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Advancing Effectiveness of Climate Adaptation

Science for Adaptation *Policy Brief* #7

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About the WASP and Policy Briefs

- The Science for Adaptation Policy Brief Series is a UN-led World Adaptation Science Programme (WASP) initiative. The briefs target researchers, policymakers, and practitioners to help them successfully bridge the science-policy-action gap.
- The WASP is overseen by 7 UN agencies: the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Environment Programme (UNEP), the World Meteorological Organization (WMO), the Intergovernmental Panel on Climate Change (IPCC), the Green Climate Fund (GCF), the Global Environment Facility (GEF) and the United Nations University (UNU). The Secretariat of the WASP is hosted at UNEP, Nairobi, Kenya.
- WASP's mission is to ensure researchers, policymakers and practitioners have the best scientific knowledge and capacity necessary to undertake effective climate adaptation policy and action.

Introduction

Evaluating the effectiveness of adaptation policies and actions is important to advance the scale and scope of climate risk reduction. The goal of this WASP Science-for-Adaptation Policy Brief (SAPB) is to enhance the understanding of the effectiveness of climate adaptation by elucidating the dynamic framing for adaptation policy and action, identifying areas where approaches for ensuring adaptation effectiveness have advanced, highlighting adaptation effectiveness in international and national policymaking, and measuring adaptation effectiveness of actions on the ground.

The overall objective of adaptation is to reduce climate change vulnerability, hazards and exposure (through enhancing adaptive capacity), resulting in reducing climate change risks. Adaptation effectiveness refers to the extent to which policies and actions reduce present and future climate risks. Measuring effectiveness is an important component of successful adaptation. Recent understanding has highlighted adaptation aims related to ambition, feasibility, equity, and justice while emphasizing the need to ensure that adaptation actions do not result in negative unintended consequences (Ara Begum *et al*. 2022). The IPCC AR6 highlights the need for adaptation solutions (i.e., that are effective over time and space) that are ambitious, feasible, and equitable, conforming to principles of justice[1] (Figure 1). (International Panel on Climate Change [IPCC] 2022)

Key messages

I. Evaluating the effectiveness of adaptation policies and actions is key to understanding whether they have reduced climate risks and achieved other intended outcomes. The goals are to ensure that adaptation is adequate to address climate risks, do not foster negative unintended consequences over space and time, and inform adaptation financing.

II. Adaptation effectiveness is vital to inform both national and local-level adaptation actions as well as progress towards the Global Goal on Adaptation and the UNFCCC global stocktake (GST).

III. However, despite the urgency to implement effective adaptation at scale, understanding adaptation effectiveness is still evolving and the development of ways to measure it is ongoing. The diverse contexts and adaptation interventions make it challenging to understand and operationalize adaptation effectiveness. Specifically, measuring change requires a definition of the baseline conditions and measurement of change against that baseline. Attributing outcomes to investments is also challenging.

