



TAMMD



Tracking
Adaptation
and Measuring
Development:
*a manual for national
governments*



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Acronyms

CRM	climate risk management
DFID	Department for International Development
ICF	International Climate Fund (UK)
IEG	Independent Evaluation Group
IIED	International Institute for Environment and Development
IPCC	Intergovernmental Panel on Climate Change
M&E	monitoring and evaluation
NCCSP	National Climate Change Strategic Plan
NSDP	National Strategic Development Plan
RCTs	randomised control trials
TAMD	Tracking Adaptation and Measuring Development
ToC	theory of change
UNFCCC	United Nations Framework Convention on Climate Change

Introduction

This manual seeks to guide national governments to use Tracking adaptation and measuring development (TAMD) framework to monitor and evaluate climate change adaptation. TAMD evaluates adaptation success as a combination of how well institutions manage climate risks and how successfully adaptation actions keep development on course.

This guide is part of a set of three guides that build on the experiences of TAMD pilot countries to guide on how to apply TAMD. There is a general step by step guide for all users¹, a manual for local governments and this manual specifically for national governments wanting to use TAMD.

Officials from planning, environment and sectoral line ministries and members of climate change committees and commissions can use this guidance to:

- evaluate policies, plans and programmes;
- evaluate the status of institutional climate risk management (CRM) processes and mechanisms;
- track national development and adaptation performance in the context of evolving climate-related risks; and
- promote long-term thinking about adaptation and development.

National governments can also use this guide to help local governments establish M&E systems to track local adaptation and development performance, which can then be aggregated at national level.

This manual presents a set of institutional ready-to-use CRM indicators that can be adapted to different contexts and suggests ways to construct and define meaningful resilience and wellbeing indicators to track development and adaptation performance.



Government workshop, Cambodia, Neha Rai

1 | Brooks and Fisher, 2014

The TAMD framework

TAMD assesses institutional CRM (Track 1) and tracks adaptation and development performance (Track 2). These processes may be linked to each other and across scales within the TAMD framework. Figure 1 illustrates how the framework assesses the way in which Track 1 interventions influence Track 2 outcomes through various processes described in a theory of change ToC.

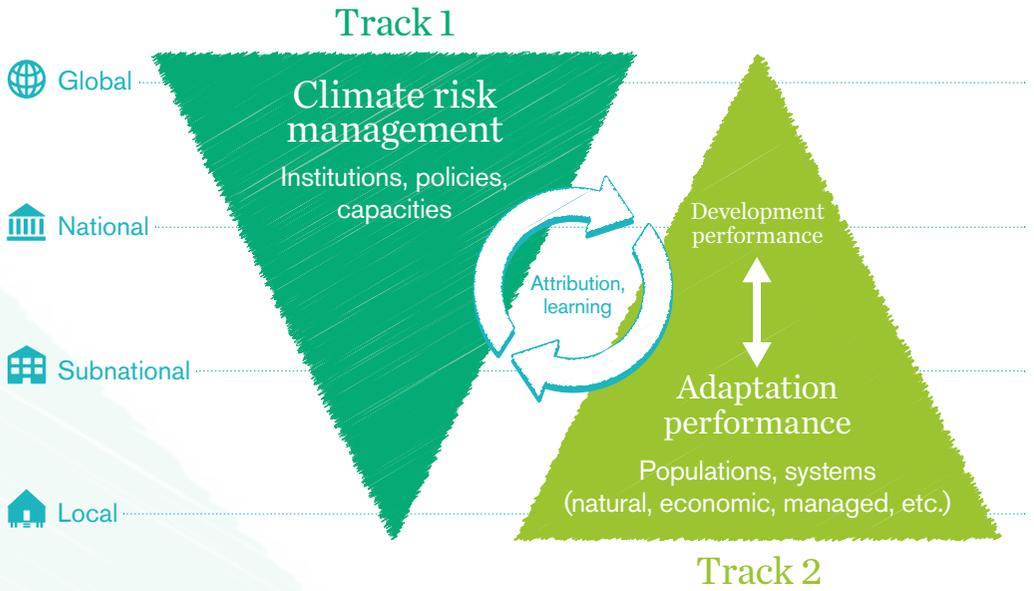


Figure 1. The TAMD framework

TAMD can also be used to evaluate an intervention’s outputs, short-term outcomes and longer-term impacts within and across both tracks, at scales ranging from multiple countries to individual villages. It can explore how adaptation and/or adaptation-relevant interventions contribute to better CRM, improve resilience and help keep development outcomes on course in a changing climate.

Box 1. Outputs, outcomes and impacts

The results of specific government interventions are most likely to be described as:

- ▶ **Outputs:** goods and services delivered.
- ▶ **Outcomes:** shorter-term changes in the population or system targeted by the intervention, resulting from the outputs.
- ▶ **Impacts:** longer-term changes that result from outputs and outcomes.

Climate risk management

Track 1 captures the institutions, policies and capacities for CRM - for example, the capacity to manage climate risks in the national climate change strategy or at sectoral level. A set of nine indicators have been developed for Track 1, which can be modified for different contexts (see 3.1).

Theories of change

A ToC relates a specific adaptation activity to its anticipated results through a set of causal mechanisms. In the TAMD framework, this can be between Tracks 1 and 2, connecting CRM to changes in resilience, or within one track. Once a ToC has been established, TAMD provides a framework for exploring the links between CRM, resilience and wellbeing/development outcomes. This can be achieved by locating these elements and the linkages between them across the TAMD framework.

Adaptation and development performance

Within Track 2, interventions should improve resilience – the ability to continue functioning in the face of shocks and stresses – and adaptive capacity – the ability to respond effectively to changing stresses and shocks, to manage or reduce risk. It should also or alternatively reduce vulnerability – the susceptibility to being harmed when exposed to an external shock or hazard.²

More simply, interventions should improve people's and systems' underlying capacity to anticipate, avoid, plan for, cope with, recover from and adapt to (climate-related) stresses or shocks. Such improvements may be characterised as outcomes. We will consequently refer to indicators of these first-level Track 2 outcomes as resilience-type indicators in this guide.

Improvements in resilience and adaptive capacity and reductions in vulnerability represent intermediate goals that should ultimately improve human wellbeing and reduce the costs of climate-related stresses and shocks. These are often referred to as development outcomes or impacts. We refer to these second-level Track 2 indicators as wellbeing indicators. They include common development indicators relating to health, nutrition, poverty/economic status, education, assets, livelihoods and lives.

Track 2 therefore encompasses both changes in resilience (adaptation-specific results) and improvements in wellbeing (more general development results).

² See the glossary of IPCC (2014) Working Group II of the report for detailed definitions

Steps in applying TAMD

Figure two shows the six key steps national governments should follow when applying TAMD.

	1	Scope	Entry points; existing systems; purpose.
	2	Theory of change	Linkages; pathways; outputs, outcomes and impact.
	3	Defining and constructing indicators	Climate risk management; resilience-type; wellbeing; climate.
	4	Measuring indicators	Sampling; baselines; methods; climate indices.
	5	Analysing and interpreting results	Attribution; aggregation; contextualising.
	6	Learning	Revisions; lessons; communicating.

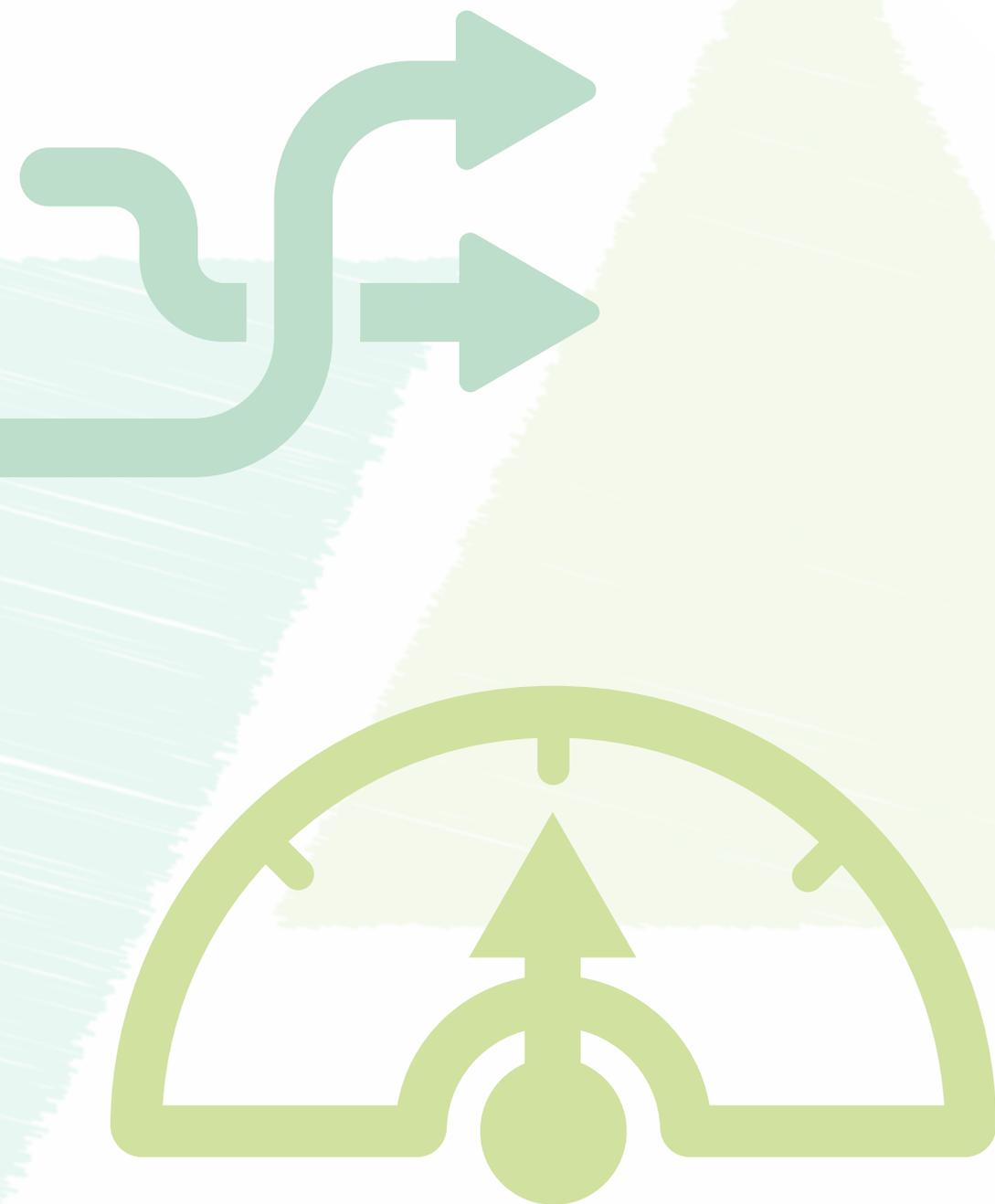
Figure 2. The six steps in applying TAMD

