

From what works to what will work

Integrating climate risks into sustainable development evaluation — a practical guide



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Abbreviations and acronyms

AAAA	Addis Ababa Action Agenda
BTR	Biennial Transparency Reports
CBD	Convention on Biological Diversity
DAC	Development Assistance Committee
EO	Earth observation
EQ	Evaluation questions
ETF	Enhanced Transparency Framework
GEF	Global Environment Facility
IPCC	Intergovernmental Panel on Climate Change
M&E	Monitoring and evaluation
MEL	Monitoring, evaluation and learning
OECD	Organisation for Economic Co-operation and Development
SBI	Subsidiary Body for Implementation
SDG	Sustainable Development Goals
TAMD	Tracking Adaptation and Measuring Development
UNGA	United Nations General Assembly
VNR	Voluntary National Reviews

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Executive summary

Seven years after the adoption of the 2030 Agenda and the Paris Agreement, the world has changed dramatically. The COVID-19 pandemic has hit economies and health systems around the world, while the climate emergency has caused environmental degradation, natural disasters and economic disruption. Climate change, with its increased and unpredictable magnitude and frequency of climatic impacts and shocks, poses radical challenges to sustainable development progress.

These changing circumstances have significant implications for how and what evidence is gathered to support sustainable development policies through monitoring, evaluation and learning (MEL) systems. Despite rapidly changing environmental, social, economic and policy contexts, the approaches, MEL methods and processes used to develop evidence for informing policy decisions on progressing sustainable development have largely remained the same over the past decade.

Current evaluative practices are ill-designed to provide the evidence and include the relevant voices needed to address the climate crisis. Existing methods and approaches still predominantly feature fragmented approaches, a focus on short-term outputs, retrospective outlooks and low levels of integrated learning, and lack integration of climate risks. Such MEL systems fail to provide an adequate basis for understanding whether and how interventions can deliver resilience and sustainable development that withstands the impacts of climate change.

There is an urgent need for countries and the international community to build robust evidence upon which to base policies that must provide sustainable development in the face of increasing climate risks. Methods for evaluating 'what works' urgently need updating to integrate consideration of 'what will work' under uncertain climate futures. A key way to do so is to improve the MEL processes to systematically and appropriately integrate climate risks across the policy planning cycle.

This guide aims to support decision makers and MEL practitioners across national governments, and the international donors and civil society that support them, to integrate climate risks into their evaluative processes. This guide is designed to be used as a toolkit that can accompany evaluators and commissioners in designing evaluations that ask the right questions now, integrating the views and possibilities of different futures for better planning.

This is not an attempt to reconcile the multitude of reporting and MEL frameworks in sustainable development. Rather, this guide provides a holistic context for evaluators to start actively integrating climate risks into their MEL processes.

This guide consists of three parts. In **part one**, we outline the context and the imperative for shifting to evaluations that will assess 'what will work'. In **part two**, we outline six practical steps for evaluators and commissioners to design evaluations that integrate climate risks, while in **part three** we provide we provide a working tool: the SDG Climate Factsheets..

We summarise the main steps as:

1. **Identify appropriate evaluation criteria and principles.** We provide context for evaluation to select the criteria and principles that will embody the normative views about what a successful outcome should be.
2. **Identify which climate risks are relevant to the context of the intervention** to be evaluated. We provide definitions of five main types of climate risks that emerge both as risks *to the implementation* of sustainable development interventions, and as risks *from the implementation* of interventions.
3. **Develop evaluation questions** focused on sustainable development and climate by considering how the evaluation criteria and principles relate to relevant climate risks. We suggest readers use the Risk-Criteria tables and the SDG Climate Factsheets in part three as a starting point to design and contextualise evaluation questions, based on sectoral and climate contexts.
4. **Identify data and data sources** needed to carry out the evaluation. We provide examples of data sources that are often neglected but essential in considering climate and sustainable development issues.
5. **Implement good evaluation practices** with considerations that will ensure that principles and criteria are embedded into the evaluation activities and methodologies.
6. **Create learning pathways** and relevant activities, materials and processes to effectively share the evaluation findings with stakeholders. Findings should be incorporated into policy and practices to support better-informed interventions and allow adaptive management.

This guide contains two working tools for evaluators and commissioners:



The Risk-Criteria tables (Step 3) provide examples of high-level evaluation questions for each combination of climate risk and evaluation criterion. These questions can be used to develop evaluation questions tailored to specific evaluation and intervention contexts.



The SDG Climate Factsheets (part three) describe the main climate risks across all 17 SDGs. These should be used to support the identification of key risks relevant to an intervention as described under part two.

Part one: a changing world needs changing methods



In the past five years, the world has seen an intensification of the climate crisis. In August 2021, the Intergovernmental Panel on Climate Change (IPCC) Working Group I report on the physical science basis of the Sixth Assessment raised the alarm, noting the current climate change trajectory was a “code red for humanity” (UN press, 2021). Global warming is affecting every region on the globe, with many changes becoming irreversible as limiting global warming will become beyond reach (IPCC, 2022).

In parallel, the assessment of global progress towards implementing the 2030 Agenda for Sustainable Development also paints a gloomy picture. Despite the United Nations calling in the summer of 2020 for the next ten years to be “the Decade of Action”, a slow global economy, deepening populist politics, biodiversity loss and two years of global pandemic have led to regressions in progress in sustainable development trends over the past years (Fenner and Cernev, 2021; Sachs et al., 2021; Shulla et al., 2021).

Climate change, with its increased and unpredictable magnitude and frequency of climatic impacts and shocks, poses radical challenges to any sustainable development progress (Challinor et al., 2018; Estrada and Botzen, 2021). In fact, sustainable development policies and interventions cannot be sustainable if they do not consider and integrate the climate risks associated with uncertain future climate scenarios. Yet few sustainable development policies and interventions systematically integrate climate risks across the planning cycle. Failure to make the two policy agendas congruent is a failure to meet both objectives (Chimhowu et al., 2019; Chong, 2018). There is a critical need to better integrate climate risks into development policy and planning to reduce negative impacts on people and ecosystems and make progress on development.

These circumstances have significant implications for how and what evidence is gathered to support sustainable development policies through MEL systems. Despite rapidly changing environmental, social, economic and policy contexts, the approaches, MEL methods and processes used to develop evidence for advising policy decisions to progress sustainable development have largely remained the same over the past decade (Gregorowski and Bours, 2022). These approaches and methods, we argue, are ill-designed to provide the evidence and include the relevant voices needed to address the climate crisis. Methods for evaluating ‘what works’ urgently need updating to integrate consideration of ‘what will work’ under uncertain climate futures.

More problematic is that evidence generation in sustainable development across all sectors rarely integrates or considers climate risks. This then begs the question: upon what evidence can policies be based to engender significant progress in sustainable development? How do we create robust evidence to advise critical actions in sustainable development in the face of an uncertain climate future?

There is an urgent need for countries and the international community to develop robust evidence upon which to base policies that must provide sustainable development in the face of increasing climate risks. A key way to do so is to improve the MEL processes to systematically and appropriately integrate climate risks across the policy planning cycle. Evaluations are also a tool for ensuring better integration of climate risks when designing new sustainable development interventions.

This guide aims to support decision makers and MEL practitioners across national governments, and the international donors and civil society that support them, to integrate climate risks into their evaluative processes. This work builds on over a decade of MEL and evaluation research and experience at IIED and its project partners. More specifically, it builds on recent work on Evaluations for the SDGs, climate adaptation monitoring, evaluation and learning systems (CAMELS) and the MEL Handbook for SDG 14, along with more than a decade of applying the Tracking Adaptation and Measuring Development (TAMD) framework. This is not an attempt to reconcile the multitude of reporting and MEL frameworks in sustainable development. Rather, this guide provides a holistic context for evaluators to start actively integrating climate risks into their MEL processes.

In **part one** of this guide, section 1 provides a brief overview of MEL processes and key sustainable development MEL systems. We deepen the rationale for integrating climate risks into MEL systems and more specifically, in evaluations, as a critical element in MEL. We then explore the status and context of the integration of climate risks into MEL systems by discussing country experiences in section 2.

In **part two**, we set out six steps to help evaluators and commissioners integrate climate risks into evaluations and related MEL systems, before concluding with key recommendations.

In **part three** we provide factsheets describing the main climate risks across all 17 SDGs.

1. Context: moving from ‘what worked?’ to ‘what will work?’

Support for the concept of sustainable development has grown incrementally over the past three decades, and in the past few years, the pace has increased. In September 2015, all UN Member States adopted the 2030 Agenda for Sustainable Development via a resolution of the UN General Assembly, and in December 2015, countries signed the Paris Agreement on climate change. Together, these two agreements heralded an era of positive multilateralism and the hope of sustained actions to “end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity” (UN DESA, 2015).

Seven years after the adoption of the 2030 Agenda and the Paris Agreement, the world has changed dramatically. The COVID-19 pandemic has hit economies and health systems around the world, while the climate emergency has caused environmental degradation, natural disasters and economic disruption. Despite the complementarity of the sustainable development and climate change agendas, their implementation has been incoherent at global and national levels, and siloed implementation remains the rule — both across mitigation, adaptation and finance in the Paris Agreement, and across sectors in the SDGs. This is despite both agendas stating the importance of coherence. As a result, actions under both agreements have been slow and underperforming (Chimhowu et al., 2019; Chong, 2018). At the country level, both the Paris Agreement and the SDGs are largely seen as reporting exercises rather than tools to accelerate and progress action; they are largely disconnected from national and local decision-making processes (Dzebo et al., 2019).

As the world faces the climate crisis, we need urgent changes in policies, interventions and practices to adapt to and avoid the drastic consequences of climate impacts and changes. In fact, climate change is preventing and even reversing progress on sustainable development (Fenner and Cernev, 2021; Sachs et al., 2021; Shulla et al., 2021). Despite the urgency of action and the fast pace of change, MEL approaches, methods and tools for assessing and advising policy development have remained unchanged for decades. Current systems tend to unhelpfully focus on enabling top-down reporting exercises rather than learning, and emphasising retrospective assessments rather than forward-looking inquiries that integrate risks. As such, evidence and processes for defining what is our best course of action in the face of an uncertain climate future are still rarely applied.

In parallel, sustainable development practitioners and evaluators have grappled with the challenge of developing improved methods to address the multi-faceted dimensions of sustainable development over the past four decades. The sustainable development paradigm recognises that any human action has consequences that could affect the development of future generations because the social, environmental and economic dimensions are deeply interconnected. Evaluation literature has often stressed the need for holistic approaches that consider the complexities of assessing the interactions between goals and unintended long-term effects of interventions (D'Errico et al., 2020; Julnes, 2019).

Several conceptual frameworks and approaches have been developed over the years — such as Evaluations for the SDGs, Blue Marble evaluations and several sets of development, planning and evaluative principles (see Section 4.1). Those approaches attempt to make sense of the complex systems at play when implementing sustainable development interventions (see Box 1). Despite calls for the improvement and concrete application of methods considering complexity to assess sustainable development, there has been limited uptake over the years.

Box 1. Complex systems in sustainable development

Complex interventions and systems are characterised by uncertainty or unpredictability, interdependence among many actors and activities, and relationships that themselves change and evolve. This means the pathways of change and connections between inputs, outputs and outcomes are non-linear and not always directly correlated (Patton, 2010; Shiell et al., 2008; Zimmerman et al., 2011).

Sustainable development interventions require managing several elements of complexity such as feedbacks, trade-offs and synergies between different social groups, sectors and scales that are affected by the interventions. This includes temporal complexities such as issues related to intergenerational equity, spatial complexities such as ripple and feedback effects of an intervention between one ecosystem to another, and cross-sectoral complexities such as investigating the trade-offs and linkages in improving both ecological systems and human wellbeing while generating economic growth (Hardi and Zdan, 1997, Elkins and Dresner, 2008; Uitto, 2016; Rowe 2018). Most often, interventions also engender unintended impacts along with the ones planned. Concepts under complex systems in sustainable development that are relevant to evaluations include feedback, trade-off, synergy and unintended effects.

1. **Feedback:** When the results of an action or intervention continue to change the effects of that action or intervention over time. Feedback loops create causal reactions that can amplify or reduce the changes delivered by the action or intervention itself. For example, in sustainable development planning, a feedback loop is created when the outcomes of an intervention result in insights gained, which are then applied to make decisions for improvement actions.
2. **Trade-off:** When a balance is achieved between two desirable but incompatible features; a compromise between factors all of which are not attainable at the same time, for example, trade-offs between social and environmental objectives captured in the SDGs (Scherer et al., 2018).
3. **Synergy:** From the Greek word for 'working together', synergy refers to the increased effectiveness that results when two or more components work together (such as people, businesses, policies). In the context of SDG implementation, two or more interventions generate synergy when their combined implementation results in progress for an SDG that is greater than the sum of the individual impacts of each intervention (Pedercini et al., 2019).
4. **Unintended effects:** When consequences arise from an intervention that were not anticipated, and which are usually negative. Addressing unintended effects in sustainable development planning involves thinking beyond the scope of the intervention's system, accounting for causal relationships and feedback loops that exist between interventions and identifying responsibilities among stakeholders (Laurenti et al., 2016).

This section first provides an overview of why MEL is a critical yet misused tool for sustainable development, with a focus on evaluations as agents of change. We then give brief overviews of the evaluative frameworks under the SDGs and the Paris Agreement, before highlighting the drawbacks of the current international evaluative regime. We also point to current evaluative frameworks from practitioners that have attempted to progress evaluation for climate and sustainable development policies and programmes.

1.1 The role of evaluations in sustainable development

There is a critical need to re-establish the role and purpose of MEL and evaluations in policy and planning if the world is to achieve sustainable and resilient development. This guide shows that MEL systems must move from looking at what worked in the past, to looking at what will work in the future — and this starts by integrating climate risks in evaluative processes. In this section, we first review the classic MEL cycle and how it relates to policy and planning, before highlighting the role of evaluations in driving sustainable development.

MEL systems aim to drive evidence-based learning and decision making to improve the performance of a range of interventions, from projects to large policy portfolios. The three components of MEL (see Box 2) involve both ongoing and sporadic processes and activities that accompany and feed back into the planning cycle. MEL systems provide tools to help decision makers assess and improve interventions based on what has worked, for whom, and how.

Why evaluations matter

Within MEL processes, evaluations leverage monitoring data and new data to determine as systematically and objectively as possible the relevance, effectiveness, efficiency and impact of activities in the light of specified objectives (Better Evaluation, 2022). Evaluation is a learning and action-oriented management tool and organisational process for improving both current activities and future planning, programming and decision making. Evaluations are the key step for moving from progress monitoring towards learning, as they question and analyse trends, experiences, theories, beliefs and assumptions.

Broadly speaking, evaluations in sustainable development aim to determine the merit, worth, significance and sustainability of policies and programmes implemented by a range of actors, including civil society organisations, government departments and multilateral organisations. They differ from other assessment exercises because they require evaluators to investigate the effects of interventions across all different performance criteria and principles. Evaluations aim to assess the factors that facilitate or hinder longer-term sustainability by looking at changes brought about by laws, regulations and procedures within and beyond the geographic boundaries in which they are adopted (D'Errico et al., 2020). However, there is no single approach for MEL evaluations in sustainable development.

By bringing together knowledge, evaluation findings and insights, learning allows us to adapt frameworks, models or processes and accelerate progress. Developing a better understanding of the complex systemic nature of sustainable development and the interventions that aim to achieve the SDGs has led to the growing use of **adaptive management** (see Box 3). Adaptive management is also increasingly needed in the face of uncertainty and can help improve the performance of interventions while reducing risks of maladaptation (Cinner et al., 2018; Lemos et al., 2007; Waylen et al., 2019).

Box 2. Monitoring, evaluation and learning are the three steps on the path to understanding progress and improving future practices

Monitoring is a management tool that helps identify problems, informs decision making, enables accountability for performance according to stated expectations and provides a basis for research, evaluation and learning. It is the routine tracking of trends and performance, usually against stated goals and as a continuous activity. A first step in effective monitoring is determining what data are needed. Data collection can be directed or mandated by agreed science and laws or designed for the context through specific indicators that point to an intervention's stated goals and expected targets. Data are collected and analysed to inform indicators, which can focus on outputs, processes or outcomes.

Monitoring helps track progress and indicates whether progress is being made. It can serve as an early-warning alert when things are going wrong or confirm that they are going well. Yet, on their own, monitoring data have limited value for learning.

Evaluation can be independent or self-initiated. Whereas monitoring is a continuous activity, evaluation most often takes place at discrete intervals. Evaluation uses monitoring data, research results and methods and systematic evidence gathering and analysis to enable judgements about the merit, worth, value or significance of a time-bound intervention — such as humanitarian action, a programme, strategy, policy, award or event — or an existing or evolving situation, service, partnership, institution or system. It starts by assessing an intervention's evaluability (how easy it will be to evaluate) to make sure that monitoring will allow for evaluation and learning. Evaluation uses monitoring and additional data to assess what is (or is not) being achieved, and for whom, and probes the reasons for and mechanisms behind these results. Evaluators often need to collect additional data — for example, through interviews, panel discussions or surveys — and to reflect on and make sense of these data.

Learning takes place at individual, group, organisational or societal levels to enable planning, improvement, strategic and operational decision making and action. Learning occurs when knowledge generated through monitoring and evaluation (M&E) and available research data are absorbed and lessons are put into practice. At the individual level, learning is critical to bringing about behavioural change. Group and organisational learning occur when lessons are applied collectively. This often requires changing rules and processes to bring about system change. Consequently, achieving societal learning and global change requires a wider level of learning followed by collective action, often achieved through a transformative approach and systems change.

A note on M&E versus MEL: Throughout this guide we refer to monitoring, evaluation and learning (MEL), except where reference is made to sources that explicitly refer to monitoring and evaluation (M&E), where the source terminology is used.

Box 3. Adaptive management

Adaptive management is an emerging learning process that integrates the design, management, monitoring and evaluation of an intervention in a framework that we can use to test assumptions and adapt and learn as an implementation unfolds. Changes in societies and ecosystems tend to be emergent, evolving over time in largely unpredictable ways. It is important for policies and interventions to be able to track the implementation of strategies and of related changes as they occur, in order to adapt and stay relevant to new circumstances. It is also important to search for emerging patterns, as they can provide useful information about the types of action that might work well, or not so well. Where necessary, decision makers and practitioners can modify approaches to respond to a range of influences, including politics, socioeconomics and uncertainty, based on evidence from MEL. They can also adjust targets and indicators over time if they become redundant, irrelevant or are not performing as expected.

Adaptive management is often represented as a cycle of planning, doing, monitoring and learning. Ultimately, the proper integration of MEL into sustainable development governance and management systems can help bring about transformational change rather than small incremental change (Kates et al., 2012). In this context, transformational change means a large-scale, deep and fundamental shift in how a system functions, including changes in policies, practices and behaviours, and also in values and norms (Burch et al., 2014; Kyle, 2021).

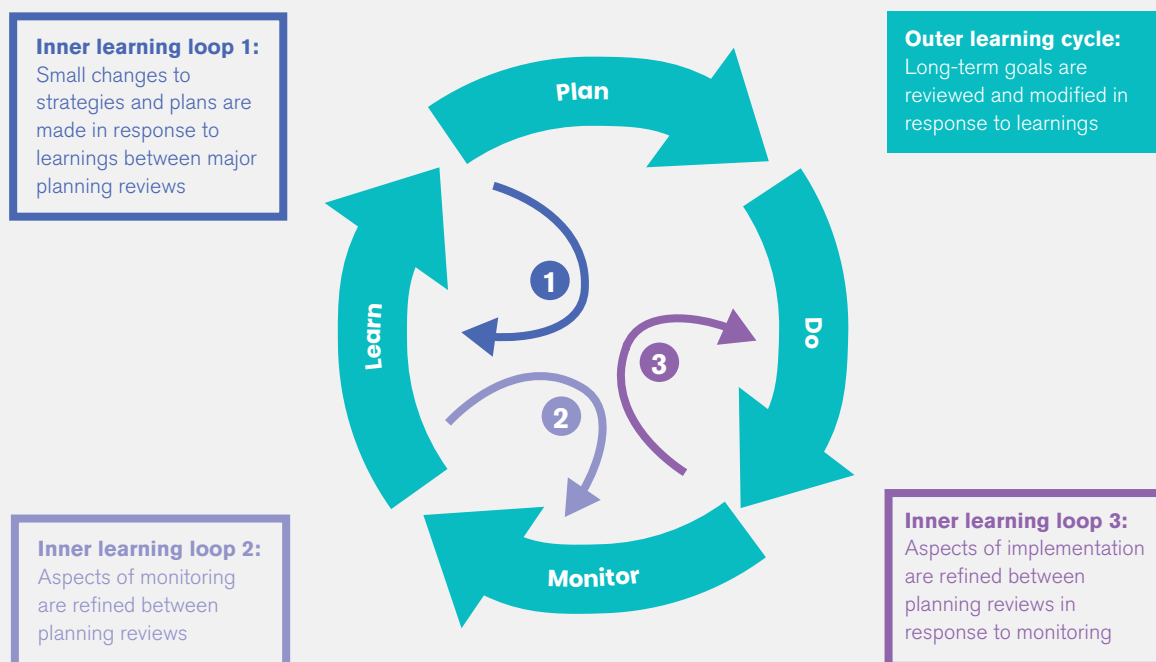


Figure 1. The adaptive management cycle

MEL and the policy cycle

Figure 2 provides an overview of how MEL contributes to learning by creating a dynamic system of improvement, innovation and impact across the policy planning and implementation cycle. Monitoring and evaluation processes intersect, so monitoring activities inform evaluation processes and vice versa. While monitoring is a continuous process, evaluation is typically a specific activity occurring at key stages of the policy cycle: before, during, and after. M&E activities will generate learning, which is also an ongoing process that can lead to improvements in interventions. Whereas learning is often left until the end of interventions but before the next policy phase, adaptive management suggests that learning moments should be taken throughout the policy cycle to adapt an intervention to new circumstances as it advances.

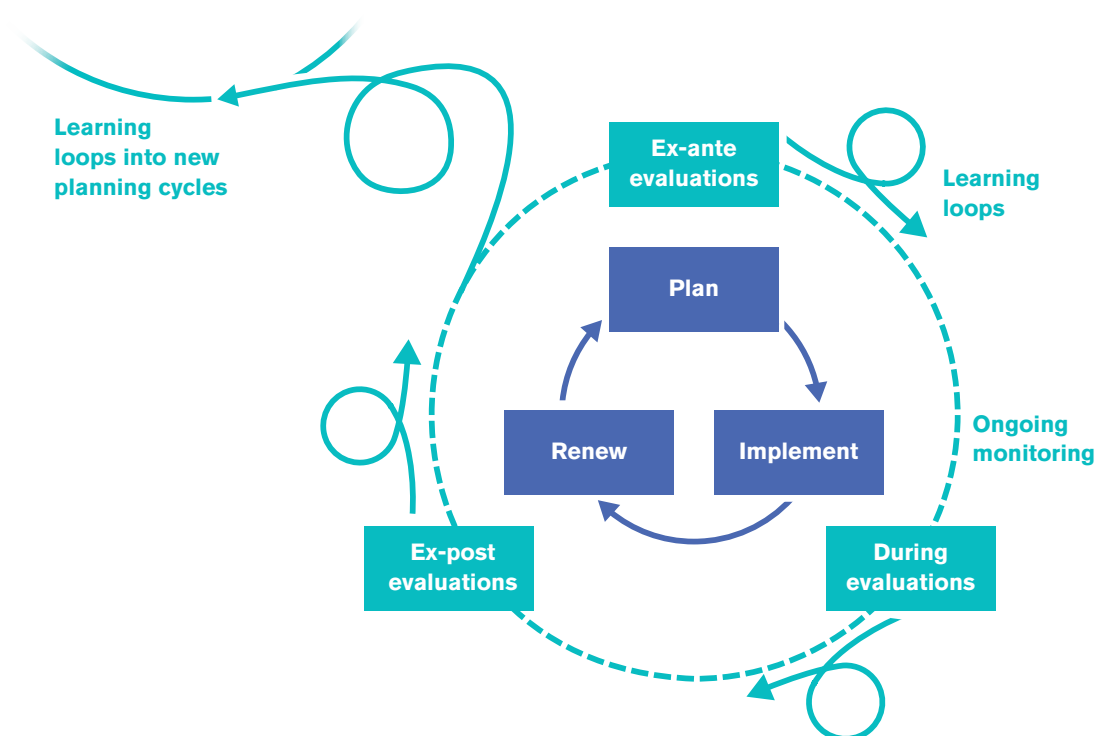


Figure 2. MEL across the policy cycle

There is a wide range of evaluation types, with different purposes and varied approaches to feeding in evidence in each of the key steps of the policy cycle. Evaluations may be conducted after an intervention has been fully implemented (ex-post or end-term), during an intervention (mid-term or formative evaluations), or before implementation starts, for example during the design and planning phase to serve a quality assurance function (ex-ante). Table 1 summarises evaluation types, related aims and commonly used approaches.

Ex-ante evaluations seek to evaluate the quality and likely success of a planned intervention *prior to its start*. This can include evaluations carried out at the design stage to prioritise and select interventions for financial support and the evaluation of different proposals at policy formulation stage. These evaluations can be used to select a specific intervention among close alternatives, to determine whether that intervention receives support, or to identify gaps and shortcomings so that the intervention design can be improved. Most ex-ante evaluations use predictive approaches to gather evidence.

Ex-post (or end-of-term) evaluations seek to identify how well an intervention was implemented *at its end or after its end*. They assess whether it successfully achieved its short- to medium-term goals (that is, within the lifetime of, or immediately following the intervention) and whether longer-term impacts are likely to be realised, based on the intervention's results to date. They occur close to the end of an intervention, or after an intervention has closed, with the aim of assessing results and impacts, and generating recommendations for the next generation of interventions. These are the most commonly used type of evaluations in sustainable development. Most end-of-term evaluations use retrospective approaches to gather evidence.

Evaluations conducted *during an intervention* fall between these two approaches and are most often held at the **formative** and **mid-term** stage. They are useful to investigate and ensure the quality of implementation to inform improvements, permitting identification of early symptoms of unintended effects. While sufficient evidence may not be available to assess an intervention's outcomes, the implementation process can be examined to determine whether key milestones have been achieved and whether implementation processes and mechanisms are functioning as intended. These evaluations use a mix of predictive and retrospective approaches.

Table 1. Evaluation types, aims and commonly used approaches

Evaluation types	Aims to assess	Approaches commonly used
Ex-ante	Which of the intervention features are most appropriate for the target population and geography The extent to which an intervention is possible, based on the goals and objectives	Proposal evaluation Design evaluation Theories of change Cost analysis Risk assessment Needs assessment
During (formative and mid-term)	How well the intervention is working to date The extent to which the intervention is being implemented as designed Whether the programme is accessible and acceptable to its target population	Process evaluation Outcome evaluation Objectives-based evaluation Middle-range theories
Ex-post (end-of-term)	Whether and the extent to which the intervention has met its ultimate goals How well the intervention performed compared to expected outcomes; what are the causal effects that have led to outcomes	Impact evaluations: Experimental (randomised control trials and quasi-experimental — see Box 4) Theory-based Case-based Synthesis Review

Box 4. The unsuitability of quasi-experimental methods in sustainable development

Randomised control trials and quasi-experimental approaches have long been dubbed the 'gold-standard' of evaluation. Yet over the past decade, increasing evidence has shed light on why they are ill-suited for evaluating the effects of sustainable development interventions and for informing the next round of future policies (Baele, 2013; Deaton and Cartwright, 2018; Hammer, 2017; Ofir, 2018). Characteristics that render them less useful for sustainable development include:

1. Their focus on private goods and interventions, rather than public or social goods such as sustainable development outcomes and policies. Under these interventions, several actors and factors will collectively contribute to results, making it difficult — and questionably useful — to assess the attribution of a single intervention to specific outcomes (Hammer, 2017).
2. Their retrospective perspective, focused on assessing net effects rather than inquiring about pathways of change. Measuring how much something has worked does not provide evidence about how the intervention contributed to intended and unintended changes, and how these may be adapted in the future. As such, randomised control trials are less useful for adaptive management approaches in complex systems (Ofir, 2018).
3. Their tendency to consider primarily short timescales for assessing effects — which rarely capture the longer-term processes through which development outcomes become observable. This is needed to maintain the assumptions that the treatment and controls must remain the same except for the intervention, which is rarely the case with sustainable development interventions. This is especially the case when considering uncertain climatic futures, under which local communities, ecosystems and systems will increasingly experience different and unpredicted impacts of climate shocks and changes.
4. Their high costs and ethical implications. Randomised control trials and quasi-experimental methods require multiple longitudinal data collections, which are costly to deploy on a large sample size or across a country. Additionally, randomised control trials require that an intervention and its pontifical benefits be delivered to a part of its target population or area first, rather than applied to all of the area and people targeted. This can undermine the trust between actors, cause conflict between targeted communities and bias results (Baele, 2013; Deaton and Cartwright, 2017).