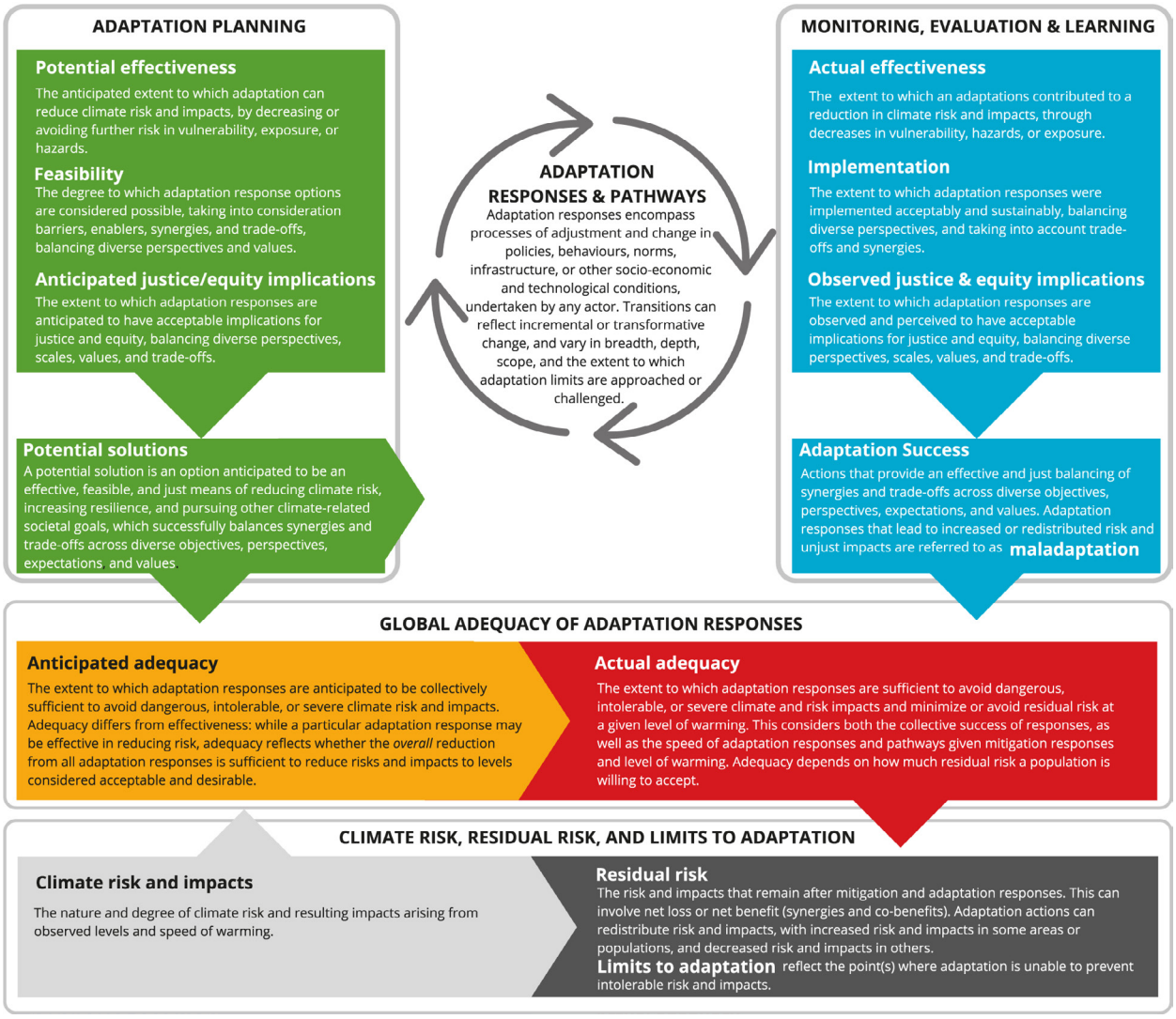
IV. Determining the effectiveness of adaptation policy and action needs to take account of the dynamic nature of adaptation. Regular re-evaluation of adaptation policies and actions over time can help to enhance adaptation effectiveness overall.

V. Adaptation interventions need to be assessed for their potential effectiveness (ex-ante) and measure actual effectiveness (ex-post) using a set of metrics identified based on specific criteria. Monitoring and evaluation during implementation helps to ensure climate risk reduction.

VI. Useful metrics for effectiveness in adaptation policy and action include quantitative and qualitative measures for risk and vulnerability reduction. Qualitative indicators include composite measures of ambition, feasibility, and equity/justice.

1. The term climate justice, while used in different ways in different contexts by different communities, generally includes three principles: distributive justice which refers to the allocation of burdens and benefits among individuals, nations and generations; procedural justice which refers to who decides and participates in decision-making; and recognition which entails basic respect and robust engagement with and fair consideration of diverse cultures and perspectives (IPCC, 2022). For IPCC definitions of equity, justice, fairness, feasibility see IPCC, 2012 WGII report (p. 2908, p. 2909, p. 1913).

Figure 1: IPCC AR6 WGII Adaptation Definitions Related to Adaptation Effectiveness[2] Source: IPCC (2022). AR6, WGII, Chapter 1, p1-49.



When considering the effectiveness of climate change adaptation, this WASP SAPB highlights two entry points:

(i) **Effectiveness of policies and plans**[3] including National Adaptation Plans (NAPs) that aim at facilitating the implementation of adaptation actions on the ground; and

(ii) **Effectiveness of actions,** such as projects and programs as contained in adaptation plans such as the NAPs, implemented on the ground that aim to reduce climate risks.

Throughout this policy brief, we highlight the discussion of the two entry points – policy and action – explicitly. Box 1 elaborates how adaptation effectiveness is defined for policies/plans, and actions. The goals are to be responsive both to UNFCCC policy challenges, as well as to provide a framework for countries to advance adaptation on the ground. In the UNEP Adaptation Gap Reports (AGR), these two entry points are referred to as "planning" and "implementation." (United Nations Environment Programme [UNEP] 2022)

2. Note from IPCC: Assessing adaptation solutions and success. A solution is defined as an adaptation option which is effective, feasible and conforms to principles of justice. These attributes can be assessed ex ante during adaptation planning. During implementation, the overall success of a response can be judged via monitoring and evaluation of these attributes. Adaptation unfolds as an iterative learning process of assessment, implementation, monitoring, adjustment and learning. A set of responses is adequate to the extent that they sufficiently reduce climate risk to levels considered tolerable. Adaptation may not fully avoid residual risks, but the more adequate the response, the less residual risk remains. Adaptation also has limits beyond which it is no longer possible to avoid intolerable risks and impacts.
3 Policies and plans are used synonymously and often include officially adopted governmental guidance and proposed strategies.

