCs, adaptation communications, national communications and NAPs.[8] The cut-off for the analysis of the various documents and databases was 5 August 2023.

Limitations

The methodology applied during this assessment has a number of material limitations that should be taken into consideration when assessing the trends described by the chapter. These are as follows:

The robustness of the assessment is tied to the accuracy and completeness of Party reporting.

As this approach uses Party submissions to the UNFCCC as its data source, it is reliant on these submissions to include accurate and complete information to provide a comprehensive picture. While the quality of Party submissions to the UNFCCC has improved over time, there are still significant variations in the completeness and quality between countries.

Incomplete reporting relating to the themes being interrogated by the assessment framework in table 2.A.1 means that there is a risk that countries could be assessed as not having meet the criteria even though – in reality – they have actually done so.

The use of a simple scoring system means that important nuances are missed.

As with the assessments conducted in the 2020 and 2021 AGRs, this assessment aims to assess all Parties to the UNFCCC. To do this, indicators are scored as either met ("Indicator met"), not met ("Indicator not met") or in progress or partially met ("Indicator partially met or in progress towards being met"). While this produces a broad global picture of adaptation planning, it hides important nuances and significant differences between countries.

Reliance on Party submissions to the UNFCCC means that there is a lag between progress being made and progress being detected using this methodology.

As with the analysis presented in section 2.2, there is an inevitable lag between a country doing something and them reporting on it within their submissions to the UNFCCC. As there are often multiple-year gaps between Party submissions to the UNFCCC, this can mean that actions that indicate improvements in the adequacy and potential effectiveness of national planning processes will not be identified through this methodology until several years later. This limitation means that the overview provided by this assessment will not be completely representative of the present picture.

8 This refers only to UNFCCC-endorsed national adaptation plans, i.e. plans submitted to the UNFCCC NAP Central.

Annex 2.B: Number of planning instruments and legal instruments published each year

Table 2.B.1 presents the data underlying figure 2.1, panel A in chapter 2. This cumulative line chart illustrates the number of countries with adaptation planning instruments and legal instruments in place by year since 2000. Table 2.B.2 presents the data underlying figure 2.1, panel B, which presents the number of planning instruments published each year.

Table 2.B.1 Number of countries with adaptation planning instruments and legal instruments in place

Year	Number of countries with adaptation planning instruments in place				Number of countries with a legal instrument in place
	At least one	At least two	At least three	At least four	
2000	0	0	0	0	0
2001	0	0	0	0	0
2002	1	0	0	0	0
2003	3	0	0	0	0
2004	3	0	0	0	0
2005	6	0	0	0	1
2006	8	0	0	0	1
2007	16	0	0	0	2
2008	26	0	0	0	4
2009	35	1	0	0	6
2010	46	3	0	0	6
2011	58	7	0	0	6
2012	81	10	0	0	10
2013	94	16	0	0	12
2014	101	22	2	0	15
2015	119	31	3	0	20
2016	130	40	6	0	21
2017	138	48	7	0	23
2018	143	55	16	2	28
2019	153	61	17	2	33
2020	157	68	21	3	37
2021	164	79	27	4	47
2022	167	85	33	6	49
2023	168	91	34	6	49

Table 2.B.2 Number of planning instruments published globally each year

Year	Number of new adaptation planning instruments published each year				
	Total	First	Second	Third	Fourth(+)
2000	0	0	0	0	0
2001	0	0	0	0	0
2002	1	1	0	0	0
2003	2	2	0	0	0
2004	0	0	0	0	0
2005	3	3	0	0	0
2006	2	2	0	0	0
2007	8	8	0	0	0
2008	10	10	0	0	0
2009	10	9	1	0	0
2010	13	11	2	0	0
2011	16	12	4	0	0
2012	26	23	3	0	0
2013	19	13	6	0	0
2014	15	7	6	2	0
2015	28	18	9	1	0
2016	23	11	9	3	0
2017	17	8	8	1	0
2018	23	5	7	9	2
2019	17	10	6	1	0
2020	17	4	7	4	2
2021	26	7	11	6	2
2022	17	3	6	6	2
2023	8	1	6	1	0

Annex 2.C: Results from the assessment of potential adequacy and effectiveness

Table 2.C.1 presents the data used to develop figure 2.2 in chapter 2. This figure illustrates the results of the assessment of the potential adequacy and effectiveness of countries' national adaptation planning processes.