Robustness and contribution are important, but these approaches should be used in specific contexts for specific questions rather than as a best practice; in sustainable development, they are far from it.

1.2 Current frameworks used in evaluations for sustainable development

Within the sphere of international development, multiple types of evaluations can be used before, during and after interventions. The MEL systems in place within international agreements aim to assess progress on actions, identify gaps and priorities and raise ambitions for further actions, finance and support.

Several agreements framing international actions for sustainable development have established MEL systems for accountability, transparency and accelerating evidence-based action as part of their settings. For example, as part of the SDG Agenda 2030, countries have agreed, among other elements, to report to one another on their national and contextualised progress towards the Sustainable Development Goals (clauses 72–91 of the United Nations General Assembly resolution 70/1, 2015). Under the Paris Agreement, countries must communicate information on their greenhouse gas emissions and their actions to reduce them and disclose their adaptation progress (article 13 of the Paris Agreement). We outline the main MEL systems for key sustainable development agreements below, with a focus on the SDGs' Agenda 2030 and the Paris Agreement.

The SDGs: Agenda 2030 and the Voluntary National Reviews

The Agenda 2030 for Sustainable Development calls for systematic follow-up and review of progress towards the SDGs. These processes are voluntary and country-led, with countries invited to submit Voluntary National Reviews (VNRs) to present to the international community at the high-level political forum, the UN body in charge of overseeing follow-up and review processes at the global level (UNGA resolution 70/299). The purpose of VNRs is to present a snapshot of where countries stand in implementing the SDGs, with a view to helping accelerate progress through experience sharing, peer-learning and partnerships. Reporting guidelines indicate that VNRs should be “rigorous and based on evidence” and should “maintain a longer-term orientation, identify achievements, challenges, gaps and critical success factors and support countries in making informed policy choices” (paragraph 74.g of 2030 Agenda). To date, approximately 90% of UN Member States have submitted at least one VNR report (UN DESA, 2021).

Evaluation is recognised as an important contributor to meaningful follow-up and review of the 2030 Agenda (Lucks et al., 2016). However, only a handful of countries have used evaluation to inform their VNRs (Meyer et al., 2018; Simon et al., 2015). Overall, MEL processes for the SDGs focus on reporting on the status of implementation through tracking of indicators rather than on evaluation to assess policy and programme effectiveness and sustainability (Schwandt et al., 2016).

The Paris Agreement: the Enhanced Transparency Framework

Under the Paris Agreement, the Enhanced Transparency Framework (ETF) specifies how signatories must provide information on their progress in climate change mitigation, adaptation measures and support provided or received on climate. The ETF is framed by modalities, procedures and guidelines for countries to implement (UNFCCC, 2022a). The ETF also provides international procedures for the review and evaluation of those reports. Overall, the ETF aims to build trust and confidence in efforts made under the Paris Agreement through transparency, and to raise ambitions for climate actions by constant evidence reporting (World Resources Institute, 2022).

The ETF comprises several elements that enable countries to report and communicate information related to their climate context and progress. Notably, unlike other international agreements, the Paris Agreement makes it legally binding for countries to prepare and submit a national climate plan — called Nationally Determined Contributions — every five years. However, the binding content is limited to planning and reporting on mitigation (emissions), while adaptation content remains voluntary. Other key instruments for planning, reporting and communicating under the ETF include Biennial Transparency Reports (BTRs), National Adaptation Plans, National Communications, and Adaptation Communications. For example, countries are invited to address nine areas of information related to climate change impact and adaptation, including monitoring and evaluation of adaptation actions and processes in the BTRs.

Additionally, the ETF includes processes for the review and evaluation of the information submitted by Parties. The International Assessment and Review process seeks to compare efforts among all developed country Parties, while the International Consultation and Analysis process seeks to increase transparency of climate actions across developing countries. Both processes are managed by the Subsidiary Body for Implementation (SBI) and involve technical reviews, along with discussion of the reviews during SBI meetings.

Another important component of the ETF is the Global Stocktake, which is a five-yearly cyclical process to review and assess the world's collective progress towards achieving the purpose of the Paris Agreement and its long-term goals (UNFCCC, 2022b).

Other international frameworks in sustainable development

Other international frameworks and agreements provide overarching policy goals relevant to assessing climate action across different sectors:

Convention on Biological Diversity (CBD) Aichi Targets. In 2010, the UN CBD adopted a global ten-year framework for action to preserve nature, captured in the Aichi Biodiversity Targets. Most of the 20 targets had not been reached by the 2020 deadline (Secretariat of the Convention on Biological Diversity, 2020). Comprehensive and ambitious, the targets were also hard to measure, relatively ambiguous and unrealistic (Green et al., 2019). Moreover, the instruments used by parties to report on progress, Biodiversity Action Plans, were more a statement of ambitions rather than a record of achievements, and as such, did not encourage thorough evaluation and learning (Nature, 2020). A new post-2020 framework for biodiversity is being developed, and experts are calling for targets that can be translated into actionable policies and lend themselves to evaluation to ensure progress.

Sendai Framework for Disaster Risk Reduction. The Sendai Framework for Disaster Risk Reduction is a voluntary fifteen-year agreement aiming to prevent new disaster risks and reduce existing disaster risks by building resilience. It contains seven global targets and 38 global indicators to measure country progress on disaster risk reduction by the year 2030. The indicators, including, for example, mortality, numbers of people affected, economic losses and damage to critical infrastructure (water, transportation, telecommunications, schools and hospitals) were designed to ensure coherence with relevant SDG targets (especially poverty reduction, cities and climate action) to facilitate reporting. For most targets, progress will be evaluated by comparing data recorded for the decade 2020–2030 with the period 2005–2015. Reporting under the Sendai Framework occurs once every two years, through the Sendai Framework Monitor, an online tool created in 2018 that allows UN Member States to submit data against the global indicators (UNDRR, 2019). In addition to global indicators, countries are encouraged to define custom targets and indicators that reflect national priorities and are embedded in their disaster risk reduction reports.

Addis Ababa Action Agenda (AAAA) on financing for development. The Addis Agenda provides a global framework for financing sustainable development by aligning all financing flows and policies with economic, social and environmental priorities. It was the outcome of the 2015 Third International Conference on Financing for Development held in Addis Ababa, Ethiopia, and has been adopted by 174 UN Member States. The AAAA focuses on the means of implementation of the 2030 Agenda, identifying several key sources of financing for development with recommendations for each: domestic public resources, domestic and international private business and finance, international development cooperation, international trade and debt. The AAAA also highlights the need for capacity-building for producing quality data for monitoring and follow up, focusing on national statistical capacities. An inter-agency task force convened by the UN Secretary-General is charged with reporting annually on progress in implementing the Addis Agenda.

New Urban Agenda. The New Urban Agenda is an action-oriented roadmap that mobilises UN Member States and other key stakeholders to drive sustainable urban development at the local level. It was adopted at the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) in Quito, Ecuador, in 2016. The Agenda was designed to ensure policy and implementation coherence with other global development agendas, and has extensive interlinkages with urban components across the SDGs, especially Goal 11 on sustainable cities and communities. In terms of follow-up and review, the UN Secretary General is tasked with reporting on the progress of the implementation of the New Urban Agenda every four years, based on voluntary inputs from countries (national, sub-national and local governments) and relevant regional and international organisations. The first quadrennial report was submitted in 2018 and its preparation was coordinated by UN Habitat. Most of the reporting related to the New Urban Agenda draws on the system of indicators and data that are available from the 2030 Agenda monitoring framework coordinated by the UN Statistics Division (UN General Assembly, 2018).

Applied frameworks from practitioners

There have been attempts to improve evaluations, or to focus on the integration of climate into evaluations. We highlight three examples below: TAMD, Evaluations to connect national priorities with the SDGs, and international climate finance mechanisms.

Tracking Adaptation and Measuring Development (TAMD). The TAMD framework was developed by IIED to integrate MEL of climate change adaptation with MEL of development, to assess both individual interventions and larger-scale (national and sub-national) development and adaptation performance (Brooks and Fisher, 2014). TAMD has an explicit focus on adaptation effectiveness, and seeks to move beyond measures focused on outputs, spending and numbers of people supported, to assess adaptation performance or ‘success’. The TAMD framework is effectively a high-level theory of change that links institutional outcomes at different scales (for example, changes in policies, governance, capacities and specific mechanisms for addressing climate risks) with changes in resilience (of people, communities and systems), which in turn are intended to secure human and environmental wellbeing, and result in improved development outcomes in the face of intensifying climate stresses and shocks. TAMD has been successfully piloted in a number of national and sub-national contexts (Artur et al., 2014; Awararis et al., 2014; Karani et al., 2014; Khan and Ur Rehman, 2014). While not designed with an explicit focus on sustainable development or the SDGs, the TAMD approach is highly flexible and applicable to SDG evaluation contexts. TAMD can be used to interrogate links between institutional processes and mechanisms (as focused on in the SDGs, for example), socio-ecological resilience and development and wellbeing outcomes framed in terms of SDG goals and targets.

Evaluation to connect national priorities with the SDGs. Still in its infancy, SDG evaluation is being pioneered by a group of multi-stakeholder partners, including national governments, multilateral organisations, independent evaluation offices and think tanks. This approach seeks to support evaluation commissioners, managers and professional evaluators to create tailored plans and approaches for SDG evaluations. It argues that evaluations must be built around the existing national context and be underpinned by the principles of the 2030 Agenda (D'Errico et al., 2020). Rather than being a one-size-fits-all approach, it supports evaluation commissioners, managers and professional evaluators to create tailored plans and approaches to SDG evaluation.

To date, few countries have used this approach for country-led SDG evaluations, Finland, Nigeria and Costa Rica being the most notable examples (D'Errico et al., 2020; Geoghegan et al., 2019), but it is gaining traction and other countries, including Colombia, are planning such evaluations.

International climate finance frameworks. Several global climate funds have developed their own results frameworks at the fund level, including the Adaptation Fund, Green Climate Fund, and the Pilot Programme on Climate Resilience. The Global Environment Facility (GEF) manages the GEF Trust Fund, the Least Developed Countries Fund and the Special Climate Change Fund, and provides guidance on core indicators and sub-indicators for use across these funds. Alignment of these results frameworks with national M&E systems for adaptation and resilience (where these exist) has been proposed as a way of driving the integration of climate change MEL within and across governments, encouraging government buy-in to MEL and enhancing the reporting capacity of countries, for example in relation to international mechanisms such as those under the Paris Agreement (Rai et al. 2019). The same study recommends that these global results frameworks also draw on national efforts to assess and report on progress towards the SDGs. The alignment of global results frameworks with both climate change and SDG assessment and reporting at the national level, represents a potentially powerful mechanism for driving the integration of climate change and sustainable development MEL.

Nonetheless, existing results frameworks from international climate finance institutions exhibit a number of shortcomings, principally a focus on the measurement of outputs at the expense of longer-term outcomes and impacts. Even where the tracking of longer-term impacts is integrated into the design of results frameworks, mechanisms for operationalising such tracking are absent (Rai et al., 2019). Global results frameworks could contribute to better integration of climate change and sustainable development MEL by incorporating and combining national climate change and SDG M&E systems and indicators and making greater efforts to establish outcome and impact-level indicators and tracking mechanisms. The TAMD framework mentioned above provides guidance on how this might be achieved by linking shorter-term proxy indicators of socio-ecological resilience relevant to sustainable development and the SDGs with longer-term impact indicators related to human and environmental wellbeing and sustainable development outcomes. Indicators of resilience need to be relevant to national and local contexts and grounded in evidence of what works in terms of increasing the capacity of people and systems to manage specific climate risks and other relevant risks (Brooks and Fisher, 2014).

1.3 How current regimes fail to integrate the complexity needed to address climate issues

At the global level, MEL of sustainable development is framed by follow-up and review processes established under Agenda 2030 (including VNRs), while climate change MEL is framed by the ETF established under the Paris Agreement. However, despite the widely recognised potential for linking sustainable development and climate action, there is little coherence across these two areas of activity when it comes to reporting and wider MEL. In particular, the extent to which climate change considerations are integrated into sustainable development evaluation is extremely limited. Consequently, sustainable development evaluation generally fails to consider the risks to sustainable development outcomes associated with climate change hazards, impacts and vulnerabilities.

The lack of attention to climate change in sustainable development evaluation, and the lack of links between sustainable development and climate change MEL, is the result of several factors. To a large extent, these are associated with the nature of the evaluation regimes that form the mainstream of current evaluation practice in sustainable development. These regimes tend to focus on top-down reporting exercises rather than on learning, emphasising retrospective assessments rather than forward-looking enquiries that consider future risks. Consequently, they also struggle to fulfil their intended purpose of supporting the policy cycle, which needs to integrate considerations of future risks to inform planning and programming.

Common barriers to learning and to effective integration of climate change are discussed below.

Emphasis on retrospective evaluations. Most evaluations are conducted during or near the end of an intervention and focus on the extent to which the intervention was implemented successfully and efficiently and whether it delivered immediate benefits. While impact and sustainability are common evaluation criteria, the focus of evaluations is overwhelmingly retrospective, and evaluations tend to be used to justify funding and the continuation of particular policies and practices. Little attention is paid to the extent to which benefits are likely to be sustained, or how impacts will evolve in the context of changed circumstances, for example, those associated with potentially significant climate change impacts. Forward-looking (ex-ante and formative) evaluations addressing relevance, effectiveness, impacts and sustainability under potentially very different climatic, environmental and social conditions are even rarer. To be fit for purpose in the context of climate change, evaluations need to adopt more integrated perspectives that combine retrospective and predictive approaches across evaluation types throughout the whole policy cycle. The lack of such perspectives means that evaluations mainly provide snapshots that are of limited utility, based on a very narrow view of what works in contexts that may be irrelevant in the foreseeable future, and that fail to address the complexity of evolving and interacting risks, including climate change risks.

Reporting burden. There are now a multitude of reporting exercises associated with international agreements, all of which increase burdens on national governments, leading to patchy reporting against these agreements, and on sustainable development in general. There is a continuing risk that the large number of complex and overlapping international conventions and commitments on aspects of sustainable development are overburdening countries, which are required to track and report on their progress — most often on a voluntary basis. Current frameworks tend to emphasise monitoring based on key indicators, and neglect or discourage the development of systems for complementary evaluation and learning.

Fragmented approaches. Siloed reporting requirements under international agreements and conventions result in uncoordinated and fragmented approaches to MEL and associated reporting that are not sufficiently forward-looking given the rapidly changing landscape of climate risks and associated mitigation and adaptation responses. National governments need to look significantly beyond 2030, and even beyond 2050, to address evolving development needs in the context of a likely increase in global mean surface temperature of more than 1.5°C, and potentially above 2°C (Brooks et al., 2019).

The cumulative effect of disjointed MEL frameworks and the failure to address post-2030 risks and needs results in reporting commitments that are little more than a long list of time-bound 'plan filling' exercises. Current processes disincentivise national governments from reflecting on their needs and priorities, discourage national ownership of MEL systems and processes and dampen adaptation ambition. Ultimately, they inhibit progress towards delivering the SDGs in a way that is sustainable in the context of rapidly intensifying climate change risks and impacts.

The discrete nature of evaluations, which are typically targeted at individual interventions, means that evidence of what does or does not work is patchy. The dependence of evaluations on capacities, data availability and accountability priorities means that they are not representative of the breadth of sustainable development interventions nor of cumulative progress towards climate or SDG targets. The focus of evaluations on single (or, at most, a small number of) sectors means that they often miss cross-sectoral trade-offs and synergies, and complex risks such as those related to climate change.

Lack of learning. Despite the rhetorical shift from 'M&E' to 'MEL', the focus remains overwhelmingly on monitoring and (to a lesser extent) evaluation at the expense of learning (Archibald et al., 2018; Baldwin, 2020; Tosey et al., 2012). There is a lack of mechanisms and funding for learning, and for implementing the lessons from monitoring and evaluation into policy and planning cycles. Consequently, existing evidence of what does and does not work for successfully delivering adaptation, resilience and sustainable development is seldom used as a basis for policy. Critically, MEL is used principally as a tool for donor accountability rather than delivering learning for progressive and transformative action. Even within a particular organisation, learning from one programme often fails to inform subsequent programmes. Consequently, learning is rarely done well, if at all, and MEL is more a 'box-ticking' exercise than a tool for adaptive management. At the global level, there are limited opportunities for decision makers and analysts to discuss the findings of the two global frameworks alongside each other. Lack of learning during and between programmes is problematic, as it prevents adaptive management and can easily lead to unintentional maladaptive actions (Eriksen et al., 2021).

Focus on short-term outputs. The emphasis on accountability and the need for donors and implementing entities to demonstrate results over relatively short project and programme timescales has resulted in a focus on outputs such as spend, co-finance, numbers of people supported, numbers of policies influenced, numbers of innovations adopted and the geographical areas covered by interventions. Minimal attention is paid to whether these outputs are effective in delivering sustainable development outcomes, addressing risks or reducing losses and damages associated with climate hazards (Leiter, 2015). Where monitoring seeks to track changes resulting from outputs, for example, improvements in resilience, this is often hampered by poor data availability, resulting in the use of indicators whose utility as proxies for resilience is limited.

Higher-level (outcome and impact) indicators defined in the results frameworks of global climate funds are often simply aggregated measures of these programme-level output indicators, or are defined in vague terms such as ‘improved resilience’. Where these indicators seek to measure reductions in mortality or economic losses associated with climate-related disasters, there is little or no guidance on how this can be done against a backdrop of rapidly evolving climate hazards and risks. The focus on outputs, and the inadequate treatment of how to operationalise and contextualise outcome and impact measures, means that monitoring and evaluation often fails to interrogate whether interventions are genuinely likely to achieve their stated objectives (Brooks et al., 2019).

Lack of integration of climate data. While climate data are routinely used in risk and vulnerability assessments and in baseline surveys used to establish the parameters of certain interventions, they are seldom used in MEL systems and activities. Yet climate data that describe climate extremes and other climate hazards (for example, slow-onset and persistent processes) are critical to assessing the effectiveness of interventions with a focus on resilience and adaptation, which are vital for sustainable development in a changing climate. Such climate data can be used to assess the utility of resilience indicators: in other words, do they accurately describe capacities to manage climate hazards and predict outcomes in the event of such hazards occurring? They can also be used to contextualise changes in development metrics and indicators of human and environmental wellbeing: for example, to determine whether apparent improvements in these metrics are sustained when hazards occur (Brooks et al., 2019; Brooks and Fisher, 2014).

2. Current experiences in integrating climate in MEL for sustainable development

The drawbacks of evaluative practices in sustainable development mean that existing MEL systems have fallen short in producing a strong and consistent body of evidence against which to assess progress, and have not translated into further actions or funding (Sachs et al., 2021). As such, current MEL systems fail to provide an adequate basis for understanding whether and how interventions can deliver resilience and sustainable development that withstands the impacts of climate change.

The existence of multiple and uncoordinated frameworks for monitoring, evaluation and reporting of sustainable development progress has given rise to numerous entry points for integrating climate change in evaluation and planning, both horizontally across sectors and vertically across levels of government. Given this complexity, what are countries, especially developing countries, currently doing to integrate climate risks in sustainable development evaluation at the national level? What challenges do they face in striving for better climate integration?

In June and July 2021, IIED conducted stakeholder interviews with a dozen MEL experts and practitioners in national governments and specialist organisations in nine countries (Bangladesh, Colombia, Costa Rica, Fiji, Germany, Kenya, Mexico, South Africa and Uganda) with the aim of documenting experiences and progress made in integrating climate risks into national evaluation systems for sustainable development. We feature quotes from our interviews with MEL experts and practitioners throughout this paper to illustrate key points.

We found that climate change is increasingly becoming a focus of MEL. There is strong awareness and acceptance of the need to identify and address climate risks — but also a wide spectrum of experiences in attempting to mainstream climate change in practice. Two main approaches to integrating climate change in evaluations emerge: monitoring and reporting on climate indicators, and one-off thematic evaluations of sustainable development policies linked to climate change.

“We have sustainable development objectives materialised in the SDG targets but if they don’t account for climate change, then these won’t be valid by 2030.”

Postdoctoral research associate at the University of Durham and the International Centre for Climate Change and Development in Bangladesh

“The first step to achieve better climate change integration is to understand what the impacts of climate shocks and changes on all sectors are. We need to know what will be the impact of climate change on the potential to achieve the SDGs, how people and the environment will be affected. This is needed in order to create a policy discussion on improving resilience.”

Lead evaluation economist, Directorate of Monitoring and Evaluation of Public Policies, Colombia

2.1 Monitoring and reporting on climate indicators

Environmental sustainability is rarely structurally built into evaluations. Some countries have started integrating climate issues into evaluative frameworks through monitoring and assessment of climate indicators. In this approach, the focus tends to be on tracking key metrics (often for the purpose of communications and reporting) rather than on evaluation and learning to support adaptive management. This is because evaluations are often output-focused, as it is methodologically harder and more expensive to carry out evaluations on longer-term outcomes and impacts.

Kenya adopted its Kenya National Adaptation Plan 2015–2030 (Republic of Kenya, 2016) to facilitate a coordinated response to climate change. It aims to mainstream climate change into planning processes, contains guidelines on who does what, when and how to ensure progress and includes key indicators. Indicators are used to prepare annual progress reports, which are then anchored into evaluation reports.

“When we develop national indicators, we always consider climate change. These indicators for climate are very clear. When they are mainstreamed within national plans then progress becomes easier to track.”

Director of M&E, Monitoring and Evaluation Directorate, Ministry of Planning, Kenya

When it comes to operationalising climate indicators, there is often a trade-off between mitigation and adaptation. Mitigation indicators are based on readily available metrics and more established methodologies, drawing on national greenhouse gas inventory data, while the assessment of adaptation is associated with greater information gaps and constraints. In several countries, evaluating mitigation has been more successful than attempting to mainstream adaptation.

South Africa is implementing an innovative multi-stakeholder tool to source data for evaluation and reporting. The Department of Forestry, Fisheries and the Environment (DFFE) has developed a National Climate Change Response Database, a collaborative system where public institutions, private sector and civil society organisations involved in climate change programmes can input data and report on progress. The data, submitted on a voluntary basis, are verified by DFFE and used for reporting purposes.

“In South Africa, projects are either earmarked as mitigation or adaptation. The process for mitigation is well oiled and mainstreamed, M&E is well known, and the government knows what information they want from projects. On adaptation, the government is learning from the mitigation side, the learning process is ongoing. [...] Integration of adaptation is not applied systematically.”

MEL expert at UNEP-World Conservation and Monitoring Centre, South Africa.

2.2 Thematic evaluations of development policies linked to climate

Other countries are addressing climate risks on a more bespoke basis in thematic evaluations of sustainable development policies or programmes. This is sometimes seen as a precondition for mainstreaming.

In **Costa Rica**, the Ministry of Planning and Political Economy (MIDEPLAN) has completed an evaluation of a large programme on biodiversity and climate change (MIDEPLAN, 2021). In this case, what helped was to have a methodological 'arsenal' that allows for standardised evaluations that can be adjusted to the context. After the evaluation, the team undertook a 'systematisation of experiences' from the evaluation process, to identify the main lessons generated during the evaluation that could constitute a route to follow for those who wish to carry out similar evaluations.

“Before being able to mainstream climate into evaluations, we need to do more climate or environment-focused thematic evaluations. We still lack expertise to do such thematic assessments.”

Evaluation technical lead, Ministry of Planning and Political Economy, Costa Rica

In **Uganda**, the M&E Department located in the Office of the Prime Minister is the body in charge of commissioning evaluation of national policies and programmes. Teams often use the [OECD Development Assistance Committee \(DAC\) evaluation criteria](#) (see Box 5), but the extent to which these criteria adequately support the integration of climate is questionable. The OECD DAC's sixth criterion is sustainability and interrogates the extent to which an intervention's benefits will last, allowing evaluators to address some aspects of climate risk, but it does not necessarily require long-term perspectives. Evaluation Terms of Reference do not make climate integration an explicit requirement in Uganda, unlike the mainstreaming of gender and HIV/AIDS issues, which has been more successful. The level of interest in integrating climate typically depends on the topic under study: for example, the evaluation of Uganda's national strategy for private sector development focused on fiscal and macroeconomic aspects while climate issues were entirely absent.

“But at the end of the day, we know private sector growth can't be done without considering climate change impacts. In Uganda, the private sector invests a lot in oil and gas, so the environmental considerations are huge. On the other hand, for an evaluation of an agricultural project, climate will be addressed as it is thematically closer to it. So overall the integration of climate change in evaluations has been ad hoc.”

Assistant commissioner for evaluation, Office of the Prime Minister of Uganda

In **Kenya**, thematic evaluations have helped identify sector-specific climate change impacts and have been used to assess the compatibility of development programmes with climate objectives. A study on climate change in the maize production sector has revealed that changing rainfall patterns and rising temperatures experienced in Kenya between 1970 and 2014 undermined food security and rural livelihoods (Kariuki et al., 2020). The findings have highlighted the urgent need for climate adaptation and mitigation and have helped inform Kenya's climate change policy. The National Climate Change Action Plan for 2018 to 2022 (Government of the Republic of Kenya, 2018), which outlines priority areas for low-carbon resilient development, emphasises nutrition and food security, to be achieved through climate-smart agricultural practices.

On energy and transport, the M&E Department of Kenya's Ministry of Planning is contemplating an evaluation to see how effective rural electrification has been in addressing greenhouse gas emissions. The objective would be to investigate whether expanding energy access is possible without causing environmental degradation. This is one of few examples of more forward-looking evaluations looking at whether policies and programmes coherently integrate sustainable development and climate actions to ensure they are appropriate in the context of climate change. Evaluation should be used to capture how climate risks affect progress or lack thereof and whether progress towards sustainable objectives is compatible with mitigation and adaptation goals.

In **Mexico**, there are few examples of successful cross-thematic climate change integration in the work of CONEVAL, the public agency in charge of coordinating the evaluation of social development policies and programmes. Mexico has little history of evaluating public policies and has focused more on public programmes. Mainstreaming climate change in national policymaking has therefore proven more difficult, given the lack of evaluations at that level.

“What has worked better is having more specific evaluations, for example, on health and climate change. The same with infrastructure, communications and transport, energy, road availability. What we did was to define the right to a healthy environment and then agree on the indicators to evaluate it according to principles. It's been evaluated in terms of accessibility, availability and quality.”

Deputy director general for coordination, National Council for Evaluation
of Social Development Policy (CONEVAL), Mexico

2.3 Challenges and limitations to better and more systematic integration of climate in evaluation

Stakeholders raised a range of challenges and limitations in trying to link climate change to evaluation work. Often, the difficulties lie in designing and implementing national MEL systems to begin with. These difficulties can be grouped into two overarching categories: i) political economy and institutional challenges and ii) capacity challenges. Table 2 sums up political economy and institutional challenges, while Table 3 sets out capacity challenges.