This WASP SAPB seeks to answer two questions related to the two entry points:

1. Regarding policies/plans: How can we know that adaptation policies and plans, including finance, are enabling adaptation actions that are effective, ambitious, feasible, equitable and just?
2. Regarding actions: How can we know adaptation actions are producing desired adaptation outcomes in terms of reducing risk?

According to the IPCC AR6 WGII Report, approaches to measuring potential effectiveness (ex-ante) are emerging. Approaches to measuring actual effectiveness (ex-post) are also emerging. This indicates slow progress despite the urgent need to scale up effective adaptation.

Box 1. Adaptation Effectiveness for Policies/Plans and Actions

According to the IPCC Working Group II AR6, effectiveness is the extent to which an action is anticipated or is observed to reduce climate-related risk. Adaptation effectiveness can be contextualized broadly for Policies and Actions. (Owen 2020; Eriksen *et al.* 2021)

Adaptation Effectiveness of Policies/Plans. From a policy-oriented perspective, effectiveness refers to the outcomes of instruments (e.g., Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs)), including the provision of finance against the adaptation needs identified by countries. Understanding the effectiveness of such policies contributes to the global stocktake (GST).

Concerning adaptation, the GST is expected to consider information on nationally determined contributions and their progress; state of adaptation efforts; financial flows; loss and damage; barriers and challenges; good practices, experience and potential opportunities to enhance international cooperation; and fairness considerations, including equity.

Adaptation Effectiveness of Actions[4]. Effectiveness of adaptation actions refers to the actual benefits of interventions (e.g., programs, and projects) in terms of climate risk reduction, including outcomes on vulnerability and adaptive capacity (See Figure 1). Understanding the effectiveness of actions "on the ground" locates a given intervention along the maladaptation-adaptation continuum and evaluates whether it serves a long-term transformational process or is only short-sighted.

Potential effectiveness is the anticipated extent to which adaptation can reduce climate risk, through decreases in impacts, vulnerability, hazards, or exposure. Actual effectiveness is the extent to which adaptations contribute to a reduction in climate risk and impacts, through decreases in vulnerability, hazards, and exposure. (Leiter 2023)

Adaptation is a Dynamic Process

Climate risk conditions (hazards, as well as exposure and vulnerability drivers) are evolving and therefore require dynamic responses, adapting a process of ongoing adjustment. For example, in coastal cities, urbanization combined with increasing climatic risks including sea level rise is exacerbating exposure and vulnerabilities to flooding and storms across the world. Because the climate is changing and will continue to change in the future, adaptation needs to be flexible and responsive both now and through the coming decades. Thus, adaptation entails sequences of actions, processes and adjustments that are implemented progressively and that require iterative evaluation of their effectiveness. This depends on how the future unfolds with both changing climate conditions and development and on how knowledge of adaptation effectiveness expands.(Werners *et al.* 2021) Using the dynamic process approach makes sense both for the policy and action realms at the international, national, subnational, local, and territorial/sector levels (also relevant for community-based and locally led adaptation actions) because it explicitly recognizes the changing conditions of both climate and development and emphasizes ongoing learning.

Thus, definitions and methods for determining the effectiveness of adaptation in regard to both policy and action need to take account of the dynamic nature of adaptation as a process, rather than consider it a static outcome. To accommodate this continuously evolving and dynamic nature of adaptation, policies are needed to evolve along with new scientific knowledge, experiences, and evidence of effectiveness. (Swanson and Bhadwal

4. The principles of best adaptation practice please see the Adaptation Gap Report (2022) Chapter 5: Effectiveness of Adaptation.

2009) For example, countries need to review and update their national adaptation plans at regular intervals to take into account new developments in risk assessments, adaptation science, and lessons from the experience of implementing adaptation. (Least Developed Countries Expert Group 2012) The 2012 UNFCCC Technical Guidelines of the NAP process expounds the guiding principle that planning for adaptation is a continuous, progressive and iterative process.

