

Adaptation metrics and the Paris Agreement

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This policy brief ...

This policy brief examines the feasibility and practicability of a set of common global adaptation indicators and their use in context of the Paris Agreement. It looks at the different purposes of applying adaptation metrics and provides recommendations for their targeted use.

Adaptation metrics need to be tailored to a particular purpose and context. A global set of all-purpose adaptation indicators is neither feasible nor desirable.

There are repeated calls to develop common adaptation metrics for use in the UNFCCC context, but a clearly defined purpose and a detailed examination of their applicability and usefulness is often missing. Since adaptation is context-dependent and closely interlinked with sustainable development, it is not possible to come up with a single metric that is able to capture adaptation outcomes in a uniform way at global level.ⁱ Adaptation indicators (see box 1 on page 2 on the interchangeable meaning of metrics and indicators) can be applied for different purposes and at different levels (e.g. local, national or global), each requiring different characteristics of the indicators used.ⁱⁱ Therefore, adaptation indicators need to be defined for a particular purpose and context, rather than searching for elusive all-purpose indicators. This is apparent in the diversity of countries' nationally determined contributions (NDCs) whose adaptation components require country-specific monitoring systems. The Global Stocktake can best be informed by a mix of information from global sources and national and subnational level. There is an opportunity to more specifically define adaptation targets and indicators, but the limits of globally standardized adaptation metrics need to be recognized.

The Paris Agreement emphasises transparency, but does not request adaptation metrics

The Paris Agreement has established a qualitative global goal on adaptation and does neither include any adaptation metrics nor request their development. The first decision of COP21 only refers to metrics in regard to anthropogenic emissions and removals in accordance with IPCC methodologies (decision 1/CP.21, paragraph 31). The Paris Agreement recognizes the im-

portance of monitoring, evaluation and learning of adaptation (Article 7) and established the transparency framework to track progress made in implementing NDCs and provide information related to climate change impacts and adaptation (Art. 13). Relevant information may also be submitted through adaptation communications (Art. 7). In order to assess the collective progress towards achieving the purpose of the agreement a Global Stocktake (GST) has been stipulated to (a) recognize adaptation efforts of develop-

ing country Parties; (b) enhance the implementation of adaptation action; (c) review the adequacy and effectiveness of adaptation and support; and (d) review the overall progress made in achieving the global goal on adaptation (Art. 7 and 14). Details of the transparency framework, the adaptation communications and the GST are currently being developed.

There is no uniform global outcome metric for adaptation and its context-specific nature poses limits for global comparability

Progress in mitigation of greenhouse gas (GHG) emissions can be assessed through global indicators that measure physical quantities like annual anthropogenic GHG emissionsⁱⁱⁱ. In contrast, there is no immediate way to measure adaptation. Adaptation can be conceptualised through different concepts like ways, e.g. through vulnerability, risk or resilience, each of which can in turn be operationalized in multiple ways which may lead to different results.^v Measuring adaptation is often more about social and economic aspects than physical ones. In addition, successful adaptation of one population group may impair the abilities of other communities

to adapt. Thus, value judgements are necessarily involved in defining successful adaptation. Whereas one ton of avoided CO₂ emissions has the same effect for mitigation irrespective of its geographic origin, supporting adaptation of a coastal town to increased sea-levels cannot be directly compared to avoiding health impacts from increasing extreme events elsewhere. Therefore, due to the different characteristics of mitigation and adaptation as summarised in table 1, **it is not possible to define a single, all-encompassing metric that can be globally applied to measure adaptation outcomes irrespective of context.** A number of adaptation outcome metrics such as avoided economic damages and avoided health impacts have been proposed, but there is often no unified way to measure them which limits their global comparability.^{iv}

A common set of adaptation indicators could not cater to all the different assessment purposes at once