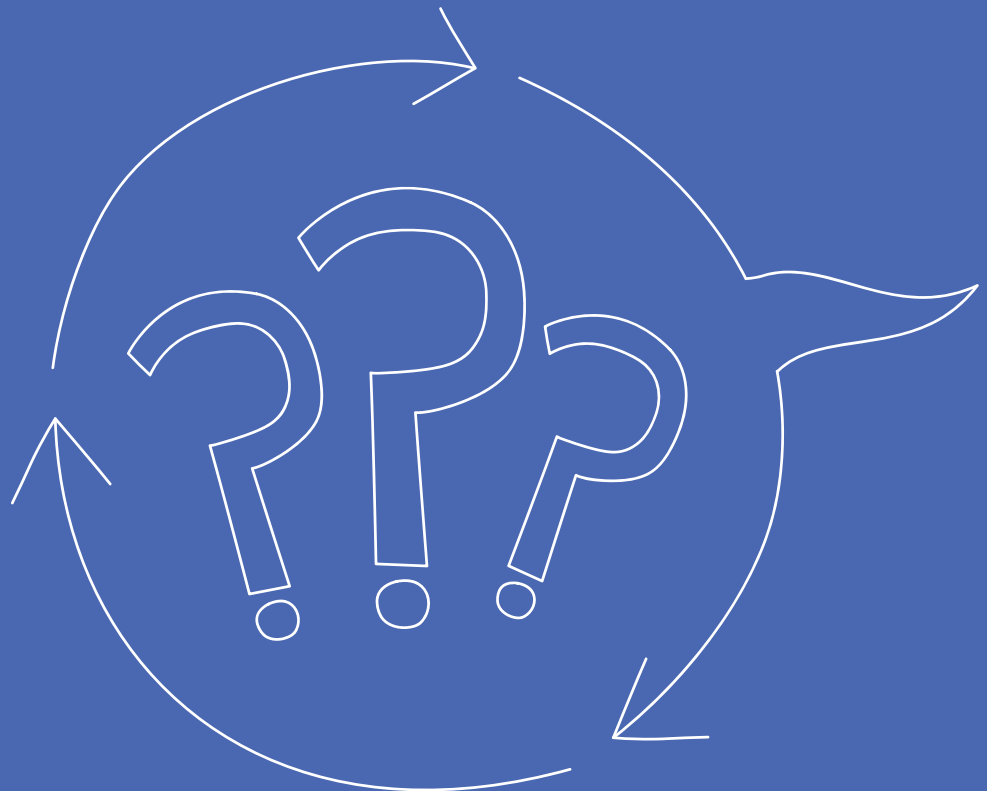
Table 2. Political economy and institutional challenges

Challenges	Examples
Weak M&E culture: Poor understanding of M&E and the need for it.	<p>“Progress is slow in promoting a culture of evaluation at all levels. M&E is not widely understood, and policymakers see it as an audit function rather than for learning purposes.”</p> <ul style="list-style-type: none"> – Director of M&E, Monitoring and Evaluation Directorate, Ministry of Planning, Kenya
Political agendas: Slow progress in making climate and sustainable development a political priority. In some contexts, the COVID-19 recovery can compete with sustainable development as a priority in political and planning discussions.	<p>“Finland has its own ministry on the SDGs whereas in Latin America we’re struggling to convince policy makers of the importance of SDGs. Going up the hierarchy it’s complicated to push this agenda forward. People higher up need to be convinced. There needs to be momentum.”</p> <ul style="list-style-type: none"> – Lead evaluation economist, Directorate of Monitoring and Evaluation of Public Policies, Colombia <p>“We struggle to make climate adaptation visible in national policies.”</p> <ul style="list-style-type: none"> – Deputy director, National Department of Environmental Affairs, South Africa
Political change and loss of information: When elected officials take office or leave office, progress can be halted or reversed, indicators and systems are replaced, often as a result of a context of competition between authorities or officials from different political parties. A change of government can lead to a loss of information.	<p>“Every six years the officials change, and indicators too even though they are the result of an international reflection and have been promoted for many years. This is because of competition between authorities when officials are from a different party. There is a loss of information when there is a change of government — even in specific ministries.”</p> <ul style="list-style-type: none"> – Deputy director general for Coordination, National Council for Evaluation of Social Development Policy (CONEVAL), Mexico
Multiple and uncoordinated M&E systems: Government departments and institutions may have fragmented and uncoordinated M&E units with no clear communication channels and unclear value chains. This makes it hard to get full information from the concerned institutions.	<p>“The Ministry of Environment came to us [Directorate of Monitoring and Evaluation of Public Policies] and asked for help in designing an M&E system for climate policy. But the problem is that there is no clear value chain, theory of change for interventions that they want to implement. It’s hard to come up with a comprehensive system.”</p> <ul style="list-style-type: none"> – Lead evaluation economist, Directorate of Monitoring and Evaluation of Public Policies, Colombia
Failure of collective action: Flat organisational structures can lead to inertia, as institutions may not take the initiative when it is perceived that someone else should also act. Integrating a cross-cutting theme such as climate into evaluation and programming requires collective action, and, in the absence of hierarchy and clear mandates, everyone’s responsibility is no one’s responsibility.	<p>“When we have a broad national evaluation, there is a problem of mandates and responsibilities. It is difficult for there to be one official who approves of the results. When everyone is involved, no one does anything. For example, in evaluating the impacts of air pollution on health, it was easier for health officials who see the effects of climate change. It’s easier to make the case of integrating climate with the health minister. There are challenges to integrating climate because of the way the country is organised.”</p> <ul style="list-style-type: none"> – Deputy director general for coordination, National Council for Evaluation of Social Development Policy (CONEVAL), Mexico
Decentralised governance hindering vertical integration: Federal systems with devolved administrations can face additional challenges in implementing a national M&E system. Sub-national governments need to be integrated in a national evaluation system with strong vertical reporting processes.	<p>“Uganda has a decentralised governance which makes connecting local to national governments complicated. Communication between the levels is possible but there is more of a focus on budgeting rather than on M&E and intended outcomes. It’s a matter of mandates and policy and legal reforms so not easy to shift.”</p> <ul style="list-style-type: none"> – Senior lecturer, Makerere University, Uganda

Table 3. Capacity challenges

Challenges	Examples
<p>Lack of quality data: A recurring technical difficulty is obtaining good quality data, especially climatic data.</p>	<p>“I tried to evaluate the impacts of climate change in the Ganges River system in relation to transboundary water management. The main challenge is the lack of essential data — both climatic and riverine data. Without appropriate data, the evaluation work did not fare very well; though it was apparent that such an attempt of evaluation of river system with consideration of climate change could contribute to sustainable transboundary water management.”</p> <p>– Deputy director, Implementation Monitoring and Evaluation Division, Ministry of Planning, Bangladesh</p> <p>“We did an evaluation of a Forest Development Plan that had a climate theme. One of the challenges was obtaining data. At the beginning we had planned to do GIS analysis but there was no data or poor-quality data available. Hence the lack of information is a big challenge. We had to create a short and complete database for biodiversity. This had cost implications, and these costs would have been saved if this data were available in the first place”.</p> <p>– Evaluation technical lead, Ministry of Planning and Political Economy (MIDEPLAN), Costa Rica</p>
<p>Defining relevant indicators: Developing indicators that adequately capture the complex interactions between climate change and economic and social wellbeing in the context of policies, programmes and projects in a useful manner is a very common challenge.</p>	<p>“A first challenge is identifying a good indicator (economic, climate adaptation or mitigation), and making sure indicators are relevant for practitioners and implementers. With donor-driven projects, indicators are no longer set in stone from the beginning, and donors now enter negotiations on what indicators are best to use.”</p> <p>– MEL expert at UNEP-World Conservation and Monitoring Centre, South Africa</p>
<p>Weak technical capacity to design and implement M&E systems: Methodological and M&E questions are often delegated to academia and not well integrated into policies. There is often a lack of skills and expertise within government for dealing with such issues internally.</p>	<p>“Pacific countries are working hard to integrate climate but need assistance as they don’t have technical and financial capacities to do it.”</p> <p>– Director, Pacific Islands Development Forum, Fiji</p> <p>“As much as we have all these frameworks in place, we still have a problem of capacity, both in terms of human and financial resources. You may have the best documentation, it is not enough until there is capacity to implement.”</p> <p>– Director of M&E, Monitoring and Evaluation Directorate, Ministry of Planning, Kenya</p> <p>“There is a lot of research in academia but little translates into governments. There’s a challenge to translate technical elements into public policy elements.”</p> <p>– Deputy director general for coordination, National Council for Evaluation of Social Development Policy (CONEVAL), Mexico</p>
<p>No forward outlook and lack of scenario planning: There is little information about the impacts of climate and environmental changes on sectors of the economy and society. This results in a lack of awareness and inaction at the highest levels of decision making.</p>	<p>“The Directorate of M&E for Public Policies is not a department that is thinking of what is going to happen. We don’t have a long-term optic to understand which groups will be hit by shocks. [...] We need an exercise that gives us information on what is going to happen (eg scenario planning) and how people and the economy will be affected. This is needed to create a policy discussion on improving coping mechanisms.”</p> <p>– Lead evaluation economist, Directorate of Monitoring and Evaluation of Public Policies, Colombia</p>

**Part two:
evaluations for the future —
asking the right questions now**



Current evaluation practices generally fail to generate appropriate evidence that can inform the next generation of sustainable development policies. This is because currently MEL systems and evaluations tend to favour fragmented approaches, focus on short-term outputs, lack feedback into learning — and most importantly, do not systematically integrate climate risks. In practical terms, evaluations are failing to ask the right questions about sustainable development interventions in a rapidly changing world and are thus not generating the necessary learning to ensure sustainable and resilient futures.

The following section provides guidance to help evaluation commissioners and practitioners to frame and design evaluations that can support climate-resilient sustainable development policies. This guidance is grounded in experiences of existing evaluation practices, supported by literature reviews and by interviews with practitioners.


How to use this section

This section provides guidance and six steps to support decision making on sustainable development across the policy cycle. The guidance can be applied to a range of sustainable development activities and interventions such as policies, strategies, plans, programmes or projects.

The guidance focuses on developing **evaluation questions** as the key instrument for providing the right evidence and learning in an uncertain climate future. The steps recognise the importance of evaluation criteria and principles as a starting point for framing evaluation questions.

We summarise the steps here, and then describe them in more detail below:

1. **Identify appropriate evaluation criteria and principles.** We provide references to the commonly used OECD DAC criteria, along with examples of relevant principles that can complement or replace criteria in framing evaluations. The criteria and principles must be contextualised to the specific evaluation.
2. **Identify which climate risks are relevant to the context of the intervention** to be evaluated. We provide definitions of five main types of climate risks that emerge both as risks *to the implementation* of sustainable development interventions, and as risks *from the implementation* of interventions. The SDG Climate Factsheets in part three should be used to guide this step.
3. **Develop evaluation questions** focused on sustainable development and climate by considering how the evaluation criteria and principles relate to relevant climate risks. The Risk-Criteria tables on pages 51–56 should be used as a starting point for generating high-level evaluation questions. The SDG Climate Factsheets can help to further design more precise evaluation sub-questions based on sectoral and climate contexts.
4. **Identify data and data sources** needed to carry out the evaluation. We provide examples of data sources that are often neglected but essential in considering climate and sustainable development issues.
5. **Implement good evaluation practices** with considerations that will ensure that principles and criteria are embedded into the evaluation activities and methodologies.
6. **Create learning pathways** and relevant activities, materials and processes to effectively share the evaluation findings with stakeholders. Findings should be incorporated into policy and practices to support better-informed interventions and allow adaptive management.

For each of the six steps, we highlight important considerations and key take-aways using the  icon.

We provide **two tools** to help commissioners and evaluators with the evaluation design process:



The Risk-Criteria tables

The five Risk-Criteria tables on pages 51–56 provide examples of high-level evaluation questions for each combination of climate risk and evaluation criterion. These questions can be used to develop evaluation questions tailored to specific evaluation and intervention contexts. The tables can be a starting point or an example of how the criteria and principles defined in Step 1 and the relevant climate risks defined in Step 2 together lead to the design of evaluation questions. For this guide, we use the OECD DAC criteria, complemented with the principle of equity, as examples.



The SDG Climate Factsheets

We provide factsheets describing the main climate risks across all 17 SDGs. These should be used to support the identification of key risks relevant to an intervention under Step 2 above. This is part of the process of identifying appropriate evaluation questions to address sustainable development. The factsheets can also be used as standalone products providing contextual information about each type of climate risk under the 17 SDGs. This allows readers to assess what specific risks they should consider for an intervention under that field/sector. They can also be used to further contextualise and narrow evaluative questions.

Evaluations for the future — a step-by-step guide

Step 1. Identify evaluation criteria and principles

When undertaking an evaluation of sustainable development activities, evaluators first need to identify a set of evaluation criteria and principles that inform the assessment of the intervention.



The criteria and principles for the evaluation must embody the context and the different normative views about what a successful outcome should be. As such, they represent the standards and values by which the intervention will be judged.

The criteria and principles guide the design of evaluation questions by identifying the priority aspects upon which the performance of an intervention will be assessed.

Multiple sets of criteria and principles have been developed over the years in relation to sustainable development, climate adaptation, mitigation and other specific thematic areas. The most commonly used evaluation criteria in development contexts are the OECD DAC evaluation criteria, reviewed in 2019 (OECD, 2019; Box 5). In some evaluations, commissioning guidelines request the evaluation to follow the OECD DAC criteria. However, where evaluators have the flexibility to choose evaluation criteria, they should carefully decide whether to use existing sets of criteria such as the OECD DAC criteria, adapt and complement them, or define their own criteria and principles. Appropriate evaluation criteria may also be derived from principles for sustainable development, climate adaptation and low-carbon development.

Many sets of criteria and principles overlap. Some sets of criteria and principles reflect a more narrowly defined and contextualised application of higher-level principles. For example, the criterion of 'equity', can become 'co-production of knowledge between actors' when applied to a specific evaluation context.

It is important for evaluators and commissioners to identify their priorities first, rather than looking for a ready-made set of criteria and principles that will suit their contexts and values.

Putting Step 1 into action

Evaluators must first choose what are the main criteria and principles that will embody what successful outcomes means. We summarise the most commonly used evaluation criteria, the OECD DAC, and some alternatives in Box 5. We then summarise three examples of principle-based evaluation frameworks, as these can be treated as alternative or complementary criteria to those such as the OECD DAC. Where evaluators do not have the flexibility to define evaluation criteria, principles may be used more generally to inform the evaluation. Ideally, evaluators should contextualise existing sets of criteria and principles, selecting those that are most relevant, omitting any that are less relevant, and adding additional criteria to enhance relevance to the evaluation context and purpose. For example, evaluations might use the OECD DAC criteria with one or more additional criteria addressing climate relevance, equity and justice, and other key issues.

Box 5. Evaluation criteria: OECD DAC and practical applications

The OECD DAC evaluation criteria are:

1. **Relevance: is the intervention doing the right things?** The extent to which the intervention objectives and design respond to beneficiaries', global, country, and partner/institution needs, policies, and priorities, and continue to do so if circumstances change
2. **Coherence: How well does the intervention fit?** The compatibility of the intervention with other interventions in a country, sector or institution
3. **Effectiveness: Is the intervention achieving its objectives?** The extent to which the intervention achieved, or is expected to achieve, its objectives, and its results, including any differential results across groups
4. **Efficiency: How well are resources being used?** The extent to which the intervention delivers, or is likely to deliver, results in an economic and timely way
5. **Impact: What difference does the intervention make?** The extent to which the intervention has generated or is expected to generate significant positive or negative, intended or unintended, higher-level effects
6. **Sustainability: Will the benefits last?** The extent to which the net benefits of the intervention continue, or are likely to continue

The 2019 revision of the OECD DAC criteria was intended to address shortcomings in the existing criteria, particularly in relation to Agenda 2030 and issues such as complexity, trade-offs, equity, gender and human rights (OECD, 2019). More attention is paid to such issues in the associated guidance (OECD, 2019), although issues such as equity have not been elevated to the status of criteria themselves. The guidance associated with the OECD DAC criteria emphasises that they should be applied in a way that is appropriate to the intervention being evaluated, its context, and the stakeholders involved, with the attention to each criterion depending on data availability, resource constraints, timing, and methodological considerations (OECD, 2019). This guidance is relevant to evaluation criteria in general.

Applying evaluation criteria in practice

Other evaluation criteria have been developed for sustainable development contexts. For example, when elaborating questions for its evaluations, the German Institute for Development Evaluation (DEval) uses the six OECD DAC evaluation criteria as a framework within which it mainstreams the principles of the Agenda 2030, such as universality, mutual accountability and trade-offs between the different SDGs. More general evaluation criteria include those represented by the '3es' framework used to assess value for money, which consists of economy, efficiency and effectiveness, to which the fourth 'e' of equity may also be added (Adou, 2016).

Principles for evaluation

Multiple sets of principles to guide sustainable development, climate adaptation and mitigation actions have been developed over the past decades. We present three examples of principle-based evaluation frameworks that evaluators can use instead of, or to complement other criteria such as the OECD DAC. We also highlight several cross-sector principles that may be of interest in Box 7.

1. Principles for Evaluations to connect evaluations with the SDGs

D'Errico et al. (2020) identify seven principles for sustainable development based on the SDG's Agenda 2030 (Box 6). Using this framework, evaluations of sustainable development interventions need to identify questions that respond to these principles, given their centrality to sustainable development. These principles have a strong focus on equity and interdependency and include resilience (although this is framed in a very general way and there is no explicit focus on climate change mitigation or adaptation).

Box 6. Principles for Evaluations to connect evaluations with the SDGs

- **Integration/coherence:** The social, economic, environmental and political dimensions of development are inextricably interlinked. Any action in one dimension will have reverberations in the others and none of the SDGs can be fully achieved without the achievement of all.
- **Leave no one behind:** No goal is met unless it is met for everyone; meeting the needs of those farthest behind should come before meeting the needs of others.
- **Equity:** Rights, opportunities and access to benefits and services are provided to all under terms that are just and fair, with the aim of increasing social and economic equality (intra-generational equity). Equal consideration is given to meeting the current generation's needs and the needs of future generations (intergenerational equity).
- **Resilience:** Individuals, social groups, human systems and/or ecosystems have the capacity to withstand social, economic or environmental stress, recover quickly from shocks and thrive under adverse or changing conditions. In social systems, resilience is particularly important for poor, marginalised and otherwise vulnerable groups.
- **Environmental sustainability:** A continuous flow of environmental goods and services essential for human development and healthy ecosystem function is maintained and to the extent possible enhanced over the long term.
- **Universality:** The SDGs are framed around global problems requiring global solutions and are applicable to all countries. It is not enough for a country to make progress on the goals within its own borders; it must also support — and not undermine by its policies or actions — the efforts of others. The principle of universality is also informed by the international environmental policy principle of common but differentiated responsibilities. This recognises that, while all countries have a responsibility to address global problems, their responsibility should reflect their level of contribution to the problem and their capacity to contribute.
- **Mutual accountability:** There is mutual respect and trust among all those working to achieve a sustainable development objective. Their roles and responsibilities are commonly agreed and equitably allocated and they are equally accountable to one another for their actions and results.

2. Adaptation principles based on Article 7 of the Paris Agreement

The framework for 'Framing and tracking 21st century climate adaptation' (Brooks et al., 2019) presents six general principles for adaptation derived from Article 7 of the Paris Agreement (see Figure 3). These principles emphasise national contexts, with a focus on transparency, accountability, gender and the needs of the most vulnerable. They also emphasise the need for enhanced adaptation ambition, guided by scientific information relating to potential future climate risks, combined with local and Indigenous knowledge for tracking vulnerabilities, impacts and adaptation outcomes. Finally, they highlight integration, and the need for adaptation actions to support SDG priorities and actions. While these principles are grounded in the text of the Paris Agreement, they have not yet been formally tested.

Table 4. Adaptation principles based on Article 7 of the Paris Agreement

Principle	Implications — what does this mean in practice?
1. Country-driven	<ul style="list-style-type: none"> Adaptation plans, strategies, policies, actions and processes should be led, designed and developed by national stakeholders, such as governments and government agencies (rather than by external actors, such as multilateral agencies, foreign firms, non-governmental organisations and consultants). Adaptation actions and processes should support national development priorities.
2. Gender-responsive	<ul style="list-style-type: none"> Adaptation should address gender-differentiated risks, vulnerabilities and impacts through gender-sensitive and gender-specific measures.
3. Participatory and transparent	<ul style="list-style-type: none"> Adaptation planning, design, implementation and assessment should involve relevant stakeholders, including the intended beneficiaries of adaptation actions and processes, and do so in a transparent manner, with information on adaptation plans, actions and performance being publicly available.
4. Addressing vulnerabilities	<ul style="list-style-type: none"> Adaptation actions and processes should target the most vulnerable people, locations and systems (including ecosystems) in order to address and reduce the risks that climate change poses to them.
5. Guided by best science and knowledge	<ul style="list-style-type: none"> Adaptation plans, strategies, policies, actions and processes should be informed by scientific information relating to future warming trajectories, climate-change risks and impacts, and vulnerabilities. Adaptation actions should be commensurate with the types and levels of risk associated with the amount of global warming expected over a given timescale, and the likely/potential impacts associated with that warming. Local and indigenous knowledge should be employed to understand risks, impacts, vulnerabilities and adaptation needs, to identify and track emerging climate hazards (particularly where conventional scientific data are unavailable), to identify and enhance local adaptive responses and to track the effectiveness of adaptation actions and processes.
6. Supportive of integration	<ul style="list-style-type: none"> Adaptation plans, strategies, policies, actions and processes should support national development priorities and the achievement of the SDGs and should be integrated into wider development plans, strategies, policies, actions and processes at the national, sub-national and sectoral level. This can be supported through activities such as climate risk screening and the assessment of wider development activities.

Source: Brooks et al. (2019).

3. Eleven principles for effective adaptation

Singh et al. (2021) identify 11 principles for effective adaptation distilled from a peer-review of adaptation research and reports, along with expert consultations. These principles aim to inform international processes such as the Global Stocktake and national and sub-national adaptation MEL. These principles cover similar ground to the Locally Led Adaptation Principles (see Box 7, below) and the Article 7 Principles, with additional emphasis on ecosystems, unintended consequences and cross-scale impacts, long-term resilience and the transformation of thinking and practice. The co-production of adaptation with communities to ensure inclusion and sustainability is also explicitly highlighted.

4. Cross-sector principles

Over the past decade, there has been a multiplication of sets of principles and criteria aiming to guide good practices in sustainable development. In Box 7 we identify further sets of principles for sustainable development and climate interventions that can serve as inspiration for evaluators and commissioners.

Box 7. Sets of principles available across sectors and context

- [Principles for Locally Led Adaptation](#) featuring eight principles which emphasise standards that climate and sustainable development finance should integrate to achieve fair and sustainable outcomes at local level (Soanes et al., 2021).
- [Principles for sustainable adaptation](#) set out four normative principles to guide responses to climate change (Eriksen et al., 2011).
- The World Bank has also developed a set of six high-level adaptation principles that differ from the above principles in that they are framed in terms of desirable outcomes rather than processes (Hallegatte et al., 2020).
- The Stockholm Environment Institute has developed seven principles for a just transition to a low-carbon economy, which also echo common adaptation principles (Atteridge and Strambo, 2020). Principles relating to justice, equity (eg in energy access), transparency, participation, local ownership and co-production of sustainable development responses are applicable in both adaptation and mitigation contexts.
- Kurz et al. (2016) suggest climate change mitigation principles specific to the forestry sector.



Principles have a key role to play in ensuring that evaluations are informed by values that might be important in the evaluation context and that are not captured by more technical evaluation criteria.

Together, evaluation criteria and principles provide the overarching frameworks within which evaluations are carried out, and support the defining of evaluation questions that reflect the purpose of an evaluation and influence how it is undertaken.



By the end of this step, you should have identified the relevant criteria and principles that reflect the norms and values prioritised for the evaluation.

Step 2. Identify relevant climate risks

Climate change impacts have implications for the performance and success of sustainable development activities and will likely make them more difficult to implement. As such, the climate crisis requires a fundamental rethinking of what constitutes sustainable development, how sustainable development is monitored and evaluated and how we learn to make better policies.

The increase in global mean surface temperature of 1.2°C experienced to date has already resulted in increased risks from heat extremes, droughts, extreme rainfall, flooding, storm surges, shifts in climatic zones and other climate-related shocks and changes (IPCC, 2022). These *hazards*, and the risks and impacts associated with them, will continue to intensify as the world warms further, likely breaching the 1.5°C threshold by the 2030s, and (in the absence of immediate massive and rapid cuts in emissions) the 2°C threshold around mid-century (IPCC, 2021). Intensifying climate extremes and longer-term changes in climatic conditions will, in combination with direct anthropogenic stresses such as pollution, increasing water demand, rapid urbanisation and habitat destruction, pose risks to sustainable development (Cramer et al., 2018).

The evolution of climate risks will depend on how climate change shapes *climate hazards*, on changes in the *exposure* of people and systems to these hazards, and on the evolution of people's and systems' *vulnerability* and *resilience* to these hazards. Some hazards may be of such a magnitude as to pose *existential risks*, while actions that fail to consider the implications of climate change may increase vulnerability and lead to *maladaptation*.

Different locations, people, sectors and contexts will face different impacts and risks related to climate change. Similarly, the extent to which different types of climate risks will affect an intervention, the expected outcomes, and the knock-on effects of that intervention on people and the environment will vary across contexts. Climate change and variability can result in risks to sustainable development activities, affecting the delivery of outputs and longer-term outcomes. They can also result in, or amplify, risks *from* sustainable development activities to people and the environment, particularly where an intervention fails to account for the effects of climate change on beneficiary populations and factors such as natural resources, economic systems, livelihoods, infrastructure and disaster risks.



Climate change and variability can result in risks to sustainable development activities and risks from sustainable development activities to people and the environment. Based on literature, we identify five key types of risk to and from sustainable development activities. Key terms used in describing these risks are defined in Box 8.

Box 8. Definitions of key concepts related to climate risks

Based on the definitions in the Glossary of Working Group II of the IPCC Fifth Assessment report (IPCC, 2014).

Adaptive capacity: The ability of systems, institutions, humans and other organisms to adjust to potential damages, to take advantage of opportunities, or respond to consequences.

Climate hazards: Climate-related physical events, trends or impacts that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources.

Existential risks: Risks that potentially threaten the survival of people, species or ecosystems, render locations uninhabitable or mean that certain activities may not be viable.

Exposure: The presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social or cultural assets in places and settings that could be adversely affected.

Maladaptation: Actions that may lead to increased risk of adverse climate-related outcomes, increased vulnerability to climate change or diminished welfare, now or in the future.

Resilience: The capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganising in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation, learning and transformation.

Risk: The potential for consequences where something of value is at stake and where the outcome is uncertain. Risk results from the interaction of hazards and vulnerabilities and is often represented as the probability of occurrence of a hazard multiplied by the impacts that result if the hazard occurs.

Vulnerability: The propensity or predisposition to be adversely affected. It encompasses a variety of concepts and definitions but is generally viewed as arising from the inherent characteristics, attributes and capacities of a system or population that mediate its ability to accommodate and manage climate hazards.

Putting Step 2 into action

Based on literature, we identify five key types of climate risk to and from sustainable development interventions and activities. As an evaluator, you should identify which of these five types of risk are most relevant to your intervention, based on the intervention context and considering the geographic context, the sector(s) in which the intervention operates, the intended outcomes of the intervention, and the time frames associated with these outcomes. For example, a cash transfer programme intended to deliver immediate poverty alleviation will be associated with very different time frames than an intervention focused on the planning infrastructure that is intended to last for decades. The near-term climate risks relevant to the former will be very different from the (likely much greater) longer-term climate risks associated with the latter.