A gender-sensitive approach is an important consideration in adaptation to ensure effective and sustainable adaptation efforts. Women have experience, expertise, perspectives, and capacities, as men do, which contribute to effective adaptation. Therefore, women should not solely be perceived as victims when addressing climate change. Rather, they are agents of change at different levels of the adaptation process. (United Nations Framework Convention on Climate Change [UNFCCC] 2015)

While the goal of adaptation is to reduce climate risk and increase resilience, in certain cases adaptation actions can exacerbate risks and vulnerabilities for certain groups of people (women, indigenous people) or natural systems. These and other forms of maladaptation can occur both concurrently and onsite as well as at different spatial (e.g., countries in the upstream of a river may construct more reservoirs in response to climate change that may deprive communities of water in the downstream) and temporal scales (deferred negative outcomes as in the case of groundwater extraction projects that lead to overexploitation of groundwater in absence of groundwater recharging and checks and balances).

Monitoring and Evaluation Approaches

Setting up monitoring and evaluation (M&E) systems that advance understanding of adaptation effectiveness can inform the global stocktake (GST) under the Paris Agreement as well as adaptation financing and policies and actions at national and subnational levels.

Adaptation as a dynamic and continuous process can pose challenges in the way that policies and actions are to be monitored and evaluated. Some of the challenges can include changing baseline conditions and changing contexts with which the benchmark comparisons are made. Hence, a dynamic monitoring and evaluation framework is necessary to accommodate the dynamic nature of adaptation. Identifying and creating practices for regular re-evaluation of climate, development, and adaptation outcomes ensures the use of monitoring data and information to inform assessment, learning, decision-making, and support.

There is a large body of evidence-based knowledge stemming from project and program evaluations, which use a range of metrics and indicators, that can inform a dynamic M&E framework. For example,the global adaptation funds (LDCF, SCCF, GCF and AF)[5] all have *# of beneficiaries and # hectares of land restored* as outcome indicators. Wherever metrics are not available, using relevant proxy metrics (e.g., area of land under optimal irrigation as a proxy for water availability for agriculture) (Christiansen *et al.* 2018) can provide an understanding of the likelihood of positive adaptation outcomes (Leiter *et al.* 2019).

Monitoring frameworks need good baselines and measurement methodologies against this baseline. Attribution of the project to the adaptation progress is often a challenge. Impact assessment methodologies that assess progress against a counterfactual, non-'treatment' group is one way of scientifically assessing attribution, which the GCF is trying out for some projects. The cost, value and use of this information for policy purposes should be carefully assessed.

A related issue is the use of quantitative, objectively verifiable indicators against qualitative, perception-based indicators, the latter being more useful for the impact of the project but more subjective and therefore arguably less scientific. Another issue is that measuring final outcome change does not necessarily tell one about the impact chain and what adaptation measures or approaches actually led to the adaptation outcome.

Adaptation metrics can be useful for evaluating adaptation effectiveness in various temporal and spatial scales (Table 1). The experiences suggest that the available indicators and metrics are highly suitable for ex-post purposes and there is a need to strengthen them for ex-ante evaluation purposes. Table 2 shows relevant adaptation metrics and indicators based on the background paper for the Global Commission on Adaptation.

5. Least Developed Countries Fund (LDCF), Special Climate Change Fund (SCCF), Global Climate Facility (GCF), Adaptation Fund (AF).

Table 1: Purposes for the use of adaptation metrics

Purpose	Temporal	Spatial	Major limitation
Assessing climate vulnerability, adaptive capacity, risk, resilience or climate impacts	Ex-ante	Any level	Limited ability to examine causal relationships
Allocation of funding	Ex-ante	Global to sub-national	Vulnerability metrics cannot be objectively measured
Determining the potential benefits of adaptation investments	Ex-ante	Any level	The hazard of disproportionately focusing on well performing indicators
Tracking the process of implementation	Ex-post	Any level	May not explain what went wrong
Assessing the effectiveness: adaptation intervention, plan or strategy	Ex-post	Any level	Indicators may not explain the reason why changes took place
Assessing the effectiveness: portfolio of adaptation interventions	Ex-post	Global to sub-national	Simplication to counting of numbers may not explain the progress
Assessing adaptation progress in a certain sector, theme or geographical area	Ex-post	Global to sub-national	Don't explain why the change has happened

Source: Adapted from Leiter *et al*. 2019.

Table 2: Types and examples of adaptation metrics

Type of adaptation metric	Description	Application examples
Indicators of climate exposure, vulnerability, risk or resilience	These indicators represent factors determining exposure, risk and vulnerability	PROVIA, GIZ and EURAC, vulnerability and risk assessments by the EEA, the UK Committee on Climate Change's Climate Change Risk Assessment Evidence Report and several others.
Context-specific indicators of adaptation interventions	Mostly these are used for M&E purposes to determine if interventions have achieved intended objectives	The work of several NGOs, bi- and multi-lateral development cooperation organizations, informs this work often with their own specific M&E frameworks.
Standard adaptation indicators of portfolios	These indicators are used for measuring the performance of a portfolio of projects	Global and national climate funds use such indicators linked to objectives and results framework.
Comparative global indices	These indices are formed based on a set of variables	Global Climate Risk Index, Notre Dame Global Adaptation Index etc. use such an approach.