These steps are iterative: results from one step can feed back into previous steps, and steps may be repeated, leading to refinements and improvements. TAMD results can be used to inform planning for subsequent adaptation investments and activities, and to develop CRM processes.

There are also cross-cutting issues – such as gender equality and the political context – to consider when applying TAMD.³

3 | Fisher, 2014

Steps





Step 1: Define scope

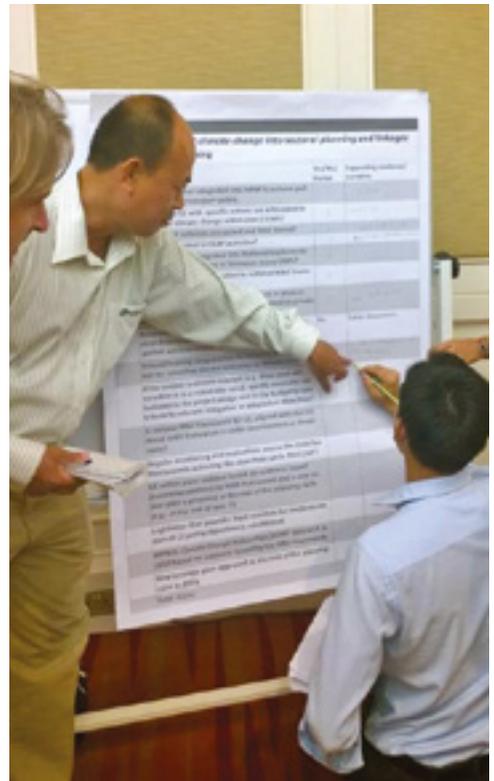
The first step in applying TAMD is identifying the scope and purpose of the M&E, including:

- entry point(s) for adaptation M&E – for example, tracking adaptation performance at national or sectoral level
- spatial and time scales (closely linked to the purpose);
- target populations and systems; and
- climate-related (and other) hazards to which they are exposed and the consequences of exposure.

Tracking national or sectoral adaptation performance is likely to focus on the quality of CRM processes and mechanisms at national level and how these are linked to national development performance (see Steps 2–5). This type of tracking will take place over long timescales – years or decades. Within such contexts, TAMD might be integrated into, or used to inform the development of, existing national M&E systems.

Populations, systems, hazards and consequences should be identified together, as differences in physical location, livelihoods or levels of poverty and vulnerability mean that consequences will differ between populations and systems. Identifying sources of information on the prevalence of hazards and their consequences for populations, groups, locations and sectors is an important part of scoping. This includes climate data for characterising climate hazards.

Table 1 summarises the most likely entry points for national governments to use TAMD, and the focus of each application.



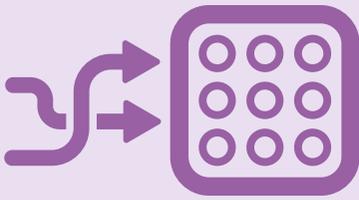
Government workshop, Cambodia, Neha Rai

Table 1. National government application levels of TAMD

Entry point	Focus		Spatial and time scales	
	Track 1	Track 2	Spatial	Time
Tracking national-level performance of adaptation	National-level institutional mechanisms for CRM	National-level development performance	National	Long (years to decades)
Tracking sectoral performance of adaptation	Sector-specific CRM	Resilience of sector Sector performance Resilience of people and (development performance of) communities as relevant to sector	National Sectoral	Long (years to decades)
Evaluating the impacts of particular policies	Policy-specific Likely to focus on CRM	Likely to focus on resilience and impacts	National or district	Short to medium (years to around a decade)

Checklist:

- Have you decided on the scale (policy, sectoral, national institution) of your M&E?
- Have you outlined targeted populations and systems, climate-related hazards and the consequences of these hazards on exposed populations and systems?
- Have you identified relevant data sources and existing M&E systems?



Step 2: Theory of Change

The next step is articulating a ToC to frame and guide your M&E. A ToC is an explanatory model or narrative that links specific interventions with outputs, outcomes and impacts via causal mechanisms and pathways.⁴

Governments can use an existing ToC or develop a new one with relevant stakeholders. Figure 3 shows how the Cambodian government built on existing ToCs from its National Strategic Development Plan (NSDP) and National Climate Change Strategic Plan (NCCSP) to create a new one. Table 2 presents some very broad ToCs for the different entry points for TAMD application.

Example of Cambodia National Pathway

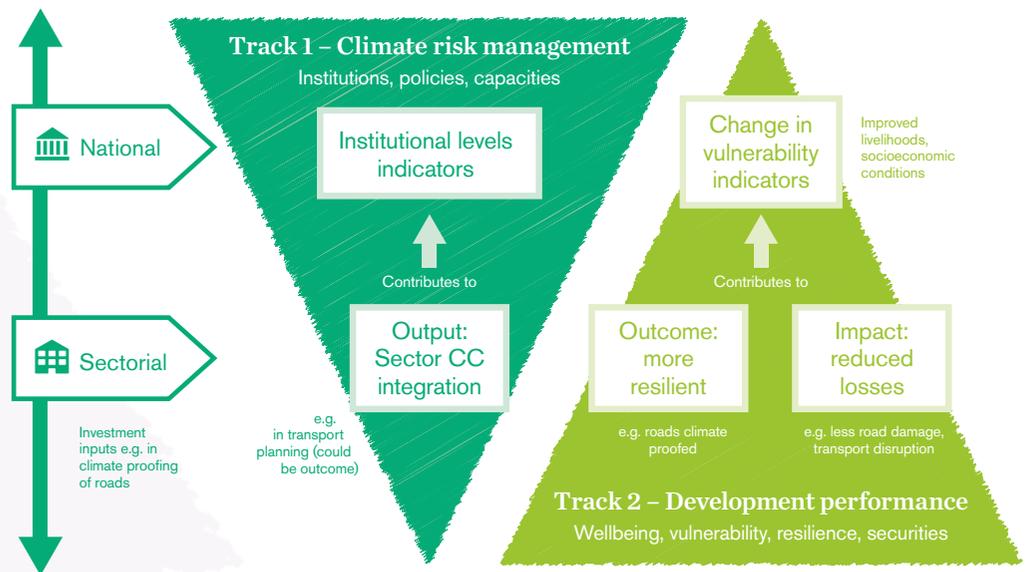


Figure 3. Cambodia's national pathway

4 | For a more detailed discussion of ToCs, see Vogel (2012) and Bours et al. (2014).

Table 2. National government application levels of TAMD

Entry point	Theory of Change
Tracking the performance of adaptation at the national level	Improved national-level CRM leads to better sub-national-level CRM, enhances resilience and builds the adaptive capacity of people, institutions and systems to respond effectively to climate change and secure and improve wellbeing and development performance.
Tracking the performance of adaptation within a particular sector	Improved sector-level CRM makes the sector more resilient and better able to respond effectively to climate change risks, thus improving performance.
Evaluating the impacts of particular policies	Policies that address climate change (directly or indirectly) influence CRM processes and factors that are important for people's and communities' resilience (and/or drivers of vulnerability).

2.1 Establishing a theory of change

Developing a ToC will identify the following.

- ▶ Assumed causal mechanisms and pathways that lead from hazards to consequences, including physical/geographical variations in exposure, societal drivers of vulnerability, limits to resilience and constraints on coping and adaptation capacities.
- ▶ Adaptation processes and mechanisms – such as better CRM and improved resilience – anticipated to result in a reduction in the consequences of hazards.
- ▶ Changes in causal mechanisms and pathways, and in the consequences of hazards, that are expected to result from adaptation and might be tracked using indicators.

Where TAMD is applied to track general adaptation and development performance, ToCs may seek to explain how multiple, evolving national-level CRM processes and mechanisms influence resilience, vulnerability and adaptive capacity, and/or how changes in these phenomena affect wellbeing and development at large. At this level, the ToC might play an important role in linking CRM and development outcomes, which can be tracked at national level.