The five types of climate risks are summarised below. The SDG Climate Factsheets in part three provide more detailed descriptions of these five types of risks, tailored to each of the 17 individual SDG contexts, with examples. The summary below should be used to develop a general understanding of climate risks, while part three can be used to guide the identification of relevant risks for specific SDG contexts. Identification of climate risks is vital for developing climate-focused evaluation questions (Step 3).

1. Risks to the implementation and outputs of sustainable development activities

Climate change can pose risks to the implementation of sustainable development activities and to the delivery of their outputs during, or shortly after the implementation period. Climate hazards and associated disasters may:

- Damage or destroy infrastructure, including green infrastructure, delivered or targeted by sustainable development activities
- Delay implementation as a result of the loss of infrastructure and/or by limiting access to resources, target areas or populations
- Increase implementation costs through losses, damages and delays.

2. Longer-term risks to the intended outcomes of sustainable development activities

Systems and practices that are viable today might not be viable in the future under different climatic conditions. Consequently, even where sustainable development activities deliver their intended outcomes in the short to medium term, climate change may mean these outcomes are not sustainable in the longer term. This may be because outcomes are associated with systems or activities that become physically unviable, too risky (economically or in terms of human life and wellbeing), or simply redundant due to:

- Declines in resource availability (for example, decreases in groundwater that result in insufficient water to sustain irrigation or declines in fish stocks due to ocean changes)
- Increases in hazard frequency and/or intensity to such an extent that the maintenance of infrastructure becomes impractical, productive activities become economically unviable, or risks associated with certain activities become unacceptable
- Existential risks to people, settlements and environmental systems leading to the abandonment of certain locations, for example, due to sea-level rise, desertification, the regular breaching of fatal temperature and humidity thresholds, shifts in climatic zones (eg with implications for ecosystem functioning) or extreme disaster risk (eg associated with melting of permafrost or glacial lake outbursts).

3. Risks from interventions to vulnerable people — societal trade-offs

Sustainable development activities that do not adequately ensure equitable distribution of risks and benefits may increase the vulnerability of specific groups of people to climate change. This can happen either directly, by increasing their exposure to climate hazards or limiting their access to specific resources on which they draw to manage climate risks, or indirectly, by increasing inequality and marginalisation, which in turn tends to increase vulnerability to a range of climatic and non-climatic risks. This may result from:

- Reduced access to critical natural resources and assets (eg dry-season grazing, alternative food and livelihood sources) resulting from displacement, land enclosure/privatisation, exclusion from conservation areas, urbanisation, agricultural expansion, infrastructure development, elite capture, and so on
- Exclusion from the benefits of development initiatives, for example, due to the capture of initiatives by local elites (Eriksen et al., 2021), including climate change mitigation, adaptation and resilience initiatives, particularly where these otherwise reduce vulnerability or exposure or build resilience and adaptive capacity
- Activities that otherwise increase exposure and vulnerability or constrain adaptation options, for example, displacement to locations where hazards are more severe (Allan et al., 2021) or activities that result in rapid urbanisation and the growth of informal settlements (Holmes et al., 2022).

4. Risks from interventions to vulnerable environments — environmental trade-offs

In principle, sustainable development actions should be less likely than conventional economic development to increase environmental vulnerability to climate change, given the centrality of the environment to sustainable development. However, there are several mechanisms through which sustainable development may increase environmental vulnerability, including:

- Environmental conservation, preservation and management that fails to address the potential for changes in viable geographic ranges of species and ecosystems due to changes in climatic conditions and shifts in climatic zones (for example, the creation of conservation areas in locations where species will not thrive in the future because of changes in climatic conditions)
- Other development that results in ecosystem fragmentation or shrinkage, constrains ecosystem and species migration (for example, due to hard infrastructure), or increases other pressures on ecosystems (eg pollution or over-exploitation, perhaps arising from resource extraction for energy transitions).

5. Risks from interventions to society at large — systemic risks and maladaptation

Development, including sustainable development, can create long-term risks where it results in large-scale dependence on resources, systems or activities that are not viable or sustainable under climate change in the long run, or where it locks in systems and behaviours that undermine or prevent the transitions that are necessary to address the twin climate and ecological crises. This can go far beyond societal and environmental trade-offs that affect certain groups or natural systems, creating risks for society at large. Even actions intended to address climate change can generate such risks, for example, where measures to address near-term risks increase longer-term risks (maladaptation). Such risks can be associated with:

- The expansion of settlements or economic activities in areas that are at high risk from climate change, for example, due to increased risks from storms, flood risk, droughts, heat extremes and wildfires, sea-level rise, declining water resources and shifts to aridity
- Economic development based heavily on resources that are threatened by climate change, such as water resources, crops and livestock whose climatic tolerances are likely to be exceeded, fisheries, forestry and other natural resources (for example, for ecotourism or climate-dependent leisure activities)
- The locking-in of unsustainable patterns of energy use and resource consumption, particularly where development is based on the superficial 'greening' of business-as-usual.



Climate change and variability can result in risks *to* sustainable development activities, and also in risks *from* sustainable development activities to people and the environment. Integrating climate change into sustainable development evaluation involves identifying risks from climate change *to* an intervention's outputs and outcomes, and risks that might arise *from* the intervention because it fails to adequately consider the climate change context.

Different interventions will face different types of climate risks, and the most relevant types of risk should be identified early on during the evaluation design, based on the five broadly defined types of risks described in this step.



By the end of this step, you should have identified the relevant climate risks *to* your intervention and *from* your intervention, across all five types of climate risks: short-term risks to outputs, long-term risks to outcomes, societal trade-offs, environmental trade-offs, and systemic risks.

Step 3. Develop evaluation questions: mapping criteria and risks

Evaluation criteria and principles, along with climate risks, provide the frame for narrowing down the focus of the evaluation. This creates a contextualised framework with which commissioners and evaluators can design the evaluation questions (EQs) that will be the means for implementing the evaluation. These EQs represent the high-level elements around which the evaluation will interrogate the performance of the intervention, rather than the specific questions that will be used as indicators or used in questionnaires and interviews. These EQs are sometimes referred to as high-level EQs, or key evaluation questions (New South Wales Government, 2020).

Commissioners and evaluators should develop EQs by considering:

1. The type of evaluation being done (eg formative, mid-term, or retrospective)
2. Its intended users and its intended uses (purposes)
3. The criteria and principles
4. The main climate risks to and from the intervention
5. The sources of data available.

This ensures EQs are relevant and useful, and that they cover the range of issues that the evaluation is intended to address.

Often, an evaluation will be focused on answering a smaller number of high-level EQs, under which sub-EQs will be developed to unpack the element of performance. In other words, high-level EQs will regroup sets of sub-level EQs, with the latter pointing to the types of indicators, methods for data collection and analysis the evaluation will use.

EQs usually need to be developed and agreed on at the beginning of evaluation planning. However, sometimes EQs are already prescribed by a commission, an evaluation system or a previously developed evaluation framework. Similarly, EQs may be tweaked throughout an evaluation based on the availability of data sources.

Putting Step 3 into action

Under Steps 1 and 2, evaluators and commissioners have examined which criteria and principles frame their evaluation, and which of the five climate risks are most relevant to their evaluation. The next step is to map climate risks onto the selected evaluation criteria and principles, using the Risk-Criteria tables (see pages 51–56).



To integrate climate change effectively into sustainable development evaluation, EQs must explicitly consider climate risks. One way to design climate-sensitive EQs is to ask which climate risks are most relevant to each evaluation criterion, and why.

This section presents a set of Risk-Criteria tables (Tables A–E) in which we provide examples of EQs that have been designed by mapping the five types of risks onto criteria and principles. The tables summarise the likely relationships between climate risks and the OECD DAC criteria plus the criterion of equity, and how these risks might be assessed in relation to the relevant criteria. Not all of these questions will be relevant to any given evaluation context, and evaluators can choose which questions are (most) relevant to an evaluation context.

The tables include both predictive and retrospective EQs, where these are likely to be significantly different. Predictive questions extrapolate into the future, whereas retrospective questions interrogate empirical evidence relating to what happened during (and perhaps immediately after) the implementation of an intervention. In some instances, these questions are very similar, or are merged into one question. For example, this is the case where the EQs address future impacts and sustainability under climate change. These questions are likely to be forward-looking regardless of whether an evaluation is conducted before, during or after an intervention, as they address longer-term outcomes significantly beyond the intervention's lifetime.

These Risk-Criteria tables define high-level EQs that can be adapted to specific sustainable development evaluation contexts. For more information on tailoring these high-level EQs to different evaluation contexts, users can refer back to Step 2, and to the SDG Climate Factsheets in part three.

While EQs are often designed in silos by commissioners or evaluators, this step can also be conducted using a participatory approach, for example, through a stakeholder inception workshop. This can help drive both internal validity and external validity of the evaluation.

Relevance of climate risks to evaluation criteria

Short-term risks are most relevant to the evaluation criterion of **efficiency**, as they are associated with increased costs or, in extreme cases, a total loss of investment. They are also important for **effectiveness**, as they may adversely affect the delivery of outputs from which longer-term outcomes and impacts are derived. For example, they may result in fewer beneficiaries being reached, or some outputs not being delivered or being only partially delivered.

Short-term risks are best addressed through risk assessments that identify the potential for extreme and unprecedented hazards to disrupt implementation (for example, through consideration of historical extremes, recent trends, and plausible unprecedented extremes — see Step 2) and measures to anticipate and reduce these risks. Forward-looking evaluations should assess whether such assessments have been undertaken and risk-mitigation measures put in place for the proposed intervention. Retrospective evaluations should ask whether such disruptions occurred, whether reasonable measures to reduce their impacts were in place and were adequate, and whether additional or alternative measures would have been more effective at reducing risks.

Long-term risks are most relevant to the evaluation criteria of **effectiveness and sustainability**; in other words, will the benefits be realised, and will they last? They are also important for the criteria of **relevance** (do interventions address future needs and are they relevant under climate change?), and **coherence** (are interventions compatible with current and potential future climate change mitigation and adaptation actions?).

Long-term risks are best addressed through climate risk assessments that consider potential future conditions based on climate projections and scenarios, and identify conditions under which outcomes succeed and fail, using approaches based on robust decision making (see Step 4). All types of evaluation need to address whether/how these longer-term risks, which are relevant over periods much longer than typical intervention/programme timescales, are addressed.

Societal trade-offs are most relevant to the evaluation criterion of **impact**, in relation to unintended adverse impacts on certain groups. They are also relevant to **coherence**, in relation to synergies and tensions with vulnerability reduction and related actions, and **equity**, given the growing focus on social, environmental and climate justice, and on loss and damage (Boyd et al., 2021).

Societal trade-offs involving risks from an intervention to certain groups are best addressed through vulnerability assessments and climate-sensitive environmental and social assessments, and through measures to ensure genuine inclusion and the participation of marginalised and vulnerable groups in sustainable development planning, design, implementation and monitoring. Ex-post evaluations need to assess whether these risks have been adequately addressed and avoided. Ex-ante evaluations need to assess whether the likelihood of such unintended consequences has been reduced through a combination of climate risk assessment and genuine inclusion of vulnerable groups.

Environmental trade-offs are most relevant to the evaluation criterion of **impact**, particularly adverse/unintended impacts on the ability of environmental systems to respond and adapt to climate change. They are also relevant to the criteria of **coherence**, in terms of synergies and tensions with climate change mitigation and adaptation actions, and effectiveness in the face of evolving climate vulnerabilities, hazards and risks.

These risks are best addressed through climate-sensitive environmental impact assessments that ask how impacts on the environment may evolve under climate change, and through climate-sensitive planning. Both ex-ante and ex-post evaluations should address whether the activities being evaluated include such assessments and act appropriately based on their findings.

Systemic risks are most relevant to the criterion of **impact**, as they relate to potential long-term adverse impacts on society or the environment at large, rather than on specific groups or systems. They are also relevant to other criteria such as **relevance**, for example, to long-term goals relating to sustainability transitions and rapid decarbonisation, and **coherence**, for example with policies intended to build resilience and deliver net-zero. They are also relevant to considerations of **equity** in relation to 'just transitions' (Bazilian et al., 2021; Henry et al., 2020; Newell and Simms, 2021).

Evaluations need to ask whether activities have been designed and/or implemented based on a consideration of how they may interact with other societal trends and contextual factors to drive complex systemic risks at the societal level. Critically, evaluators need to consider any explicit or implicit assumptions about future climate conditions, resource availability, and evolving social, economic and political contexts.



Developing the right EQs is critical to ensuring that your evaluation integrates climate risks and provides strong evidence for what will work. This is done by mapping climate risks with your selected criteria and principles, and by introducing both predictive and retrospective perspectives as part of your EQs.

Some climate risks are more relevant to some criteria and principles. Using the Risk-Criteria tables can help identify high-level EQs, along with more precise sub-level EQs about the intervention performance.



By the end of this step, you should have developed your high-level EQs, along with sub-level EQs specifying what indicators will be informed. Your evaluation commissioner — and ideally key stakeholders involved in the evaluation — will have contributed and agreed to this set of EQs.



The Risk-Criteria tables A–E.
High-level evaluation questions
incorporating climate risks and the
OECD DAC evaluation criteria and
the principle of equity.

Table A. Short-term risks to implementation and outputs



Most relevant to OECD DAC criterion of **efficiency**, in relation to potential loss of assets and outputs, and costs related to delays and price increases. Also relevant to **relevance**, **effectiveness** and **impact** if disruption means that certain groups/intended beneficiaries do not receive support. Relevant to **sustainability** for infrastructural interventions; if infrastructure is vulnerable to near-term hazards, it will be potentially more vulnerable to medium- to longer-term hazards.

Criterion	Evaluation questions
Relevance	<p>Ex-ante: Does the intervention design include measures to ensure it remains responsive to beneficiaries' needs in the event of climate-related shocks during the implementation period, as identified via climate risk assessments?</p> <p>Ex-post: Did the intervention respond to beneficiaries' needs during and following any climate-related shocks during the implementation period; were these anticipated via climate risk assessments?</p>
Coherence	<p>Ex-ante: Are the intervention's implications for emergency responses to climate shocks during implementation considered?</p> <p>Ex-post: Was the intervention compatible with emergency responses to any climate shocks that occurred during implementation — did it complement, hinder or help such responses?</p>
Effectiveness	<p>Ex-ante: Are measures in place to ensure the intervention achieves its short-term objectives in the event of one or more climate-related shocks during the implementation period?</p> <p>Ex-post: Did climate shocks occur during the implementation period, and, if so, did the intervention deliver its outputs despite such shocks?</p>
Efficiency	<p>Ex-ante: Are contingency measures in place to minimise disruption and losses in the event of climate-related shocks during the implementation period? Have these measures worked well?</p> <p>Ex-post: Did climate shocks occur during the implementation period, and, if so, were they associated with disruptions and delays (eg due to reduced access to beneficiary populations and project locations, input/labour shortages), losses (eg of infrastructural outputs) or increased costs (eg due to higher input and operating costs, replacement of lost assets, and so on)?</p>
Impact	<p>Ex-ante: Are measures in place to secure the intervention's long-term goals in the event of disruption by climate shocks during the implementation period?</p> <p>Ex-post: If climate shocks occurred during implementation, did they compromise the intervention's ability to generate the desired longer-term impacts?</p>
Sustainability	<p>Ex-ante: Are measures in place to ensure outputs are resilient to climate shocks, and will this resilience (eg of infrastructural outputs) be sufficient in the face of longer-term climate hazards and impacts?</p> <p>Ex-post: Did climate shocks occur during the implementation period, and, if so, were outputs resilient to these shocks in a way that suggests they will be resilient to future shocks and long-term impacts?</p>
Equity	<p>Ex-ante: Have vulnerability and risk assessments identified locations and population groups at highest risk from disruption by hazards and climate impacts that might occur during implementation, and have measures been put in place to ensure they receive the intended support?</p> <p>Ex-post: Did climate shocks occur during the implementation period, and, if so, did the most vulnerable and most severely affected receive the intended support despite the shocks?</p>

Table B. Long-term risks to intended outcomes



Relevant to OECD DAC criteria of **effectiveness** and **sustainability** (will the benefits be realised, and will they last?), also **relevance** (do interventions address future needs under climate change?) and **coherence** (are interventions compatible with climate change mitigation and adaptation actions?)

Equally relevant to ex-ante and ex-post evaluations, based on assessments of longer-term climate risks using projections, scenarios and robust decision-making approaches.

Criterion	Evaluation questions
Relevance	Has the intervention's design considered whether it is relevant and appropriate in the context of potential longer-term changes in climate, and their implications for beneficiaries' needs?
Coherence	Is the intervention compatible with other actions aimed at addressing longer-term climate-related risks — does it make mitigation or adaptation more easy or difficult, and does it address synergies with these actions?
Effectiveness	Is the intervention's effectiveness under plausible future climatic conditions addressed — have any necessary adaptation measures been included in the design to ensure longer-term objectives are likely to be achieved in the context of evolving climate change hazards, risks and impacts? Did shocks occur during the implementation period, and, if so, did the intervention deliver its outputs despite such shocks and long-term climate impacts?
Efficiency	Are there long-term risks that mean the intervention ultimately will be redundant, representing wasted investment, and has longer-term value for money been considered in this context?
Impact	Have the implications of potential future changes in climate been considered in relation to intended impacts, including possible adverse/unintended impacts?
Sustainability	Is the sustainability of the intervention's benefits under plausible future climatic conditions addressed — will the interventions results continue to be relevant?
Equity	Have longer-term implications for marginalised and vulnerable groups been considered and addressed, particularly in relation to their exposure and vulnerability to longer-term risks, and their ability to adapt to them?

Table C. Societal trade-offs — increased social vulnerability to climate change



Most relevant to OECD DAC criterion of **impact** (including adverse/unintended impacts on certain groups), also to criteria of **coherence** (synergies and tensions with vulnerability reduction and related actions) and **effectiveness** (in the face of evolving climate vulnerabilities, hazards and risks).

Based on risk and vulnerability assessments that address the geographically and socially differentiated nature of human vulnerability.

Criterion	Evaluation questions
Relevance	<p>Ex-ante: Is the intervention responsive to needs of marginal and vulnerable groups?</p> <p>Ex-post: Did the intervention adequately respond to the needs and priorities of the most marginal and vulnerable groups?</p>
Coherence	<p>Ex-ante: Is the intervention compatible with other initiatives aimed at reducing vulnerability, for example of marginalised and highly vulnerable groups — are synergies and tensions with vulnerability reduction, resilience and adaptation measures examined?</p> <p>Ex-post: Did the intervention look for/exploit synergies with other initiatives aimed at addressing vulnerability and its structural drivers?</p>
Effectiveness	<p>Ex-ante: Does the intervention address the vulnerability of particularly vulnerable groups, provide benefits to these groups and include safeguards to avoid inadvertently increasing vulnerability?</p> <p>Ex-post: Is there evidence that the intervention reduced vulnerability, particularly among highly vulnerable groups, and that it avoided or minimised vulnerability trade-offs?</p>
Efficiency	<p>Ex-ante: Does the intervention include measures/safeguards to avoid the impacts of climate shocks and long-term impacts during implementation falling disproportionately on vulnerable and marginalised groups?</p> <p>Ex-post: Did climate shocks occur during the implementation period, and, if so, is there evidence that the potentially disproportionate impact of these shocks on vulnerable and marginalised groups were managed and reduced?</p>
Impact	<p>Ex-ante: Does the intervention include safeguards to ensure it does not inadvertently increase the vulnerability of certain groups, even if it is otherwise meeting its objectives?</p> <p>Ex-post: Did the intervention consider and avoid/ minimise unintended adverse consequences affecting vulnerable groups, particularly in relation to their ability to cope with, respond to, recover from and adapt to climate stresses and shocks?</p>
Sustainability	<p>Ex-ante: Does the intervention consider how its impacts on vulnerable and marginalised groups may evolve over time, under changing climatic and socioeconomic conditions?</p>
Equity	<p>Ex-ante: Does the intervention explicitly consider the distributional impacts of climate change and the differential and structural drivers of vulnerability, and include safeguards to avoid reinforcing these?</p> <p>Ex-post: Has the intervention avoided reinforcing the differential and structural drivers of vulnerability, or positively addressed these?</p>

Table D. Environmental trade-offs — increased environmental vulnerability to climate change



Most relevant to OECD DAC criterion of **impact** (including adverse/unintended impacts on ability of environmental systems to respond and adapt to climate change), also to criteria of **coherence** (synergies and tensions with climate change mitigation and environmental resilience adaptation actions) and **effectiveness** (in face of evolving climate vulnerabilities, hazards and risks).

In some cases, ex-ante and ex-post EQs will be the same, given the likely long-term evolution of environmental vulnerability compared to social vulnerability. Climate-sensitive environmental impact assessments will play a key role here.

Criterion	Evaluation questions
Relevance	Does the intervention consider the need to build environmental resilience and facilitate the adaptation of natural systems; for environmentally focused interventions, is the appropriateness of the intervention considered in the context of climate change?
Coherence	Is the intervention compatible with others aimed at reducing environmental vulnerability to climate change — are synergies and tensions with greenhouse gas mitigation and environmental protection measures examined, particularly in relation to the ability of environmental systems to respond and adapt to climate change?
Effectiveness	Does the intervention include safeguards to avoid inadvertently increasing environmental vulnerability?
Efficiency	Ex-ante: Does the intervention design ensure that efficiency does not come at the expense of increased environmental vulnerability, for example, due to environmental impacts of intervention? Ex-post: Did implementation of the intervention avoid environmental impacts that would increase environmental vulnerability to climate change and climate hazards?
Impact	Ex-ante: Does intervention include safeguards to ensure it does not inadvertently increase the vulnerability of environmental systems, even if it is otherwise successful on its own terms? Ex-post: Did the intervention consider and avoid/minimise unintended adverse consequences on environmental systems, particularly in relation to their ability to absorb, recover from and adapt to climate stresses and shocks in the longer term?
Sustainability	Does the intervention consider the implications of climate change for environmental sustainability, at different scales of the intervention, and beyond?
Equity	Ex-ante: Does the intervention consider how any environmental impacts may affect marginalised or vulnerable groups, particularly those highly dependent on natural resources? Ex-post: Did the intervention avoid environmental impacts with potential adverse consequences for marginalised, vulnerable and natural resource-dependent groups?

Table E. Systemic risks



Most relevant to criterion of **impact**, but also to **relevance** (to necessary mitigation and adaptation transitions for sustainability), **coherence** (with policies related to climate transitions), and **equity** (interventions that drive systemic risks are likely to undermine equity). In the longer term, interventions that are associated with systemic risks cannot be said to be effective or sustainable.

Based on assessments of longer-term impacts in the context of the societal transitions that are necessary to deliver sustainability in the context of rapid climate change.

Criterion	Evaluation questions
Relevance	Does the intervention respond to needs for mitigation and resilience transitions?
Coherence	Is the intervention compatible with long-term strategies to deliver low-carbon, resilient societies — are synergies and tensions with wider agendas around societal-scale transitions examined, particularly in relation to qualitative changes in social systems and behaviour necessary to deliver zero-carbon and transformational adaptation?
Effectiveness	How realistic are any claims that the intervention will help drive sustainability, low-carbon and adaptation transitions?
Efficiency	Is efficiency framed in a way that avoids prioritising short-term economic metrics at the expense of actions that are necessary to support transitions to low-carbon, resilient societies, for example through lost opportunities to build capacity, change awareness and shift behaviour?
Impact	Ex-ante: Is the potential for the intervention to challenge or reinforce existing systems, and to facilitate or inhibit low-carbon and adaptation transitions, addressed in its design? Ex-post: Is the intervention likely to support or inhibit the necessary transitions for sustainability, climate resilience and climatic stability — has it challenged or reinforced the status quo in relation to these needs?
Sustainability	Ex-ante: Has the intervention considered and addressed any risks that delivery of short-term benefits may result in longer-term maladaptation? Ex-post: Can maladaptation risks be identified and if so, has the intervention established mechanisms for addressing them?
Equity	Does the intervention consider and support just transitions that seek to address structural inequalities, unequal climate change impacts and structural drivers of vulnerability?

Step 4. Identify data sources and methods

Once evaluators and commissioners have identified their EQs, the next step is to identify the appropriate sources of data to answer the questions. There may be adjustments and revisions of the EQs based on specific data that are needed to inform the perspectives of all relevant stakeholders in the evaluation.



Understanding which climate risks are most relevant to an intervention, and thus to its evaluation, and which kinds of data are most relevant to assessing these risks, is critical to establishing what types of knowledge and expertise are appropriate for the evaluation.

Evaluations draw on information and data from a wide range of sources and analysis methods to answer the EQs. Evaluations must consider trade-offs in the robustness and the feasibility of accessing specific types of data sources and analysis methods, along with issues of equity and the ethics of representing all perspectives of the intervention's performance.

Evaluations must use several sources and associated methods for data collection. This is critical to ensure that findings are triangulated and encompass the range of perspectives about the intervention's performance. This is also essential to capture and integrate the diversity of views and possibilities for different climate futures.

Including key stakeholders and all social groups involved in the intervention in the past and the potential participants in future adaptations of the intervention is critical to creating long-term positive and resilient outcomes in sustainable development. This includes minority groups such as Indigenous Peoples, and marginalised social groups such as women, young people and disabled people, who are often overlooked in intervention consultations, yet may bear most of its impacts.

Most evaluations will triangulate results by using both quantitative data (numbers) and qualitative data (open response text, images, videos) in a mixed-methods design. A combination of qualitative and quantitative data sources can improve evaluations by ensuring that the limitations of one type of data are balanced by the strengths of another. Different data sources permit the capture of different elements, for example as feedback loops and unintended impacts, framing the intervention's performance across different timescales and covering the effects of the interventions at different geographic scales. It is important to plan in advance how data sources and methods will be combined.

When considering how sustainable development interventions address climate risks, data will include sources of climate information and assessments of climate vulnerabilities, risks and impacts, as well as other sources of information, for example relating to adaptation and mitigation activities. Evaluations might look at the extent to which an intervention's design has been informed by such information, for example relating to how future climate change impacts may affect the delivery of intended benefits, or the long-term sustainability of these benefits. Alternatively, evaluations themselves might involve the analysis of climate data and related information in order to assess an evaluation against specific evaluation criteria. The acquisition, analysis and interpretation of climate data and related information require specialist expertise.

Putting Step 4 into action

This next step involves identifying and selecting data sources. There are six sources of data that are particularly relevant to integrate climate risks into the evaluation of sustainable development interventions. These are:

1. Observational and historical climate data
2. Climate projections, scenarios and 'robust decision making'
3. Earth observation and big data
4. Local and Indigenous knowledge and co-production
5. Assessments of vulnerability, resilience and risk
6. Perceptions and citizen science

Further details about each data source are given below. Used together, these data sources will help to capture the complexity of the intervention performance, as viewed from different angles.

1. Observational and historical climate data

Data derived from meteorological observing stations and historical records can tell us about the most extreme conditions experienced historically. The longer the historical record, the more likely it is to show rare extremes. Historical records can tell us whether such extremes are becoming more frequent and/or severe.

Where specific extremes are not becoming more frequent or severe, historical records can be used to define ranges of conditions under which interventions need to be viable. Where extremes are becoming more severe and/or more frequent, this indicates that interventions need to plan for the possibility of similar extremes of potentially higher magnitude (for example, intense rainfall, extreme heat, floods, droughts, storm surges) during and after implementation. Climate projections may provide some indication of how the frequency and magnitude of such extremes may evolve, although these should not be used in a deterministic manner (see below).

Historical climate data can take many forms, including:

- Data from individual meteorological observation stations, relevant where these measure conditions representative of those where an intervention is to be implemented — for example, annual and seasonal rainfall, rainfall intensity, temperature (average, minimum, maximum, wet-bulb) and maximum wind speed
- Gridded data from national or global datasets, including reanalysis data from modelling using observational data to provide estimates of conditions in locations where there are no observations
- Proxy data used to reconstruct relatively recent historical conditions where meteorological data are scarce (for example, tree ring and lake level data)
- Direct measurements of key climate-sensitive parameters such as river and lake levels, flood extent, extremes of soil moisture, rainfall onset, and so on
- Other phenological data that act as proxies for climatic conditions, including observations of natural phenomena such as flowering or migration dates.