The IPCC distinguishes between **three potential uses of indicators for adaptation**, namely (1) to identify the needs for adaptation, (2) to guide decision making on the allocation of funding and (3) to assess progress

in implementation and effectiveness of adaptation (Monitoring & Evaluation – M&E).ⁱⁱ Adaptation needs can be identified through climate risk or vulnerability assessments which are typically designed for a specific context. There is no standardised way to identify vulnerability at global level and global indices often come to different conclusions.^v The allocation of funding is ultimately a political decision and should not be based solely on a vulnerability index, since there is no objective way of measuring vulnerability.^v The third usage (M&E) can have a number of different purposes, e.g. learning, management or accountability, and can be done for a number of specific reasons (e.g. monitoring the collective achievements of a portfolio or performing ongoing monitoring to steer a project). Therefore, the different uses and purposes of adaptation metrics require different characteristics of the indicators and M&E systems. For example, comparing the results of an adaptation portfolio requires some degree of comparability, i.e. common indicators, whereas the management of projects is best based on indicators that are specific to their context and objectives. To provide orientation, the **Adaptation M&E Navigator** connects different purposes to suitable M&E methods (see box 2 on page 3).

Box 1: The meaning of ‘metric’ and ‘indicator’

As noted by the IPCC’s Fifth Assessment Report there is **no consistent use of the terms metric and indicator.**ⁱⁱ Metric can be understood as a composite indicator that is calculated on the basis of multiple indicators. For example, a vulnerability index composed of indicators for exposure, sensitivity and adaptive capacity could be seen as a metric. At the same time, the term metric is also used to refer to common quantifications of a certain subject matter as in ‘tonnes of avoided CO₂ emissions’ as mitigation metric or ‘average surface temperature’ as climate change metric. When used this way the term ‘metric’ has practically no difference to the meaning of ‘indicator’. Indeed, both terms are often used synonymously in climate policy and practice as was evident during the Pre-COP22 Adaptation Metrics Conference.ⁱⁱⁱ Hence, the term ‘metric’ does not necessarily imply anything different than ‘indicator’. We therefore use both terms interchangeable here.



Box 2: The Adaptation M&E Navigator

Monitoring and Evaluation (M&E) of adaptation can be applied for different reasons. To provide orientation the Adaptation M&E Navigator outlines eight specific purposes for adaptation M&E and matches them to suitable M&E approaches. Each M&E approach is described in detail and links to further resources and examples are provided. The online version of the Adaptation M&E Navigator is available at www.AdaptationCommunity.net under Monitoring & Evaluation at 'Multi-level M&E'. A technical description is also available as book chapter (free online access).^x

Aggregated adaptation indicators often remain at the output level, illustrating the limits of global indicators

Adaptation indicators are already being used in a variety of ways. For example, national adaptation M&E systems are using country specific indicators to assess climate impacts as well as adaptation outputs and outcomes.^{vi} At least 70% of countries' Nationally Determined Contributions (NDCs) include qualitative and 20% include quantitative adaptation indicators.^{vii} Adaptation indicators are also used by international climate funds such as the Pilot Programme for Climate Resilience (PPCR) to assess the collective achievements of their investments.^{viii} However, it has

been challenging to define adaptation indicators that are applicable across projects, sectors or geographic levels whilst also being specific enough to measure adaptation outcomes. Most of the standard indicators currently used by international climate funds remain at the output level, meaning they quantify what has been done but not whether an actual reduction in vulnerability or climate risks took place. The reason is that the outcomes of adaptation are context-specific and cannot be meaningfully expressed in a universal way.ⁱ The experiences to date with defining adaptation indicators at portfolio level illustrate the difficulties faced when attempting to develop common global adaptation indicators.^{ix}

Recommendations for the use of adaptation indicators in the context of the Global Stocktake

The following recommendations guide the use of adaptation indicators for measuring collective progress through the Global Stocktake (GST):

- 1. The different characteristics of mitigation and adaptation need to be reflected in the methodology of the GST:** Mitigation outcomes can be more easily quantified and compared through indicators than adaptation outcomes (see table 1). These differences should be taken into account when developing a methodology for the GST. In particular, some of the provisions to be addressed by the GST for adaptation under Art. 7