Table 2.C.1 Data underlying figure 2.2

Indicator	Indicator met	Indicator partially met or in progress towards being met	Indicator not met
1.1 Options address assessed risks	159	32	6
2.1 Evidence of stakeholder engagement	163	9	25
2.2 Gender consideration	140	17	40
3.1 Central administration in charge	136	0	83
3.2 Regulations	114	0	115
3.3 Incentives	82	0	64
3.4 Direct investment/Domestic funding	133	0	42
4.1 Horizontal coordination mechanisms	152	3	52
4.2 Sectoral adaptation plans	133	12	110
4.3 Vertical coordination mechanisms	70	17	111
4.4 Subnational adaptation plans	63	23	110
5.1 M&E system in place	47	40	156
5.2 Monitoring/Progress report in place	41	0	181
5.3 Evaluation undertaken and report published	16	0	61

Annex 3.A: Aim and scope of the chapter

The implementation chapter has evolved over time and has added new data sources and analyses each year (see table 3.A.1). While space limitations mean that not every analysis can be updated annually, one data source has been featured annually since 2020, namely adaptation projects newly under implementation with funding from the Adaptation Fund, the Green Climate Fund and the Global Environment Facility. These three funds officially serve the Paris Agreement and/or the United Nations Framework Convention on Climate Change (UNFCCC) and are therefore particularly relevant for debates about the adequacy and effectiveness of adaptation finance (please see Annex 3.C).

In general, the implementation chapter's scope is:

- **A focus on actual implementation** (in contrast to planning and preparatory activities). Accordingly, section 3.2 on adaptation communications is predominantly concerned with the information on implementation that is mentioned within adaptation communications, and section 3.3 on adaptation projects only considers projects that have started while excluding concept notes and approved proposals whose implementation has not yet begun. Further, apart from the total annual cumulative funding volume of new adaptation projects, all other matters of adaptation finance are covered in the finance chapter (chapter 4).
- **A global or intercontinental focus:** The chapter aims for a geographic coverage that is as wide as possible. It therefore requires data sources that are global or at least intercontinental. For further details please see the Adaptation Gap Report (AGR) 2017 which focused on tracking adaptation progress at the global level (United Nations Environment Programme [UNEP] 2017).
- **An overarching picture rather than a sectoral or regional focus:** Due to the page limitation, the implementation chapter cannot go into detail on implementation in any sector or topic. The annual focus chapter of the Adaptation Gap Report has focused on health in 2018 and on nature-based solutions in 2020. For further details on implementation at the sectoral or regional level, the Intergovernmental Panel on Climate Change Working Group II *Sixth Assessment Report* (IPCC WGII AR6) from 2022 provides a very comprehensive knowledge base (IPCC 2022).

Further details about the evolution of the implementation chapter, the data sources and types of analysis that have been carried out each year are provided in Annex 4.A of the AGR 2022 (UNEP 2022).

Table 3.A.1 Data sources in the implementation chapter of AGR

Data source	Coverage	AGR
Project documents from the three global funds that serve the Paris Agreement (Adaptation Fund, Green Climate Fund, Global Environment Facility)	Developing countries	Since 2020
Implemented adaptation reported in journal articles (data from the Global Adaptation Mapping Initiative)	Worldwide	2020 (preview), 2021 (detailed)
Organisation for Economic Co-operation and Development Creditor Reporting System: Data on projects labelled as primarily addressing adaptation	Developing countries	2021, 2022
Green Climate Fund: Documents of projects that address both mitigation and adaptation (cross-cutting projects)	Developing countries	2022
Adaptation communications submitted by countries to the UNFCCC Secretariat	Developed and developing countries	2022 (preview), 2023 (detailed)