User-friendly tools exist for accessing historical climate information, including the World Bank [Climate Change Knowledge Portal](#), and the [Climate Information Platform](#) (Africa only). Other more specialist tools and data sources include the [Centre for Environmental Analysis \(CEDA\)](#) archive and the Royal Netherlands Meteorological Institute's (KNMI) [Climate Explorer](#) and data from gridded global datasets and national and international scientific organisations. Assessing such data will require specialist expertise on the evaluation team.

2. Climate projections, scenarios and 'robust decision making'

Whereas observational and historical data gives a retrospective picture of climatic trends, a different type of data source includes climate models and scenarios. Those are forward-looking. Risks associated with future climate changes are often assessed using climate projections, which are simulations of future conditions based on models, and climate scenarios developed using these projections. Typically, many climate projections are used to define a range of possible future conditions. Climate scenarios are often developed to represent different sets of conditions within the ranges defined by the projections. For example, different scenarios will be associated with low, high and moderate changes in temperature and rainfall — exemplifying the main ranges of likely future climatic conditions. Climate scenarios should always span a range of possible futures, drawing on multiple climate projections.

Climate scenarios can be used to define ranges of uncertainty based on the range of conditions represented by the projections on which they are based. However, climate models do not necessarily represent all possible sets of future conditions. More fundamental uncertainties associated with changes outside ranges represented by climate projections are increasingly being addressed through approaches based on 'robust decision making' (Mendoza et al., 2018). These approaches start by assessing the range of conditions under which systems are viable and that favour certain decisions, and the thresholds where systems that mitigate against particular development choices will fail. The likelihood that such thresholds will be exceeded can then be assessed based on the ranges represented by climate projections and historical extremes (Brown et al., 2012). The extent to which systems and decisions are robust under conditions outside these ranges can also be assessed to identify "robust strategies [that] satisfy performance criteria against most sets of future conditions" (Bhave et al., 2016) or "adaptation solutions which are insensitive to uncertainty" (Daron, 2015).

The use and interpretation of climate projections and the development of climate change scenarios require specialist expertise. Evaluations of interventions that employ climate projections and scenarios should assess whether these projections and scenarios are appropriate to the context in question and whether they have been used appropriately.

3. Earth observation and big data

Over the past 20 years, new technologies for earth observation (EO) and geospatial analysis have allowed faster and more precise imagery of the Earth and its features. EO is primarily based on using remote-sensing technologies, providing imagery and information about our planet, its systems and the changes occurring. Satellite imagery shows us things that the eye cannot see and enables us to explain more about the Earth's biophysical properties (Verhegghen et al., 2021).

The increasing availability of new types of data through new satellites opens up opportunities to better measure results and evaluate the impacts of development interventions (Lech et al., 2018). Geospatial data helps overcome some of the methodological challenges to rigorously assessing the sustainability of interventions by providing observable and objective information on specific geographic, physical and other socioeconomic outcomes on a granular level in every part of the globe. This allows evaluations to get long-term longitudinal data on key performance indicators otherwise difficult to access (Yokoi et al., 2020). For example, the patterns and rates of deforestation over an intervention period can be contextualised within more extended periods, enabling the visualisation of certain data such as biodiversity hotspots or concentrations of population migration.

EO presents good value for money for collecting data over very large scales, but such analyses require specialist skills in processing geospatial data. Additionally, while EO can assess significant patterns and changes, it cannot interpret the cause of these changes. It is therefore critical for EO to be used in combination with other data sources to triangulate the results observed and support them with justified explanations. At the same time, an increasing number of platforms and low-tech tools are being developed to make EO accessible to local governments and communities (Eilola et al., 2019). As such, EO offers the opportunity of digitalising and mapping local knowledge and perceived changes, which can be used for risk and vulnerability assessments (see below) and in planning processes. For example, IIED, in partnership with the Madhya Pradesh Council of Science and Technology, co-developed the Climate Resilience Information System and Planning Tool for MGNREGS (CRISP-M) to map climate risk information with community-level planning processes and traditional knowledge for resilience planning (Bharadwaj, 2021).

4. Local and Indigenous knowledge and co-production

Scientific data are often lacking at the local level, and global datasets can be of limited value at this scale, particularly in terms of characterising extremes and other hazards that affect local environments and populations. These gaps can be filled by local knowledge and the profound understanding of local environments often possessed by Indigenous Peoples. Local, traditional and Indigenous knowledge is critical to understanding the local manifestations of climate change in terms of trends, changes and extremes, and their environmental and social impacts.

For effective adaptation to climate change, local and Indigenous knowledge of emerging trends and impacts will need to be combined with scientific information to form the basis of locally owned adaptation processes that anticipate and address future risks (Vincent et al., 2020). This will be especially important where existential risks to specific systems and practices necessitate their replacement with alternatives through processes of phased 'transformational' adaptation (Rippke et al., 2016). This may involve the identification of critical thresholds in climatic variables, environmental conditions or climate change impacts, and the tracking of conditions on the ground to monitor when and where such thresholds are likely to be breached. Local communities may be best placed to undertake such monitoring.

Local and Indigenous knowledge is thus critical not just for understanding recent and historical trends in local conditions but also for identifying adaptation needs, drivers of vulnerability and the distribution of vulnerability (see below). The co-production of knowledge by local people with external actors (who may be better placed to interrogate future climate risks and impacts) provides a foundation for adaptation. The co-production of adaptation responses based on this knowledge increases the likelihood of local ownership of such responses and, therefore, their sustainability (Vincent et al., 2020).

5. Assessments of vulnerability, resilience and risk

Sustainable development interventions must consider how risks and vulnerabilities (see Box 8 under Step 2) are distributed across the systems and populations they target, including risks from and vulnerabilities to climate change and its impacts. The distribution of climate-related risks and vulnerabilities, or how climate risks impact different groups and individuals due to their identity and circumstances, will have implications for how climate change affects an intervention's outcomes. For example, people may be more affected in specific geographic locations or as part of minority groups with low access to resources. The distribution of these risks and vulnerabilities may also have implications for project implementation (see above on short-term risks to implementation and outputs).

There are different definitions of risk and vulnerability, and risk and vulnerability assessments are framed differently by different actors, based on such definitions (Füssel, 2007; Füssel and Klein, 2006; Ionescu et al., 2009). However, most such assessments consider the physical climate hazards to which systems or populations may be exposed and the various 'internal' characteristics that make these systems or populations more or less susceptible to harm when exposed to specific hazards. Risk and vulnerability assessments are often used at the beginning of projects. Consequently, evaluators can use early project assessments to examine how well an intervention has managed risks and vulnerabilities, or they can conduct their own vulnerability assessments.

Vulnerability, resilience and risk assessments draw on a range of tools and methodologies that aim to review the impacts on a system (for example, a community or ecosystem) and how and where these are distributed (Parsons et al., 2016). Such assessments evaluate whether the system is susceptible to any known vulnerabilities or risks and how these may change under different future climate scenarios representing a range of possible climate futures and potential hazards.

There is a wealth of guidance on how to carry out climate vulnerability and risk assessments, including from the following sources:

UN-Habitat	<u>Climate Change Vulnerability and Risk — A Guide for Community Assessments, Action Planning and Implementation</u>
USAID	<u>Designing climate vulnerability assessments</u>
weADAPT	<u>Guidance for assessing vulnerability</u>
World Bank	<u>Climate and disaster risk screening tools</u>

6. Perceptions and citizen science

Historical climate data, climate projections and scenarios, and EO enable the assessment of an intervention across macro scales (long-term and landscape-level). Most often, people living at the local level will be considered the beneficiaries or recipients of interventions and are wrongly overlooked as active participants of an intervention. In fact, data collections at the local level don't always ask people's opinions about the intervention; they often focus on capturing observable indicators of performance, such as asking whether the volume of rice produced increased or how long it takes to walk to a water point. One way of engaging with the different social groups in local communities is to inquire about their perceptions and attitudes towards the different aspects of the intervention.

Evaluations often use proxy variables to measure the latent and multidimensional concepts of resilience and wellbeing, despite these being stated outcomes of interventions. Adaptation needs and priorities are highly context-dependent. This means that what 'increased resilience' means is derived from a lived experience and is highly subjective. Perception or 'subjective resilience or wellbeing' and attitudes thus represent an important source of data for evaluations of sustainable development interventions (Beauchamp et al., 2021; Jones et al., 2018; Jones and Tanner, 2017). Subjective assessments are useful for assessing the relevance of an intervention, its likely effectiveness and sustainability and the extent to which it addresses equity in the context of climate change. Ideally, these data will have been gathered as part of an intervention's own MEL activities, allowing changes in perceptions to be tracked over time. Alternatively, they may be gathered as part of the evaluation retrospectively, and they may be gathered to collect recommendations for a future intervention (Venable et al., 2022). Typically, such data will be used to monitor the delivery of an intervention's outputs, the efficiency of this delivery and engagement with stakeholders.

When collecting local-level data, it is important to take the time to understand the power dynamics between different social groups between and within communities and to speak to these groups separately to avoid elite capture of responses (Chaplin et al., 2019).

Subjective resilience indicators need to be developed with care, ideally through close engagement with stakeholders and beneficiaries to identify highly context-specific indicators that capture the factors that enhance the systems' and people's ability to absorb, manage and respond to shocks and stresses. Citizen science can also be used to collect perceptions of local communities, users and participants in interventions, although careful curation and interpretation of the data is required. Combining and interpreting resilience indicators can be challenging, and consideration needs to be given to how resilience is defined in relation to hazards of different types and magnitudes.



Using appropriate data sources is critical to address the complexity of sustainable development interventions. Evaluations must also investigate ethics and equity issues in selecting data sources that are representative of all social groups involved in the evaluation.



By the end of this step, you should have developed a workplan for the implementation of your evaluation that follows good practices for evaluation, identifying relevant data sources and datasets, and establishing methods for gathering new data where appropriate.

Step 5. Implement your evaluation

Evaluations should follow good practices for sustainable development MEL, and this applies equally to those components of an evaluation that address climate risks. The MEL Handbook for SDG 14 (Lucks et al. 2016) outlines good practices for MEL in the context of sustainable development evaluation targeted at SDG 14 (Life below water), based on addressing the following four factors.

Context

Just as sustainable development interventions need to be tailored to the contexts in which they are implemented, so evaluations need to be tailored to these contexts. Despite being often conducted at the national level, evaluations of sustainable development policies must consider local contexts relating to communities, livelihoods, local laws, and environmental conditions and contexts. Regional factors are also to be considered, including transboundary issues such as water management and pollution, regional governance and coordination, and data and information sharing.

When considering climate change risks, the above will extend to considerations of structural drivers of vulnerability (Eriksen et al., 2021), access to adaptation resources, transboundary responses to climate change risks and how international climate governance and finance mechanisms mediate responses to climate change, privileging some actors and excluding others (such as Allan et al., 2021).

Engagement

As with wider MEL activities, evaluations should seek to include national, regional and local stakeholders. Stakeholder mapping is particularly important for effective engagement. In the context of climate risks, this should identify vulnerable and potentially vulnerable groups for participation in the evaluation process. Engagement between these groups and other stakeholders, for example, at the national and transboundary levels, will be important for evaluation criteria such as relevance and equity. Engaging with stakeholders will involve:

- Conducting stakeholder analysis to identify key stakeholders, their roles, responsibilities, capacities, potential conflicts and ways to engage with them
- Developing a stakeholder engagement strategy to determine how you will engage with different stakeholder groups
- Developing a stakeholder engagement methodology to ensure stakeholders are on board with the evaluation, considering the different capacities of different stakeholder groups, for example, based on literacy, location, economic status, availability of and capacity to use technology (eg for gathering stakeholder feedback).

The participation and engagement of stakeholders need to go beyond data collection to include activities such as data validation and interpretation and wider learning actions that can help build ownership of interventions and MEL processes.

Inclusion of vulnerable voices

From a climate change perspective, including vulnerable groups is vital to ensuring that societal trade-offs are addressed. Inclusion must be accompanied by transparency and by processes of genuine co-creation in which stakeholders and beneficiaries play an active and meaningful role in evaluations, for example, through the design of methods to evaluate an intervention against specific criteria and in relation to climate risks, the identification and validation of indicators, and the identification of outcomes and (where relevant) impacts.

Inclusion can enhance support for MEL activities by giving people a sense of ownership of the measures associated with an intervention, and can provide a basis for future engagement. Inclusion is also consistent with the principle of 'leave no one behind' as articulated in the Agenda 2030 principles (D'Errico et al., 2020), provided it extends to the poor, marginalised and vulnerable, who are most likely to be left behind.

Integration

Sustainable development evaluations need to address the complex interactions between socio-ecological systems, climate change and wider demographic, socioeconomic and technological changes and trends. These include interactions between different sectors and different SDG areas, as well as between different interventions. Some of these interactions can be understood in terms of environmental and societal trade-offs as discussed in Step 2, while others can lead to systemic, societal-level risks, also discussed in Step 2.

In addition, evaluations need to incorporate flexibility to accommodate the unexpected, and to address new avenues of enquiry, for example, pursuing previously unidentified sources of information that become apparent during the evaluation and that may provide additional insights enabling EQs to be addressed.



The implementation of an evaluation should echo good practices in intervention implementation. It should meaningfully engage stakeholders and beneficiaries based on principles of context-sensitivity, engagement, inclusion and integration.



By the end of this step, you should have implemented the evaluation based on principles of good practice, ensuring that all relevant voices are heard, that a range of perspectives has been accommodated, and that any relevant new information sources have been followed up.

Step 6. Create learning pathways for adaptive management

Generating lessons is a crucial part of any effort to design, manage or implement sustainable development interventions, yet it is the most overlooked step in policy and evaluation processes (Pringle, 2020). Learning takes place at individual, group, organisational or societal levels and is undertaken to plan, budget, make better strategic and operational decisions, and take action. Evaluations and MEL processes are often used as exercises in accountability to stakeholders, donors and the public. However, without learning, there is only limited potential for positive adaptation and improvement in interventions. Evaluations must contribute to learning that can inform subsequent policy, planning and programming across all levels of decision making.



Learning what works, or not, and what will or won't work in future is vital for improving resilience, sustainable development and avoiding maladaptation (Eriksen et al., 2021). Evaluations, therefore, have a critical role to play in the adaptive management of sustainable development and in delivering the transformational changes in governance, behaviour, resource management and economic systems that are required to confront the multiple crises we face. Evidence on transformational adaptation suggests that shifts from incremental to transformational processes are made possible by knowledge and skills, as well as adjustments to vision, agendas and coalitions achieved through monitoring and learning (IPCC, 2022).

It is critical that evaluations create learning materials and processes which ensure that findings from the evaluation are shared and discussed. Merely sharing the evaluation report does not support active learning; not every stakeholder involved in the evaluation may be able to access findings via this route. Different types of materials and processes are needed to suit the needs of all stakeholders. For example, local communities in developing countries will rarely have access to email, and high-level government officials and decision makers may not have the time to read a long report. More generally, evaluations need to establish mechanisms that preserve learning and that are not anchored to individual interventions, but instead inform the wider policy landscape.

Putting Step 6 into action

Evaluators and commissioners should be creative in thinking about how to reach their intended audiences. Defining a learning and a communication strategy at the beginning of the evaluation (and at the start of an intervention) helps to define learning objectives (for example, understand how interventions might be 'scaled up' or lead to behavioural changes) and to identify audiences for different learning activities and processes. We include here examples of processes, activities and materials that can help to drive learning, going beyond the dissemination of findings:

- **Reflection workshops and dialogues:** These activities go beyond one-directional dissemination to create safe spaces for exchange and reflection. Convening dialogues and workshops can help explore how evaluation results translate into the lives of stakeholders and can help to co-create realistic recommendations about how these findings should be implemented in the next intervention (Monzani, 2020). These types of activities can thus create ownership of recommendations and actions, which can accelerate their uptake, rather than evaluation reports gathering dust on office shelves. Dialogues and workshops require careful design due to power dynamics, gender issues and language and culture. As such, disaggregated workshops can be required before bringing all stakeholders together in larger forums or multi-stakeholder learning groups (Pertaub et al., 2020).
- **Revisiting your theory of change:** Developing a theory of change is often done at the beginning of a project (although often omitted) to set out the intervention logic and the pathways to achieve outcomes and impacts. But theories of change are not set in stone, and it is a good practice to revise the theory of change at different stages of the intervention to check whether assumptions still hold and update them based on the implementation experience. The theory of change becomes particularly useful at the end of projects to incorporate learning from evaluations and support evidence-based decision making, for example when deciding to renew, replicate or scale up an intervention.
- **Peer-to-peer learning:** Mutually beneficial learning among peers such as project or programme managers in civil society organisations or decision makers in government enables the sharing of experiences and proposing of approaches and solutions that others can use or drawn on in their own contexts. Peer-to-peer learning also helps achieve more equal power dynamics and more participatory approaches compared to traditional teacher–student formats. In addition, it can enable coalition building among like-minded organisations and can support their voices and agency.
- **Multi-stakeholder learning groups and forums:** Learning groups and forums comprising representatives from diverse stakeholder groups can play a critical role in enabling learning. These groups and forums can bring together actors at different levels of governance, from the local to the national and transnational. Including actors operating at different scales can facilitate the transfer of knowledge and learning across scales, for example, from the local to the governmental level, enabling local experiences to inform policy and make it more relevant to local needs. Including local actors with different roles, knowledge, priorities and interests can identify conflicts, synergies and mutually beneficial solutions.

Multi-stakeholder learning and action groups can be developed around existing entities, for example, committees established to coordinate disaster response or natural resource management (CRIDF, 2018). This approach can increase the likelihood that such groups will be sustained after an intervention ends, particularly where the benefits of mutual learning can be demonstrated early on.

- **Curated resource libraries:** Organisations can enhance learning by dedicating finance and personnel to the curation of learning resources. These may include project documents, evaluations, reports, briefings, internal reviews, journal articles, datasets, training resources and other materials. Establishing staff roles for such curation can ensure that learning is preserved, that learning resources are available and that relevant learning resources can be readily identified for particular intervention or evaluation contexts. Training resources can be curated to ensure they are available on an as-needed basis, for example for new staff members, and that training is not dependent on the delivery of live training courses. Learning materials can be used to inform and reinforce the development of principles and best practices that guide an organisation's actions, based on accumulated learning that is preserved at the organisational level through careful curation.
- **Interactive training:** These activities are part of a varied strategy to maintain institutional learning and capacity strengthening for learning. Acquiring new skills is not always possible simply through long-term experience and practice (Fallowfield et al., 2002). Integrating evaluation findings and recommendations for improving interventions into training and course materials enables new ways of working and allows approaches to be disseminated and scaled up in a structured way. For example, adaptive management techniques can be shared in civil society or governmental training to improve the management of development interventions that are faced with climate shocks. Interactive and competency-based training courses permit the passing on of information through the exchange of views and experiences proactively (Cornford, 1997). This can deliver a more effective uptake of new ideas, behaviours and practices compared to one-directional teaching.



Establishing learning activities and processes is an integral part of an evaluation. Without this step, evaluation findings and recommendations fail to achieve the objective of improving future interventions. Learning is essential to understand what will and what won't work in uncertain climate futures.

Evaluators and commissioners should be creative in their learning and communication strategies, using multiple types of activities and processes to make learning accessible and scalable.



By the end of this step, you should have designed and implemented learning activities and processes for your key stakeholders.

Evaluations for a transformative world — what next?

This guide provided practical steps and guidance on how to integrate climate risks into evaluations of sustainable development interventions. Evaluations are a key component of the MEL processes accompanying the decision making and policy cycles, producing the needed evidence to learn and adapt interventions for equitable, relevant and sustainable development outcomes. Yet, current evaluation practices generally fail to generate appropriate evidence as they are mostly retrospective, focus on reporting rather than mutual accountability, and rarely integrate appropriate data sources to capture the complexity of development.

Evaluation practices must radically change to focus on informing what will work in an uncertain future — rather than looking solely at what has worked in the past — in order to enable the transformational change required to address the climate crisis.

Along with integrating climate risks, evaluations, and MEL in general, must become fully integrated into policy and planning, and must enable the engagement of citizens in order to include the views of all social groups in policy formulation. This can seem like a daunting task but it is one that can be facilitated by increasing institutional collaboration and sharing of resources between government departments and agencies. Wider sharing of data and methods across civil society, technical bodies and governments, and between local, national and regional organisations, can help create a system where each actor has a role in driving transparency and transformation in the evaluation and planning of sustainable development.

Evaluations must play a critical role in assessing and driving learning about where and for whom interventions will be most needed. By understanding what will work for people and ecosystems, countries and the international community can best direct their efforts and funding to building climate-resilient development — and leave no one behind.

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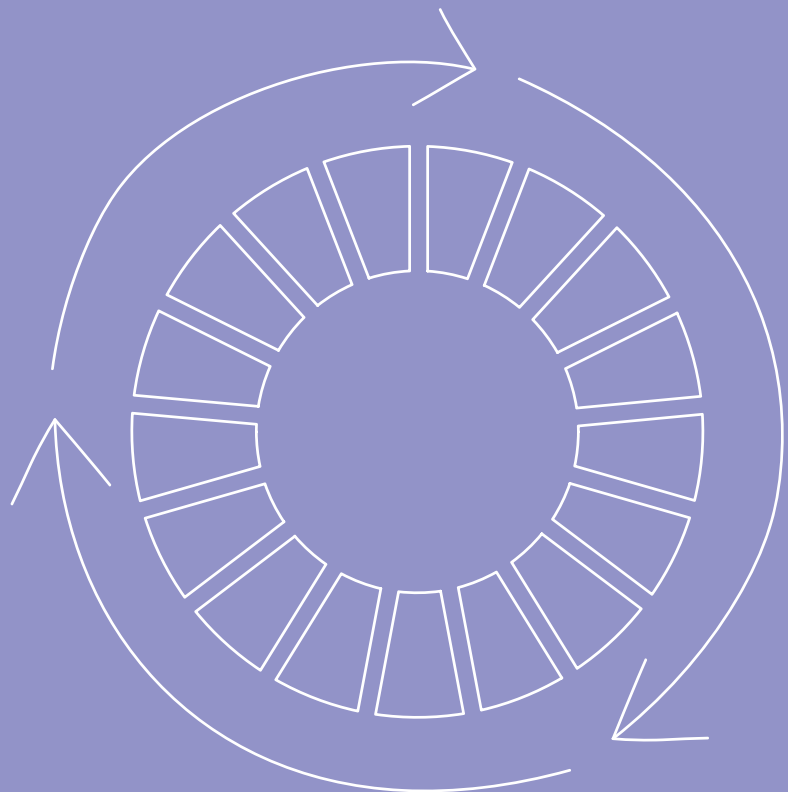
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Part three: the SDG climate factsheets





SDG 1: No poverty

End poverty in all its forms everywhere

1 NO
POVERTY



Short-term risks to the implementation and outputs of SDG 1 interventions

- Have risk assessments identified potential hazards based on historical extremes, recent trends and the potential for unprecedented extremes that could:
 - ▶ Damage or destroy critical infrastructure, housing, schools, or other spaces critical to livelihoods or the intervention
 - ▶ Delay implementation through loss of assets or reduced access to intervention areas
 - ▶ Increase implementation costs through, for example, higher prices of materials and labour, increased personnel and administrative costs associated with delays to implementation, or costs of losses and damages?
- Have risk assessments identified locations and groups at the highest risk of disruption by these hazards?
- Have policies and measures been put in place to address implementation risks, including infrastructural adaptations and contingency plans for additional funds and support to the most vulnerable in the event of such hazards/disasters?
- If hazards/disasters have occurred, how do indicators (eg infrastructure resilience, homelessness, displacement, health and food security) in affected areas compare with targets and indicators in non-affected areas?

Longer-term risks to outcomes of SDG 1 interventions

- Have risk assessments identified potential climate-related mechanisms that might undermine long-term outcomes, such as:
 - ▶ Risks to incomes, livelihoods and employment due to direct and indirect climate change impacts, including increased disaster losses, and impacts on food and commodity prices and supply chains, for example, fish migration due to ocean warming or sea-level rise, which will impact tourism (Rogerson, 2016)
 - ▶ Increased food insecurity, water scarcity, energy poverty and other shifts that disproportionately affect the poor and create heightened competition for scarce resources, both within communities and between groups/states (Lenshie et al., 2022)

- ▶ Increased mortality and morbidity caused by climate hazards, including heat stress (WHO, 2021)
- ▶ Reduced adaptive capacity as vulnerable communities face the consistent and compounding crises mentioned above, against which existing coping mechanisms will no longer suffice (Mabon et al., 2021)?
- Have risk assessments identified which groups within the realm of the intervention are most at risk from the above (eg women and girls, smallholder farmers, pastoralists and other groups)?
- Have policies and measures been put in place to identify and mitigate longer-term risks to the intervention outcomes?
- Do indicators used for poverty and inequality measurements capture aspects of evolving climate risks and resilience; do they track impacts and outcomes in the context of climate change?

Societal trade-offs from outcomes of SDG 1 interventions

- Have risk assessments examined the potential for interventions to undermine livelihoods despite providing poverty reduction benefits, for example, through:
 - ▶ Interventions that alleviate poverty for some groups at the expense of others, for instance, large infrastructure projects that generate jobs but displace Indigenous or local communities (Hagen and Minter, 2019)
 - ▶ Interventions that ultimately reduce people's coping or adaptive capacities, for example, by enforcing regulations that inhibit people's ability to engage in the informal economy or that limit access to key resources, for instance, dry season grazing, and wild food resources?
- Have risk assessments identified which groups are most at risk from the above?
- Have policies and measures been put in place to maximise adaptation and resilience and address these risks?
- Have indicators been identified and monitoring mechanisms established to track inclusion (whether all social groups participate in co-designing sustainable development interventions), vulnerability and evolution of climate hazards and associated losses and damages?

Environmental trade-offs from outcomes of SDG 1 interventions

- Have assessments considered the intervention's impacts on environmental vulnerability and emissions, such as:
 - ▶ Jobs and livelihood creation in sectors and industries that may degrade or fragment natural ecosystems, for example, in carbon- or water-intensive industries
 - ▶ Food production that contributes to environmental degradation through agrochemicals, deforestation, land conversion, industrialisation, and so on (Yu and Wu, 2018)?
- Have policies and measures been put in place to address these risks (eg environmental risks assessments)?
- Have metrics for ecosystem adaptation and resilience, emissions and other environmental impacts been identified against which the above can be measured and tracked?

Creation of longer-term and systemic risks from outcomes and impacts of SDG 1 interventions

- Have risk assessments considered how interventions may:
 - ▶ Promote poverty reduction strategies predicated on sectors, livelihoods and activities that are unsustainable under climate change or incompatible with climate action, for example, strategies that increase fossil fuel dependency or unsustainable extraction/consumption of resources
 - ▶ Increase the risk of debt traps associated with microfinance or market-based approaches to poverty reduction that increase the financial vulnerability of poor consumers, particularly where microfinance initiatives fund investments in climate-vulnerable activities or assets (Banerjee and Jackson, 2016)?
- Have climate risks to poverty reduction activities been considered, and have interventions been designed with a conscious emphasis on transformational shifts towards sustainability, (net) zero emissions and resilience, including transformational adaptation strategies, as opposed to incremental retrofitting of existing systems and practices (eg through participatory planning informed by climate and socioeconomic scenarios, based on the identification of desirable futures)?
- Have metrics and/or criteria been developed to assess the extent to which interventions are promoting and driving transformational shifts in resilience and human wellbeing in the face of evolving climate hazards and risks?

