

Considerations for the development of indicators under the framework for the Global Goal on Adaptation

Submission in response to conclusion FCCC/SB/2024/L.6, para. 9

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About this submission

The 'United Arab Emirates Framework for Global Climate Resilience' was adopted at COP28 in December 2023 as a framework for the Global Goal on Adaptation, containing 11 targets. To measure progress achieved towards these targets, it was agreed to launch a two-year work programme on indicators and as a basis for developing suitable indicators, Parties and observers were invited to submit views on existing indicators by 31 July 2024. This paper represents a submission to that process.

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1. Context and aim of the submission

At the UN climate conference COP28, held in Dubai, UAE in December 2023, Parties adopted a framework for the Global Goal on Adaptation (GGA), which was named the ‘United Arab Emirates Framework for Global Climate Resilience’ (and referred to in this submission as the *GGA framework*).¹ The GGA framework includes seven thematic targets and four targets around the four dimensions of the iterative adaptation cycle (referred to as *dimensional targets*). As a next step, it was decided:

“to launch a two-year United Arab Emirates–Belém **work programme on indicators for measuring progress achieved towards the targets** [...] with a view to identifying and, as needed, developing indicators and potential quantified elements for those targets” (Decision 2/CMA.5, paragraph 39).

As a basis for developing suitable indicators, Parties and observers were invited to submit views by 31 July 2024 on a) existing indicators and b) “information on associated methodologies and data readiness for such indicators, as well as identified gaps and areas for which the development of new indicators may be needed.” (FCCC/SB/2024/L.6, paragraph 9).

The aim of this submission is to inform the development of indicators for the four dimensional targets contained in paragraph 10 of Decision 2/CMA.5, and to inform the mapping of existing indicators under the indicator work programme. The submission builds on previous submissions by the Grantham Research Institute to the workshop series that developed the GGA framework (Leiter, 2023a; Leiter, 2024a) and to the report on doubling of adaptation finance by the Standing Committee on Finance (Leiter, 2023b). It also draws on the author’s close involvement in the preceding two-year work programme (the Glasgow–Sharm el-Sheikh work programme on the Global Goal on Adaptation) including as moderator and co-facilitator, and on his extensive research on adaptation monitoring and evaluation.² Experiences gained from the annual assessment of global adaptation progress in UNEP’s Adaptation Gap Report informed suggestions for indicators for the four targets of the iterative adaptation cycle (see section 3).

2. Key considerations for the development of indicators

The development of indicators for the targets of the GGA framework needs to consider several key aspects:

1. **Content of targets.** Multiple indicators are required for each target to track its full scope.
2. **Ambition of the targets.** Their ambition partially depends on how their wording is interpreted. The formulations of indicators and their calculation methods can influence the level of ambition.
3. **Purpose of indicators.** Countries still need to agree whether the GGA indicators are expected to be globally applicable and aggregated, or largely specific to individual countries’ contexts. This decision affects the requirements that indicators need to meet, and therefore how they are reviewed under the mapping exercise.
4. **Adaptation relevance.** Each indicator proposal needs to specify in how far it measures adaptation to climate change rather than other changes or developments.
5. **Calculation methods.** Developing clear specifications for measurement that make indicators reliable and consistent is a prerequisite for aggregation to the global level.

The role of the indicator work programme under the GGA framework and the expectations projected onto it also need to be aligned to what is feasible and to what can and cannot be achieved by global indicators. Each of these key considerations are discussed in detail below.

¹ For a review of the negotiations that led to the development of the framework for the Global Goal on Adaptation, see Leiter (2022).

² See publication list: <https://scholar.google.de/citations?hl=de&user=nurtTjUAAAAJ>

Content of the targets

Parties agreed in December 2023 that the indicators to be developed are meant to measure progress towards achieving the eleven global targets (Decision 2/CMA.5, para 39). Each target consists of several *aspects* and *specifications*.

Aspects refer to the main topic areas covered by a target.³ The water target, for example, includes the following aspects:

- Significantly reducing climate-induced water scarcity (...) towards climate-resilient water supply
- enhancing climate resilience to water-related hazards
- climate resilient sanitation
- access to safe and affordable potable water for all (Decision 2/CMA.5, para 9a);

Specifications are details that further describe the aspects, e.g. that national adaptation plans are to be “country-driven, gender-responsive, participatory and fully transparent” (2/CMA.5, para 10b).

The presence of multiple aspects within each target, and some aspects also carrying specifications, means that each target requires multiple indicators if its scope is to be fully covered. Hence, at a minimum, several dozen indicators will be needed to measure progress towards the eleven targets. However, some indicators may be more significant in indicating progress than others. Accordingly, Parties may designate some indicators as headline indicators that are supplemented by additional indicators, similar to the indicator framework of the Sendai Framework (United Nations, 2016).

Ambition of the targets

The ambition of the targets depends to some degree on how their wording is being interpreted. For example, what exactly a “significant reduction” is or when “towards a climate-resilient water supply” will have been met. Indicators are a way of defining what is being measured. The formulation of indicators, and importantly, their calculation methods can therefore influence the level of ambition. While this presents an opportunity, it also means that politics will likely play a role in the final selection of indicators. One way of solving potential conflicts is to add supplementary indicators that reflect a higher ambition, and that Parties can report on in addition to the main indicator(s) of a target. For example, indicators for target 10b on planning could be expanded beyond just the presence of National Adaptation Plans (NAPs) to also track whether they are complemented by legal instruments. This would add ambition in a way that is fully aligned with the intention of the target despite not being explicitly mentioned in it. The indicator suggestions presented in this submission include several options for further ambition (see section 3).

One target has a very low ambition level, namely the first part of target 10b on planning: “by 2030 all Parties have in place (...) national adaptation plans (...)”. The Adaptation Gap Report 2023 shows that 85% of all countries have already adopted a national adaptation planning instrument, and half of the remaining ones have not started developing one because they are in a state of conflict and/or without a functioning government (UNEP, 2023, p.8). Whilst efforts should be made to reach the remaining 15% of countries, the wording of this part of target 10b means *zero ambition* for 85% of countries. The ambition of this target could be increased by agreeing to track additional specifications, e.g. that national adaptation planning instruments are regularly revised (see suggestion in section 3).

Overall, the process of indicator formulation and the development of calculation methods will need to consider their implications for the level of ambition. Supplementary indicators that reflect higher ambition could further strengthen the influence of the GGA framework.

³ AOSIS refers to these aspects as “indicator areas” (AOSIS, 2024, p.2).

Purpose of indicators

The purpose that M&E systems are meant to achieve determines the requirements that indicators need to fulfil (Leiter, 2017). Parties decided that the purpose of the GGA framework “is to guide the achievement of the global goal on adaptation and the review of overall progress in achieving it” (Decision 2/CMA.5, para 7). Yet, countries have not yet agreed on the types of indicators to address this purpose. Three types of indicators have been proposed in countries’ submissions ahead of the GGA workshop in Bhutan in May 2024⁴:

- Indicators applicable to all countries (often referred to as ‘global indicators’)
- Indicators applicable to a sub-set of countries (e.g. to LDCs, SIDS, or mountainous countries)
- Indicators that are specific to the context and circumstances of a particular country

Countries agreed “to continue considering the nature of the final outcome” of the indicator work programme in November 2024 and in June 2025 taking into account the results of the mapping exercise (FCCC/SB/2024/L.6, para 30). The decision on the types of indicators has implications for the development and selection of indicator proposals. Indicators intended for aggregation to the global or regional level need to be applicable to all countries or to a selected sub-set. If countries would not reach consensus on the inclusion of global indicators, the review of collective progress would be limited to context-specific indicators. These indicators allow for qualitative synthesis, but not for quantitative aggregation (Leiter, 2015).