Where TAMD is applied to the M&E of a specific government intervention, a ToC should explicitly link the intervention's outputs, outcomes and impacts. National-level ToCs can guide ToCs at project, programme or sub-national levels. ToCs should result in assumptions about how adaptation activities will make desired results explicit through narratives that identify and describe the (assumed) causal mechanisms and the processes leading from interventions to results.

ToCs should consider how the processes, mechanisms and pathways that link hazards to consequences and adaptation activities to improved CRM, resilience and wellbeing might differ for different groups – most obviously, genders.

Narratives should be developed and reviewed in cooperation with core planning, finance and environment ministries as well as sectoral line ministries and other stakeholders, including beneficiaries.

2.2 Defining pathways through the TAMD tracks

Once a ToC has been established, TAMD provides a framework for exploring the links between CRM, resilience and wellbeing/development outcomes and outputs, outcomes and impacts. Locating these elements and the relationships between them, on the TAMD tracks will provide a pathway through the tracks representing the ToC.

Where there is an institutional component to the system undergoing M&E, the entry point should be located in Track 1, representing its contribution to CRM. Interventions and systems that do not target climate change explicitly or directly might still deliver ancillary adaptation benefits – for example, poverty reduction or agricultural interventions might reduce risks associated with climate variability.

The pathway will then move from Track 1 to 2, first leading to changes in resilience, adaptive capacity and/or vulnerability, and then to changes in wellbeing and development performance. Table 3 provides an example of possible changes from a national-level intervention.

Table 3. Changes in Tracks 1 and 2 for a national-scale intervention

Intervention type	Example	Track 1 changes	Track 2 changes
Improvements in CRM at national level	Climate proofing transport infrastructure	Use of climate projections to inform planning and design of transport infrastructure (e.g. location, specifications)	Lower incidence of climate-related disruption of transport services due to increased resilience of transport infrastructure Reduced loss of access to trading routes due to climate effects, resulting in better market access, improvements in incomes, investment in livelihoods, poverty reduction and economic growth

2.3 Outputs, outcomes and impacts in the TAMD tracks

At a general level, we might map outputs, outcomes and impacts to improvements in CRM processes and mechanisms; resilience of populations and systems, and wellbeing and development performance. This approach would be associated with outputs located within Track 1 and outcomes and impacts located with Track 2.

However, there is considerable variation across institutions and interventions in terms of how outputs, outcomes and impacts are defined. In principle, these can be located anywhere within the TAMD tracks, depending on whether they are associated with CRM or changes in resilience or wellbeing.

In practice, however, outputs are more likely to be in Track 1, framed in terms of their contribution to CRM. In some instances outcomes and impacts might also be located in Track 1, for example where an intervention works towards the establishment of CRM systems, process and mechanisms. Where these outputs are represented by fully-fledged CRM systems, processes and mechanisms, the outcomes and impacts will almost certainly be in Track 2.

Checklist:

- Have you linked the climate-related hazards and consequences of these hazards in a ToC?
- Have you identified the relevant adaptation mechanisms that will address these hazards and their consequences?
- Have you developed the ToC by involving relevant government stakeholders?
- Have you mapped the ToC as a pathway on the TAMD framework?
- Have you located outputs, outcome and impacts on the pathway?



Step 3: Define indicators

Indicators are metrics that measure change. They can be used to describe a situation, monitor the evolution of a situation and/or measure achievements against an objective, comparing quantitative or qualitative units to a baseline. The TAMD framework defines four categories of indicators – CRM in Track 1 and resilience, wellbeing and climate hazards in Track 2.⁵

3.1 CRM indicators

CRM indicators assess the extent and quality of institutional processes and mechanisms for addressing climate-related risks. TAMD has nine generic institutional CRM indicators.⁶

1. Climate change integration into planning
2. Institutional coordination for integration
3. Budgeting and finance
4. Institutional knowledge and capacity
5. Climate information
6. Uncertainty
7. Participation
8. Awareness among stakeholders
9. Existence and coverage of local CRM processes

The TAMD CRM indicators have a scorecard format. Each indicator consists of five questions that ask whether a particular criterion has been met, to which the answer is 'no', 'partially' or 'yes' (scored as 0, 1 or 2 respectively). Examples of scorecards can be found in Annex 1.

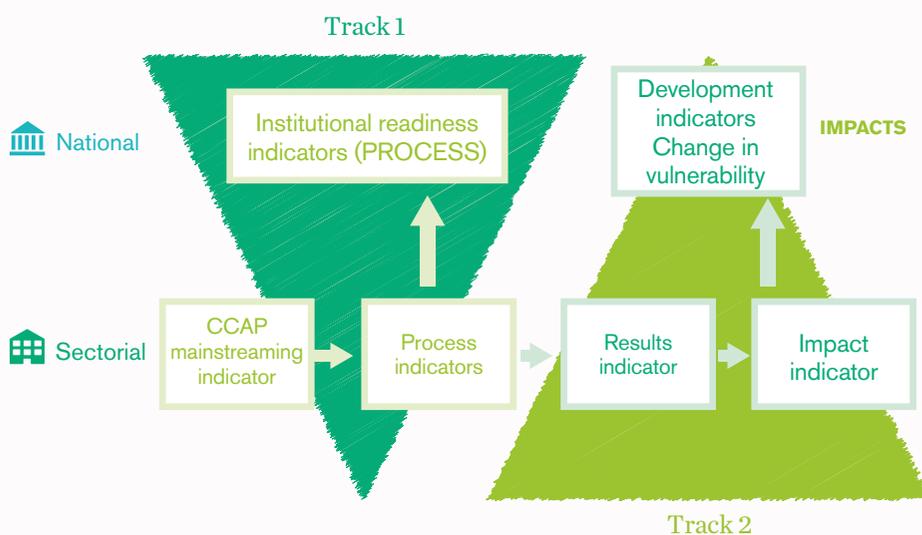
The scorecards can be used as they are, or modified for different contexts, with questions from different CRM indicators combined into new indicators. The scoring system can also be modified – for example, scoring 1–5 or 1–10 rather than 0, 1 or 2 for no, partial or yes would enable more subtle changes to be tracked. Track 1 indicators can be integrated into existing government M&E systems.

5 | Brooks, 2014

6 | Brooks et al., 2013

Box 2. Adapting TAMD CRM indicators to national contexts

The Government of Cambodia use TAMD to facilitate a national indicator framework for climate change M&E. Using TAMD, they developed national-level CRM process indicators related to capacity development and institutional reforms using a scorecard system (see Appendix 2). They prioritised the indicators into five key national areas, and developed readiness ladders to track progress in national-level CRM processes. They also adapted these ladders as sectoral indicators, and integrated them with the core indicators for the Pilot Programme on Climate Resilience.



CCAP: Five-year Climate Change Action Plans developed at the sectoral ministry level

3.2 Resilience-type indicators⁷

Resilience-type indicators seek to capture people's and systems' ability to anticipate, avoid, plan for, cope with, recover from and adapt to (evolving) stresses and shocks. These indicators generally seek to describe characteristics or attributes that affect people's or systems' propensity to cope with or be harmed by shocks and stresses. They are also predictive: higher resilience indicates a smaller likelihood of harm in the event of exposure to a hazard.

⁷ | Detailed guidance on measuring resilience has been developed to support the UK International Climate Fund (ICF)'s Key Performance Indicator No. 4 (KPI4). See: <http://bit.ly/1t9xcn2>

Resilience-type indicators are highly context specific and should therefore be developed on a case-by-case basis (see Boxes 3 and 4). They may overlap with development indicators – such as poverty, health, nutrition, demographic and economic indicators – but this should not be assumed.

Box 3. Dimensions of resilience

In general terms, resilience can be broken down into a number of dimensions which vary across contexts. A recent review identified the following potential dimensions of resilience.

- ▶ **Assets:** both physical and financial – e.g. food and seed reserves (contingency).
- ▶ **Access to services:** water, electricity, early warning systems, transport, knowledge, information.
- ▶ **Adaptive capacity:** ability to anticipate, plan for and respond to longer-term changes – e.g. by modifying current practice, creating new strategies.
- ▶ **Income and food access:** the extent of people's poverty or food insecurity before a stress/shock.
- ▶ **Safety nets:** formal and informal support networks, emergency relief, financial mechanisms such as insurance.
- ▶ **Livelihood viability:** the extent to which livelihoods can be sustained in the face of shock/stress; the magnitude of shock/stress that can be accommodated.
- ▶ **Institutional and governance contexts:** the extent to which governance, institutions, policy, conflict and insecurity constrain or enable coping and adaptation.
- ▶ **Infrastructural contexts:** the extent to which coping and adaptation are facilitated or constrained by the quality and functioning of built infrastructure, environmental systems, natural resources and geography.
- ▶ **Personal circumstances:** other factors that make individuals more or less able to anticipate, plan for, cope with, recover from and adapt to changes in stresses/shocks – e.g. debt, low socio-economic status.

Box 4. Statistical approaches to identifying resilience-type indicators

One way of identifying resilience-type indicators is to examine the significance of the relationship between socio-economic and other (e.g. environment or governance) variables and measures of the effects of climate hazards, such as mortality or economic losses. In such an analysis, the variables should be time lagged, so that measures of hazard effects represent a period after that represented by the socio-economic variables. When these are strongly correlated with hazard effects, they can be used as proxies for resilience or vulnerability, based on their ability to 'predict' these effects. It is important to seek logical explanations for strong correlations between these variables, to eliminate the possibility of spurious correlations.