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SDG 2: Zero hunger

End hunger, achieve food security and improved nutrition and promote sustainable agriculture

2 ZERO HUNGER



Short-term risks to the implementation and outputs of SDG 2 interventions

- Have risk assessments identified potential hazards based on historical extremes, recent trends, and the potential for unprecedented extremes that could:
 - ▶ Damage or destroy infrastructure, materials and equipment involved in the intervention
 - ▶ Delay implementation through loss of assets or reduced access to intervention areas
 - ▶ Increase implementation costs through, for example, higher prices of materials and labour, increased personnel and administrative costs associated with delays to implementation, costs of losses and damages
 - ▶ Cause the intervention to fail altogether, for instance, crops planted not withstanding drought or hazards?
- Have risk assessments identified locations and groups at highest risk of disruption by these hazards?
- Have policies and measures been put in place to address implementation risks, including infrastructural adaptations and contingency plans for additional funds and support to the most vulnerable in the event of such hazards/disasters?
- If hazards/disasters have occurred, how do indicators linked to the intervention outputs in affected areas compare with indicators in non-affected areas?

Longer-term risks to outcomes of SDG 2 interventions

- Have risk assessments identified potential climate-related mechanisms that might undermine long-term outcomes, such as:
 - ▶ Reduced food availability due to declining crop yields and/or extinction of local species as rising temperatures and changing precipitation patterns disrupt ecosystems, favour the emergence of pests and diseases, and erode soil productivity (IPCC, 2020)

- ▶ Reduced agricultural productivity and depressed incomes of small-scale producers and rural households
- ▶ Rising food prices impacting consumers' ability to purchase nutritious food, especially in urban and non-farming households, affecting diets and health
- ▶ Increased food loss and waste due to supply chain disruptions caused by hazards, from storage to transport networks (Davis et al., 2020)?
- Have risk assessments identified which groups within the realm of the intervention are most at risk from the above (for example, women and children from low-income backgrounds are particularly vulnerable to food price shocks)?
- Have policies and measures been put in place to identify and mitigate longer-term risks to the intervention outcomes?
- Do indicators used for agri-food systems adaptation and resilience capture aspects of evolving climate risks and resilience; do they track impacts and outcomes in the context of climate change?

Societal trade-offs from outcomes of SDG 2 interventions

- Have risk assessments examined the potential for interventions to undermine livelihoods, despite providing SDG 2 benefits, for example, through:
 - ▶ Agricultural value-chain interventions that are not pro-poor or nutrition-sensitive (for example, increasing farm incomes or greening food production can make food commodities costlier for low-income consumers (Mausch et al., 2020))
 - ▶ Risks to health and occupational safety of agricultural workers due to the use of potentially harmful chemical inputs such as pesticides and fertilisers (De-Assis et al., 2020)?
- Have risk assessments identified which groups are most at risk from the above?
- Have policies and measures been put in place to maximise adaptation and resilience and address these risks?
- Have indicators been identified and monitoring mechanisms established to track inclusion (whether all social groups participate in co-designing sustainable development interventions), vulnerability, and evolution of climate hazards and associated losses and damages?

Environmental trade-offs from outcomes of SDG 2 interventions

- Have assessments considered the intervention's impacts on environmental vulnerability and emissions, such as:
 - ▶ The reliance on agricultural expansion, and water-intensive and energy-intensive agricultural practices, which contribute to deforestation, biodiversity loss, increased emissions, and land degradation (Poore and Nemecek, 2018)
 - ▶ Pollution by plastic food and beverage packaging (Phelan et al., 2022)?
- Have policies and measures been put in place to address these risks and maximise adaptation and resilience of agri-food systems and value chains?
- Have metrics for ecosystem adaptation and resilience, emissions and other environmental impacts been identified against which the above can be measured and tracked?

Creation of longer-term and systemic risks from outcomes and impacts of SDG 2 interventions

- Have risk assessments considered how interventions may:
 - ▶ Encourage agricultural expansion or intensification in high-risk areas exposed to heat and water stress
 - ▶ Lock in unsustainable patterns of water use and resource consumption, a risk where development is based on business-as-usual but with renewables, rather than shifts to less resource- and energy-intensive systems and practices (Brooks, 2020)
 - ▶ Promote food systems that are not resilient to the long-term productivity decline, which is expected to affect several key crops in different regions of the world (Committee on World Food Security, 2012)?
- Have interventions been designed with a conscious emphasis on transformational shifts towards sustainability, (net) zero emissions, and resilience, as opposed to incremental retrofitting of existing systems and practices? Pathways to transformational change include:
 - ▶ Maximising positive environmental and socioeconomic feedback loops, aligned with the Earth's carrying capacity, population growth, urbanisation, global migration, and other megatrends (Béné et al., 2019)
 - ▶ Transforming farming into an attractive and viable livelihood option for young people (FAO, 2014).
- Have metrics and/or criteria been developed to assess the extent to which interventions are promoting and driving transformational shifts in areas such as the above?

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SDG 3: Good health and well-being

Ensure healthy lives and promote well-being for all at all ages

3 GOOD HEALTH AND WELL-BEING



Short-term risks to the implementation and outputs of SDG 3 interventions

- Have risk assessments identified potential hazards based on historical extremes, recent trends, and the potential for unprecedented extremes that could:
 - ▶ Damage or destroy health infrastructure, diminishing capacity of the healthcare system, including primary care, hospitals and accidents/emergencies to cope with the impacts of increasing climate-related health risks
 - ▶ Delay implementation through loss of assets or reduced access to intervention areas, for example, reduced access to medicines and healthcare materials due to disruptions in supply chains
 - ▶ Increase implementation costs through, for example, higher prices of materials and labour, increased personnel and administrative costs associated with delays to implementation or costs of losses and damages?
- Have risk assessments identified locations and groups at highest risk of disruption by these hazards (eg women and children, people living in informal settlements, rural communities with low transport access, and in vulnerable ecosystems such as coastal areas)?
- Have policies and measures been put in place to address implementation risks, including infrastructural adaptations and contingency plans for additional funds and support to the most vulnerable in the event of such hazards/disasters (Machalaba et al., 2015)?
- If hazards/disasters have occurred, how do indicators (eg morbidity/mortality, especially infant and maternal, injuries, nutrition, access to healthcare) in affected areas compare with targets and indicators in non-affected areas?

Longer-term risks to outcomes of SDG 3 interventions

- Have risk assessments identified potential climate-related mechanisms that might undermine long-term outcomes, such as:
 - ▶ Increased injuries, mortality and morbidity due to the physical impacts of hazards and hostile climatic conditions (excessive temperature, heatwaves, humidity, windstorms, storms) and associated increased pressure on health services from indirect impacts such as malnutrition/food insecurity, heart and other diseases from pollution, lack of sanitation and hygiene, and epidemics (Afshin et al., 2019; Machalaba et al., 2015)
 - ▶ Increased dependencies on medicine and health supply chains that won't be viable or sustainable in the long-term due to costs of transport or accessibility
 - ▶ Saturation of healthcare systems due to casualties from climate shocks and emergencies, interrupting long-term prevention and detection care of other diseases such as cancer treatments
 - ▶ Operational threats from disasters causing power outages, infrastructure damage and potential failure of medical equipment and refrigeration of medical supplies
 - ▶ Emergence of new diseases from climate-related environmental change and ecosystem alteration such as permafrost melting, sea-level rise, deforestation and human–wildlife interactions (Seymour, 2016)?
- Have risk assessments identified which groups within the realm of the intervention are most at risk from the above?
- Have policies and measures been put in place to identify and mitigate longer-term risks to the intervention outcomes?
- Have metrics been identified to track health outcomes and health system performance (eg mortality, morbidity, injury, access to healthcare and medicine, mental wellbeing, quality of life) differentiated across different social groups in the context of climate change, using relevant climate indicators to track climate trends, variations and extremes?

Societal trade-offs from outcomes of SDG 3 interventions

- Have risk assessments examined the potential for interventions to undermine livelihoods, despite providing SDG 3 benefits, for example, through:
 - ▶ Healthcare systems that cater to certain groups and exclude the most vulnerable communities (eg systems that are financially or physically inaccessible)
 - ▶ Public health plans and strategies that do not consider changes in vulnerability due to population movements via urbanisation and migration of people from vulnerable locations to other areas (eg movement of people from islands and coastal regions, areas experiencing extreme aridification, areas exposed to fatal wet-bulb temperatures and extreme disaster risk) (Holmes et al., 2022)?
- Have risk assessments identified which groups are most at risk from the above?
- Have policies and measures been put in place to maximise adaptation and resilience and address these risks (eg pro-poor healthcare provision, rights-based approaches)?
- Have indicators been identified and monitoring mechanisms established to track risks related to urbanisation, population movement, healthcare access, and inclusion (whether all social groups participate in co-designing sustainable development interventions), vulnerability, and evolution of climate hazards and associated losses and damages?

Environmental trade-offs from outcomes of SDG 3 interventions

- Have assessments considered the intervention's impacts on environmental vulnerability and emissions, such as:
 - ▶ Increased pollution and contamination arising from inadequate medical waste management or use of single-use medical equipment, for example, masks, and personal protection equipment, as in the case of the COVID-19 pandemic
 - ▶ Emissions generated by health infrastructure or services, such as diesel generators, transport or cooling equipment during heatwaves?
- Have policies and measures been put in place to address these risks and maximise adaptation and resilience of healthcare systems, infrastructure and medical resources?
- Have metrics for environmental pollution, sustainability of health inputs, soil degradation, emissions, medical waste and other environmental impacts been identified against which the above can be measured and tracked?

Creation of longer-term and systemic risks from outcomes and impacts of SDG 3 interventions

- Have risk assessments considered how interventions may:
 - ▶ Fail to acknowledge or prepare for potentially overwhelming health impacts of climate change through multiple climate-related disasters, persistent long-term climate hazards that erode food/water security and human health and wellbeing, and existential risks such as periodic fatal wet-bulb temperatures that make regions potentially uninhabitable (Andrews et al., 2018; Im et al., 2017; Kang et al., 2019)
 - ▶ Be affected by a diversion of funds and resources in favour of interventions that respond to emergencies and climate shocks, disrupting research and progress towards developing medical treatments for AIDS, cancer, tuberculosis and malaria and combatting hepatitis, water-borne diseases and other communicable diseases
 - ▶ Concentrate on physical health and neglect the impacts of climate change on people's mental health, for instance, immediate stress in response to a climate hazard or shock, and long-term climate anxiety over a large section of the population (Berry et al., 2009; Hayes et al., 2018)
 - ▶ Increase poorer countries' dependence on health solutions developed in high-income countries, leading to unequal access due to intellectual property regimes or hoarding on behalf of producer countries (eg COVID-19 vaccine inequality) (Sekalala et al., 2021)?
- Have interventions been designed with a conscious emphasis on transformational shifts towards sustainability, (net) zero emissions, and resilience, including transformational adaptation strategies, as opposed to incremental retrofitting of existing systems and practices?
- Have metrics and/or criteria been developed to assess the extent to which interventions are promoting and driving transformational shifts in areas such as risk management, epidemiological surveillance, health research and intellectual property and global healthcare value chains?

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SDG 4: Quality education

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

4 QUALITY EDUCATION



Short-term risks to the implementation and outputs of SDG 4 interventions

- Have risk assessments identified potential hazards based on historical climate extremes, recent trends and the potential for unprecedented extremes that could:
 - ▶ Damage or destroy new educational infrastructure
 - ▶ Affect school attendance/enrolment through reduced functionality of school infrastructure, inability to physically access schools, and reduced capacity to access education (for example, because of an inability to pay, or the pressure of coping with crises)
 - ▶ Delay implementation through loss of assets, inhibiting access to intervention areas
 - ▶ Increase implementation costs through, for example, higher prices of materials and labour, increased personnel and administrative costs associated with delays to implementation or costs of losses and damages?
- Have risk assessments identified locations and population groups at highest risk of disruption by these hazards?
- Have policies and measures been put in place to address implementation risks, including infrastructural adaptations and contingency plans for additional funds and support to the most vulnerable in the event of such hazards/disasters?
- If hazards/disasters have occurred, how do indicators (eg school opening, attendance, families accessing education) in affected areas compare with targets and indicators in non-affected areas?

Longer-term risks to outcomes of SDG 4 interventions

- Have risk assessments identified potential climate-related mechanisms that might undermine longer-term outcomes, such as:
 - ▶ Reduced school attendance and achievement due to repeated disaster damage to schools (Adejuwon, 2018)

- ▶ Impacts of climate change on household incomes and child health and nutrition
- ▶ Impacts of changes on the nature and timing of agricultural labour demand (eg shifts in harvest times meaning children miss key schooling periods)
- ▶ Reduced availability of financial and other resources (Escaleras and Register, 2011; Kousky, 2016; Rush, 2018; Skoufias, 2003)?
- Have risk assessments identified which locations and groups are most at risk from the above?
- Have policies and measures been put in place to address longer-term risks, including infrastructure adapted to potential future conditions, long-term contingency budgets, social protection and other support mechanisms for the most vulnerable, or regular review of learners' needs (eg around shifting agricultural and term dates)?
- Have indicators been identified and monitoring mechanisms been established to track accessibility of education, student attendance and enrolment and educational outcomes?
- Have indicators representing climate stresses and shocks relevant to the above outcomes been identified, and are data available to contextualise educational indicators using these climate indicators (Brooks et al., 2019; Brooks and Fisher, 2014)? Have mechanisms and systems for tracking and curating these indicators been established?

Societal trade-offs from outcomes of SDG 4 interventions

- Have risk assessments examined the potential for expansions of educational access to:
 - ▶ Increase gender inequality, which is widely linked to increased vulnerability of women to climate shocks and stresses, and which is more likely in already vulnerable groups directly dependent on natural resources for their livelihoods (eg smallholders, pastoralists), for instance, where parents choose to, or can only afford to, educate one child (Dyer, 2016)
 - ▶ Result in the exclusion of certain social groups, exacerbating social inequality in general and increasing vulnerability (eg via lack of access to certain services or resources) (Heleta and Bagus, 2021)
 - ▶ Erode Indigenous, traditional and local knowledge, and thereby the adaptive capacity inherent in these systems (Ahearn and Bumochir, 2016; Dyer, 2016)

- ▶ Undermine livelihoods, for example, by preventing children from participating in livelihood activities
- ▶ Expose children and staff to environmental and climate risks due to school locations in areas at high/increasing risks of climate hazards or with high pollution levels (Ochola et al., 2010; Yousefi et al., 2020)?
- Have policies and measures been put in place to address these risks, for example, to ensure access to education for girls, to tailor education and its delivery to local contexts, including those of high mobility, and to address location-specific risks associated with climate and environmental hazards?
- Have indicators been identified and monitoring mechanisms established to track inclusion, access and inequality, particularly in relation to gender, disability, marginalised and vulnerable groups and groups engaged in livelihoods that are particularly challenging in terms of the delivery of education services? Have mechanisms for assessing adverse impacts on livelihoods and traditional knowledge and other unintended consequences been established?

Environmental trade-offs from outcomes of SDG 4 interventions

- Have assessments considered the impacts of educational interventions, particularly the construction of new schools and related infrastructure, on environmental vulnerability and emissions, such as:
 - ▶ Increased areas of hard surface reducing infiltration and increasing flood risk (Miller and Hutchins, 2017; Thacker et al., 2019)
 - ▶ Increased emissions from infrastructure, energy consumption, consumables and transport (Pons and Wadel, 2011)?
- Have policies and measures been put in place to minimise emissions (eg through choices relating to procurement, construction, energy and consumables and the impacts of new schools on transport patterns and behaviour) and other environmental impacts (eg through physical location, materials, waste, transport routes)?
- Have metrics for emissions and other environmental impacts been identified against which the above can be measured and tracked?

Creation of longer-term and systemic risks from outcomes and impacts of SDG 4 interventions

- Has the potential been considered for the expansion of education via initiatives supported by donors and international organisations to reproduce norms and values that:
 - ▶ Emphasise consumption and instrumental approaches to the environment that are in opposition to principles of sustainability
 - ▶ Normalise actions that drive emissions growth and increase vulnerability (eg reliance on threatened resources, concentration of settlement and economic activities in high-risk areas)
 - ▶ Erode worldviews and undermine livelihoods and practices embedded in local cultures that might be more compatible with sustainability (Komatsu and Rappleye, 2018; Vladimirova and le Blanc, 2016)?
- Have curricula been designed to emphasise sustainability and build awareness and capacity for addressing climate change through mitigation and adaptation? Do they explore alternative economic and development models more compatible with sustainability and climate resilience and norms and values that create enabling environments for sustainability and climate action?
- Have metrics and/or criteria been developed to assess the extent to which curricula genuinely promote sustainability and climate action?

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SDG 5: Gender equality

Achieve gender equality and empower all women and girls

5 GENDER
EQUALITY



Short-term risks to the implementation and outputs of SDG 5 interventions

- Have risk assessments identified potential hazards based on historical extremes, recent trends, and the potential for unprecedented extremes that could:
 - ▶ Damage or destroy infrastructure or spaces that are important to the wellbeing of women and girls, for example, increased flooding, which displaces them from market spaces or schools
 - ▶ Delay implementation through loss of assets or reduced access to intervention areas
 - ▶ Increase implementation costs through, for example, higher prices of materials and labour, increased personnel and administrative costs associated with delays to implementation, or costs of losses and damages?
- Have risk assessments identified locations and groups at highest risk of disruption by these hazards, especially considering intersectional vulnerabilities?
- Have policies and measures been put in place to address implementation risks, including infrastructural adaptations and contingency plans for additional funds and support to the most vulnerable in the event of such hazards/disasters?
- If hazards/disasters have occurred, how do indicators (eg income, health, livelihoods, education) in affected areas compare with targets and indicators in non-affected areas?

Longer-term risks to outcomes of SDG 5 interventions

- Have risk assessments identified potential climate-related mechanisms that might undermine long-term outcomes, such as:
 - ▶ Women and girls' loss of livelihoods, employment opportunities and life prospects as schools, marketplaces and other workplace infrastructure are damaged or inaccessible due to climate hazards (Nakate, 2022)
 - ▶ Increased food insecurity, which disproportionately affects women and girls who are often responsible for household food provision and who often eat last and least

- ▶ Heightened health risks, including poor reproductive and maternal health as climate change disrupts the provision of family planning commodities, exposure to infectious diseases and increased mortality among women and girls (Sellers, 2016)
 - ▶ Threats to women and girls' personal safety during disasters as displacement puts them at increased risk of physical, psychological and sexual violence, for example, when women-only shelters or sanitation facilities are not included in disaster response planning (OECD, 2021)
 - ▶ Increased workload, physical and psychological pressure incurred by women and girls as household and care duties disproportionately fall on them during climate shocks (OECD, 2021)?
- Have risk assessments identified which groups within the realm of the intervention are most at risk from the above?
 - Have policies and measures been put in place to mitigate longer-term risks to the intervention outcomes (eg investments in gender-responsive adaptation, gender financing mechanisms, securing women's land rights)?
 - Do indicators used for gender equality outcomes capture aspects of evolving climate risks and resilience; do they track impacts and outcomes in the context of climate change?

Societal trade-offs from outcomes of SDG 5 interventions

- Have risk assessments examined the potential for interventions to undermine livelihoods despite providing SDG 5 benefits, for example, through:
 - ▶ Interventions that engage women in new productive activities (eg roles in agriculture, fisheries, and so on, which are generally held by men) without suitable compensation or acknowledgement of their existing reproductive workload (Stacey et al., 2019)
 - ▶ Imported approaches that fail to consider or plan for local and societal gender norms, for instance, interventions in resource or conservation management, which are often led by men and in which the inclusion of women can produce household or community tensions (Ushewokunze, 2012)
 - ▶ Interventions that enable women to participate in markets from which they are traditionally excluded, generating oversaturation and negatively impacting existing producers
 - ▶ Interventions that introduce women-led land tenure arrangements but disenfranchise Indigenous or customary local landholders
 - ▶ Failing to account for intersecting marginalities or diverse gender identities, sexual orientation, disability status, and so on?

- Have risk assessments identified which groups are most at risk from the above?
- Have policies and measures been put in place to maximise women and girls' adaptation capacities and resilience to the above risks?
- Have indicators been identified and monitoring mechanisms established to track inclusion (whether all social groups participate in co-designing sustainable development interventions), vulnerability and evolution of climate hazards and associated losses and damages?

Environmental trade-offs from outcomes of SDG 5 interventions

- Have risk assessments considered the intervention's impacts on environmental vulnerability and emissions, such as:
 - ▶ Interventions that increase women's livelihoods through participation in industries that contribute to environmental degradation, for example, resource extraction, and water-intensive textile production
 - ▶ Interventions that increase women's land use or tenure security but promote harmful agricultural or land-use practices
 - ▶ Adverse unintended consequences arising from the intervention, for instance, higher ocean pollution due to the provision of plastic menstrual products (Kaur et al., 2018)?
- Have policies and measures been put in place to address these risks and maximise the adaptation and resilience of women and girls?
- Have metrics for the adaptation and resilience of women and girls, and other environmental impacts that affect them, been identified against which the above can be measured and tracked?

Creation of longer-term and systemic risks from outcomes and impacts of SDG 5 interventions

- Have risk assessments considered how interventions may:
 - ▶ Increase women's employability and professional opportunities in sectors and industries that are traditionally female-dominated, and are associated with lower wages and/or lower status compared to male-dominated professions

- ▶ Promote tokenistic gender equality policies and practices, such as, for example, gender quotas in the workplace when the overall organisational culture fails to challenge masculine norms (Holgersson and Romani, 2020)?
- Have interventions been designed with a conscious emphasis on transformational shifts towards sustainability, (net) zero emissions, and resilience, including transformational adaptation strategies, as opposed to incremental retrofitting of existing systems and practices, for example, through participatory planning informed by climate and socioeconomic scenarios based on the identification of desirable futures (eg addressing entrenched social norms, behavioural change, legal, policy and governance arrangements)?
- Have metrics and/or criteria been developed to assess the extent to which interventions are promoting and driving transformational shifts in areas such as risk management, resource use, energy consumption and mobility?

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SDG 6: Clean water and sanitation

Ensure access to water and sanitation for all

6 CLEAN WATER
AND SANITATION



Short-term risks to the implementation and outputs of SDG 6 interventions

- Have risk assessments identified potential hazards based on historical extremes, recent trends, and the potential for unprecedented extremes that could:
 - ▶ Damage or destroy water and sanitation infrastructure (for example, reservoirs)
 - ▶ Delay implementation through loss of assets or reduced access to intervention areas
 - ▶ Increase implementation costs through, for example, higher prices of materials and labour, increased personnel and administrative costs associated with delays to implementation, or costs of losses and damages?
- Have risk assessments identified locations and groups at highest risk of disruption by these hazards?
- Have policies and measures been put in place to address implementation risks, including infrastructural adaptations and contingency plans for additional funds and support to the most vulnerable in the event of such hazards/disasters?
- If hazards/disasters have occurred, how do indicators (for instance, infrastructure resilience, value for money, performance of water, sanitation and hygiene (WASH) systems) in affected areas compare with targets and indicators in non-affected areas?

Longer-term risks to outcomes of SDG 6 interventions

- Have risk assessments identified potential climate-related mechanisms that might undermine long-term outcomes, such as:
 - ▶ Increased water scarcity, as freshwater supplies decrease and water consumption for drinking and irrigation increases to deal with higher temperatures, resulting in increased pressures on water resources (including competition between rural and urban areas, and upstream and downstream users) (Schewe et al., 2014)
 - ▶ Pollution of open water points (eg wells) and damage to infrastructure due to extreme rainfall (Whitehead et al., 2009)

- ▶ Increased risk of salinisation as sea-level rise causes saltwater to penetrate coastal aquifers or the freshwater supplies of coastal riverine cities
- ▶ Increased prices of water and sanitation services undermining access for all (Gerlach and Franceys, 2010)?
- Have risk assessments identified which locations and groups in the intervention are most at risk from the above?
- Have policies and measures been put in place to identify and mitigate longer-term risks to the intervention outcomes (eg integrated water management, including through transboundary management, water monitoring, pro-poor pricing structures, investment in new water conservation and recycling technologies)?
- Do indicators used for water security, sanitation and hygiene capture aspects of evolving climate risks and resilience; do they track impacts and outcomes in the context of climate change?

Societal trade-offs from outcomes of SDG 6 interventions

- Have risk assessments examined the potential for interventions to undermine livelihoods, despite providing SDG 6 benefits, for example, through:
 - ▶ Increased inequality in water access if the poorest lose access to current sources but cannot afford the water from new infrastructure (Eriksen et al., 2021)
 - ▶ Attempts to secure freshwater supply that penalise downstream users or users with historical/customary water rights
 - ▶ Increased competition between users, for example, conflict over water collection points
 - ▶ Expanding access to drinking water at the expense of groundwater, which hinders sustainable supply in the long term?
- Have risk assessments identified which groups are most at risk from the above?
- Have policies and measures been put in place to maximise adaptation and resilience and address these risks?
- Have indicators been identified and monitoring mechanisms established to track inclusion (whether all social groups participate in co-designing sustainable development interventions), vulnerability, and evolution of climate hazards and associated losses and damages?

Environmental trade-offs from outcomes of SDG 6 interventions

- Have assessments considered the intervention's impacts on environmental vulnerability and emissions, such as:
 - ▶ Emissions or environmental degradation from water and sanitation infrastructure, for example, wastewater treatment plants and seawater desalination plants (Campos et al., 2016)
 - ▶ Displacement of environmental impacts to other areas, for example, waste diversion?
- Have policies and measures been put in place to address these risks?
- Have metrics for infrastructure resilience, emissions, and other environmental impacts been identified against which the above can be measured and tracked?

Creation of longer-term and systemic risks from outcomes and impacts of SDG 6 interventions

- Have risk assessments considered how interventions may lead to situations where:
 - ▶ Improved water provision leads to increased water use, which accelerates water scarcity due to extraction combined with impacts of changing temperature and rainfall patterns
 - ▶ Water infrastructure may encourage or consolidate settlements in areas at high risk of water stress in the future?
- Have interventions been designed with a conscious emphasis on transformational shifts towards sustainability, (net) zero emissions and resilience, such as requiring the renegotiation of water agreements between countries if flows change substantially?
- Have metrics and/or criteria been developed to assess the extent to which interventions are promoting and driving transformational shifts in areas such as risk management and resource use?

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SDG 7: Affordable and clean energy

Ensure access to affordable, reliable, sustainable and modern energy

7 AFFORDABLE AND
CLEAN ENERGY



Short-term risks to the implementation and outputs of SDG 7 interventions

- Has the implementation been affected by climate change? If the intervention is renewed, extended or a similar intervention takes place, will its implementation be affected by climate change?
- Have risk assessments identified potential hazards based on historical extremes, recent trends, and the potential for unprecedented extremes that could:
 - ▶ Damage or destroy energy infrastructure (eg power plants)
 - ▶ Delay implementation through loss of assets or reduced access to intervention areas
 - ▶ Increase implementation costs through, for example, higher prices of materials and labour, increased personnel and administrative costs associated with delays to implementation, or costs of losses and damages?
- Have risk assessments identified locations and groups at highest risk of disruption by these hazards?
- Have policies and measures been put in place to address implementation risks, including infrastructural adaptations and contingency plans for additional funds and support to the most vulnerable in the event of such hazards/disasters?
- If hazards/disasters have occurred, how do indicators (eg linked to energy infrastructure and supply chain resilience) in affected areas compare with targets and indicators in non-affected areas?