Designing global indicators is easier for the dimensional targets since they refer to policy processes whose four generic dimensions are applicable to all countries, even though countries vary in their administrative traditions and political structures. Identifying common indicators for thematic targets is facilitated where existing global processes, indicators and definitions closely match the wording of the targets. For example, the World Health Organization (WHO) has defined ten components of a climate-resilience health system that could be used to track progress towards the respective aspect of the health target of para 9c (WHO, 2023). The mapping exercise will provide an indication of the extent to which the thematic targets can be covered by globally or regionally applicable indicators.

It is often evoked that globally applicable indicators would constitute an increased burden to countries, but that is not necessarily the case. The effort required to report on an indicator depends primarily on the ease with which the underlying data can be gathered. A global indicator like “having a NAP in place” requires no extra data gathering effort by Parties. On the contrary, context-specific indicators can be data demanding – it fully depends on the specific indicator. Hence, it cannot be generalised from the three types of indicators listed above what level of effort is required for their operationalisation. Furthermore, the data for globally applicable indicators does not necessarily have to be provided through country reporting. It could also be directly gathered by international organisations or, where applicable, through Earth observation.⁵

Adaptation relevance

The inclusion of targets in the GGA framework and their scope was one of the contentious issues during the GGA work programme in 2023 (Leiter, 2023a). Ultimately, the eleven global targets were only agreeable to all countries by focusing explicitly on adaptation rather than on broader development aims. Each of the targets agreed to in Decision 2/CMA.5 is worded with climate resilience and adaptation as their objective. Accordingly, indicator proposals will need to demonstrate in how far they measure adaptation and climate resilience.

A counterexample that has been suggested as an indicator for the thematic target “(d) Reducing climate impacts on ecosystems and biodiversity” is the index of the Red List of Threatened Species that is managed by the International Union for Conservation of Nature (IUCN). The Red List is “the world’s most comprehensive information source on the global extinction risk status of animal, fungus and plant

⁴ Submissions in response to Decision 2/CMA.5, para 41 (see Leiter, 2024a).

⁵ The International Space Science Institute conducted a workshop on the potential of earth observation for adaptation tracking in June 2024, see: <https://forum.issibern.ch/climate-adaptation/>

species”.⁶ Yet, importantly, the causes of species extinction are mainly non-climate related, namely habitat destruction, overfishing and hunting. In fact, the most recent global assessment report on biodiversity and ecosystem services found that around 85% of direct drivers of biodiversity reduction are unrelated to climate change (IPBES, 2019; Figure SPM2). The total number of species threatened with extinction is therefore not a valid indicator for the reduction of climate impacts on ecosystems and biodiversity. Even if it was valid, its interpretation would be far from straightforward. If the total number of threatened species was to decline, this could be due to improvements in habitat protection while climate impacts are further increasing. Hence, even a decline would not necessarily indicate reduced climate impacts on ecosystems and biodiversity.

The importance of the adaptation relevance was recognised by Parties in the draft conclusions agreed to in June 2024 in Bonn where it is listed as the second consideration for the selection of indicators, just after relevance to the targets (that is, meeting the very purpose of the indicators) (FCCC/SB/2024/L.6, paragraph 12b). Demonstrating the adaptation relevance will therefore be an important matter in the selection of indicators for the GGA targets.

Calculation methods

Clear ways of calculating and interpreting indicators are indispensable for a reliable, effective and transparent use of indicators for tracking progress towards the GGA framework. Elaborating and agreeing on a calculation method can be far more challenging than formulating an indicator (see Leiter et al., 2019). For example, “number of beneficiaries” is a commonly used indicator by multilateral climate funds, but clear guidance on whom to count as beneficiary is lacking which leads to unreliable and incomparable figures (e.g. Pauw et al., 2020). The review of the indicator proposals collected through the mapping exercise should therefore pay special attention to the measurability of indicators. Ultimately, all indicators selected under the indicator work programme need to come with clear application guidance to countries and custodian organisations to ensure that indicators are applied in a consistent way.

The role of indicators under the GGA framework

The GGA framework is a global framework as part of a UN process whose Parties are national governments. While the GGA framework is intended to guide and mobilize adaptation action and support more broadly, the four dimensional targets are explicitly about the actions of national governments. The indicators selected for these targets will therefore be designed to measure progress at the national level rather than to track actions by all types of actors down to the local level. It will likewise not be possible for global indicators to track changes in resilience or vulnerability at the community level. It is ambitious enough to develop feasible and useful indicators for the GGA framework at the national and global level within the remaining year until COP30 (compare the timeline in Leiter, 2024a).

Global indicators provide a snapshot rather than a detailed understanding of adaptation in particular contexts. The indicators of the GGA framework should therefore be seen as complementary to, rather than as a substitute for, country-specific indicators of national adaptation MEL systems. The latter are tailored to a country’s NAP and administrative system and ideally also provide policy recommendations.⁷ It is therefore very useful that one of the eleven global targets is to strengthen national adaptation MEL systems (target 10d – see below).

Contrary to an expectation that is sometimes voiced in blog-posts and advocacy publications, the indicator work programme is not a programme to develop all-purpose adaptation indicators. Indicators are best developed for a particular purpose and context and linked to a theory of change that explains how adaptation is expected to work (Leiter et al., 2019). The reasons why there are no universal indicators for adaptation and why measuring adaptation is so different from measuring mitigation of greenhouse gas emissions remain in place regardless of the indicator work programme (see Leiter &

⁶ The Red List Background & History: <https://www.iucnredlist.org/about/background-history>

⁷ Factsheets of national adaptation M&E systems are available at: <https://www.adaptationcommunity.net/monitoring-evaluation/national-level-adaptation/>

Pringle, 2018). The expectations for the indicator work programme therefore need to be proportionate to what is feasible while utilizing the opportunity to develop suitable indicators to track the implementation of the GGA framework.

3. Indicators for the dimensional targets

This section discusses the development of indicators for the dimensional targets as contained in Decision 2/CMA.5, para 10a-d.

Impact, vulnerability and risk assessment

- (a) Impact, vulnerability and risk assessment: by 2030 all Parties have conducted up-to-date assessments of climate hazards, climate change impacts and exposure to risks and vulnerabilities and have used the outcomes of these assessments to inform their formulation of national adaptation plans, policy instruments, and planning processes and/or strategies, and by 2027 all Parties have established multi-hazard early warning systems, climate information services for risk reduction and systematic observation to support improved climate-related data, information and services

This target contains two aspects:

1. Having conducted impact, vulnerability and risk (IVR) assessments with the specifications that they are:
 - a. Up-to-date
 - b. Have been used to inform national adaptation planning and policy making
2. Having established multi-hazard early warning systems, climate information services and systematic observation

a1: Impact, vulnerability and risk assessments – What needs to be clarified for indicator development?

- (a) The scope of the IVR assessments is left undefined in the target. The most immediate interpretation would be a national-level climate risk or vulnerability assessment as already conducted by numerous countries (EEA, 2018)
 - a. Almost every country will have dozens, in some cases hundreds, of project or local-level climate vulnerability or risk assessments, but they would be based on different methodologies and are typically not comparable. A national-level assessment would use a consistent methodology which would make it a suitable interpretation for scoring an indicator on this aspect of the target (see e.g. Warren et al., 2018). This interpretation would leave open which assessment methodology is being used, i.e. it would not be prescriptive (for an overview of methodologies, see Conway et al., 2019).
- (b) What counts as “up-to-date”. Several countries have established a policy cycle for adaptation which includes a national climate vulnerability or risk assessment, e.g. the UK or Germany. In some cases, this cycle is enshrined in a climate law, e.g. in UK’s Climate Change Act from 2008.⁸ Typically, the risk assessment cycle is four to five years, in some cases up to seven years (e.g. in Germany). These national climate risk or vulnerability assessments are complex undertakings that often take two years or more to produce. This duration needs to be considered when settling on a suitable definition for “up-to-date”.
- (c) How to determine whether the outcomes of IVR assessments have informed the formulation of national adaptation plans, policy instruments, and planning processes. This specification will likely require a qualitative assessment based on clear guidance.