This approach was used in Cambodia to identify indicators of vulnerability to floods, storms and droughts, using local-level data in a national database. They isolated a small sub-set of vulnerability indicators from a much larger one and used these to produce preliminary maps of vulnerability to different types of hazards at commune and district levels. These indicators can be validated and possibly augmented – e.g. through the inclusion of new, vulnerability-focused questions in the national census – on the basis of participatory vulnerability assessments in selected communes.

The concepts of resilience, vulnerability and adaptive capacity are only meaningful when they refer to specific entities, hazards, consequences and timescales. In other words:

- ▶ Who is (not) resilient?
- ▶ To what?
- ▶ With respect to what consequences?
- ▶ Over what period(s)?

For example, when we talk about a population's resilience to future droughts over the next decade, specifying the consequences – reduced food security – allows us to link resilience with wellbeing and to identify relevant wellbeing indicators within our ToC.

Once we have identified the factors that are most important for mediating resilience, vulnerability or adaptive capacity, we need to construct indicators for measuring and tracking them.⁸

Within national M&E systems, changes in resilience might be aggregated from data at the district, village, household or even individual level. Such aggregation will only be possible if resilience-type indicators are measured at these levels.

Resilience-type indicators might be based on questions incorporated into census or other surveys conducted at the national level that target individuals or households. However, given the highly context-specific nature of resilience, vulnerability and adaptive capacity, such questions need to be constructed very carefully. It might be possible to identify general questions that provide information on key aspects of resilience across different populations and contexts. However, it is more likely that questions designed to yield information on resilience will need to be different for different population groups and contexts. One way of addressing this problem is to undertake assessments that seek to disaggregate national populations according to the factors influencing their resilience, vulnerability and adaptive capacity. Such disaggregation might be based on geographic location, type of livelihood, gender, level of poverty, etc. Once different 'resilience groups' have been identified, these groups might be sampled at regular intervals (e.g. every few years) to see how their resilience is evolving, the results from sampling might be scaled up to the national level.

An alternative approach is to identify the characteristics that make particular districts or smaller administrative units more or less resilient to climate shocks and stresses. These characteristics can be represented by indicators that can be reported by sub-national bodies (e.g. district governments).

Other entities whose resilience might be tracked under national monitoring systems include sectors (e.g. agriculture), infrastructure (e.g. water, transport), ecosystems and local economies. Again, relevant indicators will need to be identified that represent the key factors mediating the ability of these systems to anticipate, plan for, avoid, cope with, recover from and adapt to the evolving climate stresses to which they are exposed.

8 | Guidance on identifying, constructing, aggregating and interpreting resilience-type indicators – originally developed to support the UK International Climate Fund (ICF) and DFID's BRACED programme – can be applied to any project or programme targeted at resilience, vulnerability or adaptive capacity. See: <http://bit.ly/1t9xcn2>

3.3 Wellbeing indicators⁹

Ultimately, adaptation success will be measured in terms of indicators that represent the costs of climate-related shocks and stresses to assets, livelihoods and lives. This will overlap to a large extent with standard development indicators.

3.4 Climate hazard indicators

Climate indicators identify and track trends and variations in climate hazards that may complicate the interpretation of wellbeing indicators. If we are to use measures of wellbeing to assess adaptation, we should consider other factors or events including climate variations.

Climate indicators should represent the hazards that are most relevant to the adaptation context, at different scales – from the processes resulting from a hazard to the adverse consequences targeted by adaptation actions. The most common indicators of climatic conditions – average or extreme temperature, average daily rainfall, total annual or seasonal rainfall – may be some of the least useful. More useful indicators often collected by the national meteorological agencies include:

- maximum rainfall intensity (for runoff and flood risks);
- composite drought indices; onset date of seasonal rains;
- number of days without rain during the growing season; and
- intensity of destructiveness.

3.5 Linking indicators and scales

Different types of indicators should then be linked by a ToC (Step 2).

The scales at which different types of indicators are measured also need to be considered, as these may differ. For example, it may be possible to link a national-level CRM with improvements in district or local-level resilience.

9 | See Appendix 4 for examples of wellbeing indicators.

Checklist:

- Have you identified the categories of indicator you need?
- Have you identified relevant output, outcome and impact indicators in your existing plans, strategies and databases?
- Can you use existing TAMD scorecards? Do you need to modify them or create new ones?
- Have you identified appropriate proxies of resilience for resilience-type indicators from existing databases?
- Can you use wellbeing indicators from existing sources and link these to existing monitoring systems?
- Have you identified appropriate climate indices to assist in interpreting the results of wellbeing indicators?
- Are all indicators logically linked in the ToC?



Men going to market, Ethiopia, Susannah Fisher



Step 4: Measuring indicators

4.1 CRM indicators

Data for CRM indicators can be gathered via:

- ▶ Self-assessment – for example, where an institution is tracking the development of its own CRM capacities.
- ▶ Expert assessment by national consultants who are familiar with the relevant contexts.
- ▶ Structured or semi-structured interviews or focus groups with key stakeholders.

The relevant indicator scorecards for tracking institutional CRM processes should be completed at regular intervals – annually or bi-annually. The first set of measurements will constitute a baseline. It is important to record and collate narratives from stakeholders and experts to support the interpretation of scorecards.

4.2 Resilience-type indicators

Resilience-type indicators measure characteristics of populations and systems, and therefore can be measured at any time – it is not necessary to wait until shocks and stresses have occurred in order to measure whether resilience, vulnerability and adaptive capacity have improved. Where resilience, vulnerability and/or adaptive capacity are being tracked as part of national monitoring systems, the relevant indicators might be measured every few years. Where changes in resilience indicators are being measured to assess the success of a specific intervention, data might be collected at the beginning and end of the intervention.

As mentioned in Step 3, resilience-type indicators might be incorporated into national census or surveys. Where this is not practical, results from national databases can be validated through periodic sampling and household surveys, with populations assessed by

1. Longitudinal surveys of small representative samples. This involves tracking changes in the circumstances of the same individuals or households over time.
2. Longitudinal surveys of statistically representative samples. This could involve building questions on resilience into national census.
3. Randomised (or cross-sectional) sampling of populations. Such samples can only reveal changes over time in very general terms. They cannot tell us how many people experience improvements or declines in resilience. Population sampling needs to address the issue of disaggregation to understand the experiences of different groups, enabling those responsible for M&E to identify people who are not benefiting from adaptation activities.

4.3 Wellbeing indicators

In contrast to resilience-type indicators, wellbeing indicators should be measured over periods that include hazard events. This is so the effects of hazards on wellbeing can be identified and assessed (e.g. adverse impacts on health, mortality and economic growth of climate shocks). This will involve monitoring over several years to ensure:

- comparison of the effects of similar shocks/stresses before and after adaptation actions or policies have been taken;
- comparison of the consequences of a shock/stress across different groups/populations; or
- assessment and comparison of the effects of a shock/stress, with expectations –of what would have happened in the absence of adaptation actions of policies.

For M&E within national systems, the focus is more likely to be on tracking wellbeing indicators over long periods to identify trends. Indicators for costs in terms of assets, livelihoods and lives should be cumulative, aggregated over periods of a year or longer.

It is good practice to construct historical baselines for wellbeing indicators wherever possible, to place changes in a longer-term context. This is easier with wellbeing than resilience indicators, as the former overlap significantly with development indicators. Where baselines cannot be constructed for recent historical periods, you can track changes in wellbeing using climate indices to contextualise or calibrate indicators (see Step 5).

4.4 Climate indicators and indices

Climate indicators should be measured parallel to wellbeing indicators wherever possible to characterise variations and identify trends. The frequency of measuring climate data will be greater than frequency of measuring wellbeing indicators, and will depend on which climate variables are most relevant. For example, wellbeing indicators might include annual measures of agricultural productivity, which are affected by droughts and heavy rainfall. Droughts are unlikely to be measured in terms of annual rainfall, but rather in terms of indicators such as the number of days without rain in the growing season, meaning that rainfall data will need to be measured on a daily basis. Similarly, rainfall intensity will be measured in terms of variables such as the maximum amount of rainfall in a 24 hour period, again requiring daily data.

It is highly desirable to construct historical climatic baselines (climatologies) over as long a period as possible. This enables us to determine whether climate hazards are intensifying and whether changes are historically unusual – in other words, manifestations of climate change. However, climate data is often sparse or non-existent, making the reconstruction of historical baselines difficult. In such circumstances, efforts should be made to establish systems to measure the climate variables that are most relevant to the wellbeing indicators being tracked.

Table 4. Baselines and sources for different indicator types

Indicator/index type	Baseline	Sources
CRM	Construct from first application of scorecards	Scorecards completed by stakeholders
Resilience-type (including vulnerability, adaptive capacity)	Construct at start of monitoring period	Proxies of resilience identified within national databases
Wellbeing (development performance, costs to assets, lives, livelihoods)	Historical baselines desirable, otherwise construct at start of monitoring periods	Most likely secondary (census, national databases); some primary collection may be necessary
Climate	Historical baselines (averages) highly desirable	National hydro-meteorological services; international organisations

Checklist:

- Have you established how you will collect data on the scorecards?
- For resilience-type indicators, have you established how you will gather baseline data?
- For wellbeing and climate indicators, can you construct a historical baseline?
- Have you determined how climate indices will be measured and used?
- How can secondary data and primary data support each other?
- How often do you need to collect data on indicators?
- For resilience-type and wellbeing indicators, how will you disaggregate results?