Longer-term risks to outcomes of SDG 7 interventions

- Have risk assessments identified potential climate-related mechanisms that might undermine long-term outcomes, such as:
 - ▶ Increased energy demand for cooling due to rising temperatures and more frequent heatwaves, and the ability of infrastructure to handle excess demand during extreme weather (Jessel et al., 2019)

- ▶ Impacts on renewable energy production, for instance, changing rainfall patterns affecting water availability for hydroelectric power plants, or temperature increases diminishing the efficiency of photovoltaic cells and, therefore solar power output (Solaun and Cerdá, 2019)
- ▶ Impacts on the reliability and performance of energy systems affecting household energy security, for instance, power outages (Schaeffer et al., 2012)
- ▶ Impacts on the ability of low-income consumers to purchase energy access due to compounded vulnerabilities to climate change leading to energy poverty (Jessel et al., 2019)?
- Have risk assessments identified which groups within the realm of the intervention are most at risk from the above?
- Have policies and measures been put in place to mitigate longer-term risks to the intervention outcomes (eg design of resilient energy infrastructure/climate-smart subsidies)?
- Do indicators used for energy access capture aspects of evolving climate risks and resilience; do they track impacts and outcomes in the context of climate change?

Societal trade-offs from outcomes of SDG 7 interventions

- Have risk assessments examined the potential for interventions to undermine livelihoods, despite providing SDG 7 benefits, for example, through:
 - ▶ Renewable energy production that competes with other natural resource uses, for example, land and water for agriculture, or undermines land and resource rights
 - ▶ Clean energy interventions that advance large-scale production but overlook distribution to poor people through grid extension or expanding off-grid access
 - ▶ Adverse health impacts of off-grid energy solutions such as generator use and risk of exposure carbon monoxide (Jessel et al., 2019)
 - ▶ Lack of affordable energy sources, which increases energy inequality?
- Have risk assessments identified which groups are most at risk from the above?
- Have policies and measures been put in place to maximise adaptation and resilience and address these risks (eg social impact assessments for land-based investments in renewable energy)?
- Have indicators been identified and monitoring mechanisms established to track inclusion (whether all social groups participate in co-designing sustainable development interventions), vulnerability, and evolution of climate hazards and associated losses and damages?

Environmental trade-offs from outcomes of SDG 7 interventions

- Have assessments considered the intervention's impacts on environmental vulnerability and emissions, such as:
 - ▶ Increased emissions from energy production and consumption and rural electrification
 - ▶ Impacts on biodiversity when renewable energy infrastructure overlaps spatially with conservation areas (Bennun et al., 2021)
 - ▶ Light pollution from rural electrification and impacts (UNEP, 2020)?
- Have policies and measures been put in place to address these risks?
- Have metrics for energy systems adaptation and resilience, emissions and other environmental impacts been identified against which the above can be measured and tracked?

Creation of longer-term and systemic risks from outcomes and impacts of SDG 7 interventions

- Have risk assessments considered how interventions may:
 - ▶ Lead to situations where the pursuit of renewable energy drives other risks, for example, political and geopolitical tensions
 - ▶ Drive dependency on the extraction of minerals critical for the clean energy transition, for example, graphite, lithium and cobalt (Hund et al., 2020)
 - ▶ Encourage the development of renewables in occupied and contested territories, entrenching conflict (Allan et al., 2022; WSRW, 2021)
 - ▶ Increase energy demand and consumption at the expense of improved energy efficiency and behavioural change, for example, by encouraging technocratic solutions that are not sustainable in the long term or act as barriers to systemic change?
- Have interventions been designed with a conscious emphasis on transformational shifts towards sustainability, (net) zero emissions and resilience, including strengthening links between energy, adaptive capacity and resilience?
- Have metrics and/or criteria been developed to assess the extent to which interventions are promoting and driving transformational shifts in areas such as risk management, resource use, energy consumption and mobility?

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SDG 8: Decent work and economic growth

Promote inclusive and sustainable economic growth, employment and decent work for all

8 DECENT WORK AND ECONOMIC GROWTH



Short-term risks to the implementation and outputs of SDG 8 interventions

- Have risk assessments identified potential hazards based on historical extremes, recent trends and the potential for unprecedented extremes that could:
 - ▶ Damage or destroy capital stock and economic infrastructure, for example, disruption of production facilities and supply chains
 - ▶ Delay implementation through loss of assets or reduced access to intervention areas
 - ▶ Increase implementation costs through, for example, higher prices of materials and labour, increased personnel and administrative costs associated with delays to implementation, or costs of losses and damages?
- Have risk assessments identified locations and groups at highest risk of disruption by these hazards?
- Have policies and measures been put in place to address implementation risks, including infrastructural adaptations and contingency plans for additional funds and support to the most vulnerable in the event of such hazards/disasters?
- If hazards/disasters have occurred, how do indicators (eg linked to the resilience of infrastructure, capital stock, supply chains) in affected areas compare with targets and indicators in non-affected areas?

Longer-term risks to outcomes of SDG 8 interventions

- Have risk assessments identified potential climate-related mechanisms that might undermine long-term outcomes, such as:
 - ▶ Loss of jobs that rely on vital ecosystems services when these are endangered by climate change (ILO, 2018)

- ▶ Worsened working conditions due to environmental hazards and climatic conditions undermining the health and security of workers and reducing labour productivity (Andrews et al., 2018)
- ▶ Reduced access to productive employment for certain groups, for example, women and girls being excluded from the labour market due to increased household work during climate shocks
- ▶ More opportunities for human traffickers to exploit vulnerable groups via mechanisms of increased poverty, displacement and migration (IOM, 2017)
- ▶ Prevalence of an informal economy, which provides livelihood coping mechanisms but is generally associated with slow growth, low productivity and high inequality (Ohnsorge and Yu, 2021)?
- Have risk assessments identified which groups within the realm of the intervention are most at risk from the above?
- Have policies and measures been put in place to identify and mitigate longer-term risks to the intervention outcomes?
- Do indicators used for employment and economic growth capture aspects of evolving climate risks and resilience; do they track impacts and outcomes in the context of climate change?

Societal trade-offs from outcomes of SDG 8 interventions

- Have risk assessments examined the potential for interventions to undermine livelihoods, despite providing SDG 8 benefits, for example, through:
 - ▶ Efforts to formalise jobs that may undermine opportunities for resilience and safety nets that informality provides (Fanelli and Monteiro, 2019)
 - ▶ Professional integration initiatives that leave women and other vulnerable groups behind?
- Have risk assessments identified which groups are most at risk from the above?
- Have policies and measures been put in place to maximise adaptation and resilience and address these risks?
- Have indicators been identified and monitoring mechanisms established to track inclusion (whether all social groups participate in co-designing sustainable development interventions), vulnerability, and evolution of climate hazards and associated losses and damages?

Environmental trade-offs from outcomes of SDG 8 interventions

- Have assessments considered the intervention's impacts on environmental vulnerability and emissions, such as:
 - ▶ Job creation and economic growth strategies predicated on natural resource extraction, such as the extraction of minerals critical to the clean energy transition as part of green economic recovery strategies (Jacobs et al., 2021)?
- Have policies and measures been put in place to address these risks and maximise opportunities for green and inclusive economies?
- Have metrics for resource use and protection, emissions and other environmental impacts been identified against which the above can be measured and tracked?

Creation of longer-term and systemic risks from outcomes and impacts of SDG 8 interventions

- Have risk assessments considered how interventions may:
 - ▶ Kickstart economic development processes that lead to environmental degradation at intermediate levels of economic development, following an environmental Kuznets curve (Stern, 2018)
 - ▶ Lead to a decoupling of growth from environmental degradation that is confined to one locality and predicated on the offshoring of emissions rather than genuine systemic decoupling (Fezzigna et al., 2019; Office of National Statistics, 2019; Parrique et al., 2019)
 - ▶ Fail to interrogate the types of jobs, their relevance for future contexts and their system-wide impacts (eg the risk that job creation encourages people to settle in areas at risk from climate change or the risk that new jobs and industries drive unsustainable consumption)?
- Have interventions been designed with a conscious emphasis on transformational shifts towards sustainability, (net) zero emissions, and resilience, including transformational adaptation strategies, as opposed to incremental retrofitting of existing systems and practices (for instance, through participatory planning informed by climate and socioeconomic scenarios, based on the identification of desirable futures)?
- Have metrics and/or criteria been developed to assess the extent to which interventions are promoting and driving transformational shifts in areas such as employment and livelihoods, labour relations, business and human rights, and economic growth narratives?

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SDG 9: Industry, innovation and infrastructure

Build resilient infrastructure, promote sustainable industrialization and foster innovation

9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



Short-term risks to the implementation and outputs of SDG 9 interventions

- Have risk assessments identified potential hazards based on historical extremes, recent trends and the potential for unprecedented extremes that could:
 - ▶ Damage or destroy infrastructure such as rural roads (Jamshed et al., 2020)
 - ▶ Delay implementation through loss of assets, reduced access to intervention areas, or interruption to supply chains, or result in only partial implementation of, for example, infrastructure projects
 - ▶ Increase implementation costs through delays, higher material, labour, personnel and administrative costs or costs of losses and damages (Apurva et al., 2020; Ballesteros-Pérez et al., 2015)
 - ▶ Cause the intervention to fail altogether (eg through catastrophic impacts in intervention areas, destruction of project infrastructure, or prohibitive inflation of costs) (Daheshpour and Herbert, 2018)?
- Have risk assessments identified locations, sectors and elements of supply chains at highest risk of disruption by these hazards?
- Have policies and measures been put in place to address implementation risks, including infrastructural adaptations, the identification of alternative supply chains, and contingency budgets?
- Have indicators been developed and monitoring mechanisms established to assess the resilience of inputs and outputs, including supply chains and infrastructure, and to keep track of costs?

Longer-term risks to outcomes of SDG 9 interventions

- Have risk assessments identified potential climate-related mechanisms that might undermine long-term outcomes, such as:
 - ▶ Persistent disruptions to supply chains adversely affecting industry and innovation (Ghadge et al., 2020)
 - ▶ Diversion of finance away from industry and innovation (eg by government) to address more frequent and increasingly catastrophic climate-related disasters (Batten, 2018; Volz et al., 2020)
 - ▶ Frequent damage to infrastructure such as rural roads, adversely affecting connectivity (Jamshed et al., 2020)?
- Have risk assessments identified which groups within the realm of the intervention are most at risk from the above?
- Have longer-term policies and measures been put in place to ensure the resilience of supply chains and to ensure continued financial support to industries in the event of climate-related disasters?
- Have indicators been developed to monitor the resilience of relevant infrastructure, industries and associated supply chains, and to track impacts and outcomes in the context of climate change?

Societal trade-offs from outcomes of SDG 9 interventions

- Have risk assessments examined the potential for interventions to:
 - ▶ Increase the vulnerability of people displaced or otherwise affected by the development of infrastructure and extractive industries (Kramarz et al., 2021)
 - ▶ Exclude certain groups from technological and other innovations, exacerbating inequality, marginalisation and differential vulnerability (eg compared to groups using technology for resilience and adaptation) (Eriksen et al., 2021)?
- Have risk assessments identified activities most likely to result in the above, and which groups are most at risk?
- Have policies and measures been put in place to guard against the negative impacts of infrastructure development and resource extraction and to avoid exclusion?
- Have indicators been identified and monitoring mechanisms established to track the above impacts and associated changes in vulnerability?

Environmental trade-offs from outcomes of SDG 9 interventions

- Have assessments considered the intervention's impacts on environmental vulnerability and emissions, such as:
 - ▶ Direct and indirect impacts of improved transport links on ecosystems, including fragmentation, pollution, disturbance, increased exploitation and degradation
 - ▶ Ecological impacts of resource extraction for construction of infrastructure and technology products, including high-tech products (Sonter et al., 2020)?
- Have policies and measures been put in place to address these risks, for example, based on standards and codes of practice?
- Have metrics been identified for industrial emissions, other environmental impacts, the resilience of impacted environmental systems and environmental governance, against which the above can be measured and tracked?

Creation of longer-term and systemic risks from outcomes and impacts of SDG 9 interventions

- Have risk assessments considered how interventions may:
 - ▶ Increase climate risks by creating large-scale dependence on infrastructure that is insufficiently resilient to large, potentially unexpected climate change impacts
 - ▶ Support innovation and industrialisation that is only superficially sustainable and does not sufficiently account for long-term climate change risks (Puig et al., 2021; Truong et al., 2022)?
- Have interventions been designed with a conscious emphasis on transformational shifts and innovation for sustainability, (net) zero emissions, and resilience, including transformational adaptation strategies, as opposed to incremental retrofitting of existing systems and practices (eg through participatory planning informed by climate and socioeconomic scenarios, based on the identification of desirable futures)?
- Have metrics and/or criteria been developed to assess the extent to which interventions are promoting and driving transformational shifts and innovation in areas such as risk management, resource use, energy consumption and mobility?

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SDG 10: Reduced inequalities

Reduce inequality within and among countries

10 REDUCED INEQUALITIES



Short-term risks to the implementation and outputs of SDG 10 interventions

- Have risk assessments identified potential hazards based on historical extremes, recent trends, and potential for unprecedented extremes that could:
 - ▶ Damage or destroy infrastructure intended to expand access to key resources and services (for example, water, electricity, transport, education), reducing inequalities by serving marginalised or vulnerable groups (Daheshpour and Herbert, 2018)
 - ▶ Result in certain populations or areas not benefiting from an intervention because they cannot be reached during implementation?
- Have risk assessments identified locations and groups at highest risk of disruption by these hazards, particularly marginalised, excluded or highly vulnerable locations and groups (Lam and Kuipers, 2019)?
- Have policies and measures been put in place to address implementation risks, including contingency plans to ensure marginalised, excluded and vulnerable groups are not left behind in the event of disruptions to implementation?
- If hazards/disasters have occurred, have the anticipated benefits failed to reach certain intended beneficiaries, and how do outcome indicators compare between the most marginalised/vulnerable and the wider beneficiary population?

Longer-term risks to the outcomes of SDG 10 interventions

- Have risk assessments identified potential climate-related mechanisms that might undermine long-term outcomes, such as:
 - ▶ Geographically or socially differentiated exposure to climate hazards and risks that will disproportionately affect certain groups, eroding the long-term benefits of the intervention and the wellbeing of these groups (Cappelli et al., 2021; Islam and Winkel, 2017)
 - ▶ Changes in social, economic or other contexts related to broader societal changes mediated by climate change and/or actions to address it that may make the intervention less effective or relevant for certain population groups?

- Have risk assessments identified which groups within the realm of the intervention are most and least likely to be affected by the above risks?
- Have policies and measures been put in place to identify and mitigate longer-term risks to the intervention outcomes?
- Do indicators used for tracking inequality capture how it is affected by climate change and climate action, for example, by being interpreted in the context of climate information or incorporating beneficiary feedback on how outcomes are affected by contextual factors related to climate risk and action?

Societal trade-offs from outcomes of SDG 10 interventions

- Have risk assessments examined the potential for interventions to:
 - ▶ Increase inequality and marginalisation by targeting certain groups and excluding others (Eriksen et al., 2021)
 - ▶ Focus on certain types of inequality while ignoring others, particularly where these may be exacerbated by climate change (Sultana, 2021)?
- Have risk assessments identified which groups are most at risk from the above by examining who may be excluded and the climate vulnerabilities of mechanisms intended to address inequality?
- Have policies and measures been put in place to maximise adaptation and resilience and address these risks?
- Have indicators been identified and monitoring mechanisms established to track inclusion (whether all social groups participate in co-designing sustainable development interventions), vulnerability, and evolution of climate hazards and associated losses and damages?

Environmental trade-offs from outcomes of SDG 10 interventions

- Have assessments considered the intervention's impacts on environmental vulnerability and emissions, such as reliance on the exploitation of natural resources for inequality reduction, where this might increase environmental vulnerability to climate change (Elliott et al., 2014)?
- Have policies and measures been put in place to address these risks and support the resilience and adaptation of environmental systems, to the extent that this is relevant to actions intended to reduce inequality?
- Have metrics of climate sensitivity been identified for potentially vulnerable natural resources against which the above can be measured and tracked?

Creation of longer-term and systemic risks from outcomes and impacts of SDG 10 interventions

- Have risk assessments considered the extent to which interventions may:
 - ▶ Increase vulnerability by neglecting climate change impacts and management options in actions to reduce inequality (for instance, through promoting more 'productive' but climate-insecure livelihoods at the expense of less productive but climate-resilient livelihoods) (Birkmann et al., 2022)
 - ▶ Predicate reduced inequality on economic models and activities that might be unsustainable under climate change, driving systemic maladaptation risks (IPCC, 2022)
 - ▶ Focus on addressing the symptoms of inequality, such as poverty, insecure livelihoods and uneven access to resources, without addressing the underlying structural drivers of inequality, fragility and vulnerability that are related to factors such as governance and power relations (Eriksen et al., 2021)
 - ▶ Fail to address the global North contributions to climate change while focusing on sustainability in the global South, although it contributes least to climate change and is generally more exposed and vulnerable to climate change impacts?
- Have interventions been designed with a conscious emphasis on transformational shifts towards sustainability and resilience that involve addressing the structural drivers of inequality, fragility and vulnerability?
- Have drivers of inequality been identified, including structural drivers and drivers operating at multiple scales, and metrics developed to track these drivers?

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SDG 11: Sustainable cities and communities

Make cities and human settlements inclusive, safe, resilient and sustainable

11 SUSTAINABLE CITIES AND COMMUNITIES



Short-term risks to the implementation and outputs of SDG 11 interventions

- Have risk assessments identified potential hazards based on historical extremes, recent trends, and potential for unprecedented extremes that could:
 - ▶ Damage or destroy new urban infrastructure (Kumar, 2021)
 - ▶ Delay implementation through loss of assets or reduced access to intervention areas
 - ▶ Increase implementation costs through higher prices of materials and labour, increased personnel and administrative costs associated with delays to implementation, or costs of losses and damages?
- Have risk assessments identified locations and population groups at highest risk of disruption by these hazards, for example, in low-lying areas, coastal areas and informal settlements?
- Have policies and measures been put in place to address implementation risks, including infrastructural adaptations and contingency plans for additional funds and support to the most vulnerable in the event of such hazards/disasters?
- If hazards/disasters have occurred, how do relevant indicators (eg access to infrastructure and services, and functioning of urban systems such as transport, communications, energy and water) in affected areas compare with targets and indicators in non-affected areas?

Longer-term risks to outcomes of SDG 11 interventions

- Have risk assessments identified potential climate-related mechanisms that might undermine longer-term outcomes, such as:
 - ▶ Increased disaster risks associated with storms, floods and mudslides, intensified by changes in precipitation, sea-level rise, changes in storm tracks and behaviour (frequency, intensity) or deglaciation (eg glacial lake outburst flooding) (Kumar, 2021)

- ▶ Increases in frequency, intensity and duration of heat extremes, including episodic wet-bulb temperature extremes that cross the threshold of human survivability (Andrews et al., 2018; Im et al., 2017; Kang et al., 2019)
- ▶ Direct and indirect effects of climate change on urban livelihoods, incomes and food prices/security, for example, via impacts on local and regional agricultural productivity, and impacts on remote producing regions, markets and supply chains (Dodman et al., 2022)
- ▶ Impacts on the habitability of urban areas via the above mechanisms?
- Have risk assessments identified which locations and groups are most at risk from the above; are there existential risks to entire cities, municipalities, or urban areas (eg from sea-level rise)?
- Have policies and measures been put in place to address longer-term risks, including infrastructural adaptations, appropriate disaster response (eg early warning, shelters, plans), social protection and other support mechanisms for the most vulnerable, revisions to planning and zoning, reconfiguration and redesign to accommodate sea-level rise or increased runoff, and so on?
- Do indicators used for urban development capture aspects of evolving risks and resilience; do they track impacts, for example, loss and damage, mortality and morbidity and disruption to services, in the context of evolving climate hazards (Brooks et al., 2019; Brooks and Fisher, 2014)?

Societal trade-offs from outcomes of SDG 11 interventions

- Have risk assessments examined the potential for interventions to:
 - ▶ Increase (relative) exposure or vulnerability of certain groups to climate change, for instance, due to failure to take adaptation actions necessary to address intensifying hazards and risks such as sea-level rise, worsening heat extremes, more intense precipitation (associated with more significant runoff and flood/mudslide risks) or failure to address risks associated with increased exposure of certain groups due to rapid urbanisation (Dodman et al., 2022)
 - ▶ Privilege certain groups in terms of access to services, infrastructure or resources, for example, through preferential development of certain areas and neglect of others, or elite capture of resources, exacerbating social inequality in general and increasing vulnerability (eg via lack of access to certain services or resources) (Eriksen et al., 2021)
 - ▶ Increase vulnerability via displacement, for example, driving displaced people into high-risk informal settlements?

- Have policies and measures been put in place to address these risks, for example, screening for climate risks?
- Have indicators been identified and monitoring mechanisms established to track inclusion (whether all social groups participate in co-designing sustainable development interventions), vulnerability, and evolution of climate hazards and associated losses and damages?

Environmental trade-offs from outcomes of SDG 11 interventions

- Have assessments considered impacts on environmental vulnerability and emissions, such as:
 - ▶ Reduced resilience and adaptive capacity resulting from habitat fragmentation, disturbance and confinement resulting from urban expansion or reconfiguration, including prevention of habitat migration (eg in response to sea-level rise) (Seifollahi-Aghmiuni et al., 2022)
 - ▶ Increased areas of hard surfaces reducing infiltration and increasing flood risk (Miller and Hutchins, 2017; Thacker et al., 2019)
 - ▶ Increased emissions from infrastructure, energy consumption, consumables and transport, including whole-lifetime emissions (eg in production of renewables infrastructure, electric vehicles) (Pons and Wadel, 2011)?
- Have policies and measures been put in place to minimise emissions, including based on urban planning and design as well as materials and energy sources (eg reducing energy use and use of private vehicles) and adverse impacts on environmental vulnerability (eg migration corridors, facilitation of inland migration of coastal ecosystems, actively reducing stresses such as pollution and habitat disturbance)?
- Have metrics for emissions and other environmental impacts been identified against which the above can be measured and tracked?

Creation of longer-term and systemic risks from outcomes and impacts of SDG 11 interventions

- Have risk assessments considered how interventions may:
 - ▶ Lock in/encourage settlement and settlement expansion in high-risk areas exposed to large increases in disaster risk (eg tropical storms and catastrophic flooding), climatic desiccation and extreme water stress, permanent inundation due to sea-level rise, periodic fatal combinations of heat and humidity, and so on (Gajjar et al., 2019)
 - ▶ Lock in unsustainable patterns of energy use and resource consumption, a risk where development is based on 'business-as-usual but with renewables', rather than shifts to less resource- and energy-intensive systems and practices and reduced reliance on private (electric) vehicles, which will require behavioural change supported by appropriate policies (Brooks, 2020)?
- Have interventions been designed with a conscious emphasis on transformational shifts towards sustainability, (net) zero emissions, and resilience, including transformational adaptation strategies, as opposed to incremental retrofitting of existing systems and practices (eg through participatory planning informed by climate and socioeconomic scenarios, based on the identification of desirable futures)?
- Have metrics and/or criteria been developed to assess the extent to which interventions are promoting and driving transformational shifts in areas such as risk management, resource use, energy consumption and mobility?

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SDG 12: Responsible consumption and production

Ensure sustainable consumption and production patterns



Short-term risks to the implementation and outputs of SDG 12 interventions

- Have risk assessments identified potential hazards based on historical extremes, recent trends, and the potential for unprecedented extremes that could:
 - ▶ Damage or destroy infrastructure, for example, waste treatment or recycling facilities
 - ▶ Delay implementation through loss of assets or reduced access to intervention areas
 - ▶ Increase implementation costs through, for example, higher prices of materials and labour, increased personnel and administrative costs associated with delays to implementation or costs of losses and damages?
- Have risk assessments identified locations and groups at highest risk of disruption by these hazards?
- Have policies and measures been put in place to address implementation risks, including infrastructural adaptations and contingency plans for additional funds and support to the most vulnerable in the event of such hazards/disasters?
- If hazards/disasters have occurred, how do indicators (eg linked to infrastructure, supply chain performance and resilience) in affected areas compare with targets and indicators in non-affected areas?

Longer-term risks to outcomes of SDG 12 interventions

- Have risk assessments identified potential climate-related mechanisms that might undermine long-term outcomes, such as:
 - ▶ Disruptions to production infrastructure and waste management systems, for example, increased risk of release of chemical waste to air, water and soil due to intensified climate hazards
 - ▶ Increased food losses due to the destruction of food stocks or damage to cold chain infrastructure due to climate hazards (Davis et al., 2020)

- ▶ Failure of sustainable management plans and business sustainability practices due to changing climatic context and shifting baselines
- ▶ Reduced means of implementation for the circular economy agenda generally as climate change leads to escalating costs and is being prioritised by public and private actors?
- Have risk assessments identified which groups within the realm of the intervention are most at risk from the above?
- Have policies and measures been put in place to identify and mitigate longer-term risks to the intervention outcomes?
- Do indicators used for sustainable management plans and green economy reforms capture aspects of evolving climate risks and resilience; do they track impacts and outcomes in the context of climate change?

Societal trade-offs from outcomes of SDG 12 interventions

- Have risk assessments examined the potential for interventions to undermine livelihoods, despite providing SDG 12 benefits, for example, through:
 - ▶ Industrial restructuring and phasing out of highly polluting industries and sectors destroying jobs and livelihoods, for instance, in apparel value chains (Repp et al., 2021)
 - ▶ Occupational health risks of waste collectors and workers in the recycling industry as demand for recycled products increases (Zolnikov et al., 2018)
 - ▶ Increased inequality between countries as low- and middle-income countries that are dependent on extractive industries lose out if demand for primary raw materials drops globally (Schroder, 2020)
 - ▶ Increased inequality and vulnerability if poorer consumers cannot afford new circular and cleaner goods and services and are penalised for continuing to consume in traditional ways, for example, carbon tax penalising drivers when electric cars are not affordable (Bell, 2020)
- Have risk assessments identified which groups are most at risk from the above?
- Have policies and measures been put in place to ensure a 'just transition' and address these risks, for example, through green fiscal reforms, just transition plans for sunset industries or intersectional environmental policymaking?
- Have indicators been identified and monitoring mechanisms established to track inclusion (whether all social groups participate in co-designing sustainable development interventions), vulnerability, and the impacts of green transitions on people?

Environmental trade-offs from outcomes of SDG 12 interventions

- Have assessments considered the intervention's impacts on environmental vulnerability and emissions, such as:
 - ▶ Carbon emissions from end-of-life product handling and recycling, including from transport to and from recycling facilities
 - ▶ Emissions from increased digitalisation of the economy, such as high water and energy consumption of data centres (although not initially as digital economy development is associated with reduced emissions up to a certain point) (Li et al., 2021)?
- Have policies and measures been put in place to address these risks and maximise adaptation and resilience of supply chains and circular economy models?
- Have metrics for emissions and other environmental impacts been identified against which the above can be measured and tracked?

Creation of longer-term and systemic risks from outcomes and impacts of SDG 12 interventions

- Have risk assessments considered how interventions may:
 - ▶ Promote corporate sustainability reporting practices that enshrine business-as-usual but with lower emissions or offshoring of emissions (Hatchwell, 2021)
 - ▶ Implement a green or circular economy transition that fails to consider issues of justice, equity and inclusion (Schroder, 2020; Zagonari, 2020)
 - ▶ Advance a circularity agenda that is focused on improving per-unit resource efficiency and usage but doesn't deal with absolute resource usage, consumer demand and incentives facing profit-seeking providers?
- Have interventions been designed with a conscious emphasis on transformational shifts towards just and inclusive sustainability, (net) zero emissions and resilience (eg consumer behavioural change, green fiscal reforms and fossil fuel subsidy removal, strong environmental impact and supply chain disclosure, green procurement)?
- Have metrics and/or criteria been developed to assess the extent to which interventions are promoting and driving transformational shifts in areas such as the above?

