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Integrating Agriculture in National
Adaptation Plans (NAP-Ag) Programme

*Safeguarding livelihoods and promoting
resilience through National Adaptation Plans*

November 2019

Strengthening monitoring and evaluation for adaptation planning in the agriculture sectors

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Integrating Agriculture in National Adaptation Plans
(NAP-Ag) Programme - Safeguarding livelihoods and promoting
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Acronyms

BMU	German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
ETF	Enhanced Transparency Framework
FAO	Food and Agriculture Organization of the United Nations
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GST	Global Stock Take
IIED	International Institute for Environment and Development
IKI	International Climate Initiative
IPCC	Intergovernmental Panel on Climate Change
LDC	Least Developed Country
LEG	UNFCCC Least Developed Countries Expert Group
KCSAFP	Kenya Climate Smart Agriculture Framework Programme
M&E	Monitoring and evaluation
MRV	Monitoring, reporting and verification
NAP	National Adaptation Plan
NAP-Ag	Programme on Integrating Agriculture in National Adaptation Plans
NCCAP	National Climate Change Action Plan in Kenya and Philippines
NDC	Nationally Determined Contribution
OECD	Organisation for Economic Co-operation and Development
OREDD	Regional Observatories on Environment and Sustainable Development, Morocco
RBMES	Results-Based Monitoring and Evaluation System, Philippines
SDGs	Sustainable Development Goals
TAMD	Tracking Adaptation and Measuring Development tool, IIED
TOC	Theory of Change
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
VIA	Vulnerability and impact assessment

Executive summary

The importance of monitoring and evaluation (M&E) of climate change adaptation has been highlighted at global level, including under the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement. Simultaneously, adaptation M&E systems are beginning to emerge at the national level in the context of national planning and budgeting processes. This technical guidance note details how to develop M&E systems for adaptation planning in agriculture sectors.

The first section of the guide introduces the general concept of M&E, then outlines M&E of adaptation specifically and explains how adaptation M&E relates to the agriculture sectors. The second section provides an overview of the steps needed to design an adaptation M&E framework and plan for agriculture sectors. This note provides guidance mainly for technical staff working to strengthen M&E of adaptation in agriculture sectors. It is also relevant for policy and decision makers engaged in broader national adaptation and development planning, budgeting and implementation processes in which agriculture forms a key component.

Section 1 introduces key M&E concepts, explains the relevance of climate change adaptation, and frames the global policy context for M&E of adaptation. It presents the reasons for carrying out adaptation M&E, which include enhancing learning on adaptation, carrying out flexible management of adaptation under climate uncertainty, ensuring accountability for national decision makers and donors, and compliance with national and international reporting requirements. The section then presents some of the challenges of long-term measurement of adaptation results, both at the national level and across sectors.

M&E for adaptation can be carried out on a variety of scales; national, sectoral, sub-national, project portfolio or project level. To date, there is some experience in building M&E systems for adaptation planning at the sectoral level, including for the agriculture sectors, in

the context of an overall national M&E system for adaptation. Therefore, this guidance note draws primarily on national-level literature and experiences that can be applied to a sectoral context. It aims to increase understanding of how adaptation M&E can be carried out in the agriculture sectors and how it can feed into national level planning, M&E and decision-making processes. In countries where national adaptation planning (NAP) processes exist, a systematic approach to M&E of adaptation at the national level can be carried out as part of a national adaptation planning (NAP) process.

In the agriculture sectors (agriculture, livestock, forestry, fisheries and aquaculture), adaptation can be pursued through stand-alone adaptation interventions, or through integrating adaptation considerations into existing agriculture sector policy and planning. Adaptation M&E frameworks for agriculture sectors can help determine if a range of implemented adaptation actions, policies and plans are achieving their desired results on a broader scale. This guidance note also provides advice on how to conduct gender-sensitive monitoring in order to measure progress on gender equality and women's empowerment within adaptation planning and implementation for agricultural sectors.