Annex 3.B: Analysis of adaptation communications

This year's implementation chapter analyses adaptation communications that have been submitted by countries under the Paris Agreement starting in 2020. Adaptation communications can either be submitted as stand-alone documents or a section in a nationally determined contribution (NDC), national adaptation plan (NAP), or national communication can be designated as an adaptation communication. In contrast to NDCs and NAPs, which typically communicate countries' commitments and intentions, stand-alone adaptation communications have the potential to include new information on implemented adaptation. Therefore, the document selection criteria for the analysis contained in this chapter only included stand-alone adaptation communications while excluding cases where countries had retrospectively nominated previously submitted NDCs or NAPs to serve as their adaptation communication. In fact, the governance function of NDCs under the Paris Agreement is primarily that of a pledging instrument, while the transparency framework is intended to report on follow-up (Leiter 2023). Accordingly, the *NDC Synthesis Report* found that information on implemented adaptation is not typically reported in NDCs (UNFCCC 2022).

While draft guidance on adaptation communications has been published in 2022, countries have discretion over the scope, content and format of their adaptation communications (UNFCCC Adaptation Committee 2022). There is also no common timeline. An important question therefore is whether adaptation communications provide new information on implementation; this year's implementation chapter is exploring this question. The database used is the Adaptation Communications Registry, which stores the documents countries have communicated as their adaptation communication.[9] By the cut-off date of 31 August 2023, a total of 59 countries and the European Union had submitted an adaptation communication. Over half (35) of them were submitted as stand-alone documents and therefore included in the analysis (see table 3.B.2).

Table 3.B.1 outlines the protocol that guided the extraction of data from these documents, including the dimensions, variables and their definitions as well as the coding options. The protocol builds on similar analysis such as the Global Adaptation Mapping Initiative (Lesnikowski *et al.* 2021), and assessments of national communications (e.g. Lesnikowski *et al.* 2015).

Adaptation communications differ in the extent of detail they provide on implemented adaptation actions. Some detail on implemented actions was found in adaptation communications submitted by Antigua and Barbuda, Australia, Austria, Benin, Burkina Faso, Canada, Eswatini, Ghana, Haiti, Iceland, Indonesia, Jamaica, Liberia, Norway, Portugal, Saint Lucia, Togo, United Kingdom of Great Britain and Northern Ireland and Zimbabwe. Extensive detail of implemented actions was found in adaptation communications from countries such as Benin, Ghana, Japan and Mexico.

9 See https://unfccc.int/ACR.

Table 3.B.1 Protocol for extracting and analysing data from adaptation communications

Part 1: Overview of an adaptation communication (relates to the entire text of an adaptation communication)			
Dimension	**Variable**	**Definition**	**Instructions and coding options**
Country attributes	Country	Name of the country to which the adaptation communication belongs	Open field
	Region	Based on the United Nations classification of geographical regions of the world	(Select one) Africa, Asia, Europe, Latin America and the Caribbean, North America, Oceania
	UNFCCC classification	Based on the Annexes to the UNFCCC	(Select one) Annex I, Non-Annex I
Document attributes	Type of document	This refers to the type of document that a country has designated to be its adaptation communication according to the Adaptation Communication Registry (https://unfccc.int/ACR). Although all documents available in the registry were included in our database, only stand-alone adaptation communications were considered in the data extraction and analysis.	(Select one) Stand-alone adaptation communication, NDC, NAP, national communication
	Year of submission	Year of submission as indicated on the Adaptation Communication Registry	Open field (number)
	Update	Is the adaptation communication an update of a previous submission?	Yes, No
	Document language	Primary language used in the adaptation communication	Open field (text)
	Support received	Did the country receive external support to facilitate the preparation of the adaptation communication?	Yes, No If yes, from whom?
Equity	Equity addressed (general)	Does the adaptation communication provide evidence on whether and how social inequalities are addressed in the planning and implementation of adaptation action? This is assessed by considering descriptions of how the priorities of contextually relevant social groups such as youth, women and persons with disabilities are integrated into the design and implementation of adaptation actions as well as in the evaluation of the distribution of adaptation costs and benefits. (See separate variables that assess consideration of equity within specific adaptation actions.)	Yes, No If yes, provide evidence