Step 5: Analysing results

Indicators need to be interpreted to determine whether, how and why CRM, resilience and wellbeing are improving. Where indicators are used to assess the effectiveness of national activities, the extent to which changes reflected in the indicators can be attributed to these activities will need to be evaluated. Assessment of whether or not CRM, resilience or wellbeing has improved, and the attribution of any such improvements to particular activities, will be based on different approaches for each of these three types of indicator.

5.1 CRM indicators

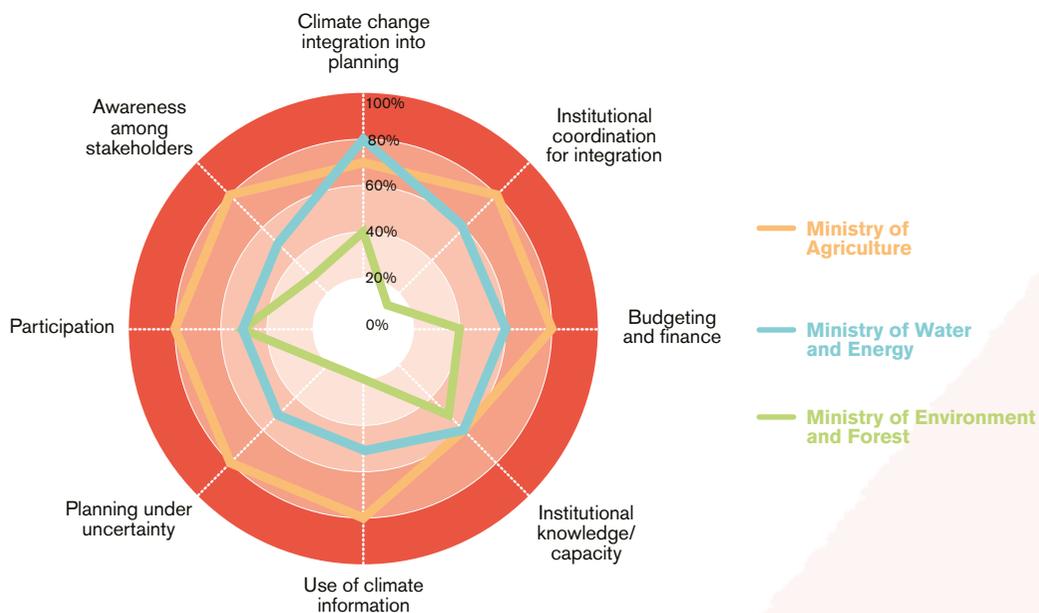
Changes in scorecard-type CRM indicators are relatively straightforward to interpret. Changes in the scores for individual indicators can be tracked over time, while multiple indicators can be aggregated by adding scores together. The generic TAMD CRM Track 1 indicators have been constructed so that higher scores should indicate improved CRM. Nonetheless, it is still desirable to complement these indicator scores with narrative information so that a clear picture of the extent and nature of any improvement.

Another way of evaluating improvements in CRM within a system is to construct a “ladder” of CRM measures that defines a pathway of improvement for the system. This can be done for different dimensions of CRM (c.f. the different TAMD Track 1 CRM indicators). Such ladders can be tailored to specific systems, as has been done for the Cambodia national climate change response M&E system (see Box 2). Track 1 indicators can also be tailored to assess CRM at different scales. For example, institutional scorecards were used at the national, regional and Woreda levels to understand the institutional context for the Sustainable Land Management Programme (SLMP) in Ethiopia (see Appendix 3). At the national level, the assessment shows varying level capacity in managing climate risks within environment, water and energy and agriculture ministry (Awraris et al., 2014).

Figure 4 demonstrates the results of a national level assessment in Ethiopia across the nine dimensions covered by the CRM scorecard.

If CRM indicators reveal an improvement in the extent and quality of CRM, the extent to which this can be attributed to an intervention will need to be assessed. We can gather supporting narratives from experts and/or stakeholders regarding how and why they believe CRM has improved as a result of specific activities, and convert their answers into quantitative scores.

Figure 4: Results of national-level CRM assessment in Ethiopia



	Indicator	Score % for		
		Ministry of Agriculture	Ministry of Water and Energy	Ministry of Environment and Forest
1	Climate change integration into planning	70	80	40
2	Institutional coordination for integration	80	60	10
3	Budgeting and finance	80	60	40
4	Institutional knowledge/capacity	60	60	50
5	Use of climate information	80	50	20
6	Planning under uncertainty	80	50	20
7	Participation	80	50	50
8	Awareness among stakeholders	80	50	30

5.2 Resilience-type indicators

Analysing resilience-type indicators can show changes over time in the dimensions or aspects of resilience being tracked.

Multi-criteria approaches, thresholds and coupled indicators

Changes in resilience might be tracked using multiple individual indicators, or multiple composite indices, with each representing a particular dimension of resilience. Where multiple composite indices are tracked, the number of indices is likely to be small. We might say that resilience has improved in general if some of these indicators show improvements while others remain stable.

Attributing/contributing changes in indicators to adaptation actions

Where resilience-type indicators exhibit improvements, we may want to assess whether these improvements can be attributed to specific actions. At the national level, governments might simply assume attribution/contribution where improvements in resilience parallel adaptation activities. Assessing attribution is also an important part of comparing adaptation approaches or assessing multiple adaptation interventions in similar contexts. To be comparable, adaptation or CRM activities need to take place in similar contexts and their ToCs must have the same end points.

National governments may use a number of approaches to complement the analysis of national trends (directions of change) with methods for attributing changes to adaptation actions.

- **Stakeholder or beneficiary narratives** can provide information on the extent to which government stakeholders think a specific activity has contributed to changes in resilience.
- **Randomised control trials** are involve sampling statistically representative sections of a treatment (beneficiary) and control (non-beneficiary) population to establish any significant differences in key indicators between the two groups (Humphreys et al., 2012, Gilbert, 2013).
- **Difference-in-difference approach** involves measuring indicators before and after an intervention for sample populations from a treatment and control group and comparing the differences in indicators between the two populations.
- **Large-scale longitudinal studies** track changes in the circumstances of the same individuals or households over time. In the national contexts, such studies might be carried out using sufficiently large numbers of individuals to be representative of a population at large, or using a much smaller number of carefully selected population that are representative of the population at large. The resilience of these individuals or households can tracked using appropriate resilience indicators through surveys that also incorporate attribution questions where these are relevant (e.g. to a particular set of actions or policies). Longitudinal studies might examine those benefiting and not benefiting from certain adaptation activities, bringing in elements of RCTs and the difference-in-difference approach and thus combining comparisons in time with comparisons in space.

These methods are statistically powerful, but require significant resources and raise both practical and ethical issues, particularly when conducting national-level M&E.

5.3 Wellbeing indicators and climate data

As with other indicators, a key challenge in analysing and interpreting wellbeing indicators is attributing changes to specific activities and determining whether they demonstrate that adaptation has taken place. We can apply the same methods used for resilience-type indicators, outlined in 5.2.

Climate data and information can help contextualise or calibrate wellbeing indicators. Considering qualitative climate information alongside wellbeing indicators will help determine whether any changes have occurred in the context of worsening, stable or improving climate hazards. Using quantitative climate data will confirm that both groups are exposed to the same climate hazards. Climate information therefore has an important role to play in ‘contextualising’ RCT, difference-in-difference and longitudinal studies.

Climate information can also help contextualise or calibrate wellbeing indicators to evaluate adaptation effectiveness where RCT or difference-in-difference approaches are not feasible.

Approaches to contextualising wellbeing indicators

There are various different approaches to using climate data to contextualise wellbeing indicators.



Theory of change process with national meteorological agency, Ethiopia, Diane Guerrier

Table 5. Contextualising wellbeing indicators

Approach	Purpose	Level of resources needed	Level of technical capacity needed	Data used
Narratives informed by climate information	To explore reasons for changes in wellbeing – gives context and narrative.	Low to medium – for participatory assessments and surveys to construct or collect narratives.	Low	Stakeholder perceptions informed by data on mortality, economic losses or other costs where available.
Case-by-case comparison	To compare effects of similar climate hazards before and after adaptation measures/actions have been taken.	Medium	Medium	Climate data used to compare cases (do not require long historical climate records). Stakeholder perceptions and/or data on mortality, economic losses or other costs.
Combined climate and wellbeing metrics	To create indices linking wellbeing with climatic stresses and shocks.	Medium	Medium	Need to cover long periods over which many hazards occur and trends can be identified.
Statistical modelling of counterfactual	Compare wellbeing changes against a counterfactual situation over long timeframes.	High	High	Good climate and wellbeing data spanning a period of sufficient duration to represent trends and correlations.

1. Case-by-case comparisons

Climate data can illuminate the severity of individual hazards. For example, daily pressure, rainfall and maximum wind speed data can be used to characterise storms and identify events of similar magnitude occurring in the same district. Such events might occur before and after certain adaptation actions have taken place, allowing comparison of asset and livelihood costs and impacts on wellbeing. Using stakeholder narratives and other analyses, we can then compare the differences in wellbeing indicators to see if they can be explained in terms of adaptation delivered by particular interventions.