Source: Adapted from Leiter *et al*. 2019.

Temporal Dimensions of M&E

At international, national, and regional/sectoral levels, the evaluation of adaptation effectiveness can be taken up in several timeframes: ex-ante, monitoring and evaluation (M&E) during the implementation of adaptation, and ex-post evaluations. (Leiter and Pringle 2018) Adaptation as a dynamic process denotes that a series of such evaluations are necessary over some time (Figure 2). Each subsequent intervention builds upon the learnings from the M&E and ex-post results of the previous stage.

1. **Ex-ante assessment** – This is a forward-looking perspective for assessing adaptation effectiveness before the adaptation policies and actions are implemented. Before formulating and implementing adaptation strategies and plans, it is important to consider future climate and development scenarios and identify effective pathways and actions. Important questions related to ex-ante assessment include what are the desired outcomes, what are the most cost-effective options and what is their timeframe(s) of implementation (lead time until effectiveness and duration of benefits), and what are the possible co-benefits or trade-offs with other critical socio-economic, climate and environment objectives, such as biodiversity, mitigation potentials, and development. Systematic collection and analysis of data play an important role in ex-ante assessment.
2. **M&E during implementation** – It is important to monitor and evaluate projects and programs as they are implemented. Measuring progress in adaptation relates to the system(s) of concern and requires proxy measurements designed to determine the extent and nature of these adjustments. Climate vulnerability, risk and resilience indicators and metrics are key components of M&E during implementation.

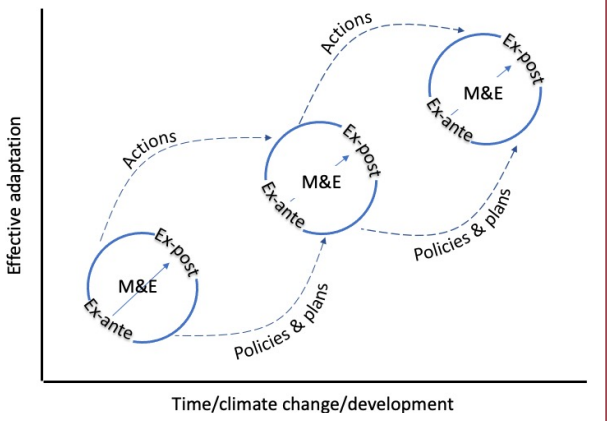
3. **Ex-post evaluation** – This is a key perspective for measuring adaptation effectiveness after policies and actions have been implemented. Usually, it focuses on achieving outcomes related to reduced risk, vulnerability and increased resilience. Ex-post evaluation can provide evidence of desired outcomes attributed to specific adaptation policies and actions and demonstrate their cost-effectiveness in the delivery of the outcomes. It can lay the foundation for future effective adaptation interventions as climate change and development evolve.

A Dynamic M&E Framework for Adaptation

Figure 2 presents the dynamic process framework for ex-ante assessment, monitoring and evaluation of adaptation effectiveness during the implementation of adaptation actions and ex-post evaluations of policies and actions. The dynamic process framework includes consideration of ongoing adjustments and benchmarked outcomes, as well as climate change and development through time.

Dynamic monitoring and evaluation framework help policymakers and implementers keep track of the adaptation progress over a long period across several projects and programs and enable mid-course corrections if necessary. From the lens of administrators and government departments, concrete metrics to avoid

Figure 2: Dynamic monitoring and evaluation framework for adaptation effectiveness



negative outcomes from extreme climate events are essential. Metrics and monitoring and evaluation contribute to anticipatory learning and accountability that help in improving and possibly contributing to transformational adaptation. The goal is that by emphasizing adaptation as a process of learning and doing, learning will support generating implementable solutions based on the understanding of what worked and what didn't. Learning often requires contextual information in addition to quantitative metrics. (IPCC 2022)

Linking to International and National Policies

The focus on adaptation effectiveness differs when considering international and national levels. At the international level, measuring adaptation effectiveness will be an important component in relation to negotiations for Global Goal on Adaptation, as well as climate finance. (Adaptation Committee 2021) Aggregating national goals on adaptation may also provide relevance at the international level. At national levels, there is a need for more sectoral, procedural, and action-oriented evaluations.