Indigenous knowledge	Indigenous knowledge incorporated (generally)	Does the adaptation communication provide evidence of the incorporation of Indigenous knowledge in adaptation planning, implementation and evaluation? Indigenous knowledge is typically unique to a cultural group, generated through long histories and interactions with their natural environment, and is passed on from one generation to another. (See separate variables that assess consideration of Indigenous knowledge within specific adaptation actions.)	Yes, No If yes, provide evidence
Local knowledge	Local knowledge incorporated (generally)	Is there evidence in the adaptation communication that indicates the consideration of local knowledge in adaptation planning, implementation and evaluation? (See separate variables that assess consideration of Indigenous knowledge within specific adaptation actions.)	Yes, No If yes, provide evidence
Implementation, tracking and reporting	Implemented adaptation actions	Does the adaptation communication provide information on projects, programmes or measures that are under implementation or have been completed?	Yes, No
	Details on implemented adaptation actions	What is the total number of implemented actions listed in the adaptation communication?	Open field (number)
		What is the number of implemented adaptation actions for which many details are provided?	Open field (number)
		What is the number of implemented adaptation actions for which few details are provided?	Open field (number)
		What is the number of implemented adaptation actions for which no details are provided?	Open field (number)
Adaptation barriers	Barriers	Does the adaptation communication provide information on the conditions hindering effective implementation of adaptation? Categories of these barriers include financial, technological, sociocultural, political and institutional barriers (Biesbroek *et al.* 2013; Eisenack *et al.* 2014).	Yes, No If yes, which ones? (Open field)

Part II: Implemented actions (analysis of specific details of each implemented action)			
Dimension	**Variable**	**Definition**	**Options (codes)**
Implemented actions	Adaptation action	This refers to the adaptation programmes, initiatives and activities that the country reports to have undertaken. To avoid double counting, this excludes actions supported by a country to be undertaken in another country.	Open field (text)
	Action description	Provides more detailed information on the adaptation action	Open field (text)
	Adaptation status	What is the status of the reported actions?	(Select one) Ongoing, Completed, Unclear/ unspecified
	Adaptation type	This variable classifies the adaptation actions based on their focus (Berrang-Ford *et al.* 2021)	(Select one) Behavioural/cultural, Ecosystem-based, Institutional, Technological/ infrastructural, Economic, Other, Multiple
	Action type	This variable considers the depth and scale of the implemented adaptation action (Lesnikowski *et al.* 2015)	(Select one) Preparatory, Substantive actions (local/pilot), Substantive (large scale), Unclear/unspecified
Sectoral focus	Sector	In which sector is the action implemented? This variable matches the sectoral information provided in the adaptation communication with sector categories used in the Adaptation Gap Report 2020 (UNEP 2021a).	(Select one) Agriculture and livestock, Water security, Human health and well-being, Biodiversity and ecosystems, Fisheries, Energy, Transport and infrastructure, Forestry, Cross-cutting, Multiple
Adaptation context	Hazards	What types of hazards does the adaptation action address?	Sea level rise, Extreme precipitation and inland flooding, Increased frequency and intensity of extreme heat, Drought, Rising ocean temperatures and ocean acidification, Wildfires, Storms (cyclones, hurricanes, etc.), General climate impacts, Multiple
	Vulnerability	What type of vulnerability does the action target?	Poverty, Agriculture and food insecurity, Health and well-being, Education, Gender equality, Inequalities (other than gender), Clean water and sanitation, Energy security, Work and economic growth, Industry, innovation and technology, Sustainable cities and communities, Consumption and production, Marine and coastal ecosystem services, Terrestrial and freshwater ecosystem services, Peace, justice and strong institutions, General vulnerability, Other, Multiple, Unclear