Section 2 proposes a seven-step process to support the development of M&E systems for adaptation planning in agriculture sectors. This process can track progress in two ways: i.) progress in implementing adaptation programme portfolios or policies in the agriculture sectors, and ii.) progress towards achieving adaptation outcomes in the agriculture sectors, measured by how successful these interventions and policies are at reducing vulnerability, improving adaptive capacity, and supporting the overall well-being of different populations affected by the impacts of climate change.

Step 1: Understanding the policy context

The first step identifies the entry points for developing an M&E system for adaptation in agriculture sectors. This step assesses the main climate change impacts the country is already facing and expects to face in the agriculture sectors; analyses the policy context and policy objectives for adaptation and agriculture; and identifies potential mandates to develop M&E systems for adaptation, including M&E of adaptation in the agriculture sectors.

Step 2: Developing a shared adaptation goal and pathways for integrating adaptation in the agriculture sector

Step 2 discusses the importance of stakeholders developing a shared understanding of what long-term adaptation goals they are hoping to achieve for the agriculture sectors, and how they hope to achieve these goals. A Theory of Change (TOC) can be of particular use while designing an adaptation M&E framework for agriculture sectors. A TOC collectively defines goals and steps that link outputs, outcomes and impacts. The technical note presents a set of existing tools and approaches for developing adaptation M&E systems which are particularly applicable to agriculture sectors.

Step 3: Defining the purpose and focus of the monitoring and evaluation framework

Understanding the purpose of the adaptation M&E framework for agriculture sectors will allow to tailor the framework to the specific context in which it will be deployed. This will help to narrow down on the types of indicators and data needed. Step 3 discusses the aspects of adaptation to be measured (process, outcomes or impacts) and who will use the results of the adaptation M&E system.

Step 4: Developing an monitoring and evaluation framework for adaptation in the agriculture sector

An M&E or results framework for adaptation in agriculture sectors will provide a logical picture of how different elements, for example different adaptation programmes and/or policies for the diverse subsectors of agriculture (crop, livestock, fisheries, forestry, among others) contribute to achieving the overall adaptation goal of the sector. It addresses the relationship between inputs and results in a focused and practical manner and details how these feed back into decision making.

Step 5: Identifying indicators to track adaptation in the agriculture sector

The next step is selecting indicators for each level of the M&E Framework - impact, outcomes, outputs and activities. Both process-based and outcome-based indicators can be considered. A stocktake or review of existing M&E frameworks and their indicators and reviews of indicators used by similar adaptation programmes and projects elsewhere will help identify appropriate indicators to use. Once stakeholders have agreed upon a set of indicators for each level of the M&E framework, they can define a baseline and agree upon targets.

Step 6: Identifying the sources and type of data and information required for each indicator

This step involves defining the data and information needs of the M&E framework in accordance with the chosen indicators. The guidance note points out that it is crucial to consider the data that is already available on climate trends, vulnerabilities, economic and social dimensions, status of natural resources, and land use. The guidance note discusses challenges in identifying sources of data, and presents different data collection tools.



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Step 7: Operationalising monitoring and evaluation for adaptation decision-making in the agriculture sector

This final step discusses the operationalisation of the adaptation M&E framework through an M&E Plan. The M&E Plan is a management tool that specifies the measures that will be used for data gathering to ensure that the M&E Framework is adequately populated with data. The M&E plan helps determine how chosen indicators will be observed and measured. It identifies the human and financial resources needed for delivery, how information will be reported and communicated, and how information is used in decision making. Ideally, M&E results will feed back into an iterative planning process on adaptation at both sectoral (agriculture ministry) and national (national adaptation planning processes, such as NAPs) levels. Where relevant, the results will also be integrated into national development processes, which in turn may feed into reporting on SDGs. The results can aid in future decision making, including decisions regarding investments and prioritisation of adaptation options.