⁸ The Grantham Research Institute held an event “15 years of the Climate Change Act in the UK” in April 2024 whose recording is available here: <https://www.lse.ac.uk/granthaminstitute/events/15-years-of-the-climate-change-act-in-the-uk/>

- a. The clearest evidence exists where the NAP or similar policies directly respond to the risks identified in the national climate risk assessment, e.g. where the NAP or actions contained therein are structured according to the identified risks. In some countries, this linkage is a statutory requirement created by a national climate law (e.g. in the UK).
- b. A special case is where a national IVR assessment is undertaken for the first time while a NAP or a similar adaptation planning instrument is already in place. Hence, it might take several years before an updated NAP is produced. In such a case, the specification that the national IVR assessment informs planning processes could be deemed as met if there are explicit decisions or directives that require government authorities to consider the findings of the assessment in their ongoing actions.

Further ambition

- Many SIDS do not have a national climate risk assessment since there are no climate projections for their territory. As Evens et al. (2024) point out: "most of the climate change projections used at the location of small islands are actually representative of the open and deep ocean rather than an island and its shallow waters" (p.668). Additional indicators for further ambition could therefore track the progress in developing climate projections compatible with small island scales (see Evens et al., 2024 for details).

a2: Multi-hazard early warning systems, climate information services and systematic observation – What needs to be clarified for indicator development?

- (a) The first part of this aspect (early warning systems – EWS) corresponds to an indicator under Target G of the Sendai Framework for Disaster Risk Reduction (hereafter: Sendai Framework). This part is therefore already being tracked at the global level based on country reporting to the United Nations Office for Disaster Risk Reduction (UNDRR). UNDRR and the World Meteorological Organisation (WMO) publish an annual report entitled “Global Status of Multi-Hazard Early Warning Systems” which analyses countries’ self-reported data. To operationalise the indicator “Number of countries that have multi-hazard early warning systems”, UNDRR defined four common elements of these systems and reports countries’ progress towards them (UNDRR, 2023). This part of target 10a of the GGA framework can therefore fully rely on existing data sources. The additional attention through the GGA framework could be used to encourage even more countries to regularly report on this indicator under the Sendai Framework.
- (b) Whether early warning systems, climate services and systematic observation are meant to be one connected aspect or multiple independent aspects. It is not clear whether the second part of target 10a (“climate information services for risk reduction and systematic observation”) is meant to be directly connected to EWS or if it constitutes an additional aspect. The four elements of multi-hazard EWS as defined by UNDRR include “Risk knowledge” and “Observations & forecasting” which could be seen as matching the respective parts of target 10a. If interpreted this way, then the data (i.e. the number of countries that have progressed on these elements) is already being self-reported by countries under the Sendai Framework. Additional efforts would only be required from those countries that do not yet report under the Sendai Framework, or those that do not report regularly.
- (c) If this part of the target is interpreted as an additional aspect that goes beyond EWS, then it would need to be specified what types and scope of climate services and systematic observations countries are expected to establish.
 - a. On climate services, one option would be to utilize WMO’s global climate services dashboard which assesses countries’ provision and application of climate services and the capacities of national meteorological offices. A sectoral breakdown for water, agriculture, health, disaster risk reduction and energy is an additional component of the

dashboard.⁹ Since 2019, WMO has also been publishing an annual “State of Climate Services” report.¹⁰ Adopting these available data sources and their calculation methods would therefore not require any additional reporting efforts by Parties.

- b. The substantial body of literature on the production and use of climate services, especially in developing countries, could be reviewed to determine if additional aspects related to this part of target 10a would warrant regular monitoring, and if so, what suitable indicators could be (e.g., Jones et al., 2015; Vaughan et al., 2019; Boon et al., 2024).

Planning

(b) Planning: by 2030 all Parties have in place country-driven, gender-responsive, participatory and fully transparent national adaptation plans, policy instruments, and planning processes and/or strategies, covering, as appropriate, ecosystems, sectors, people and vulnerable communities, and have mainstreamed adaptation in all relevant strategies and plans

This target contains two aspects:

1. Having in place a national adaptation plan, policy instruments, planning processes and/or strategies that are:
 - a. country-driven, gender-responsive, participatory and fully transparent
 - b. covering, as appropriate, ecosystems, sectors, people and vulnerable communities
2. Having mainstreamed adaptation in all relevant strategies and plans

b1: National adaptation plans, policy instruments, planning processes and/or strategies – What needs to be clarified for indicator development?

- (a) What to count as relevant policy instruments, planning processes and strategies. A suitable requirement would be for any policy instruments, planning processes and strategies to be explicitly directed at adaptation and to be sufficiently detailed and specific (see Leiter, 2021, section 2). Such a definition would allow counting documents or processes that combine adaptation and mitigation or adaptation and other topic areas such as disaster risk reduction while excluding documents that contain only general content on adaptation. Accordingly, the planning chapter in the Adaptation Gap Report only counts documents that “contain specific, time-bound policies and tools that are focused on adaptation” (UNEP, 2023b, p.5). The report uses the umbrella term of “national adaptation planning instruments” to refer to relevant national adaptation documents regardless of their specific title.¹¹
- (b) Whether the scope of the target covers mainly the national or also the sub-national level. If the scope is understood to be the national level, then the analysis that UNEP’s Adaptation Gap Report has been providing annually since 2020 can be used to track this aspect of target 10b (see Table 1 in the Annex of this submission).
- (c) If the scope of the target is understood as covering also sub-national adaptation planning and policy making, a distinction could be made between state-level and local or city-level planning. The initiative *RegionsAdapt* of the organization *Regions4* tracks adaptation planning of currently 73 regional governments¹² and publishes an annual progress report (Cran et al., 2023). Several studies have compiled and analysed local adaptation plans including in Europe (Reckien et al., 2023) and the US (Stults & Woodruff, 2017). One study with a global scope found that of the 401

⁹ WMO Climate Services Dashboard;
<https://app.powerbi.com/view?r=eyJrljoiY2JmYzZmNDYtNmU3ZS00ZTAwLWlyYjAtOTcyMz00ZDc5NDJiIiwidCI6ImVhYTZiZTU0LTQ2ODctNDJiNC05ODI3LWwNDRiZDhlOGQzYyIsImMiOjI9>

¹⁰ <https://wmo.int/publication-series/state-of-climate-services>

¹¹ Countries use different titles for their NAPs or NAP-like documents. The UK, for example, calls it “National Adaptation Programme”. Other countries have both a NAP and a national adaptation strategy (see EEA, 2020, section 1.2).

¹² List of participating regional governments: <https://regions4.org/r2r-list-of-signatories/>

urban areas that have a population of over 1 million people, just 73 cities (18%) had an adaptation plan in 2014 (Araos et al., 2016). While a dedicated body of research on local adaptation planning has evolved in over a decade, a global database of local adaptation plans does not seem to exist yet. In the interim, countries could decide to cover sub-national and local adaptation planning based on available data via an optional supplementary indicator. Doing so might spur the development of a global database of local adaptation planning.¹³

- (d) How to account for gender-responsiveness and inclusivity of national adaptation planning documents and processes. This specification could be covered by one or more additional indicators drawing on existing literature and experiences (e.g. Dazé & Hunter, 2022) and on the supplementary guidance for gender-responsive NAP processes (NAP Global Network & UNFCCC, 2019).
- (e) How to account for sectoral coverage and the inclusion of vulnerable communities. The NAP Global Network operates the database “NAP Trends” that analyses the content of NAPs (currently covering 57 NAPs from developing countries).¹⁴ Its analytical categories including gender and vulnerable groups, nature-based solutions and sectoral integration directly speak to the respective specifications of target 10b. NAP Trends is continuously updated drawing on NAPs submitted to the UNFCCC’s portal “NAP Central”. Strengthened by the close collaboration between the NAP Global Network and the UNFCCC secretariat, the analysis of NAP Trends could therefore serve as data source for this part of target 10b.