Table 1: Comparison of key characteristics of mitigation and adaptation

Characteristic	Mitigation	Adaptation
Which ultimate outcomes are supposed to be measured?	Increase in global average surface temperature, annual anthropogenic GHG emissions, GHG concentration of the atmosphere.	Avoided negative impacts of climate change, reduced climate vulnerability and risk and increased climate resilience.
What is being measured?	Physical conditions.	Combination of socio-economic and physical conditions.
Can it be objectively measured?	Yes. Whilst there are different ways to measure the global average surface temperature or estimate global emissions, the underlying units (°C and tons of CO ₂) are based on objective scales.	No, vulnerability and resilience depend on the definition and operationalisation. Value judgements are involved, for example about the weighting of indicators.
Is the unit of measurement to define success specific to a certain place and context?	No, one ton of avoided CO ₂ emissions has the same global effect no matter where it was avoided.	Yes, adaptation of a particular population group to a particular set of climate impacts at a particular place is not directly comparable to another place.

Source: Modified from Leiter & Pringle (2017).¹

like 'Enhance the implementation of adaptation action' cannot be addressed through indicators alone.^{vii}

2. Information on achieved results are necessary to assess progress towards the global goal:

The global goal on adaptation is outcome-based. Therefore, its progress cannot be measured based on information about needs, vulnerabilities and intentions alone, but requires information about the actual results of adaptation actions.

3. Output-level indicators cannot be taken to sufficiently measure the global goal on adaptation:

Indicators on the output level like many of those currently used by international climate funds (e.g. 'number of tools developed') do not capture the actual level of vulnerability reduction or increase in resilience. Hence, on their own such indicators are not sufficient to measure the global goal on adaptation.

4. Go beyond quantitative aggregation:

Aggregation is not restricted to adding up simple data like 'number of countries'. To overcome the disadvantages of standardised indicators, countries like South Africa or the UK are already using more flexible frameworks. South Africa has defined a set of desired adaptation outcomes, progress of

which will be measured through a synthesis of information provided by national, provincial and local governments.^{xi} The UK is assessing the almost 400 actions listed in its national adaptation programme through specific indicators for each priority area coupled with feedback from the implementers of each action.^{xii} These examples demonstrate that aggregation can be done in a more meaningful way than through simply adding up data from output indicators.

5. Consider country-specific adaptation information for the Global Stocktake:

More than 40 developed and developing countries are drafting or have already implemented national adaptation M&E systems.^{xiii} As a result, several countries already regularly report on their national progress. The GST should consider these country-driven information as important input that reflects countries' unique circumstances^{xvi}.

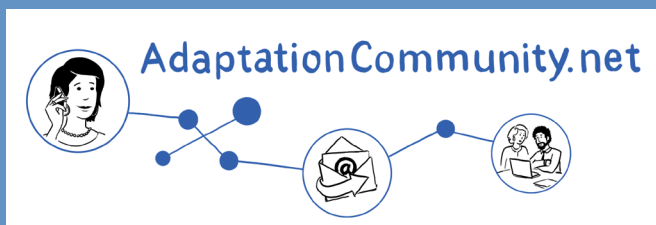
6. Ensure that the whole spectrum of adaptation is covered:

A small number of global aggregate indicators such as those used for SDG 13 on climate action (e.g. 'number of countries that have communicated the establishment of an integrated policy/strategy/plan') do not account for the depth and breadth of adaptation taking place. The NDCs show the

broad range that adaptation covers in terms of sectors and priorities, so a small set of indicators would not sufficiently take stock of progress being made.

7. Remain flexible over time: Adaptation practice and experience is growing over time as is evident when considering the status of adaptation five years ago. The GST should therefore not be limited to a permanently fixed set of indicators but ensure a certain degree of flexibility in order to update the assessment methodology in the future.