Each of the above seven steps provides a list of stakeholders to engage and poses questions for reflection among key stakeholders. All steps are designed to be implemented by M&E units and technical staff working on adaptation in Ministries of Agriculture,

engaging other stakeholders where relevant. Each step also suggests a set of possible actions and outputs, as well as a list of resources for further reading.

The importance of tracking adaptation outcomes in the agriculture sectors lies in the strategic importance of this sector for national adaptation in most developing countries. It is therefore important to link the M&E of adaptation in the agriculture sector to learning, planning and decision making on adaptation planning processes and outcomes at the national level, including NAPs. It is also crucial to consider how this may relate to overall sustainable development. When integrated as part of comprehensive adaptation planning, budgeting and implementation processes, including NAPs, M&E of adaptation in the agriculture sectors can play a critical part in enhancing adaptive capacity and ensuring food security in a changing climate.

This technical guidance note was developed under the co-led United Nations Development Programme (UNDP) and Food and Agriculture Organization of the United Nations (FAO) Programme *Integrating Agriculture in National Adaptation Plans (NAP-Ag)*, which works to strengthen the integration of climate change concerns related to agriculture-based livelihoods within existing national planning and budgeting processes.

Introduction

This technical guidance note is developed under the co-led United Nations Development Programme (UNDP) and Food and Agriculture Organization of the United Nations (FAO) Programme *Integrating Agriculture in National Adaptation Plans* (NAP-Ag). The NAP-Ag Programme is a multi-year initiative (2015-2020) being implemented in 11 countries (see Map 1) and funded by the International Climate Initiative (IKI) of the German Federal Ministry for the Environment,

Nature Conservation and Nuclear Safety (BMU). The Programme helps to integrate agricultural sectors into the National Adaptation Plan (NAP) process in African, Asian and Latin American countries. It works closely with policy and technical staff in key ministries including agriculture, environment, planning and finance as well as local government to strengthen the integration of climate change concerns related to agriculture-based livelihoods into existing national planning, budgeting and implementation processes.

NAP-Ag Programme Countries



Source: Department of Field Support Geospatial Information Section (formerly Cartographic Section) Map No. 4136 Rev. 12.1 UNITED NATIONS, July 2018

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Ultimately, by contributing to NAP processes and the achievement of targets laid out in partner countries' Nationally Determined Contributions (NDCs) and the Sustainable Development Goals (SDGs), in particular SDG-2 "Zero Hunger" and SDG-13 "Climate Action", the programme contributes to:

- setting the national adaptation agenda based on priorities related to the agricultural sectors;
- enhancing regional and global dialogue and cooperation on scaling up adaptation actions that affect food security and livelihoods;
- integrating concerns and priorities into relevant national and sectoral planning and budgeting processes; and
- accessing international climate finance.

NAP-Ag also aims to improve systems for evidence-based results for NAPs. This entails: i) the use of impact evaluation (FAO and UNDP, 2018) to generate evidence-based results on adaptation interventions, which can inform decision making; and ii) strengthening capacity and monitoring and evaluation (M&E) frameworks for monitoring the effectiveness of adaptation in the agriculture sectors. Both approaches include the systematic integration of gender-sensitive indicators and the collection of sex-disaggregated data. This guidance note focuses on part ii), and is designed to assist countries hoping to track the effectiveness of their adaptation planning processes in the agriculture sectors.

Who can use this guide?

This technical guidance note is aimed primarily at technical staff working on strengthening the M&E of adaptation in the agriculture sectors. Secondly, it is aimed at policy and decision makers that can use adaptation M&E information from the agriculture sectors to inform adaptation planning, both in the agriculture sectors specifically and as part of broader national adaptation and development planning and budgeting processes. This includes technical staff working on the NAP-Ag programme and national stakeholders in planning and policy, such as:

- M&E units in Agriculture Ministries;
- technical staff working on climate change adaptation in Agriculture Ministries;
- units and institutions carrying out research and gathering climate-relevant data;
- extension services gathering M&E data; and
- policy makers working on climate change adaptation, leading or coordinating actors of the NAP processes, e.g. in Ministries of Environment and Planning, and cross-sectoral climate change coordination bodies.