Further ambition

- The Adaptation Gap Report 2023 found that 85% of countries already have a detailed national adaptation planning instrument. Hence, for the great majority of countries, the first part of target 10b is already met. The Adaptation Gap Report shows that many countries are updating their national adaptation planning instrument over time (see Figure 1). To increase the ambition level of this part of target 10b, a specification could be added regarding the currentness of the adaptation plan or strategy. Doing so would be consistent with the specification of target 10a that IVR assessments have to be “up-to-date”. Since the Adaptation Gap Report is already capturing this information, no further effort on behalf of countries would be required. Accounting for this aspect in the indicator(s) would significantly increase the meaningfulness of assessing progress towards this target.¹⁵
- Target 10b does not explicitly mention legal instruments. Yet, legal instrument for adaptation have shown to be effective in ensuring and enforcing adaptation planning and reporting including by providing a stable framework across election cycles. For example, as of 2021 at least nine countries had legal requirements for monitoring and evaluation of NAP implementation through a national climate law (Leiter, 2021, p.185). Recently, countries began to adopt specific national adaptation laws, e.g. in Japan, Germany and South Korea. According to the 2023 Adaptation Gap Report, 25% of countries have a legal requirement for the preparation of national adaptation planning instruments in place (see Figure 1). Due to their importance for further strengthening adaptation planning and implementation, progress tracking towards target 10b could also include legal instruments for adaptation. The Adaptation Gap Report already provides the data, so no additional efforts on behalf of countries would be required.

¹³ The Carbon Disclosure Project maintains a database of city adaptation actions which could be taken as proxy measure, assuming that cities that report adaptation actions will also have a local adaptation plan. The dataset will be analysed in the implementation chapter of this year’s Adaptation Gap Report (Leiter et al., forthcoming).

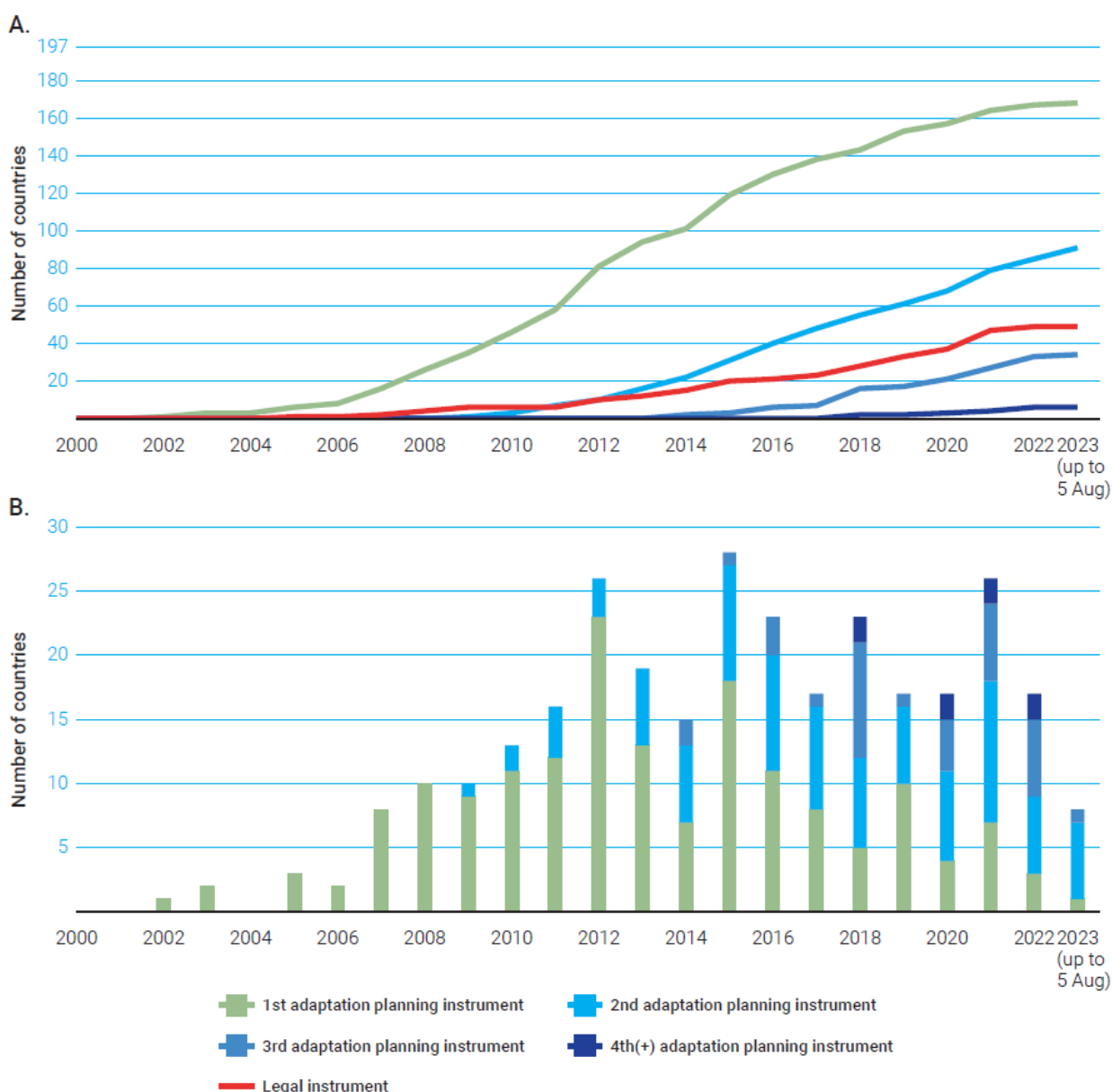
¹⁴ <https://trends.napglobalnetwork.org/>

¹⁵ See also this commentary on how simplistic global metrics can provide a false sense of progress:

<https://www.lse.ac.uk/granthaminstitute/news/beyond-simplistic-metrics-assessing-global-progress-on-adaptation-to-climate-change/>

Figure 1: Evolution of national adaptation planning instruments and their updates over time.

Figure 2.1 Global progress in national adaptation planning since 2000. **Panel A:** Cumulative number of countries that have prepared a first, second, third or fourth national planning instrument or a legal instrument since 2000. **Panel B:** Number of national planning instruments published globally each year.



Source: Adopted from the planning chapter of the Adaptation Gap Report 2023 (UNEP, 2023, p.10).

b2: Having mainstreamed adaptation in all relevant strategies and plans – What needs to be clarified for indicator development?

If adaptation planning remains siloed from other government planning, its effectiveness will be limited. Accordingly, one of the two objectives of the NAP *process* (which goes beyond the NAP document) is:

“To facilitate the integration of climate change adaptation, in a coherent manner, into relevant new and existing policies, programmes and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate” (Decision 5/CP.17, paragraph 1).