Social inclusion	Indigenous knowledge	Is there evidence of the consideration on Indigenous knowledge in the context of the specific adaptation action?	Yes, No
	Local knowledge	Is there evidence of the consideration of local knowledge in the context of the specific adaptation action?	Yes, No
	Vulnerable groups	Which vulnerable groups are targeted with the adaptation action?	Youth, Elderly, Low-income populations, Persons with disabilities, Migrants, Indigenous people, Ethnic minorities, Farmers, Herders, Fisherfolk, None, Other, Multiple, Unspecified
Adaptation lead	Leading organization	Which level of government, agencies or groups led the implementation of the adaptation action?	(Select one) Foreign agency or finance provider (internationally led), National government or agencies (nationally led), local organizations or groups (locally led)
Implementation results	Reported results	Does the adaptation communication include information on the results associated with the implemented adaptation actions?	Yes, No
	Type of reported results	What is the nature of the results reported?	(Select one) Outputs, Outcomes, Impacts, Multiple
	Adaptation effectiveness	Does the adaptation communication include results that demonstrate the effectiveness of implemented actions?	Yes, No
	Maladaptation	Is there any evidence (implicitly or explicitly) that adaptation failed or exacerbated risk or vulnerability?	Yes, No
	Benefits to extremely vulnerable groups	Which vulnerable groups are reported to have benefited from the implementation of this adaptation?	Youth, Elderly, Low-income populations, People with disabilities, Migrants, Indigenous people, Ethnic minorities, Farmers, Herders, Fisherfolk, None, Other, Multiple, Unspecified

Adaptation context	Hazards	What types of hazards does the adaptation action address?	Sea level rise, Extreme precipitation and inland flooding, Increased frequency and intensity of extreme heat, Drought, Rising ocean temperatures and ocean acidification, Wildfires, Storms (cyclones, hurricanes, etc.), General climate impacts, Multiple
	Vulnerability	What type of vulnerability does the action target?	Poverty, Agriculture and food insecurity, Health and well-being, Education, Gender inequality, Inequalities (other than gender), Clean water and sanitation, Energy security, Work and economic growth, Industry, innovation and technology, Sustainable cities and communities, Consumption and production, Marine and coastal ecosystem services, Terrestrial and freshwater ecosystem services, Peace, justice and strong institutions, General vulnerability, Other, Multiple, Unclear
Funding towards adaptation actions	Funding sources	Is the funding source for the particular adaptation action reported?	Yes, No If yes, provide information on the sources/ funder Open field (text)
	Funding type	Is the funding source domestic, international or both?	(Select one) Domestic, International, Domestic and International, Other If international, is it through bilateral or multilateral financial mechanisms?

Table 3.B.2 List of countries that have submitted stand-alone adaptation communications as at 31 August 2023

Country name	Year of submission	UNFCCC classification
Antigua and Barbuda	2022	Non-Annex I
Australia	2021	Annex I
Austria	2021	Annex I
Benin	2022	Non-Annex I
Burkina Faso	2022	Non-Annex I
Canada	2021	Annex I
Chile	2022	Non-Annex I
Eswatini	2021	Non-Annex I
European Union	2021	Annex I
Ghana	2021	Non-Annex I
Haiti	2022	Non-Annex I
Iceland	2023	Annex I
Indonesia	2022	Non-Annex I
Italy	2021	Annex I
Jamaica	2022	Non-Annex I
Japan	2023	Annex I
Liberia	2021	Non-Annex I
Madagascar	2022	Non-Annex I
Marshall Islands	2020	Non-Annex I
Mexico	2022	Non-Annex I
Namibia	2021	Non-Annex I
Netherlands	2021	Annex I
Nigeria	2021	Non-Annex I
Norway	2021	Annex I
Portugal	2021	Annex I
Republic of Korea	2023	Non-Annex I
Rwanda	2021	Non-Annex I
Saint Lucia	2022	Non-Annex I
Spain	2021	Annex I
Sweden	2022	Annex I
Switzerland	2020	Annex I
Togo	2023	Non-Annex I
United Kingdom of Great Britain and Northern Ireland	2020/2021	Annex I
United States of America	2021	Annex I
Zimbabwe	2022	Non-Annex I

Annex 3.C: Implemented adaptation actions funded by the Adaptation Fund, Green Climate Fund and Global Environment Facility

The analysis of this data source has been included in the implementation chapter since its first edition in 2020. Since 2022, the total amount of the annual combined funding volume of new adaptation projects from these three global funds is also provided. The methodology of this part of the chapter has remained consistent with previous years. Details are provided in the Annexes of the AGR 2022, namely Annex 4.B (data sources) and Annex 4.C (calculation methods) (UNEP 2022).