This guide will be complemented by a set of training modules, which can be used at capacity building events with key stakeholders involved in developing and implementing adaptation M&E systems at national and sub-national levels.

Structure of the technical guidance note

The technical guidance note focuses on **how adaptation can be integrated into existing agriculture sector M&E frameworks**, whilst recognising the importance of considering how agriculture can be integrated into national adaptation M&E frameworks, where they exist.

The first section of the guide introduces M&E in general, then focuses on M&E of adaptation specifically and explains how it pertains to the agriculture sectors.

The second section provides an overview of the potential steps required to design an adaptation M&E framework and M&E plan for the agriculture sectors. This section includes information on understanding the policy context, defining a Theory of Change and focus, developing an M&E framework, identifying indicators and sources of information, and operationalising an M&E plan. The document provides case studies of existing national level adaptation M&E frameworks that integrate agriculture. For each step, the guidance note provides a set of guiding questions, proposes key stakeholders to engage and actions to undertake, and suggests resources for further reading.

SECTION 1. Introduction to monitoring and evaluation for and adaptation

1.1. What is monitoring and evaluation? Some basic definitions

Monitoring and evaluation (M&E) forms the basis for clear and accurate reporting on the results achieved by an intervention (project or programme), policy or broader planning and implementation process. Information reporting is an opportunity for critical analysis, organisational learning, informed decision making and assessing the impact of various actions. M&E is a powerful learning tool that enhances stakeholders' understanding of the country's climate change risks and vulnerabilities by performing periodic climate risk assessments, assessing whether adaptation interventions are achieving their objectives, and providing lessons learnt from past actions to inform and strengthen future adaptation planning and implementation. As such, M&E of adaptation is increasingly recognised as an important component of national adaptation responses (OECD, 2017).

M&E literature uses differing terms to emphasise that the information collected through monitoring needs to be periodically reported, and lessons learnt from evaluation can inform and improve planning and implementation of future adaptation actions, including modifying policy, plans and interventions (OECD, 2017). In this guidance note, the term M&E encompasses both the concept of "monitoring, evaluating and learning" as stated in the Paris Agreement, and "reporting, monitoring and review" as used in the NAP Technical Guidelines of the Least Developed Countries Expert Group (LEG) of the United Nations Framework Convention on Climate Change, UNFCCC (LDC Expert Group, 2012).



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Monitoring is the continuous collection of information that enables stakeholders to track whether an intervention is achieving set objectives, and to change course where needed (UNDP, 2009:8).

Evaluation is a systematic collection and analysis of information from either completed or ongoing activities, at a specific point in time, to determine the extent to which they are achieving stated objectives and contributing to decision making (UNDP, 2009:8.) Evaluations involve identifying and reflecting upon the effects of what has been done, and judging their worth.

Monitoring versus evaluation

While recognising the differences between monitoring and evaluation, it is important to remember that both are integrally linked. Monitoring typically provides the

data for evaluation, and elements of evaluation occur during monitoring. Table 1 below highlights the differences between monitoring and evaluation.

Table 1

Differences between monitoring and evaluation

Monitoring	Evaluation
Continuous: day-to-day	Periodic: important milestones
Focuses on short-term results and effects	Focuses on long-term results and effects
Documents progress	In-depth analysis of achievements
Focuses on inputs and outputs	Focuses on outcomes and impact
Alerts managers to problems, including progress that is unexpected or accelerated	Provides lessons, highlights significant accomplishments and offers recommendations for improvement
Self-assessment	External analysis
Monitors achievement of programme or policy objectives	Analyses why intended results were or were not achieved
Links activities and their resources to objectives	Assesses specific causal contribution of activities to results
Translates objectives into performance indicators and set targets	Examines results of implementation
Routinely collects data on indicators and compares actual results with targets	Explores unintended results

Source: Adapted from *Monitoring and Evaluation – What is the Difference?* USAID, 2005

1.2. What is adaptation?

Adaptation refers to adjustments in ecological, social or economic systems in response to actual or expected climatic stimuli and their effects or impacts. It refers to changes in processes, practices and structures to moderate potential damages, or to benefit from opportunities associated with climate change (IPCC, 2001:881).