There are several methodologies for assessing the effectiveness of adaptation and the support provided for it. A background report by the Adaptation Committee and the Least Developed Countries Expert Group for the UNFCCC describes some of these methodologies. (Leiter 2021) The report contains information on the purpose of the review of the effectiveness of adaptation and support in the context of the GST and a compilation of existing methodologies (see Box 2). (UNFCCC 2021)

The UNFCCC global stocktake (GST). Adaptation has been placed in parity with greenhouse gas mitigation in the Paris Agreement including through the Global Goal on Adaptation. (UNFCCC 2016) It has been a component of growing importance in development agendas and international funding. With increasing climate risks, enhanced and accelerated action on climate change adaptation is essential to prevent climate change-induced adverse impacts, reducing some potential losses and damages, and spurring sustainable development across sectors and geographies. However, a commonly accepted methodology assessing the adequacy and effectiveness of adaptation support and action will not be in place for the first GST in November/December 2023. What has been commonly accepted is that conducting the GST will be a learning-by-doing process and that the second GST can build on the experiences of the first. (Fisher 2023)

National Adaptation Plans. Adaptation effectiveness plays a key role in the National Adaptation Plans (NAPs). It is also relevant for regional adaptation plans as more and more regions are considering regional plans (e.g., The Pacific Adaptation to Climate Change (PACC) Programme for the Pacific Island States). NAPs are national action plans and strategies that are officially endorsed at the national level. NAPs have three essential functions that need to be evaluated as climate changes (p.8). (UNFCCC 2021)

- NAPs are supported by an iterative process of observation and research, analysis, assessment, priority-setting, planning, implementation, reporting, monitoring, review and evaluation.

Box 2. Methodologies to review the adequacy and effectiveness of adaptation

Monitoring climate risk/vulnerability over time
Monitoring the level of climate risks/vulnerabilities over time through repeated assessments and analyzing whether any changes can be linked to the adaptation measure is one way of assessing effectiveness of adaptation.

Applying a theory of change to illustrate and assess the adaptation process
A theory of change explains how adaptation is assumed to take place and can help to identify suitable adaptation measures. Comparing the theory of change and its underlying assumptions to the actual situation can then inform the effectiveness of adaptation.

Asking beneficiaries
Given the local contextualization of climate impacts, adaptation and the assessment of its effectiveness lend themselves well for local stakeholder consultation and other participatory processes. Asking beneficiaries about whether implemented actions have enabled them to better deal with climate impacts provides reliable information about adaptation effectiveness and can also enhance ownership of the actions.

Applying country-specific adaptation M&E systems
As an increasing number of countries are developing national adaptation policies and plans, it is relevant for them to understand the degree of implementation and effectiveness of these plans as well as the overall national preparedness to the expected impacts of climate change.

Source: Adaptation Committee – LDC Expert Group of the UNFCCC 2021. p11.

- NAPs state what is known about vulnerability and which adaptation actions are prioritized over a given period for the country.
- NAPs are policy instruments that coordinate and drive the actions of all actors and stakeholders in their pursuit of national adaptation goals.

Links to Funding and Investments. There has been an increase in the scale and proliferation of funds and institutional resources devoted to climate change adaptation. International funds have indicator frameworks that are evolving so that climate finance can maximize adaptation effectiveness on the ground. Accompanying this increasing investment and expenditure in climate change adaptation is a need for mechanisms to prioritize adaptation actions and to keep track of the progress in the outcomes of these investments. Dynamic M&E for adaptation can contribute to robust ways to maximize the success and accountability of investments and minimize the potential for maladaptation.