Several studies have examined mainstreaming of adaptation into national planning in particular countries, most recently in South Korea (Kim & Shin, 2024). A study by the OECD (2016) examined the extent of mainstreaming of adaptation into national development plans of 15 developing countries. Runhaar et al. (2018) review literature on mainstreaming adaptation. While there is a dedicated body of literature on the extent to which adaptation has been mainstreamed into national planning and into development cooperation, no detailed and up-to-date analysis with global coverage seems to exist. The following therefore needs to be clarified for indicator development:

- (a) What to count as mainstreaming. A definition and criteria for different degrees of mainstreaming are needed. The OECD study from 2016 used three broad categories (wide, limited and no integration). Importantly, given that adaptation is by now commonly mentioned in policy documents, progress towards this aspect of target 10b should consider the degree of mainstreaming rather than just scoring it as a binary “yes/no”. A binary indicator is prone to overestimate the extent of genuine mainstreaming if generic mentioning of adaptation is deemed sufficient. A binary indicator would also not allow tracking further progress once a document would meet the minimal criteria of mainstreaming being ‘present’. Hence, such an indicator could quickly reach the saturation point, i.e. where mainstreaming would appear to have been “completed” in most countries.
- (b) What to count as “in all relevant strategies and plans”. To track progress on this part of target 10b, countries will need to agree on a scoring methodology. The scope of mainstreaming could be defined in multiple stages such as following:
 - i. No evidence of mainstreaming into relevant strategies and plans
 - ii. Mainstreaming into some relevant strategies and plans
 - iii. Mainstreaming into a majority of relevant strategies and plans
 - iv. Mainstreaming into most relevant strategies and plans
 - v. Mainstreaming into all relevant strategies and plans

Progress towards this part of target 10b could then be shown as an aggregate score and global/regional average of the scope of mainstreaming achieved by countries. Importantly, as emphasised under bullet point (a), criteria for what counts as mainstreaming are needed, and the scoring methodology should account for different degrees of mainstreaming.

- (c) What to count as “relevant” strategies and plans. Immediately relevant are:
 - national development plans and their implementation plans (where existing and applicable),
 - strategies and plans of line ministries,
 - budget plans of the treasury and of line ministries,
 - sectoral plans and strategies such as national water strategies or agricultural development strategies, and
 - other relevant national-level plans such as green growth or poverty reduction strategies (where existing).

Countries could define types of relevant documents such as the ones above in order to clarify what counts as “relevant”.

- (d) Whether to include sub-national strategies and plans. Similar to the respective question for the first part of target 10b, countries will need to agree whether the target on mainstreaming is meant to extent to the sub-national level. Sub-national mainstreaming could also be accounted for through optional indicators as part of further ambition to the target.
- (e) Which data sources to use.
 - The [Climate Change Laws of the World](#) database of the Grantham Research Institute at LSE is the most comprehensive and up-to-date global database of climate change plans,

strategies and laws.¹⁶ It currently includes almost 2,700 plans and over 1,200 laws. The database therefore offers an effective and efficient way to identify relevant documents. New documents can be submitted via a simple online form.¹⁷

- Countries can point to relevant documents in their communications to the UNFCCC secretariat, especially in BTRs when they report progress towards the targets of the GGA framework.

Implementation

- (c) Implementation: by 2030 all Parties have progressed in implementing their national adaptation plans, policies and strategies and, as a result, have reduced the social and economic impacts of the key climate hazards identified in the assessments referred to in paragraph 10(a) above

This target contains two aspects:

1. Countries have progressed in implementing their NAPs
2. Social and economic impacts of key climate hazards have been reduced.

c1: NAP implementation – What needs to be clarified for indicator development?

Countries are increasingly publishing NAP implementation progress reports or NAP evaluations. As of 2021, 27 countries had published at least one NAP progress report or evaluation (Leiter, 2021). This figure has risen to over 40 by 2023 (UNEP, 2023). These reports are an important source of information for tracking progress towards target 10c. The following needs to be clarified:

- (a) How to determine whether countries have progressed in implementing their NAPs. Due to the diversity in NAPs and in national circumstances, and due to the great variety in scope and detail provided in NAP progress reports, it is infeasible at this stage to generate a comparable quantitative NAP implementation score.¹⁸ However, distinct implementation stages with generic milestones could be defined and the information provided by countries via either their NAP progress and evaluation reports or via their reporting through BTRs could be used to qualitatively determine the stage countries are in. The aggregate score and global or regional average could then be reported as progress towards the first part of target 10c. This year's implementation chapter of the Adaptation Gap Report will for the first time analyse NAP progress reports and will provide further details on how to synthesize progress across countries (Leiter et al., forthcoming).

c2: Reduced social and economic impacts of the key climate hazards – What needs to be clarified for indicator development?

- (a) What to count as key climate hazards. The target answers this question by referring to hazards identified in national climate risk assessments. However, if the reduction in social and economic impacts is to be aggregated to the global level, then countries will need to agree to a common list of climate hazards to enable comparability. For example, Formetta & Feyen (2019) consider seven types of climate-related hazards: floods, flash floods, coastal floods, cold-related hazards, heatwaves, drought, and wind-based hazards. Countries could also refer to the recently approved WMO Event Types List which mentions over 20 types of hazardous events, but some of them are not climate-related (WMO, 2023). Hazard classification is being further advanced under the Sendai Framework (see UNDRR, 2020).
- (b) Whether the reductions in social and economic impacts of climate hazards are intended to be quantified, or if evidence of reductions of any magnitude will be the basis for a binary indicator

¹⁶ <https://climate-laws.org/>

¹⁷ <https://form.jotform.com/233294135296359>

¹⁸ On the challenges of formulating adaptation indicators that apply to diverse contexts, see Leiter & Pringle (2018).

(i.e., reductions achieved: yes or no). In case of a binary assessment, countries would need to agree on general characteristics for reductions to be counted, e.g. if a minimum level of the amount or scope of reductions would apply.

(c) If reductions are to be aggregated: What methodology to use to estimate reductions in social and economic impacts. There are two general approaches:

- Trend analysis of climate change impacts over time. Here, the two main challenges are 1.) that climate impacts show a high variability from year to year depending on the magnitude of hazards that occur, meaning that year-on-year comparisons are not meaningful (see Figure 1 in Formetta & Feyen, 2019); and 2.) that economic impacts need to be normalised against changes in wealth and against changes in the spatial distribution of assets (Neumayer & Barthel, 2011).
- Comparisons against a counterfactual, i.e. estimating whether social and economic impacts of climate-related hazards are lower than in a scenario where adaptation had not been undertaken. This approach is far more complex than trend analysis and its estimations are very sensitive to the chosen counterfactual. Counterfactuals would be needed for all relevant hazards in all countries based on a common methodology which seems infeasible at present.

(d) If reductions are to be aggregated: what data source to use. While countries could refer to their own cost estimates if included in reporting under the Paris Agreement, meaningful aggregation to the global level would require a standardised methodology and its consistent and transparent application. In the absence of an agreement on such a methodology, the following data sources could be utilised:

- For economic costs, countries could refer to the Sendai Framework Target C “Disaster-related economic losses” and its associated methodologies. In this case, no further efforts would be needed. Moreover, UNDRR is currently developing a new disaster losses and damages tracking system which will provide better and more accessible data of the economic impacts of disasters.¹⁹
- For social impacts, countries would need to define what counts as social impact and how to quantify these impacts. As a proxy, countries could refer to Sendai Framework Targets A “Disaster-related deaths and missing persons” and B “Disaster-affected population” for which data is already available.

(e) How to determine the causality that reductions in social and economic impacts of climate hazards were caused by NAP implementation. As a pragmatic approach, countries could be asked to explain the linkage between NAP implementation and reported reductions in social and economic impacts in their BTRs. Rather than *attribution* (i.e. reductions caused entirely by NAP implementation), countries could also explain whether NAP implementation has *contributed* to realising the reductions alongside other influencing factors.

Monitoring, evaluation and learning

(d) Monitoring, evaluation and learning: by 2030 all Parties have designed, established and operationalized a system for monitoring, evaluation and learning for their national adaptation efforts and have built the required institutional capacity to fully implement the system

This target contains two aspects:

1. Having designed and operating a national adaptation monitoring, evaluation and learning (MEL) system
2. Having built the capacity to fully implement it

¹⁹ See: <https://www.undrr.org/building-risk-knowledge/disaster-losses-and-damages-tracking-system-dldt>

d1: National adaptation MEL system – What needs to be clarified for indicator development?