The objectives of adaptation and the effectiveness in achieving them generally fall into three categories:

- Reducing the development deficit: Adaptation activities aim to ensure that communities meet their basic needs and move out of poverty. Being in a stronger position to withstand additional shocks and stresses makes them better able to respond to additional climate risks.

Box 1

Key definitions in adaptation

Adaptation: The process of adjustment to actual or expected climate change and its effects in order to either lessen or avoid harm or exploit beneficial opportunities. (IPCC, 2014:118).

Adaptive capacity: The ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences. (IPCC, 2014:118).

- Addressing current climate variability: Adaptation activities aim to ensure that households, communities or governments manage and respond to short term climate risks.
- Addressing future climate risks: Adaptation activities aim to ensure that development is capable of managing future climate risks, particularly in terms of sustainability of infrastructure and sustaining livelihoods (IIED, 2016b). See Box 2 for an example.

Five general components tend to comprise adaptation activities: observation, assessment of climate impacts and vulnerability, planning, implementation, and monitoring and evaluation of adaptation actions. Adaptation actions may vary for different countries or sectors depending on the relevant climate risks; inherent vulnerabilities to be addressed; and the human, institutional and systemic capacities as well as the financial resources available.

Given the complexity and long-term nature of climate change, it is essential that adaptation be designed as a continuous and flexible process which includes feedback through M&E. The implementation of adaptation actions needs to be regularly monitored, evaluated and revised, considering both the validity of the underlying scientific assumptions and the appropriateness of projects, policies and programmes. This includes analysing project, policy and programme effectiveness, efficiency and overall impact. M&E of adaptation actions can be undertaken throughout the adaptation process and/or after adaptation actions have been implemented. Developing a monitoring and evaluation framework for adaptation is useful to ensure clearly formulated goals, objectives and output measures as well as the availability of good quality data on the overall adaptation process. This guidance note provides examples of countries' efforts to monitor and evaluate adaptation in the agriculture sector.

Box 2

Climate-smart coffee and cocoa value chains: an example of addressing future climate risks

Cocoa and coffee are particularly sensitive to climate change and variability, which is posing a threat to millions of farmers; the national economies of entire countries; and the global coffee, cocoa and chocolate industries. These industries rely heavily on the production of millions of smallholder farmers for whom these tropical crops are a primary source of income, such as in El Salvador, Ghana, Guatemala, Honduras, Ivory Coast, Liberia, Nicaragua, Peru, Rwanda, Tanzania and Uganda. Cocoa and coffee are also key foreign revenue generators for many economies.

To address this challenge, the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) Climate-Smart Value Chain project assesses climate change exposure of coffee and cocoa systems and leverages existing smallholder [value chain interventions](#) to ensure that risks, costs and rewards are shared by everyone in the value chain, from farmers to consumers.

Source: CCAFS Annual Report, 2016. Accessed online 3.12.2018 at <https://ccafs.cgiar.org/research/annual-report/2016/climate-smart-coffee-cocoa-value-chains-on-rise>

1.3. The global policy context for monitoring and evaluation of adaptation

The importance of M&E of adaptation has been highlighted at a global level, including under the UNFCCC Paris Agreement (see Box 3.), the Sustainable Development Goals (SDGs) within the framework of the 2030 Agenda for Sustainable Development, and the Sendai Framework for Disaster Risk Reduction 2015-2030. All aim, amongst other goals, to reduce climate vulnerability and enhance adaptive capacity (see Figure 1), and have established related reporting requirements. The importance of M&E is further reflected in the Nationally Determined Contributions (NDCs) submitted by Parties under the Paris Agreement (FAO, 2016a).