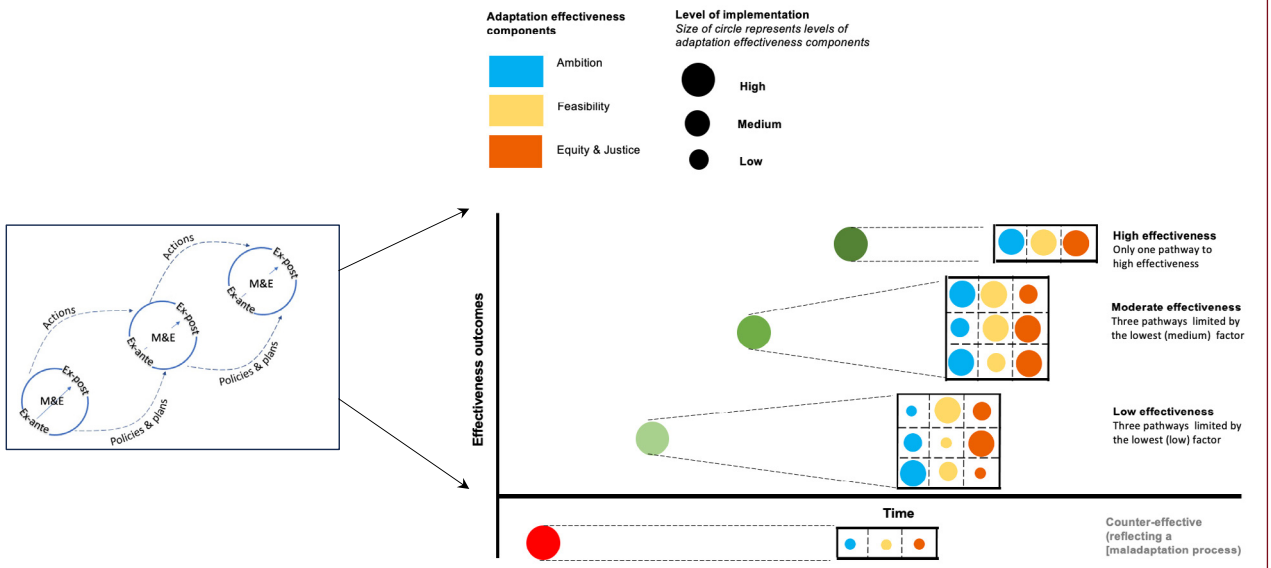
Assessing the Potential Effectiveness of Adaptation Actions

Figure 3 presents an approach that countries and/or sectors can use to assess potential effectiveness, with explicit inclusion of ambition, feasibility, and equity/justice particularly at a program/project level. In the most recent Adaptation Gap Report (UNEP 2022), the assessment of adequacy and effectiveness of adaptation planning focused on two similar criteria; inclusiveness (i.e., equity/justice) and implementability (i.e., feasibility). This approach can be used iteratively as part of the dynamic adaptation process described before. The approach is scalable from local to national and global levels and hence is applicable to community-based and locally led adaptation to national level adaptation actions. It also accommodates the modularity of adaptation actions i.e., implementing a sequence of adaptation projects addressing various elements of risk in a sequential manner.

Figure 3 presents the three main components–Ambition, Feasibility, Equity and justice–for assessing potential effectiveness.

- The first component relates to "ambition" and describes the degree of climate risk reduction (through vulnerability reduction and resilience increase) to be expected from a given option or a set of options. (Currie-Alder *et al.* 2021) For example, ambitious adaptation projects relating to sea level rise and storm surge can include multiple, simultaneous, and larger-scale interventions, such as widening riverbeds, moving dikes inland, digging flood channels, and expanding green spaces to provide long-term flood safety as well as offer co-benefits.
- The second component refers to the "feasibility" of the option or group of options, and that depends on a series of enabling conditions such as, for example, affordability and the existence of adequate governance arrangements. For example, watershed management as an adaptation intervention can be feasible if technology, human capital and financial resources are available; however, its feasibility can be low if local institutional capacity is lacking.

Figure 3: An approach to assess potential adaptation effectiveness



- The third component relates to "equity and justice", designating the degree to which equity and justice are at the center of adaptation policies, plans and actions. This is a new criterion that can be measured by such indicators as the inclusion of community groups in adaptation decision-making (UNEP 2022). For example, there is a need for climate resilient development plans for informal settlements to place equity and justice at the forefront regarding access to electricity, clean water, sanitation, and waste collection.

Combining high ambition, high feasibility and high equity/justice is a promising way to achieve the highest possible adaptation effectiveness. This requires the iterative dynamic process shown in Figure 2 to be multifaceted (e.g., across institutions) and responsive (i.e., decisions are taken and implemented over short periods). If any component of adaptation effectiveness falls short of high degree, it may result either in medium or low adaptation effectiveness. Maladaptation occurs when all components of adaptation effectiveness are low.

Responding to Low-Income Country Needs

The framing of adaptation as a process also applies to the needs and priorities of communities and stakeholders in low-income countries. Hence, these countries also need an ongoing measurement of the effectiveness of both policy and action in a dynamic way.

The new approach presented in Figure 3 enables the ex-ante assessment of adaptation effectiveness with the criteria of ambition, feasibility, and equity and justice. This approach can help countries in preparation of proposals and reports on progress to funding agencies like the GCF and GEF as it can guide systematic collection of data and its use for effective adaptation decision making.