As of August 2021, more than 60 countries had been developing or were already operating a national adaptation monitoring and evaluation (M&E) system (Leiter, 2021). Importantly, progress on this target needs to be tracked against actual actions on MEL rather than based on mere pledges to undertake it. Almost every NAP mentions that MEL is intended but as of 2021, more than 60% of countries were not tracking its implementation (Leiter, 2021). Progress tracking on this target therefore needs to be based on evidence of actions rather than based on intentions, as the latter would yield a gross overestimation of progress (ibid.).

The following needs to be clarified:

- (a) How to define the design, establishment and operation of a national adaptation MEL system. Based on a global stocktake of NAP M&E systems, Leiter (2021) proposed four stages of development and two stages of operation:
 - a. Early stage of developing the MEL system (e.g. having undertaken workshops to design the adaptation MEL system and having initiated capacity building activities)
 - b. Development had begun, but stalled (e.g. due to a lack of funding or changes in political will)
 - c. Advanced stage of developing the MEL system (e.g. an approach or methodology has been drafted, data sources have been identified)
 - d. MEL system approved: the system has been fully developed, but is not yet operating
 - e. MEL system in operation:
 - i. Progress reports have been published
 - ii. Evaluation of NAP implementation has been undertaken & published

These or similar stages and clear definitions for each would provide a useful basis for tracking progress towards this target. In particular, they would account for the multi-year process that is required to develop a national adaptation M&E system, as the experiences documented in Hammill et al. (2014), Leiter et al. (2017), and Leiter (2021) demonstrate.

It also needs to be clarified if there is a difference between the terms “established”, “operationalised” and “fully implemented”, and if so, what the difference is.²⁰ In the study by Leiter (2021), an adaptation M&E system being “in operation” is defined as generating data and sharing information as demonstrated by the publication of a NAP progress report or a NAP evaluation. In this case, the term “in operation” is synonymous to “implemented”. An interesting aspect in regard to “fully implemented” is that practically all countries were found to continue improving their adaptation M&E system after the first progress reports had been published (ibid.). For example, in Germany an evaluation was added four years after the first adaptation monitoring report had been published, and the UK Committee on Climate Change keeps enhancing its assessment approach in every biennial reporting cycle. This could be reflected in the definition of development stages of national adaptation MEL systems.

d2: Capacity for fully implementing the national adaptation MEL system – What needs to be clarified for indicator development?

- (a) How to determine and measure “the required institutional capacity”. If distinct development stages of a NAP M&E system are used to track progress on target 10d as proposed above, then the stage of a MEL system being *in operation* automatically requires that the necessary capacity to operate the system has been built. This way of tracking progress on target 10d would therefore avoid the need for a separate methodology to determine what “required institutional capacity” means in each country.

²⁰ “established” could be seen as matching the stage of “MEL system approved, but not yet in operation” in Leiter (2021).

- (b) To capture the aspect of capacity building, countries could be asked to report in their BTRs if they have received dedicated support for the implementation of this target, and whether gaps in capacity are holding back the full operation of a national adaptation M&E system. Importantly, the very design of a national adaptation M&E system needs to consider the available and required resources in order to enable ongoing operation over time.²¹ All developing countries that had started the development of a national adaptation M&E system or had already one in operation in 2021 had received some form of technical and/or financial support (Leiter, 2021). Reporting progress on this part of target 10d could therefore be about that support in light of a country's specific needs to get a national adaptation MEL system under way.

4. Conclusion

The mapping exercise could be organised according to the aspects and specifications contained in the targets. It would be useful to draft an overview diagram that shows the extent to which the aspects are covered by existing or proposed indicators, and where gaps remain. To facilitate the selection of promising indicator candidates, the report of the mapping exercise should highlight for every indicator:

- Its adaptation relevance
- What is needed to get to a clear calculation method for the indicator
- What effort is needed for data collection and analysis

Developing and agreeing to an indicator set by COP30 is ambitious, especially when considering the time it took to develop the indicator frameworks of other global treaties.²² The process of involving experts needs to be effectively managed while remaining efficient and feasible given resource constraints (see Leiter, 2024a). Parties need to agree on outstanding matters of the modalities of the indicator work programme at CMA6 in November 2024, especially on the expected outcome of the work programme. The key considerations for the development of indicators outlined in this submission and the detailed suggestions for the development of the dimensional indicators can guide the process going forward.

²¹ See the new guidebook for the development of NAP M&E systems (Beauchamp et al., 2024) and its predecessor (Price-Kelly et al., 2015).

²² At the sixth GGA workshop in June 2023 in Bonn, UNDRR and the Convention on Biological Diversity (UNCBD) secretariat shared their experience of how their global targets and indicators were developed. See agenda, presentations and links to recordings at: <https://unfccc.int/event/sixth-workshop-under-the-glasgow-sharm-el-sheikh-work-programme-on-the-global-goal-on-adaptation>

References

- AOSIS (2024) *AOSIS submission on the UAE-Belem Work Programme to develop indicators for the UAE Framework for Global Climate Resilience*. Samoa on behalf of Alliance of Small Island States (AOSIS), submission dated 3 April 2024. https://www4.unfccc.int/sites/SubmissionsStaging/Documents/202404031108---AOSIS%20adaptation_Submission%20text%20plus%20data%20gaps.pdf
- Araos M et al. (2016) Climate change adaptation planning in large cities: A systematic global assessment. *Environmental Science & Policy*, 66: 375-782.
- Beauchamp E, Leiter T, Pringle P, Brooks N, Masud S, & Guerdat P (2024). *Toolkit for monitoring, evaluation, and learning for National Adaptation Plan processes*. NAP Global Network & Adaptation Committee. International Institute for Sustainable Development.
- Boon E, Meijering J V, Biesbroek R, Ludwig F (2024). Defining successful climate services for adaptation with experts. *Environmental Science & Policy*, 152: 103641. <https://www.sciencedirect.com/science/article/pii/S1462901123002903>
- Brown K, DiMauro M, Johns D, Holmes G, Thompson D, Russell A, Style D. 2018 Turning risk assessment and adaptation policy priorities into meaningful interventions and governance processes. *Philosophical Transactions of the Royal Society A*, 376: 20170303.
- Cran M and Regions4's climate team (2023) *Progress report 2023. Addressing Climate Justice in Regional Adaptation Planning and Actions*. <https://regions4.org/publications/regionsadapt-progress-report-2023/>
- Conway D et al. (2019) The need for bottom-up assessments of climate risks and adaptation in climate-sensitive regions. *Nature Climate Change*, 9(7), 503–511.
- Dazé A, & Hunter C (2022) *Gender-responsive National Adaptation Plan (NAP) processes: Progress and promising examples* (NAP Global Network synthesis report 2021–2022). International Institute for Sustainable Development. <https://napglobalnetwork.org/wp-content/uploads/2022/08/napgn-en-2022-gender-nap-synthesis-report.pdf>
- EEA (2018) *National climate change vulnerability and risk assessments in Europe*. European Environment Agency (EEA) Report No. 1/2018. <https://www.eea.europa.eu/publications/national-climate-change-vulnerability-2018>
- EEA (2020). *Monitoring and evaluation of national adaptation policies throughout the policy cycle*. European Environment Agency (EEA) Technical report No. 06/2020. <https://www.eea.europa.eu/publications/national-adaptation-policies>
- Evens J P et al. (2024) Higher-resolution projections needed for small island climates. *Nature Climate Change*, 14(7): 668–670. <https://www.nature.com/articles/s41558-024-02028-9>
- Formetta G & Feyen L (2019) Empirical evidence of declining global vulnerability to climate-related hazards. *Global Environmental Change*, 75: 10920.
- Hammill A, Dekens J, Olivier J, Leiter T, & Klockemann L (2014). *Monitoring and evaluating adaptation at aggregated levels: A comparative analysis of ten systems*. GIZ GmbH. [also available in French and Spanish] <https://www.adaptationcommunity.net/monitoring-evaluation/national-level-adaptation/>
- IPBES (2019) *Global assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. IPBES secretariat, Bonn, Germany. <https://www.ipbes.net/global-assessment>
- Jones L et al. (2015) Ensuring climate information guides long-term development. *Nature Climate Change*, 5(9): 812-814.
- Kim J Y & Shin J (2024) Evaluating sectoral pathways and barriers in mainstreaming climate change adaptation. *Climate Risk Management*, 45: 100627.
- Leiter T (2015) Linking monitoring and evaluation of adaptation to climate change across scales: Avenues and practical approaches. *New Directions for Evaluation*, 147, 117–127. <https://www.onlinelibrary.wiley.com/doi/full/10.1002/ev.20135>
- Leiter T (2017) The Adaptation M&E Navigator. A decision support tool for the selection of suitable approaches to monitor and evaluate adaptation to climate change. In: Uitto, J., Puri, J., van den Berg, R.D. (Eds.): *Evaluating Climate Change Action for Sustainable Development*, pp.327-341. Springer International Publishing. https://link.springer.com/chapter/10.1007/978-3-319-43702-6_18