Mechanisms exist at the global level that allow information sharing on adaptation progress and learning, including National Adaptation Plans or NAPs (see Box 4), NDCs and adaptation communications. Parties already regularly report to the UNFCCC on

adaptation via the National Communications. In the future, national reporting to the Enhanced Transparency Framework (ETF) under the UNFCCC could aim to track progress towards achieving Parties' individual NDC targets (See Box 5), including identifying good practices, priorities, needs and gaps under Article 4 as well as Parties' adaptation action under Article 7. This process of reporting and review will further inform progress towards the global adaptation goals through the Global Stock Take (GST) under Article 14 (See Box 3).

At least 40 countries are already operating national adaptation M&E frameworks (see 1.6.; UNEP, 2017). National level M&E of adaptation can eventually contribute to reporting on a country's achievements towards goals of the Paris Agreement, as described above; SDGs, in particular SDG-13 "Climate Action"; and the Sendai Framework (Leiter & Olivier, 2017; United Nations Climate Change Secretariat, 2017).

Box 3

The Paris Agreement and monitoring and evaluation

The Paris Agreement, adopted in 2015, builds upon the United Nations Framework Convention (UNFCCC) adopted in 1992 and brings all signatory nations together to combat climate change and adapt to its effects. The Paris Agreement requires all Parties to report their efforts through nationally determined contributions (NDCs), most of which also include actions on adaptation.

The Paris Agreement, for the first time, proposes a global adaptation goal: "enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to contributing to sustainable development and ensuring an adequate adaptation response [...]" (Paris Agreement, Art.7.1.). The Agreement further makes specific reference to monitoring and evaluating adaptation:

"Each Party shall, as appropriate, engage in adaptation planning processes and the implementation of actions, including the development or enhancement of relevant plans, policies and/or contributions, which may include: (d) Monitoring and evaluating and learning from adaptation plans, policies, programmes and actions " (Paris Agreement, Art.7.9.)

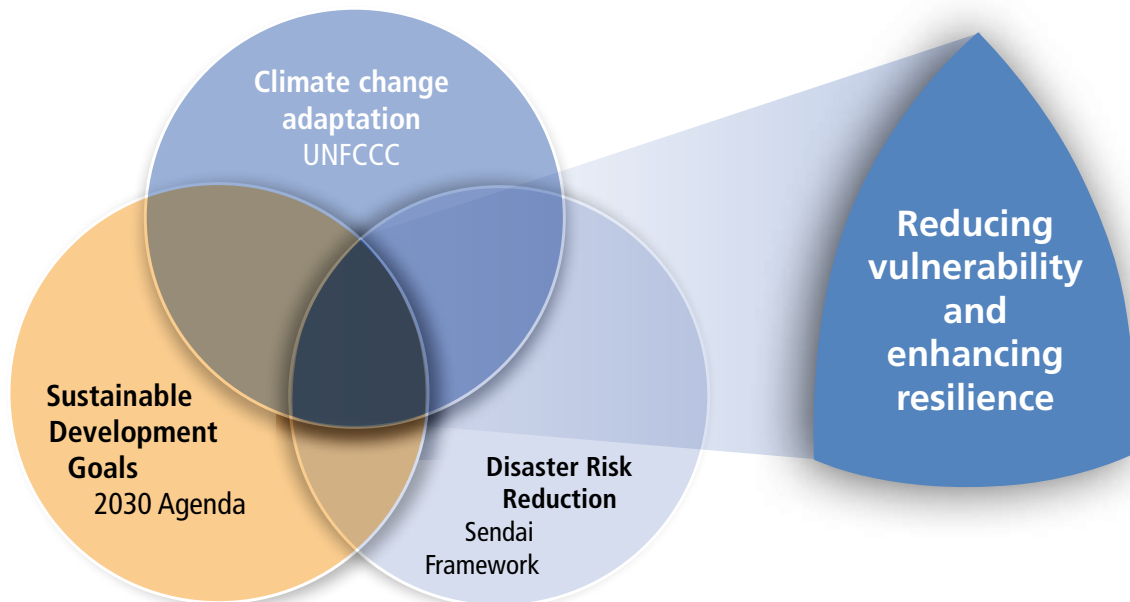
The Paris Agreement foresees the establishment of a transparency framework to provide a clear understanding of climate change action. It is stated that "in order to build mutual trust and confidence and to promote effective implementation, an enhanced transparency framework for action and support, [...] is hereby established" (Paris Agreement, Art.13).