2. Combined climate and wellbeing metrics

By combining climate data with wellbeing indicators we can create indices of losses for each event – for example, mortality per flood or drought. Such indices are crude and might be misleading if they are not supported by contextual information about the relative magnitudes of hazard events. If used at all, these indices should examine losses per event above a specified magnitude, or losses per event for hazards within a specified range of magnitudes. These indices might be more useful if they are based on average losses across a number of events, measured over a period significantly longer than (i) the return period and (ii) any cycles of variation, of the hazard(s) in question. Average losses can then be compared over time for these multi-year periods, although such comparisons can by definition only be made on timescales measured in multiples of the period over which losses per event are averaged. Nonetheless, this might be a useful approach for tracking adaptation effectiveness at the national level on timescales of decades.

3. Statistical modelling of counterfactuals

There may be quantitative relationships between climate variables and wellbeing indicators – for example, there is a strong correlation between rainfall and GDP growth in some African countries – and in sub-Saharan Africa as a whole.

We can use such historical relationships to model wellbeing indicators. For example, linear regression can help predict the expected values of wellbeing indicators in the absence of adaptation, creating a counterfactual scenario based on the correlation between these indicators and climate variables. We could then compare these wellbeing values with measured values of wellbeing indicators.

We can also construct a counterfactual on the basis of observed relationships between wellbeing indicators and climate variables without using linear regression. For example, experience might indicate that mortality could increase between x and y per cent when temperatures exceed T°C for more than N days. This expectation can then be compared with reality. This is essentially still an exercise in statistical modelling, despite being based on a more interpretive approach than regression analysis.

In the above examples, deviations of measured wellbeing indicators and mortality from expectations might be due to adaptation activities. Combining these approaches with RCTs, difference-in-difference studies or qualitative stakeholder or beneficiary narratives will increase confidence in attribution.

Table 6. How climate hazards can affect trends in wellbeing indicators

Trend in wellbeing indicators	Possible explanations: <i>Climate hazards have...</i>
Wellbeing has improved over time	<ul style="list-style-type: none"> ▪ intensified and adaptation has enhanced wellbeing, despite increased potential risks. ▪ not changed, but adaptation has delivered benefits. ▪ somewhat improved, with adaptation amplifying resulting benefits. ▪ significantly improved, but adaptation actions have contributed little.
Wellbeing has remained more or less stable	<ul style="list-style-type: none"> ▪ intensified, but adaptation has prevented deterioration in wellbeing (invisible benefits). ▪ not changed and adaptation has not delivered benefits. ▪ improved, but adaptation has been counterproductive or irrelevant in the face of other drivers.
Wellbeing has declined over time	<ul style="list-style-type: none"> ▪ intensified and adaptation has not been effective. ▪ intensified, but adaptation has prevented an even greater decline in wellbeing. ▪ not intensified and adaptation has been counterproductive or irrelevant in the face of other drivers.

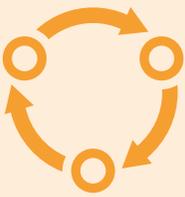
5.4 TAMD and evaluation criteria

Where TAMD has been used to develop a forward-looking M&E system for adaptation planning, we can also use it to design a retrospective evaluative step to ensure development remains on track. This can be integrated into a learning and evaluation step at the end of the planning cycle.

The retrospective evaluation could include checking the mechanisms in the ToC, seeing if the identified resilience indicators are still relevant and examining the ToC and indicators from the perspective of any new climate data for the region. We could create a counterfactual, or analyse hazards experienced before and after the planning response for a case-by-case comparison. Even if counterfactuals or statistical analysis were not possible, we could still analyse the general nature and direction of any changes in climate hazards, thus contextualising any changes in wellbeing indicators.

Checklist:

- Have you analysed your CRM results and presented them in an accessible way?
- Have you established a practical way to analyse your resilience-type indicators over time?
- If you are using resilience-type indicators, do you need to address aggregation, including issues of weightings and thresholds?
- If you need to address attribution, which method(s) will you use?
- If you are using wellbeing indicators, how will you contextualise these using climate information?
- How will you use the results and what format will be most useful?



Step 6: Learning

The complexity and urgency of adaptation demands greater transparency to its intended beneficiaries as well as an emphasis on effectiveness and learning from results.

Carefully designed M&E processes that support continuous learning are particularly important in light of adaptation outcomes being complex, long-term and uncertain. There are several ways you can make learning more integral to M&E:

- ▶ Consider M&E in initial planning and follow a clear ToC, revisiting and revising it through implementation.
- ▶ Be clear how the information collected will be used in planning
- ▶ Build an explicit learning phase into planning cycles.
- ▶ Involve beneficiaries and key stakeholders in M&E to build ownership and learn from the evaluation process.
- ▶ Institutionalise the learning function into a unit or existing team.

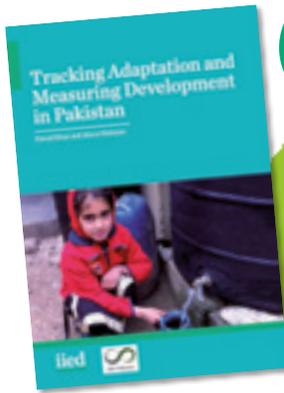
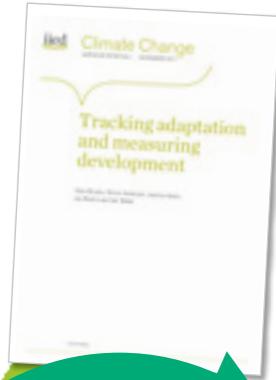
Learning needs to be fed into national strategies and plans, to monitor the resilience and achievements of respective strategies with as much evidence as possible regarding what works in your national context.

Checklist:

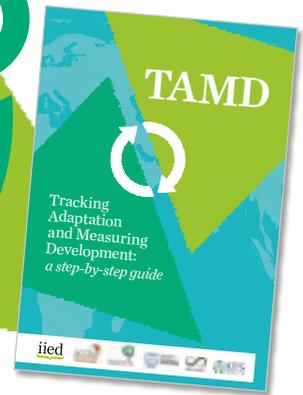
- Have you integrated M&E across the planning cycle and/or built in a learning phase?
- When will you revisit and revise the ToC?
- Have you assessed your learning around contextual dimensions of resilience?
- What have you learnt about the correlations between wellbeing and resilience indicators, and the links between CRM and adaptation and development outcomes?
- Have you ensured this information is available to stakeholders?

Further reading on TAMMD

1] A series of conceptual papers on TAMMD



IIED's publications on TAMMD fall into three main categories:



3] A series of country reports documenting experiences of piloting TAMMD

2] A series of technical guidance notes for practitioners using TAMMD



Download publications at www.iied.org/pubs

1] Conceptual TAMD papers

- ▶ The original theoretical framing paper that outlines the rationale for a methodology that can track adaptation and measure development – Brooks, N. *et al.* 2011. Tracking adaptation and measuring development (TAMD). Working Paper 1. IIED. <http://pubs.iied.org/10031IIED>
- ▶ A working paper that provides practical guidance on how to put the TAMD concepts outlined in Working Paper 1 into action. – Brooks, N. *et al.* 2013. TAMD, an operational framework for tracking adaptation and measuring development. Working Paper 5. IIED. <http://pubs.iied.org/10038IIED>
- ▶ A briefing that provides an overview of the TAMD framework for policymakers and practitioners. – Anderson, S. 2012. TAMD, a framework for assessing climate adaptation and development effects. Briefing Paper. IIED. <http://pubs.iied.org/17234IIED>