- Leiter T (2021) Do governments track the implementation of national climate change adaptation plans? An evidence-based global stocktake of monitoring and evaluation systems. *Environmental Science & Policy*, 125: 179-188. <https://www.sciencedirect.com/science/article/pii/S1462901121002379>
- Leiter T (2022) Too little, too slow? Climate Adaptation at the United Nations Climate Change Negotiations since the Adoption of the Paris Agreement. *Carbon & Climate Law Review*, 16(4): 243-258. <https://cclr.lexxion.eu/article/CCLR/2022/4/5>
- Leiter T (2023a) *Submission on the Glasgow–Sharm el-Sheikh work programme on the Global Goal on Adaptation*. Grantham Research Institute on Climate Change and the Environment and Centre for Climate Change Economics and Policy, London School of Economics and Political Science. <https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2023/03/Submission-on-the-Glasgow%E2%80%93Sharm-el-Sheikh-work-programme-on-the-Global-Goal-on-Adaptation.pdf>
- Leiter T (2023b) *Submission to the report on the doubling of adaptation finance*. Grantham Research Institute on Climate Change and the Environment and Centre for Climate Change Economics and Policy, London School of Economics and Political Science. <https://www.lse.ac.uk/granthaminstitute/publication/submission-to-the-report-on-the-doubling-of-adaptation-finance/>
- Leiter T (2024a) *Modalities for the Indicator Work Programme under the Global Goal on Adaptation*. Grantham Research Institute on Climate Change and the Environment and Centre for Climate Change Economics and Policy, London School of Economics and Political Science. https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2024/04/Modalities-for-the-Indicator-Work-Programme-under-the-Global-Goal-on-Adaptation_LSE-consultation-submission.pdf
- Leiter, T. (2024b) Nationally determined contributions (NDCs) as a governance instrument – accounting for politics, negotiation progress, and related mechanisms under the Paris Agreement. *Environmental Politics*, 33(3): 552-557. <https://www.tandfonline.com/doi/full/10.1080/09644016.2023.2252312>
- Leiter, T., Buitrago, M.F., Druta, A., Guiterrez, J.E., Harley, M., Makholela, T., Ponlok, T., Ramarou, T., Vargas, C.R., & Wallin, E. (2017). Country-specific assessments of adaptation progress. In: UNEP (eds.): *The Adaptation Gap Report 2017: Towards Global Assessment*, pp. 23-33. United Nations Environment Programme (UNEP). <https://www.unenvironment.org/resources/adaptation-gap-report-2017>
- Leiter T and Pringle P (2018) Pitfalls and potential of measuring climate change adaptation through adaptation metrics. In: Christiansen L, Martinez G, and Naswa P (Eds.) *Adaptation Metrics: Perspectives on measuring, aggregating and comparing adaptation results*, pp.29-47. UNEP DTU Partnership. <https://unepccc.org/publications/adaptation-metrics-perspectives-on-measuring-aggregating-and-comparing-adaptation-results/>
- Leiter T, Olhoff A, Al Azar R, Barmby V, Bours D, Clement VWC, Dale TW, Davies C and Jacobs H (2019) *Adaptation metrics: Current landscape and evolving practices*. Background paper for the Global Commission on Adaptation. <https://gca.org/reports/adaptation-metrics-current-landscape-and-evolving-practices/>
- Leiter T, Njuguna L, Singh C, Bours D, Vyas D (forthcoming). Global progress on adaptation implementation. In: UNEP (Eds): *Adaptation Gap Report 2024*. (will be launched ahead of COP29).
- NAP Global Network & UNFCCC. (2019). *Toolkit for a gender-responsive process to formulate and implement National Adaptation Plans (NAPs)*. <https://napglobalnetwork.org/resource/toolkit-for-gender-responsive-national-adaptation-plans/>
- Neumayer E & Barthel F (2011) Normalizing economic loss from natural disasters: A global analysis. *Global Environmental Change*, 21: 13-24.
- Nowak A et al. (2024) Opportunities to strengthen Africa’s efforts to track national-level climate adaptation. *Nature Climate Change*, 14(8): 876–882. <https://www.nature.com/articles/s41558-024-02054-7>
- OECD (2016) *Mainstreaming Adaptation in National Development Planning*. OECD Development Co-operation Working Paper 29, July 2019. https://www.oecd-ilibrary.org/development/mainstreaming-adaptation-in-national-development-planning_5jlsv0689qs6-en
- Pauw, P.W., Grüning, C., & Menzel, C. (2020). *Number of beneficiaries as an indicator for adaptation: do the numbers add up?* GCF Monitor published by the FS-UNEP Collaboration Centre of the Frankfurt School of Finance and Management. <https://www.fs-unep-centre.org/wp-content/uploads/2020/04/GCFMonitor-edition2-final.pdf>
- Price-Kelly H, Leiter T, Olivier J, & Hammill A (2015). *Developing national adaptation monitoring and evaluation systems: A guidebook*. Published by GIZ and IISD in collaboration with the UNFCCC Adaptation Committee