Annex 5.A: Opportunities for addressing loss and damage

Loss and damage and attribution

Attribution relates to loss and damage in terms of climate justice i.e. who is responsible for damages because of historical greenhouse gas emissions (Huggel *et al.* 2013). The attribution of extreme events increasingly informs scientific risk and vulnerability assessments (Intergovernmental Panel on Climate Change [IPCC] 2021). Some argue that the evidence for attribution of loss and damage resulting from rapid and slow onset changes in climate remains inconclusive (King *et al.* 2023). Losses and damages from such events are commonly attributed to climate change because of its high salience, because such impacts are consistent with modelled projections of changes in climate, and because the attribution of impacts to climate change cannot be disproved (IPCC 2012). The emphasis on attribution risks overemphasizing hazards rather than the socioeconomic context of exposure and vulnerabilities. This carries implications for adaptation actions and feasible solutions.

Actions for addressing loss and damage

Risk insurance, recognized both among the disaster risk reduction and climate change adaptation communities, has been proposed as an effective instrument for addressing losses and damages (Loster 2019). As a market instrument, it works either for risk spreading or risk mitigation depending on how the price of risk is communicated to the insurance subscriber. Experience suggests that insurance can help buffer shocks from weather and climate vagaries. Traditionally, the shocks have been buffered through social security programmes and through measures such as establishing irrigation and flood control systems and promoting flood- and drought-tolerant agricultural production systems. However, with the increasingly volatile weather and climate conditions, these measures are becoming insufficient, and gains in the adoption rate of new technologies are hard to come by. The residual risk not addressed by these measures is to be managed by the insurance. However, insurance should not be seen as a sole tool. To address the risk systematically and efficiently, risk layering approaches are needed where countries have a range of options starting from budgetary adjustments, contingency funds, contingent disaster financing arrangements with financial institutions and risk insurance. Risk layering enables countries to allocate low-cost options first and reserve high-cost options for exceptional conditions. Measures such as the Horn of Africa Risk Transfer for Adaptation effectively combine risk retention, risk transfer and risk mitigation into livelihood generation programmes, and such package measures could provide a solution to other developing and vulnerable regions.

The growth in insurance in many parts of the world is not reaching its potential due to the limitations of insurance policies including heavy subsidies not conveying the cost of risk-taking to the insurance subscribers, contributing to a large protection gap. There is also a need to expand the weather index insurance programmes, as opposed to indemnity-based insurance programmes, which can help address issues such as adverse selection and moral hazard. Designing a reliable index requires strengthening the weather, climate and crop production data, a major bottleneck in most developing countries. One of the major limitations of insurance and similar market-based instruments is that they largely ignore non-economic losses and damages. This could be changed by innovations such as combining the payment of ecosystem services with crop insurance premiums, which would help the package address both the economic and non-economic losses and damages. Innovations such as savings-linked insurance programmes and linking social security programmes with insurance have been advocated to make insurance affordable but are not evaluated and publicized widely. Risk insurance also needs to be expanded to cover infrastructure, both public and private.

Regional- and national-level catastrophic insurance, catastrophe bonds and insurance pools are being increasingly adopted with great success. The rise of regional insurance pools that provide sovereign risk transfer coverage is gaining attention. Catastrophe bonds issued in the aftermaths of the 2011 Tōhoku earthquake in Japan and the 2021 Super Typhoon Odette in the Philippines have helped finance recovery operations significantly. For these instruments to be effective, an appropriate risk layering approach needs to be put in place starting from increasing the capacity at risk retention at the lower level of risk, to risk transfer at the higher levels of risk.