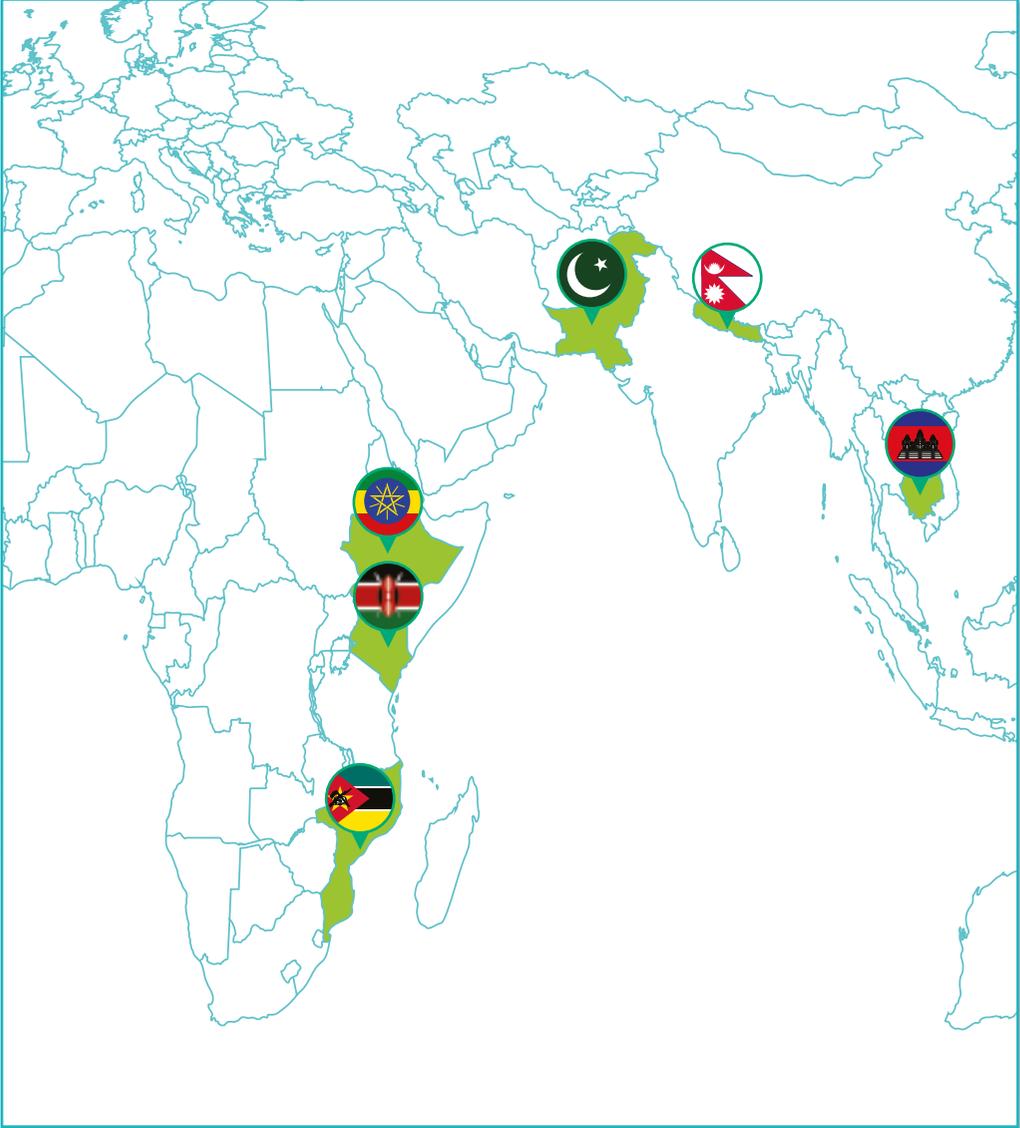
2] Guidance documents

- ▶ Step by step guidance to using TAMD.
– Brooks, N., and Fisher, S., 2014, TAMD: a step by step guidance, Toolkit. IIED. <http://pubs.iied.org/10100IIED>
- Brooks, N. 2013. TAMD Climate Risk Management Indicators: Methodological note. IIED. <http://pubs.iied.org/G03881.html>
- ▶ Guidance for local planners on using TAMD.
– Karani *et al.* 2015, TAMD: a manual for local planning, Toolkit IIED.
- ▶ A briefing on selecting indicators for adaptation M&E.
– Brooks, N. 2014. Indicators for the monitoring and evaluation of adaptation. Briefing. IIED. <http://pubs.iied.org/17273IIED>
- ▶ A briefing on using institutional scorecards. – Rai, N and Nash, E. 2014. Evaluating institutional responses to climate change in different contexts. Briefing. IIED. <http://pubs.iied.org/17271IIED>
- ▶ A briefing on thinking about gender when applying TAMD.
– Fisher, S. 2014. Tracking Adaptation and Measuring Development through a gender lens. Briefing. IIED. <http://pubs.iied.org/17270IIED>
- ▶ A briefing on using climate data to understand trends
– Brooks, N., 2014. Using wellbeing indicators and climate information to assess adaptation effectiveness. Briefing. IIED. <http://pubs.iied.org/17275IIED>



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3] Country reports



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Cambodia

– Rai, N. *et al.* 2014. Developing a national framework to track adaptation and measure development in Cambodia. Briefing . IIED. <http://pubs.iied.org/17259IIED>

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Pakistan

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– Khan, F. & Rehman, A. 2014. Tracking Adaptation and Measuring Development in Pakistan. Research report. IIED. <http://pubs.iied.org/10104IIED>



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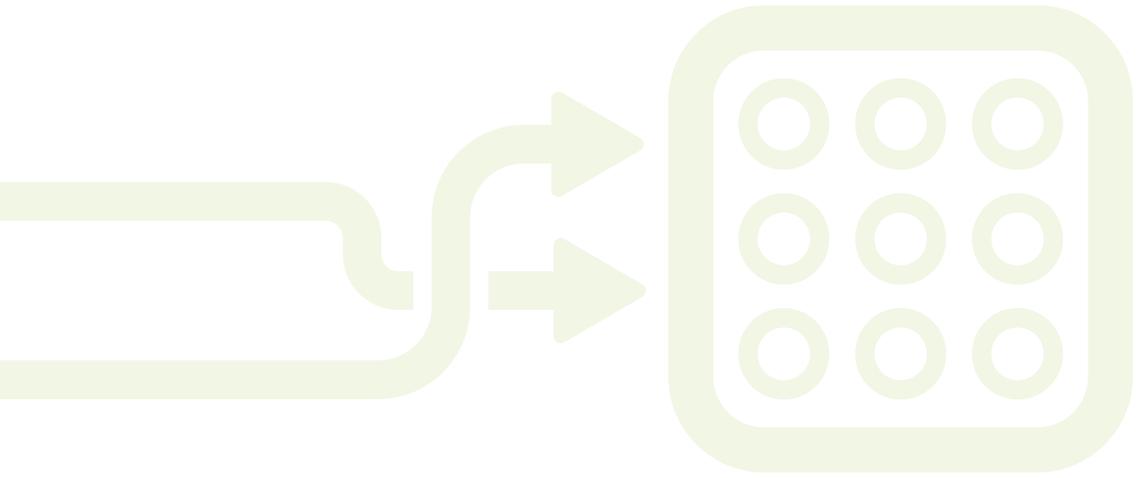
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Annexes



Annex I: Climate risk management scorecards (Track 1)

INDICATOR 1. CLIMATE CHANGE INTEGRATION INTO PLANNING Representation of strategies that address climate change in relevant planning documents & processes	No	Partial	Yes
1. Is there a climate change plan or strategy set out in a dedicated strategy document and/or embedded in the principal planning documents at the level being assessed (e.g. national, sector, ministry)?			
2. Is there a formal (e.g. legal) requirement for climate change (adaptation/mitigation) to be integrated or mainstreamed into development planning (c.f. requirement for EIA for certain activities/projects)?			
3. Have specific measures to address climate change (adaptation/mitigation) been identified and funded?			
4. Are climate-relevant initiatives routinely screened for climate risks?			
5. Is there a formal climate safeguards system in place that integrates climate risk screening, climate risk assessment (where required), climate risk reduction measures (identification, prioritisation, implementation), evaluation and learning into planning?			
SCORE (No. of "YES" answers x 2, plus no. of "PARTIAL" answers x 1)			

INDICATOR 2. INSTITUTIONAL COORDINATION FOR INTEGRATION Extent and quality of coordination of climate risk management across relevant institutions	No	Partial	Yes
1. Has an authoritative body been tasked with coordinating climate change planning and actions?			
2. Does the coordinating body have high convening authority/hierarchical importance across other cross sectoral departments or ministries?			
3. Has a dedicated institutional mechanism been defined for coordination and implementation across sectors?			
4. Is there dedicated funding or certainty of long term funding for sustaining this institutional coordination mechanism?			
5. Is there regular contact between the coordinating body and relevant ministries and agencies (e.g. in key climate-sensitive sectors)?			
SCORE (No. of "YES" answers x 2, plus no. of "PARTIAL" answers x 1)			

INDICATOR 3. BUDGETING AND FINANCE Financial support for climate change mainstreaming & initiatives – funding available for local initiatives, locally-owned/driven	No	Partial	Yes
1. Is funding available to pilot measures that address climate change (e.g. adaptation, risk management, mitigation, low-carbon development)?			
2. Is funding available to roll out/support mainstreaming/integration of climate change?			
3. Do mechanisms/capacities exist for assessing the costs associated with measures to address climate change, such as those identified during climate screening/risk assessment?			
4. Is funding available to cover the costs of the necessary climate change measures identified (and costed) during climate screening/risk assessment?			
5. Are actions to address climate change supported by an authoritative financial entity (e.g. at national level, Ministry of Finance)?			
SCORE (No. of "YES" answers x 2, plus no. of "PARTIAL" answers x 1)			

INDICATOR 4. INSTITUTIONAL KNOWLEDGE/CAPACITY Level of knowledge and training of key personnel in climate change issues and mainstreaming processes	No	Partial	Yes
1. Does planning involve individuals with some awareness of climate change?			
2. Does planning involve individuals with formal training in climate change issues?			
3. Does planning involve individuals who have attended accredited courses on climate change, development, planning and "mainstreaming" issues?			
4. Is integration of climate change into planning overseen by individuals with in-depth knowledge of integration/mainstreaming processes?			
5. Are enough people with the required training involved in planning processes?			
SCORE (No. of "YES" answers x 2, plus no. of "PARTIAL" answers x 1)			

INDICATOR 5. USE OF CLIMATE INFORMATION Extent to which climate information is (i) used to inform responses to climate change and (ii) generated, at all levels of society	No	Partial	Yes
1. Does planning take account of observational data relating to climate trends and variability?			
2. Does planning take account of climate projections - is climate information (forecasts, projections, information on responses) readily accessible via information sharing platforms or networks (e.g. for screening)?			
3. Is there sufficient access to climate information generated by foreign and international organisations (e.g. IPCC, research bodies, academic institutions)?			
4. Is the use of scientific information from external sources complemented by the use of domestically generated information including local/traditional/ indigenous knowledge?			
5. Does the capacity to interpret and use climate information (e.g. in scenario planning, risk frameworks, vulnerability assessments) exist?			
SCORE (No. of "YES" answers x 2, plus no. of "PARTIAL" answers x 1)			