- and the Least Developed Countries Expert Group. [also available in French and Spanish]
<https://www.adaptationcommunity.net/monitoring-evaluation/national-level-adaptation/>
- Reckien D et al. (2023) Quality of urban climate adaptation plans over time. *npj Urban Sustainability*, 3: 13.
<https://www.nature.com/articles/s42949-023-00085-1>
- Runhaar, H., Wilk, B., Persson, Å., Uittenbroek, C., & Wamsler, C. (2018). Mainstreaming climate adaptation: taking stock about what works from empirical research worldwide. *Regional Environmental Change*, 18, 1201–1210.
- Stults M & Woodruff S C (2017) Looking under the hood of local adaptation plans: shedding light on the actions prioritized to build local resilience to climate change. *Mitigation and Adaptation Strategies for Global Change*, 22:1249–1279.
- United Nations (2016) *Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction*. Document A/71/644, 1 December 2016.
- UNDP (2016) *A New Vision for Weather and Climate Services in Africa*, United Nations Development Programme.
- UNDRR (2020) *Hazard definition and classification review: Technical report*. United Nations Office for Disaster Risk Reduction. <https://www.undrr.org/publication/hazard-definition-and-classification-review-technical-report>
- UNDRR (2022) *Multi-hazard early warning system custom indicators & methodologies for computation*. United Nations Office for Disaster Risk Reduction. <https://www.undrr.org/publication/multi-hazard-early-warning-system-custom-indicators-methodologies-computation>
- UNDRR (2023) *Global Status of Multi-Hazard Early Warning Systems 2023*. United Nations Office for Disaster Risk Reduction. <https://www.undrr.org/media/91954/download?startDownload=20240814>
- UNEP (2023a) *Adaptation Gap Report 2023*. United Nations Environment Programme.
<https://www.unep.org/resources/adaptation-gap-report-2023>
- UNEP (2023b) *Adaptation Gap Report 2023. Online Annexes*. United Nations Environment Programme.
https://wedocs.unep.org/bitstream/handle/20.500.11822/43998/Annexes_AGR2023.pdf?sequence=1&sAllowed=y
- UNFCCC (2023) *National Adaptation Plans 2023. Progress in the formulation and implementation of NAPs*. UNFCCC LDC Expert Group. <https://unfccc.int/documents/635394>
- Vaughan C, Hansen J, Roudier P, Watkiss P, & Carr E (2019) Evaluating agricultural weather and climate services in Africa: Evidence, methods, and a learning agenda. *Wiley Interdisciplinary Reviews Climate Change*, 10(4), e586.
- Warren RF, Wilby RL, Brown K, Watkiss P, Betts RA, Murphy JM, Lowe JA. 2018 Advancing national climate change risk assessment to deliver national adaptation plans. *Philosophical Transactions of the Royal Society A*, 376: 20170295.
- WHO (2023) *Operational framework for building climate resilient and low carbon health systems*. World Health Organization. <https://www.who.int/publications/i/item/9789240081888>
- WMO (2023) *Implementation Plan for the Methodology for Cataloguing Hazardous Events*. EC-76/Doc. 3.1(11), 28 November 2023. https://meetings.wmo.int/EC-76/_layouts/15/WopiFrame.aspx?sourcedoc=%7b40cec1da-2380-4eb7-aa45-08e29c3fe8ea%7d&action=default

Annex: Indicator tables

The table template was shared with observer organisations to support the compilation of indicator proposals by the secretariat. However, the table format does not allow capturing the detailed considerations and suggestions that are provided in section 3 for the development of indicators for the dimensional targets. The following tables therefore describe only two main indicators: the presence of national adaptation planning instruments and of national adaptation MEL systems. The tables should be read together with the details provided in section 3.

Progress on adaptation planning (first part of the target from para 10b)

Suggested indicator	Adoption of a detailed and up-to-date national adaptation planning document
Specify the relevance to GGA target(s)	10b (National Adaptation Plans, Policies, Strategies) – please note that this indicator does not cover the aspect of mainstreaming (see section 3 in this submission for considerations for an additional indicator on mainstreaming)
relevance to adaptation, including enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change	100% relevant – Planning for adaptation
information on associated methodologies (if available) including clarity of methodologies associated with the indicator	See the online Annex of UNEP's Adaptation Gap Report (UNEP, 2023b)
information on data readiness (if available)	Published annually in UNEP's Adaptation Gap Report (UNEP, 2023a)
Whether quantitative and/or qualitative information applies to the indicators;	Quantitative
Level (local, national, regional and global)	National
The ability of the indicators to reflect regional, national and local circumstances	Reflects national circumstances in so far as every country develops a NAP and other adaptation policies and strategies according to its national circumstances
Information on whether the indicator is already being reported on and how (and if so, can this info be accessed)	Yes, annually in the Adaptation Gap Report in its chapter on adaptation planning (see UNEP, 2023a). The report is freely available on UNEP's website (https://www.unep.org/resources/adaptation-gap-report)
The ability of the indicators to be aggregated across levels	The indicator can be aggregated from the national to the global level. If sub-national adaptation planning gets well-defined, it could equally be aggregated from sub-national level to the global level (see details in section 3 of the submission)

The ability of the indicators to be disaggregated by demographic and socioeconomic characteristics, such as vulnerability, gender, age, disability, race, socioeconomic status, and status as Indigenous Peoples, as appropriate	N/A, but additional indicators could track the gender-responsiveness of adaptation plans, policies and strategies
Is based on the best available science?	Yes, based on a flagship global assessment report by UNEP
Is based on Indigenous Peoples' knowledge and local knowledge systems?	No, and it is not covering the local level.
References UNEP (2023a) <i>Adaptation Gap Report 2023</i> . United Nations Environment Programme. https://www.unep.org/resources/adaptation-gap-report-2023 UNEP (2023b) <i>Adaptation Gap Report 2023. Online Annexes</i> . United Nations Environment Programme. https://wedocs.unep.org/bitstream/handle/20.500.11822/43998/Annexes_AGR2023.pdf?sequence=1&isAllowed=y	

NAP MEL systems and communication of implementation progress (target from para 10d)

Suggested indicator(s)	Countries report on NAP implementation progress
Specify the relevance to GGA target(s)	10c (NAPs being implemented) and 10d (M&E system in operation)
relevance to adaptation, including enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change	100% relevant – Implementation of the NAP
information on associated methodologies (if available) including clarity of methodologies associated with the indicator	The indicator should be based on evidence of actual reporting rather than on stated intentions or claims that a country will undertake MEL (see Leiter, 2021 for details).
information on data readiness (if available)	Baseline published in Leiter (2021)
Whether quantitative and/or qualitative information applies to the indicators;	Quantitative
Level (local, national, regional and global)	National
The ability of the indicators to reflect regional, national and local circumstances	Reflects national circumstances in so far as every country develops a national adaptation M&E system for its own context (see Leiter et al., 2017)
Information on whether the indicator is already being reported on and how (and if so, can this info be accessed)	Yes, annually in the Adaptation Gap Report in its chapter on adaptation planning (see UNEP, 2023a). It provides data on three indicators:

	5.1 M&E systems for adaptation 5.2 A published monitoring/progress report 5.3 A published evaluation report For the indicator proposed here, no difference would be made between the type of document (i.e., whether it is a progress report or an evaluation report). Hence, the proposed indicator would just say “A NAP implementation progress or evaluation report has been published” (see submission for details). Please note that the peer-reviewed article (Leiter, 2021) should be used as baseline since the 2020 Adaptation Gap Report, where the data for these indicators was first analysed, still used intentions rather than evidence to score these indicators (see explanations in the article).
The ability of the indicators to be aggregated across levels	The indicator can be equally applied to reporting at sub-national level (see Leiter, 2015)
The ability of the indicators to be disaggregated by demographic and socioeconomic characteristics, such as vulnerability, gender, age, disability, race, socioeconomic status, and status as Indigenous Peoples, as appropriate	N/A
Is based on the best available science?	Yes, based on published research (Leiter, 2021)
Is based on Indigenous Peoples’ knowledge and local knowledge systems?	No. It is not covering the local level.
References Leiter, T. (2015). Linking monitoring and evaluation of adaptation to climate change across scales: Avenues and practical approaches. <i>New Directions for Evaluation</i>, 147, 117–127. https://www.onlinelibrary.wiley.com/doi/full/10.1002/ev.20135 Leiter, T. (2021). Do governments track the implementation of national climate change adaptation plans? An evidence-based global stocktake of monitoring and evaluation systems. <i>Environmental Science & Policy</i>, 125, 179-188. https://www.sciencedirect.com/science/article/pii/S1462901121002379 Leiter, T., Buitrago, M.F., Druta, A., Guitierrez, J.E., Harley, M., Makholela, T., Ponlok, T., Ramarou, T., Vargas, C.R., & Wallin, E. (2017). Country-specific assessments of adaptation progress. Chapter 4 in: UNEP: <i>The Adaptation Gap Report 2017: Towards Global Assessment</i>, pp. 23-33. United Nations Environment Programme (UNEP). https://www.unenvironment.org/resources/adaptation-gap-report-2017 UNEP (2023a) <i>Adaptation Gap Report 2023</i>. United Nations Environment Programme. https://www.unep.org/resources/adaptation-gap-report-2023	