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SDG 13: Climate action

Take urgent action to combat climate change and its impacts

13 CLIMATE ACTION



Short-term risks to the implementation and outputs of SDG 13 interventions

- Have risk assessments identified potential hazards based on historical extremes, recent trends, and potential for unprecedented extremes that could:
 - ▶ Damage or destroy infrastructure used for the adaptation and mitigation of climate changes and impacts, for instance, damage to flood defence systems or solar panels
 - ▶ Delay implementation through loss of assets, such as materials to create infrastructures that improve resilience, or reduced access to intervention areas where the most vulnerable people and ecosystems are located
 - ▶ Increase implementation costs through, for example, higher prices of materials and labour, increased personnel and administrative costs associated with delays to implementation or costs of losses and damages?
- Have risk assessments identified particularly marginalised, excluded or highly vulnerable locations and groups, and the most vulnerable places, such as coastal areas? This is especially relevant to Least Developed Countries and Small Island Developing States.
- Have policies and measures been put in place to address implementation risks, including infrastructural adaptations and contingency plans for additional funds and support to the most vulnerable in the event of such hazards/disasters?
- If hazards/disasters have occurred, how do human indicators (eg self-perceived resilience, food security, assets, income) and environmental indicators (eg carbon emissions, pollution, soil fertility) in affected areas compare with targets and indicators in non-affected areas (Schipper and Langston, 2015)?

Longer-term risks to outcomes of SDG 13 interventions

- Have risk assessments identified potential climate-related mechanisms that might undermine long-term outcomes, such as:
 - ▶ Failure to consider an appropriate timescale for assessing the intended and unintended effects of the interventions (5–10 years), for example, investing in water irrigation in increasingly drought-prone areas (Beauchamp and Pertaud, 2021)
 - ▶ Poor design and planning that underestimate the increased magnitude and frequency of climate changes and shocks (eg disaster risk management systems that have not planned for likely increases in rainfall patterns and volumes)
 - ▶ Sustainability and climate policies that consider climate impacts in silos and fail to consider the trade-offs between different sectors and social groups?
- Have risk assessments identified which groups, production systems and ecosystems within the realm of the intervention are most at risk from the above?
- Have policies and measures been put in place to identify and mitigate longer-term risks to the intervention outcomes?
- Do indicators used for tracking perceived and observed changes in human and environmental resilience, vulnerability and human wellbeing capture aspects of evolving climate risks; do they track impacts and outcomes in the context of climate change?

Societal trade-offs from outcomes of SDG 13 interventions

- Have risk assessments examined the potential for interventions to undermine human wellbeing, despite providing SDG 13 benefits, for example, through:
 - ▶ Land-based mitigation, such as afforestation or large-scale bioenergy production that competes with agriculture and other land uses and creates risks for food production and prices (Fujimori et al., 2019)
 - ▶ Adaptation measures that reinforce inequality and the vulnerability of specific social groups, for example, by reinforcing existing power relations (Eriksen et al., 2021) or involving land tenure reform or agricultural expansion that inhibits pastoralists' mobility and coping strategies (Holmes et al., 2022)
 - ▶ Strategies that undermine the culture, traditions and human rights of Indigenous Peoples and local communities or that erode and disregard traditional knowledge and strategies that value variability (Krätli, 2015)

- ▶ Low or zero-carbon transition strategies that increase the vulnerability of the poor, for example, through displacement for renewable energy infrastructure or flat carbon taxes that burden low-income households (Andersson and Atkinson, 2020; del Bene et al., 2018; Fremstad and Paul, 2019; Sovacool et al., 2021)?
- Have risk assessments identified which groups are most at risk from the above?
- Have policies and measures been put in place to maximise adaptation and resilience and address these risks?
- Have indicators been identified and monitoring mechanisms established to track inclusion (whether all social groups participate in co-designing sustainable development interventions), vulnerability, and evolution of climate hazards and associated losses and damages?

Environmental trade-offs from outcomes of SDG 13 interventions

- Have assessments considered the intervention's impacts on environmental vulnerability and emissions, such as:
 - ▶ Enabling short-term adaptation strategies that lead to increased emissions and pollution, for example, the use of air conditioning in response to increased heat waves in cities
 - ▶ Release of carbon emissions due to the loss or destruction of infrastructure and assets, such as carbon sequestration assets or destruction of trees during forest fires or floods
 - ▶ Building infrastructure that ultimately leads to environmental vulnerability of ecosystems through land-use changes, fragmentation and reduction of areas of biodiversity?
- Have policies and measures been put in place to address and minimise trade-offs between adaptation and mitigation?
- Do mitigation or adaptation actions use relevant metrics to track potential adverse impacts on environmental vulnerability, resilience and adaptive capacity (eg environmental emissions through land use and land surface change)?

Creation of longer-term and systemic risks from outcomes and impacts of SDG 13 interventions

- Have risk assessments considered how interventions may:
 - ▶ Lock-in adaptation and mitigation strategies that will not be viable in the long-term due to the potential magnitude of future climate impacts (eg encouraging the creation of wells in a region where water will be unavailable due to climatic changes over the next 15–30 years)
 - ▶ Promote mitigation strategies predicated on the outsourcing of emissions rather than internalising mitigation strategies into direct business supply chains and planning processes
 - ▶ Encourage sustainability and climate policies that prioritise decarbonisation at the expense of adaptation and loss and damage in the most vulnerable ecosystems and communities
 - ▶ Focus on market-based solutions at the expense of actions that do not lend themselves to market mechanisms, such as managing public goods and investment in resilience governance and planning systems?
- Have interventions been designed with a conscious emphasis on transformational shifts towards sustainability, (net) zero emissions and resilience, including transformational adaptation strategies, as opposed to incremental retrofitting of existing systems and practices, for instance, through participatory planning informed by climate and socioeconomic scenarios, based on the identification of desirable futures (eg emphasising just transition narratives, tackling greenwashing, promoting genuine decoupling of economic growth and environmental degradation)?
- Have metrics and/or criteria been developed to assess the extent to which interventions are promoting and driving transformational shifts in areas such as extraterritorial emissions, resource use and climate-informed risk management to ensure commensurate adaptation responses (Pringle and Leiter, 2018)?

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SDG 14: Life below water

Conserve and sustainably use the oceans, seas and marine resources for sustainable development



Short-term risks to the implementation and outputs of SDG 14 interventions

- Have risk assessments identified potential hazards based on historical extremes, recent trends, and potential for unprecedented extremes that could:
 - ▶ Damage or destroy infrastructure involved in marine conservation or restoration
 - ▶ Delay implementation through loss of assets or reduced access to intervention areas, for example, activities being impeded by tropical storms, marine heatwaves, or coastal flooding
 - ▶ Increase implementation costs through, for example, higher prices of materials and labour, increased personnel and administrative costs associated with delays to implementation or costs of losses and damages?
- Have risk assessments identified locations and species groups at highest risk of disruption by these hazards?
- Have policies and measures been put in place to address implementation risks, including infrastructural adaptations and contingency plans for additional funds and support to the most vulnerable in the event of such hazards/disasters?
- If hazards/disasters have occurred, how do indicators (eg species reproduction, marine acidity, debris and nutrient pollution) in affected areas compare with targets and indicators in non-affected areas?

Longer-term risks to outcomes of SDG 14 interventions

- Have risk assessments identified potential climate-related mechanisms that might undermine long-term outcomes, such as:
 - ▶ Changes in aquatic species composition and movement due to ocean acidification, warming, algal blooms, and so on, which cause marine species to decline, adjust migratory patterns, or relocate to colder regions, or cause a shift in competitive advantage among species (Thomas et al., 2020, Poloczanska et al., 2016)

- ▶ Increased coastal degradation owing to sea-level rise, extreme weather and/or human infrastructure, especially harming Small Island Developing States and Least Developed Countries with a maritime façade (UNFCCC, 2007)
- ▶ Exacerbated ocean pollution, for instance, tropical storms, which can disperse mismanaged waste between terrestrial, freshwater and marine environments (Ford et al., 2022)?
- ▶ Destructive fishing practices associated with poverty as climate shocks push people to overfish to compensate for lower incomes, leading to depletion of marine resources and creating food insecurity (Cinner, 2009)
- Have risk assessments identified which locations and/or species within the realm of the intervention are most at risk from the above?
- Have policies and measures been put in place to identify and mitigate longer-term risks to the intervention outcomes (eg climate-informed marine spatial planning, ecosystem-based management, sustainable tourism and subsidy mechanisms to reduce overfishing)?
- Do indicators used for coastal and marine ecosystem preservation and adaptation and resilience of fishing communities capture aspects of evolving climate risks and resilience; do they track impacts and outcomes in the context of climate change?

Societal trade-offs from outcomes of SDG 14 interventions

- Have risk assessments examined the potential for interventions to undermine livelihoods, despite providing SDG 14 benefits, for example, through:
 - ▶ Exclusionary conservation approaches, for example, protected areas that undermine local access and management rights for resource extraction (fishing, mangrove harvesting, and so on) or displace local communities
 - ▶ The introduction of regulatory demands that generate impossible-to-meet standards for small-scale fisheries or that fail to consider vulnerable fishing communities (Gaines et al., 2019)
 - ▶ Marine development approaches that erode Indigenous, traditional and local knowledge and, therefore, the adaptive capacity inherent in these systems
 - ▶ Adverse unintended consequences arising from the intervention, for example, new species migration routes that interfere with human activities?

- Have risk assessments identified which groups are most at risk from the above (eg small-scale fisheries, Indigenous communities, women and migrant workers who are notably vulnerable to shifts in access to and management of marine spaces) (Thomas et al., 2020)?
- Have policies and measures been put in place to maximise adaptation and resilience and address these risks?
- Have indicators been identified and monitoring mechanisms established to track inclusion (whether all social groups participate in co-designing sustainable development interventions), vulnerability, and evolution of climate hazards and associated losses and damages?

Environmental trade-offs from outcomes of SDG 14 interventions

- Have assessments considered the intervention's impacts on environmental vulnerability and emissions, such as:
 - ▶ Whether the intervention is inhibiting ecosystem adaptation, for example, conservation interventions that enable an influx of a particular species, destabilising ecosystem balance and biodiversity (Gaines et al., 2019)
 - ▶ Whether the intervention is increasing environmental vulnerability, for example, seawalls play an important role in adapting to storms and sea-level rise, but may lead to increased coastal degradation, undermine natural beach processes or exacerbate inland flooding (Olsson et al., 2019; UNFCCC, 2007)?
- Have policies and measures been put in place to address these risks and minimise environmental trade-offs?
- Have metrics for ecosystem adaptation and resilience, emissions, and other environmental impacts been identified against which the above can be measured and tracked?

Creation of longer-term and systemic risks from outcomes and impacts of SDG 14 interventions

- Have risk assessments considered how interventions may:
 - ▶ Attempt to preserve existing marine ecosystems in situ when climate change means they will not be viable in the future, which may actively inhibit ecological adaptation
 - ▶ Entrench imported, Northern approaches to biodiversity conservation and undermine other more diverse and local knowledge systems
 - ▶ Emphasise conservation approaches that focus on combatting destructive practices through policing and criminalising vulnerable groups without addressing structural drivers (poverty, exploitation, conflict, cultural and religious beliefs, and so on) (Urbina, 2019)?
- Have interventions been designed with a conscious emphasis on transformational shifts towards sustainability, (net) zero emissions, and resilience (eg considering cultural dynamics that drive consumer demand for endangered seafood, especially in Asian markets (Fabinyi et al., 2017))?
- Have metrics and/or criteria been developed to assess the extent to which interventions are promoting and driving transformational shifts in areas such as marine and coastal risk management, resource use, energy consumption and mobility?

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SDG 15: Life on land

Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss



Short-term risks to the implementation and outputs of SDG 15 interventions

- Have risk assessments identified potential hazards based on historical extremes, recent trends, and potential for unprecedented extremes that could:
 - ▶ Damage or destroy infrastructure involved in ecosystem conservation or restoration
 - ▶ Delay implementation through loss of assets or reduced access to intervention areas (for example, riverbank or land restoration activities impeded by flooding)
 - ▶ Increase implementation costs through, for example, higher prices of materials and labour, increased personnel and administrative costs associated with delays to implementation or costs of losses and damages?
- Have risk assessments identified locations and species groups at highest risk of disruption by these hazards?
- Have policies and measures been put in place to address implementation risks, including infrastructural adaptations and contingency plans for additional funds and support to the most vulnerable in the event of such hazards/disasters?
- If hazards/disasters have occurred, how do indicators (eg species reproduction, richness, variety, soil quality) in affected areas compare with targets and indicators in non-affected areas? Has the intervention been less successful in areas where there has been a hazard?

Longer-term risks to outcomes of SDG 15 interventions

- Have risk assessments identified potential climate-related mechanisms that might undermine long-term outcomes, such as:
 - ▶ Threats to species and habitat survival (Nunez et al., 2019) and ecosystem stability (García-Palacios et al., 2018) leading to the loss of natural ecosystems and declining biodiversity

- ▶ Accelerating land degradation, particularly in low-lying coastal areas, river deltas, drylands and permafrost areas
- ▶ Reduced quality and quantity of carbon sinks, which provide essential climate mitigation (eg mangroves, forests)
- ▶ Reduced liveability of entire regions (eg ecosystems unable to provide food and water for life on earth, or invasive alien species)?
- Have risk assessments identified which locations and/or species (fauna and flora) within the realm of the intervention are most at risk from the above?
- Have policies and measures been put in place to identify and mitigate longer-term risks to the intervention outcomes (eg environmental impact assessments, sustainable forest management, rights-based initiatives to support Indigenous Peoples and local communities to manage land in a way that protects biodiversity and avoids deforestation) (Veit, 2019)?
- Do indicators used for land ecosystem preservation capture aspects of evolving climate risks and resilience; do they track impacts and outcomes in the context of climate change?

Societal trade-offs from outcomes of SDG 15 actions

- Have risk assessments examined the potential for interventions to undermine livelihoods (McShane et al., 2011), despite providing SDG 15 benefits, for example, through:
 - ▶ Exclusionary conservation approaches (Sigalla, 2013) or approaches that disregard the history of land tenure, conflict and resource use in intervention habitats (Indiana University, 2007), for example, regulating the extraction of natural resources that support local livelihoods or creating protected areas that displace Indigenous Peoples or local communities (Muhumuza and Balkwill, 2013)
 - ▶ Imported approaches that erode Indigenous, traditional and local knowledge and thereby the capacity of some groups to adapt to climate change
 - ▶ Adverse unintended consequences arising from an intervention, for instance, new species migration routes or animal behaviour that interferes with or endangers human livelihoods?
- Have risk assessments identified which groups are most at risk from the above?
- Have policies and measures been put in place to maximise adaptation and resilience and address these risks?
- Have indicators been identified and monitoring mechanisms established to track inclusion (whether all social groups participate in co-designing sustainable development interventions), vulnerability, and evolution of climate hazards and associated losses and damages?

Environmental trade-offs from outcomes of SDG 15 interventions

- Have assessments considered the intervention's impacts on environmental vulnerability and emissions, such as:
 - ▶ Whether the intervention is inhibiting ecosystem adaptation, for example, national park delimitations can impede species migration (Hofmann et al., 2021)
 - ▶ Whether the intervention is increasing environmental vulnerability (eg poorly managed rewilding harming existing biodiversity (IUCN, 2021) such as when newly introduced animal species lead to overgrazing and degradation of native vegetation)
 - ▶ Whether infrastructural interventions (eg in the context of coastal erosion) generate emissions?
- Have policies and measures been put in place to address these risks and maximise adaptation and resilience of ecosystems?
- Have metrics for ecosystem adaptation and resilience, emissions, and other environmental impacts been identified against which the above can be measured and tracked?

Creation of longer-term and systemic risks from outcomes and impacts of SDG 15 interventions

- Have risk assessments considered how interventions may:
 - ▶ Attempt to preserve existing ecosystems in situ when climate change means they will not be viable in the future, potentially actively inhibiting ecological adaptation
 - ▶ Entrench imported, Northern approaches to biodiversity conservation and undermine other more diverse knowledge systems?
- Have interventions been designed with a conscious emphasis on transformational shifts towards sustainability, (net) zero emissions, and resilience, for example, by a more comprehensive rethinking of biodiversity governance systems (Leventon et al., 2021)?
- Have metrics and/or criteria been developed to assess the extent to which interventions are promoting and driving transformational shifts in areas such as risk management, resource use and rights?

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SDG 16: Peace, justice and strong institutions

Promote just, peaceful and inclusive societies



Short-term risks to the implementation and outputs of SDG 16 interventions

- Have risk assessments identified potential hazards based on historical extremes, recent trends, and potential for unprecedented extremes that could:
 - ▶ Hinder or prevent access to areas or populations targeted by peacebuilding or related (eg governance) interventions
 - ▶ Delay implementation or result in partial implementation, with only a subset of intended beneficiaries reached
 - ▶ Increase implementation costs through delay and increased operational costs, where peacebuilding interventions involve infrastructural elements (Apurva et al., 2020; Bachmann and Schouten, 2018; Ballesteros-Pérez et al., 2015)?
- Have risk assessments identified locations and groups at highest risk of disruption by these hazards?
- Have policies and measures been put in place to address implementation risks, including contingency budgets and flexibility in implementation schedules to accommodate disruption associated with climate-related disasters?
- If hazards/disasters have occurred, how do indicators in affected areas compare with targets and indicators in non-affected areas?

Longer-term risks to outcomes of SDG 16 interventions

- Have risk assessments identified potential climate-related mechanisms that might undermine long-term outcomes, such as:
 - ▶ An increase in the frequency and/or severity of climate-related disasters leading to displacement, migration, and breakdowns in law and order that facilitate sexual violence and human trafficking (IOM, 2016)
 - ▶ The potential for climate hazards to create contexts in which it is more difficult to provide justice and uphold rights and freedoms for citizens, and combat crime and corruption, thus eroding institutional and governance capacities (Krampe, 2019)

- ▶ Increased insecurity associated with climate change impacts, disasters and environmental degradation, which may exacerbate existing drivers of conflict (but note the contested nature of climate-conflict links) (Abrahams, 2020; Eklöw and Krampe, 2019)?
- Have risk assessments identified the underlying drivers of insecurity and critically examined the evidence for any context-specific links between climate and insecurity, identified which locations and groups are most at risk from climate change impacts and assessed how these locations and groups map onto existing patterns of insecurity?
- Have policies and measures been put in place to address existing drivers of insecurity and fragility, complemented with resilience and adaptation measures where appropriate?
- Have indicators been developed to track the drivers of insecurity, including underlying non-climatic drivers?

Societal trade-offs from outcomes of SDG 16 actions

- Have risk assessments examined the potential for interventions to:
 - ▶ Undermine or remove livelihood, income and coping options associated with activities outside the formal economy that may be illegal but provide financial security for certain groups
 - ▶ Label certain actors and livelihood strategies as security risks, for example, pastoralists in areas characterised by farmer–herder conflicts (Baldwin, 2013; Hartmann, 2010; Verhoeven, 2011)
 - ▶ Secure peace settlements that exclude or marginalise certain actors or parties to a conflict (Allan, 2021)
 - ▶ Create or exacerbate social, political or violent conflict through measures such as displacement, exclusion (from governance mechanisms, geographic areas, natural resource access/use, and so on), marginalisation (eg from decision-making processes) — for instance, in association with mitigation and adaptation actions?
- Have risk assessments identified which groups are most at risk from the above?
- Have policies and measures been put in place to minimise risks of exclusion, marginalisation, displacement, other adverse human rights impacts, and conflict creation/exacerbation?
- Have indicators been identified and monitoring mechanisms established to track impacts on groups most at risk from the above, and potential conflicts?

Environmental trade-offs from outcomes of SDG 16 interventions

- Have assessments considered the intervention's impacts on environmental vulnerability and emissions, such as:
 - ▶ Impacts of peacebuilding activities on environmental vulnerability and emissions, for instance, through changes in access to natural resources resulting from peace settlements and conflict resolution initiatives (eg cessation of conflicts can open up previously inaccessible areas to exploitation and settlement)
 - ▶ Peace settlements that normalise situations that undermine environmental sustainability or increase environmental vulnerability, for example, a ceasefire in Western Sahara normalises physical partition by 'berm', which disrupts drainage systems and starves downstream ecology of moisture, resulting in localised desertification (Allan, 2021)?
- Have policies and measures been put in place to track the impacts of interventions on natural resources, ecosystems, and environmental vulnerability?
- Have metrics for environmental health, vulnerability, and sustainable resource management been identified against which impacts of increased access to relevant areas and natural resources can be tracked?

Creation of longer-term and systemic risks from outcomes and impacts of SDG 16 interventions

- Have risk assessments considered how interventions may:
 - ▶ Predicate peacebuilding on arrangements for natural resource access/sharing and transboundary management that might be unsustainable or amplify risks under climate change (eg related to land and water use, and settlement and economic activity in areas at high potential future risk from climate-related disasters)
 - ▶ Promote peace settlements that marginalise or exclude certain groups for the sake of political expediency, denying them access to global climate governance and finance mechanisms and increasing their exposure and vulnerability to climate change (Allan, 2021)
 - ▶ Promote peace settlements that normalise governance arrangements that are unsustainable under climate change?

- Have interventions been designed to ensure that arrangements for resource use and resource sharing are sustainable under climate change, and that peacebuilding arrangements do not increase vulnerability and exposure through exclusion and marginalisation?
- Have metrics and/or criteria been developed to track/avoid environmental sustainability and exclusion/marginalisation in conflict contexts?

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SDG 17: Partnerships for the goals

Revitalise the global partnership for sustainable development

17 PARTNERSHIPS
FOR THE GOALS



Short-term risks to the implementation and outputs of SDG 17 interventions

- Have risk assessments identified potential hazards based on historical extremes, recent trends, and potential for unprecedented extremes that could:
 - ▶ Damage or destroy infrastructure enabling trade, affecting supply chains and reducing production and livelihoods (Becker et al., 2018)
 - ▶ Delay implementation and create difficulties in reaching target groups and locations for official development assistance, or transfer of science and technologies
 - ▶ Reduce the number and magnitude of collaborations due to increased implementation costs through, for instance, higher prices of materials and labour, increased personnel and administrative costs associated with delays to implementation or costs of losses and damages?
- Have risk assessments identified the changes in opportunities for investment, collaboration and partnerships in low- and middle-income countries and the most vulnerable communities and ecosystems at highest risk of disruption by these hazards?
- Have policies and measures been put in place to address implementation risks, including infrastructural adaptations and contingency plans for additional funds and support to the most vulnerable in the event of such hazards/disasters?
- If hazards/disasters have occurred, how do indicators (eg disaggregated data on livelihoods, on people engaged and benefiting from trade, on investment and collaborations, and on volume and quality of finance that reaches vulnerable areas and people) in affected areas compare with targets and indicators in non-affected areas (Abualghaib et al., 2019)?

Longer-term risks to outcomes of SDG 17 interventions

- Have risk assessments identified potential climate-related mechanisms that might undermine long-term outcomes, such as:
 - ▶ Reductions in investments, collaborations and partnerships bilaterally and globally due to the need to focus on responding to climate impacts nationally (eg redirection of funds from official development assistance for climate adaptation to support response to hurricanes in the United States)

- ▶ The risk that simplistic measurement of progress based on short-term timelines and focused on profit metrics emphasises more profitable yet less environmentally friendly intervention goals, production systems and investments (Michaelowa and Michaelowa, 2007)
- ▶ Investment, trade, scientific and technological transfers and partnerships favouring locations or sectors that are not the most vulnerable to climate change (eg making decisions based on the availability of the internet, electricity and transport), resulting in rural and isolated areas attracting less investment and collaboration (Brenton and Chemutai, 2021)
- ▶ Conflict and political disruption from climate impacts and related resource scarcity affecting the extent of collaboration between countries (Elgendy and Pouran, 2022)?
- Have risk assessments identified which groups within the realm of the intervention are most at risk from the above?
- Have policies and measures been put in place to identify and mitigate longer-term risks to the intervention outcomes? (for example, innovative debt financing instruments (Steele and Patel, 2021))
- Do indicators used for the governance of trade, investment and development capture aspects of evolving climate risks and resilience; do they track impacts and outcomes in the context of climate change (Newell et al., 2021)?

Societal trade-offs from outcomes of SDG 17 interventions

- Have risk assessments examined the potential for interventions to undermine livelihoods, despite providing SDG 17 benefits, for example, through:
 - ▶ Increased vulnerability of certain social groups when the volume of trade and official development assistance addressing sustainable development is reduced due to climate shocks (Friel et al., 2020)
 - ▶ Reinforcing unequal partnerships and power dynamics that favour formal elite and educated sections of populations at the expense of poor and less educated people
 - ▶ Global partnerships privileging certain types of experience and excluding the knowledge and experience of vulnerable groups (eg Indigenous communities)?

- Have risk assessments identified which groups are most at risk from the above? For instance, people who are not always considered by global production systems or employment, such as informal workers, disabled people, women, and Indigenous Peoples.
- Have policies and measures been put in place to maximise adaptation and resilience and address these risks?
- Have indicators been identified and monitoring mechanisms established to track inclusion (whether all social groups participate in co-designing sustainable development interventions), vulnerability, and evolution of climate hazards and associated losses and damages?

Environmental trade-offs from outcomes of SDG 17 interventions

- Have assessments considered the intervention's impacts on environmental vulnerability and emissions, such as:
 - ▶ Increased exports by developing countries based on short-term environmentally damaging, emissions-intensive and socially inequitable economic activities at the expense of long-term sustainable practices (Jensen, 2020)
 - ▶ Increased vulnerability of communities and ecosystems due to the externalities of investments implemented without appropriate environmental impact assessments, environmental safeguards or impact reduction and mitigation strategies (Brenton and Chemutai, 2021)
 - ▶ Increased pollution and emissions due to trade and investments based on non-renewable energy and carbon-intensive energy sources
 - ▶ Lack of diversification in investment, trade and collaboration based on metrics that prioritise financial gain at the expense of environmental sustainability?
- Have policies and measures been put in place to address these risks and maximise adaptation and resilience of production and economic systems, access to global finance and resources and long-term sustainable financial outcomes?
- Have metrics for environment, social and governance in trade and investment, adaptation and resilience, emissions, and other environmental impacts been identified against which the above can be measured and tracked?

Creation of longer-term and systemic risks from outcomes and impacts of SDG 17 interventions

- Have risk assessments considered how interventions may:
 - ▶ Privilege some actors (specifically states) over others (eg non-self-governing territories, Indigenous Peoples, autonomous regions and other non-UN member states), excluding the latter from financial and technical support for climate action
 - ▶ Direct disincentives for investment and trade in highly vulnerable regions, communities and ecosystems due to the high climate risks to production and productivity
 - ▶ Lock economies and communities into cycles of reliance on official development assistance for addressing sustainable development and the climate crisis, undermining domestic resource mobilisation efforts (Kompas et al., 2018).
 - ▶ Emphasise technocratic solutions in technology transfer over other solutions, including those involving behavioural change
 - ▶ Destabilise macroeconomic systems and global trade and investments, leading to nationalist/conservative economic and political agendas at the expense of global and transboundary collaboration (Batten, 2018)?
- Have interventions been designed with a conscious emphasis on transformational shifts towards sustainability, (net) zero emissions and resilience, including transformational adaptation strategies?
- Have metrics and/or criteria been developed to assess the extent to which interventions are promoting and driving transformational shifts in areas such as risk management, resource use, energy consumption and mobility?

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Knowledge
Products

Toolkit

July 2022

Monitoring, evaluation and learning; Climate change

Keywords:

Monitoring and Evaluation (M&E), development planning, transparency, climate change governance, Sustainable Development Goals (SDGs)

Seven years after the adoption of the 2030 Agenda and the Paris Agreement, the world has changed dramatically. Yet methods and approaches for evaluating sustainable development interventions have remained largely unchanged. Monitoring, evaluation and learning systems are failing to provide a basis for understanding how future sustainable development interventions can withstand the impacts of climate change. There is an urgent need for countries and the international community to move from looking at 'what works' to evaluating 'what will work'.

This guide will support evaluation commissioners and evaluators across sectors to integrate different and uncertain climate futures into their evaluations to achieve better planning. We provide the context for the imperative to shift towards evaluations that assess 'what will work' in the face of an uncertain climate future. We outline six practical steps for designing evaluations that integrate climate risks and provide two practical working tools to support that process.



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