The inherent characteristics of adaptation defy the definition of a single uniform global outcome metric comparable to tonnes of avoided CO₂ for mitigation. Similarly, there is no single global indicator for sustainable development. **Since the global goal on adaptation is outcome-oriented, it cannot be sufficiently measured through simple output indicators** like number of countries or people. The GST should therefore go beyond aggregation based on a fixed set of indicators. Examples from pioneering national adaptation M&E systems illustrate more flexible approaches that can be built upon. The GST should also consider a variety of sources of information from global to subnational level and should remain flexible to adjust its methodology to new advances over time.



An online platform to support adaptation to climate change: AdaptationCommunity.net offers insights into different topics:

- Mainstreaming & NAP
- Climate Information & Services

- Vulnerability and Climate Risk Assessments
- Loss & Damage
- Ecosystem-based Adaptation
- Monitoring & Evaluation
- Private Sector Adaptation

Publications, tools and videos on climate change adaptation are available. Detailed information on the training courses 'NAP country-level training' and 'Adaptation monitoring and evaluation (M&E)' can also be found online as well as a tool to analyse the adaptation components of NDCs. AdaptationCommunity.net is continuously expanding its resources and offering regular webinars to provide users with the latest information, country experiences and adaptation tools.



Endnotes

- i. Leiter, T. & Pringle, P. (2017). The pitfalls and potentials of measuring climate change adaptation through adaptation metrics. Adaptation Perspective Series. UNEP DTU.
- ii. IPCC (2014). Climate Change 2014 Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects, Chapter 14.
- iii. IPCC (2014) [Mitigation of Climate Change. Contributions of Working Group III.](#)
- iv. Köhler & Michaelowa (2013). [Quantification of adaptation benefits and comparison of coastal protection adaptation projects in Vietnam.](#)
- v. GIZ (2017). [Policy Brief: Can climate vulnerability and risk be measured through global indices?](#)
- vi. GIZ (2014). [Repository of adaptation indicators.](#)
- vii. OECD (2016). [Communicating Progress in National and Global Adaptation to Climate Change.](#)
- viii. GIZ (2017). [PPCR: The PPCR Monitoring and Reporting System.](#)
- ix. Ford & Berrang-Ford (2016). [The 4Cs of adaptation tracking: consistency, compatibility, comprehensiveness, coherency.](#) Mitigation and Adaptation Strategies for Global Change, 21(6): 839–859.
- x. 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.](#)
- xi. Department of Environmental Affairs (2016). [Monitoring the Adaptation Landscape in South Africa.](#)
- xii. GIZ (2017). [The UK Adaptation Monitoring and Evaluation Framework.](#)
- xiii. Detailed factsheets of national adaptation M&E systems are available at [www.AdaptationCommunity.net](#) under [national-level M&E.](#)
- xiv. Kingdom of Morocco (2016): Submission to the Ad Hoc Working Group on the Paris Agreement at COP22 contained in FCCC/APA/2016/INF.2/Add.1.
- xv. GIZ (2017). [Policy Brief: Country-specific adaptation M&E systems.](#)
- xvi. Leiter, T. (2017). Country-specific assessments of adaptation progress. In: UN Environment: Adaptation Gap Report 2017.
- xvii. Kingdom of Morocco (2016): Submission to the [Ad Hoc Working Group on the Paris Agreement at COP22](#) contained in FCCC/APA/2016/INF.2/Add.1.

About the GIZ Project ‘Effective Adaptation Finance – M&E Adapt’

The GIZ project ‘Effective Adaptation Finance – M&E Adapt’ has developed the **Adaptation M&E Toolbox** which includes innovative methods and approaches for the assessment of adaptation actions at national and local level.^{xiv} On behalf of the Federal Ministry for Economic Cooperation and Development (BMZ), the project supports developing countries in the design and operationalization of national adaptation M&E systems.^{xv} It also facilitates learning through international exchange and capacity building.

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