Despite the growing attention on risk insurance, others have cautioned against overemphasis and instead focused on strengthening social protection programmes and social safety nets (Richards *et al.* 2023). Such a recommendation aligns with the risk layering approach mentioned earlier. Social protection measures (e.g. child and women welfare, pension schemes, health insurance, unemployment benefits) are poorly developed in many countries. These measures need to be scaled up and made dynamic to respond to emerging needs and projected dynamic stresses including climate change.

Just like insurance, **early warning systems (EWS)** have also gained much attention. The demand for support on EWS among least developed countries (LDCs) is high (31 out of 46 nationally determined contributions [NDCs] and 11 out of 14 national adaptation plans [NAPs] of the LDCs).. EWS play an important role in minimizing the possible loss and damage, including the loss of human and animal life depending on the lead time that the early warning can provide. Globally, the focus on early warning has been on providing more lead time, providing appropriate early warning information, appropriately targeting the information recipients, reaching the last mile, incorporating multi-hazard approaches, helping initiate early action, building the capacity at the local level including local communities, and the language used in an early warning by combining information with 'what to do' along with the nature of the impending risk. The incredible growth of mobile networks brings unprecedented opportunities, and the implementation of mobile EWS plays a critical role. Technological advancements including the use of social media applications such as Facebook and WhatsApp have contributed to the rapid dissemination of early warnings. In 2022, United Nations Secretary-General António Guterres called for action to protect every person with EWS by 2027. Initiatives such as Early Warnings for All by the World Health Organization and United Nations Office for Disaster Risk Reduction, which aim to protect everyone from climate events by 2027, are expected to revolutionize the way early warnings are made available and early actions are taken for all countries saving millions of lives and livelihoods. The related Executive Action Plan requires investments of US$3.1 billion over five years in advancing multi-hazard EWS, focusing on risk knowledge, forecasting, preparedness and people-centred communication (World Meteorological Organization 2022).

Human mobility and planned relocation have been widely discussed as a necessary option to avoid loss and damage in the context of countries with significant sea level rise impacts such as Bangladesh and Pacific island States, or places where certain sudden and slow onset events pose greater existential threat that cannot be managed. These contexts pose specific policy and implementation challenges including the cost of planned relocation, the availability of options, especially for the small island developing States in the Pacific), and related sociopolitical implications both for the relocated populations and for people in the receiving areas. Planned relocation is one of those options that can work for both slow and sudden onset events and for both economic and non-economic loss and damage. There is increasing research on how migration as an adaptation strategy can lead to the mobility of vulnerabilities and produces maladaptive outcomes (Cundill *et al.* 2021).

Although migration has been considered an adaptive measure in contexts where alternative adaptation measures are not possible, some scholars emphasize providing alternative adaptation strategies, particularly for community members who perceive migration options as their very last resort (Wodon *et al.* 2014; Banerjee 2017). Caution is necessary since migration could be an indication of failure to adapt and an indication of reaching limits to in situ adaptation. On-farm adaptation measures such as providing reliable water supply and weather forecasts can mitigate the push factors behind migration while minimizing losses and damages (Cattaneo *et al.* 2019). However, in situations such as extreme events, migration and relocation may be the only option, and this requires proper planning and preparation to minimize loss and damage.

Some countries (e.g. Brazil, Ethiopia, Fiji and Papua New Guinea) are considering migration as their ex ante response to loss and damage and have facilitated planned relocation or voluntary migration of highly vulnerable communities and support for both migrants and host communities (Mombauer, Link and van der Geest 2023). By contrast, ex post responses to human mobility are not well considered in climate policies, partly because of the difficulty in making a rigorous distinction between climate-induced human mobility and others. Migration across borders could be more complicated and there is a need to identify appropriate measures to address the issues faced by these sections of the communities.

Countries have begun increasingly reflecting mobility and related policies in their NDCs and NAPs, which can be considered a starting point to explore synergies and make connections between NDCs, NAPs and other processes in and outside the United Nations Framework Convention on Climate Change (UNFCCC) to address mobility-related loss and damage (Mombauer, Link and van der Geest 2023).