INDICATOR 6. PLANNING UNDER UNCERTAINTY Institutional capacity for decision-making under climatic uncertainty	No	Partial	Yes
1. Does planning (and wider climate change dialogue) incorporate 'envelopes of uncertainty', defined as plausible ranges of key climatic parameters over relevant timescales, informed by climate projections where feasible?			
2. Does planning make use of scenario planning exercises, preferably based on 'envelopes of uncertainty'?			
3. Does planning explicitly address risks associated with 'maladaptation'?			
4. Is planning guided by well-developed frameworks and methodologies that address uncertainty?			
5. Do mechanisms exist for ensuring that planning guidance is updated with new information on climate change as it becomes available?			
SCORE (No. of "YES" answers x 2, plus no. of "PARTIAL" answers x 1)			

INDICATOR 7. PARTICIPATION Quality of stakeholder engagement in decision-making to address climate change	No	Partial	Yes
1. Are all relevant levels of governance (national, provincial/district, local/ community) (required to be) represented in planning process?			
2. Are those who might be adversely affected by climate change initiatives represented in planning/decision-making?			
3. Are those most in need of / likely to benefit from measures to address climate change represented?			
4. Are the poorest and most marginalized members of society represented?			
5. Is the participation of all the above groups sustained throughout planning and implementation (i.e. at the start, end and throughout an initiative)?			
SCORE (No. of "YES" answers x 2, plus no. of "PARTIAL" answers x 1)			

INDICATOR 8. AWARENESS AMONG STAKEHOLDERS Level of awareness of climate change issues, risks and responses	No	Partial	Yes
1. Are stakeholders aware of climate change and its potential implications (e.g. for their sector, for society at large)?			
2. Are stakeholders aware of potential, available, or on-going climate change response options?			
3. Does relevant information reach key stakeholders (e.g.) in climate-sensitive sectors?			
4. Do institutional mandates raise awareness of and disseminate information about climate change (risks, impacts, responses, etc)?			
5. Is adequate funding available for awareness raising among relevant stakeholders and public at large?			
SCORE (No. of "YES" answers x 2, plus no. of "PARTIAL" answers x 1)			

Annex II.

Modified scorecard on inclusion of climate change in planning documents (Cambodia)

Level of inclusion of climate change in long, medium (NSDP) and short term (PIP) national and sub-national planning documents.			
Step	Milestone	Yes/No/Partial	Supporting evidence/narrative
1	Climate change is mentioned in NSDP 2009–2013 but no specific measures on fund allocation		
2	Response to climate change is articulated in NSDP 2014–2018 and specific actions and indicators are included from CCCSP with related fund allocations		
3	Responsibility for climate change integration in national M&E Framework is assigned within NIS/MoP.		
4	Climate change actions plans are integrated into the PIP.		
5	Formal Procedures are in place in CDC for screening major donor and private sector investments against climate risk.		
6	Subnational (commune and district) budgets and planning guidelines integrate climate change.		
7	At least one third of the most vulnerable provinces budget in their Provincial Development Plans the climate change actions identified in the sectoral Climate Change Action Plans.		
8	At least half of the most vulnerable provinces budget in their Provincial Development Plans the climate change actions identified in the sectoral Climate Change Action Plans.		
9	Almost all of the most vulnerable provinces budget in their Provincial Development Plans the climate change actions identified in the sectoral Climate Change Action Plans.		

Annex III.

Use of scorecard at the national level in Ethiopia

Indicators		Score % for		
		Ministry of Agriculture	Ministry of Water and Energy	Ministry of Environment and Forest
1	Climate change integration into planning	70	80	40
2	Institutional coordination for integration	80	60	10
3	Budgeting and finance	80	60	40
4	Institutional knowledge/ capacity	60	60	50
5	Use of climate information	80	50	20
6	Planning under uncertainty	80	50	20
7	Participation	80	50	50
8	Awareness among stakeholders	80	50	30

Annex IV.

Examples of Track 2 indicators from the Kenya TAMD feasibility test

Level	Indicators
Output *	<ul style="list-style-type: none"> ▪ Number of constructed/rehabilitated water sources for livestock and humans ▪ Number of rehabilitated veterinary laboratories ▪ Number of trainings held for natural resource management committees (dedhas)
Outcome **	<ul style="list-style-type: none"> ▪ Number of livestock and households with access to water during dry season ▪ Number of months water is available in constructed/rehabilitated water points ▪ Time spent fetching water for domestic use ▪ Prevalence of livestock and human disease outbreaks per year ▪ Quantities of milk and meat produced per household per year
Impact	<ul style="list-style-type: none"> ▪ Household expenditure patterns ▪ Quantities of food surplus sold at markets ▪ Frequency of marriage and other cultural ceremonies held per year ▪ Number of conflict incidences ▪ Number of families migrating due to climate hazards ▪ Number of children born ▪ Number of schools, dispensaries, mosques, permanent settlements constructed ▪ Number of children enrolled and retained in schools ▪ Number of families on food relief ▪ Number of livestock ▪ Number of new businesses or small-scale traders in the market

Source: Karani et al. (2014)

Notes:

*The first two output indicators represent Track 2 entry points relating to activities intended to directly improve resilience and/or reduce vulnerability. The third output could be viewed as a Track 2 entry point intended to directly enhance adaptive capacity, or as a Track 1 entry point intended to improve community-level CRM.

**To a large extent, outcome-level indicators may be viewed as indicators of resilience, and impact level indicators as indicators of wellbeing.

Glossary

Adaptation intervention: An activity, project or programme that aims to help people or systems respond to the challenges and hazards posed by the effects of climate change.

Adaptive capacity: The ability or potential to respond effectively to changing stresses and shocks to manage or reduce risk.

Attribution: The process of establishing the primary cause for a noted change.

Baseline: Information and data that is gathered prior to the start of an intervention, which serves as an initial reference point from which future evaluations will be measured against.

Climate risk management: The extent and quality of institutional processes and mechanisms for addressing climate-related risks.

Contextualisation: A process of accounting for change in the frequency and severity of climate-related shocks and stresses over time.

Control group: Used in randomised control trials or quasi-experimental methods as a comparative group that has not received an input or intervention.

Counterfactual: Used in a comparison to show the situation when a certain action or input has not taken place, compared to the situation in which these actions did take place.

Evaluation: An occasional or periodic activity to assess achievements, in a systematic and objective manner, for the purpose of informing stakeholders, re-orienting future activities and/or drawing lessons for future interventions.

Hazards (climate-related): physical manifestations of climate change and variability including climate-related phenomena that can be either rapid onset, coming in the form of a shock – for example, a flood – or slow onset, or a stress, such as variable rainfall.

Impacts: Longer-term changes that result from outputs and outcomes.

Indicators: A quantitative or qualitative variable that provides a simple basis for assessing achievement, change or performance.

Livelihoods: The capabilities, assets (including both material and social resources) and activities required for a means of living.

Longitudinal surveys: A methodology that involves the tracking of changes in circumstances of the same individuals or households over time.

Monitoring: A process to keep track of progress and external factors, on a continual basis, to inform management decisions and allow the timely adoption of corrective measures, where necessary.

Outcomes: Shorter-term changes in the population or system targeted by the intervention, which result from the outputs.

Outputs: Goods and services delivered by an intervention

Randomised control trials: A methodology that involves sampling statistically representative groups of the population who have either received an input or treatment or have not (the control group) to see if there are significant differences between the two.

Resilience: The ability of a system to resist, absorb and recover from the effects of hazards in a timely and efficient manner, preserving or restoring its essential basic structures, functions and identity.

Theory of change: A pathway or pathways connecting activities to the anticipated changes of a policy or programme through a set of causal mechanisms.

Wellbeing: Aspects of human development and livelihoods such as health, nutrition, poverty/economic status, education, assets, and lives.

Vulnerability: Vulnerability to climate change is the degree to which geophysical, biological and socio-economic systems are susceptible to, and unable to cope with, adverse impacts of climate change.



Terracing in Rukum District, Nepal, Susannah Fisher

IIED is a policy and action research organisation promoting sustainable development and linking local priorities to global challenges. We are based in London and work on five continents with some of the world's most vulnerable people to strengthen their voice in the decision-making arenas that affect them.

The Climate Change Group works with partners to help secure fair and equitable solutions to climate change by combining appropriate support for adaptation by the poor in low- and middle-income countries, with ambitious and practical mitigation targets.

Garama 3C Ltd is a small UK-based consultancy firm specialising in climate change and international development.

The Institute for Social and Environmental Transition – Pakistan is a research organisation based in Islamabad and affiliated to ISET International.

Echnoserve, Ethiopia is a private research consultancy company based in Addis Ababa.

ACCRA is a consortium of NGOs working on climate resilience issues.

LTS Africa is a leading provider of technical services in support of sustainable development.

The Integrated Development Society, Nepal (IDS Nepal) is a non-profit development NGO.



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Tracking adaptation and measuring development (TAMD) is a conceptual framework to monitor and evaluate climate change adaptation. This manual seeks to guide national governments to use TAMD. TAMD evaluates adaptation success as a combination of how well institutions manage climate risks and how successfully adaptation actions keep development on course.

This manual is part of a set of three publications that build on the experiences of TAMD pilot countries to give guidance on how to apply TAMD. There is a general step by step guide for all users, a manual for local governments and this manual specifically for national governments.

This is the first version of this guidance building on the experience of testing TAMD in Kenya, Mozambique, Nepal, Pakistan, Cambodia and Ethiopia. This guidance will be updated and revised as more experience is generated on each step.



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