As highlighted in the AGR 2022, low-income countries are especially faced with data challenges to quantify adaptation effectiveness:

> **"Data to quantify adaptation effectiveness are limited yet urgently needed, especially for higher levels of warming and complex or cascading risks and especially in low-income countries. However, existing evidence shows that hybrid solutions addressing multiple dimensions of climate-related risks – for example by bringing together climate information, infrastructure, and nature-based and institutional solutions – tend to be more effective than single solutions."**

Data needed include climate observations and projections, impacts of extreme events, vulnerability (e.g., changes in the number of people affected, analyzing the gender-differentiated impacts), resilience (e.g., establishment of policies, plans and projects) as well as adaptation strategies of women and men. In the dynamic adaptation process, multiple solutions need to be optimized through sequencing over time. For example, the New York City Panel on Climate Change has developed the flexible adaptation approach to manage risk of coastal flooding over time. (Rosenzweig and Solecki 2019). To be effective in the long term, solutions need to be context-specific and address the underlying causes of vulnerability (such as underlying structural inequities, gendered disadvantages, livelihoods, and exposure), in addition to reducing climate-related exposures and vulnerabilities to climate hazards. (UNEP 2022)

Conclusions and Recommendations

The dynamic nature of adaptation brings additional complexity making it a challenging task to measure its effectiveness in changing contexts and uncertainties. However, with the improving understanding of climate risks and underlying uncertainties, and improved understanding of human and environmental responses to climate change, robust frameworks are being developed for framing adaptation effectiveness and to operationalize these frameworks into implementable monitoring and evaluation systems. Framing adaptation effectiveness as a dynamic process provides flexibility for it to continuously evolve over time.

Assessing the adaptation effectiveness of policies/plans and actions is a priority. Employing dynamic M&E frameworks will help to track progress in adaptation along a sequence of policies, programs, and projects implemented across a range of scales. There is emerging evidence-based information on indicators and metrics that can inform developing dynamic M&E systems. Challenges such as establishing baselines and factoring climate uncertainties into decision-making are still a work in progress. Ambition, feasibility, and equity and justice are essential criteria for assessing potential adaptation effectiveness.

The availability and use of disaggregated data (including on gender) needs improvement, including climate risk information and socioeconomic metrics, to better inform scenario approaches. There have been advances in measurement techniques and data analytics. So, it is essential that dynamic M&E systems take these advances and continuously incorporate them. However, it is essential to recognize that not everything that can be measured is important, and not everything important can be measured.

The need for more gender-disaggregated data to be able to fully understand the role of women as agents of change in the context of climate change in both the public and the private sphere, as well as to ensure that the critical role of women – in all their diversity – in delivering more effective and robust climate outcomes is embedded in policy development. (UNFCCC 2022)

Learning is especially relevant for adaptation since the information that is gathered about effectiveness (both when it works and when it doesn't) can then be used to inform adaptive management, and for course correction and scaling up and out of good practices. Learning in turn is part of adaptive capacity and information and knowledge about effectiveness should help increase adaptive capacity.

There is an urgent need to link adaptation planning with outcomes. Moving from a focus on approaches to measure actual effectiveness in terms of risk reduction requires developing new methods to link risk assessments with appropriate adaptation options. There is a need to build a robust link between risk assessments and identification of effective adaptation actions.

The scientific community should be encouraged to develop context-specific assessment frameworks for understanding the effectiveness of combinations of adaptation options over time and help national to local decision-makers to decide about the most relevant actions. Funding should also emphasize process rather than just be project focused. Parties can be encouraged to organize National Adaptation Plans and other communications through dynamic process approaches and identify national goals on adaptation which can be effectively tracked.

Recommendations for International Policy

- Support the development of guidance and tools for assessment of adaptation effectiveness related to policies/plans and actions.
- Support the development of adaptation effectiveness methods that can be applied to specific contexts, but still allow for comparing various contexts, (for example, synthesis assessments by the UNFCCC for the GST).

Recommendations for National Policies and Plans

- Develop country-context or regional-context frameworks and indicators for national policies.
- Design strategies to build capacity at subnational levels that enable the development of adaptation policies rooted in local contexts taking into account climatic and socio-economic realities.
- Utilizing the dynamic M&E adaptation effectiveness framework, identify national goals on adaptation, which could be aggregated into a global goal on adaptation.

Recommendations for Action

- Establish coordinated monitoring and evaluation systems at national and local levels with identification of roles, responsibilities, and interactions.
- Strengthen data collection systems and analytics for social, environmental and economic variables at the local level.
- Collect the evidence base for projects and programs that have already been implemented showcasing what has worked and what has not to inform future actions.
- Develop metrics for key criteria of potential effectiveness including ambition, feasibility, and equity and justice.
- Build capacity of both men and women stakeholders to engage in formulation and implementation of adaptation in the areas of understanding climate risks, developing adaptation metrics, establishing monitoring and evaluation, and using tools and techniques.

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