Fiji and Solomon Islands have published their planned relocation guidelines in the context of climate change impacts (Fiji, Ministry of Economy 2018; Solomon Islands 2022) and the same effort goes with some more countries such as Sri Lanka, which has conducted legal framework and policy on labour migration, climate change adaptation, migration health and disaster risk management, but still lacks specific policy on human mobility.

Largely, protection and accommodation policies are well developed compared with policies addressing relocation, which are still too theoretical/impractical and missing guidance on safeguarding equity and justice (Hauer *et al.* 2020). Planning for migration could be resource-intensive, particularly for sea level rise, but can be addressed through coordinated gender-responsive policy interventions from the global to the local level.

Scholars and practitioners agree on the point that community-based solutions and approaches play a valuable role in policy design and making the best and most sustainable use of such solutions. Proper legal frameworks are still needed. It is beneficial to accommodate the rule of law requirements into the climate change process at different levels (i.e. local, national and international) to protect rights, empower women and men to avoid and reduce risk, create resilience and guide a positive migration.

The opportunity for future policies and interventions would be to consider how to break the negative chains of impacts related to human mobility.

Although not a measure, **loss and damage databases** play an important role in supporting decision-making and in-risk assessments, and hence deserve a special mention here. The loss and damage databases have been strengthened in many countries through the intervention of the United Nations Development Programme, United Nations Office for Disaster Risk Reduction (UNDRR) and other agencies (UNDRR 2023). These efforts have helped in bringing the data on loss and damage that are otherwise spread across multiple departments and ministries into a single platform. At the time of drafting this report, 88 countries have disaster databases set up, all of which comprise developing countries, and about 24 per cent of these countries have data that are up to or beyond 2020. These databases cover 16 indicators that equally cover both economic and non-economic losses and damages. Some of the major issues with these databases are the quality of data, including missing time series data for an extended period, and not covering comprehensive and gender-sensitive indicators that can fully inform the loss and damage discourse and decision-making in the context of climate change.

A well-established adaptation measure that is also now considered to have synergistic benefits for addressing loss and damage is **ecosystem-based approaches and community engagement**. Mangroves and green infrastructure solutions are being applied for both sudden onset and slow onset climatic events. Nature-based solutions (NBS) have the potential to play an important role in addressing loss and damage through ecosystem restoration, rehabilitation and recovery. Further research is needed on how NBS help address loss and damage.

Measures for addressing non-economic loss and damage that have already occurred include social restitution, rehabilitation, satisfaction and compensation.

Restitution involves reconstructing built heritage. It also involves restoring natural sites important to Indigenous cultures and well-established ways of being, even if such restorations can only be partial and gradual.

Rehabilitation refers to social services aimed at revitalizing economic and psychological recovery. Rehabilitation takes the form of activities such as psychological support, memorialization and legal support. For example, memorialization encompasses representation or redressing lost heritage (e.g. the Museum of New Zealand, which keeps the memory of the Indigenous populations and sites that have been lost). There is also growing focus on the rehabilitation of built and natural heritage through ex ante actions such as risk assessments (Westley *et al.* 2011). Social rehabilitation can include strengthening mental health capacity (e.g. the Institute of Mental Health in Singapore trained 600 community workers in China, Indonesia and Thailand to strengthen mental capacity and emotional resilience).

Satisfaction refers to symbolic measures such as apologies or truth-seeking processes. The former seeks to openly acknowledge the extent of losses and damages experienced and accept responsibility for them. The latter involves government-led enquiries, typically in the context of injustices or negligence. Apology, recognition of harm and truth-seeking have been used by some governments for past suffering (e.g. Canada's Truth and Reconciliation Commission). Central to the success of these measures is that they are "seen as proportional and genuine by those they are directed toward" (Klinsky 2016). Satisfaction-related measures may trigger litigations and demand for **compensation**. The relevance and effectiveness of these measures for cultural heritage, Indigenous knowledge and ways of being can vary significantly.

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For more information: unep.org/environment-fund

UN environment programme

For more information:
unep-communication-director@unep.org
United Nations Avenue, Gigiri
P O Box 30552, 00100
Nairobi, Kenya

unep.org