In addition, the Paris Agreement, refers to the Global Stocktake to assess the collective progress towards achieving the Agreement purpose and long-term goal (Paris Agreement, Art.14).

A detailed analysis of the M&E provisions of the Paris Agreement is provided in the Adaptation Gap Report 2017, Chapter 2 (UNEP, 2017).

Figure 1

Adaptation and its monitoring is a key objective of all three post-2015 agendas (United Nations Climate Change Secretariat, 2017)



As more governments move from raising awareness for the necessity of adaptation to developing and implementing adaptation plans and policies- including the National Adaptation Plan process agreed by the parties to the UNFCCC- M&E of adaptation at the national level is gaining importance.

National level adaptation M&E systems are beginning to emerge, as will be summarised in section 1.6. Countries where NAP processes exist can carry out a systematic approach to national level adaptation M&E in the context of a NAP process (see Box 4). The NAP Technical Guidelines recommend the establishment of

an M&E system from the outset of a NAP process (LDC Expert Group, 2012). A NAP M&E system should aim to align itself with existing development and sectoral M&E frameworks. A NAP M&E system can provide a means for countries to track national progress towards adaptation targets and national development goals. For example, countries can track their progress through aggregation of outcomes of adaptation programmes and projects; as well as monitor and iteratively update the process of adaptation planning and implementation in the agriculture sector (Element D, Step 3 – FAO 2017b; see also Price-Kelly *et al.*, 2015).

Box 4

UNFCCC: National Adaptation Plans (NAPs)

National Adaptation Plans were established in 2010 as part of the Cancun Adaptation Framework to enhance urgent action on adaptation, and were adopted by Parties to the United Nations Framework Convention on Climate Change (UNFCCC Decision 1/CP.16.). NAPs enable countries to identify medium-term to long-term adaptation needs, and develop and implement strategies and programmes to address those needs. NAPs aim to:

- reduce vulnerability to climate change by building adaptive capacity and resilience; and
- ensure that climate change adaptation is integrated into development planning in all sectors and at all levels of planning.

Box 5

Reporting on adaptation in the global context under the Enhanced Transparency Framework (ETF)

Although the details on how to measure progress against a global goal on adaptation under the Paris Agreement (PA) remain an open question, Modalities, Procedures and Guidelines (MPGs) for the transparency framework for action and support referred to in Article 13 of the PA were agreed at the UNFCCC COP 24 (FCCC/CP/2018/L.23). In accordance with the MPGs, under the ETF Parties should submit their first Biannual Transparency Report (BTR) and national inventory report by the end of 2024. The BTRs should provide GHG inventories, information necessary to track progress in implementing and achieving Parties' Nationally Determined Contributions (NDCs), climate change impacts and adaptation support (financial, technology transfer, capacity building) provided and received. Adaptation communications can be submitted as a component or in conjunction with a BTR and cross-reference previously reported information. The following chapters can be included:

- I. Introduction
- II. National inventory report of anthropogenic emissions by sources and removals by sinks of GHG
- III. Information necessary to track progress made in implementing and achieving NDC under Article 4 of the PA
- IV. Information related to climate change impacts and adaptation under Article 7 of the PA
- V. Information on financial, technology development, transfer and capacity building support provided and mobilized under Article 9-11 of the PA
- VI. Information on financial, technology development, transfer and capacity building support received under Article 9-11 of the PA
- VII. Technical expert review
- VIII. Facilitative, multilateral consideration of progress

Information that could facilitate, inter alia, recognition of the adaptation efforts of developing country Parties could cover the following topics:

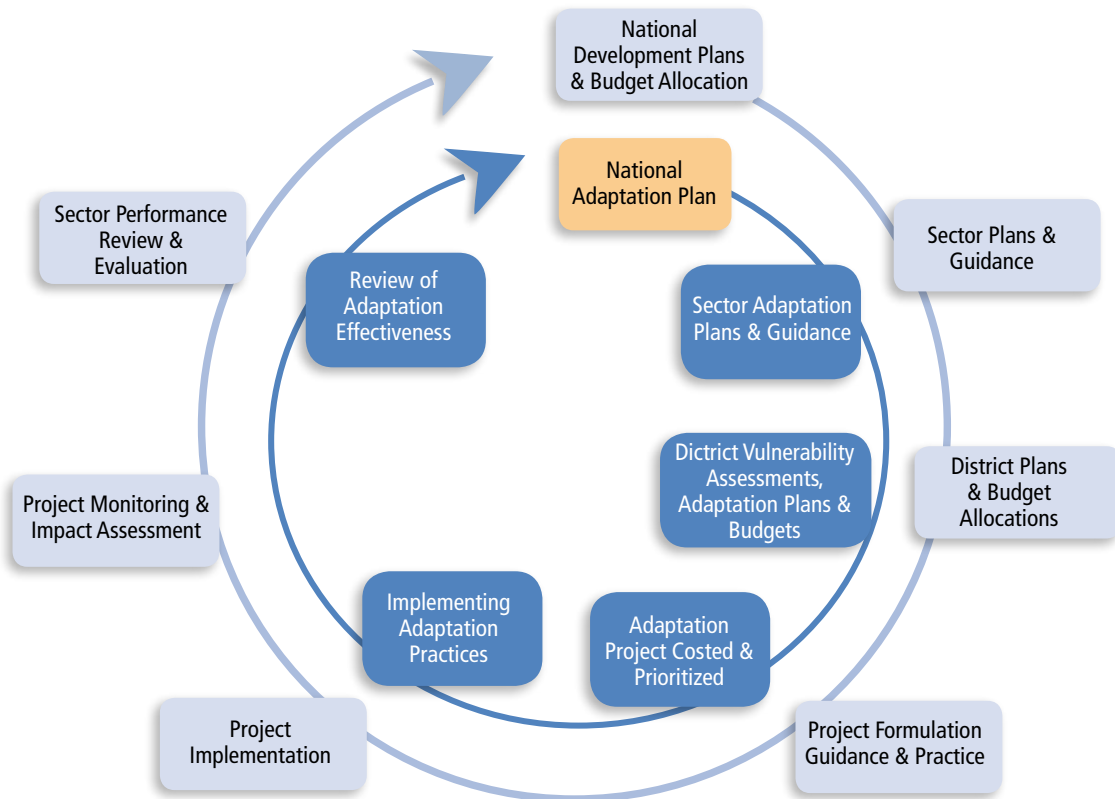
- A. National circumstances, institutional arrangements and legal frameworks
- B. Impacts, risks and vulnerabilities, as appropriate
- C. Adaptation priorities and barriers
- D. Adaptation strategies, policies, plans, goals and actions to integrate adaptation into national policies and strategies
- E. Progress on implementation of adaptation
- F. M&E of adaptation actions and processes
- G. Information related to averting, minimizing and addressing loss and damage associated with climate change impacts
- H. Cooperation, good practices, experience and lesson learned
- I. Any other information related to climate change impacts and adaptation under Article 7

This Guidance Note can therefore be used to contribute to national reporting on adaptation under the PA, given that agriculture is an adaptation priority for many countries, as stated in their NDCs.

1.4. Monitoring and evaluation as part of the national adaptation planning cycle

Planning, budgeting and implementation processes are closely interlinked, whilst M&E is an integral part of these. Adaptation planning can be seen as a cycle which includes the development of national plans and budgets; further definition of sectoral, and local

plans and budgets; costing and prioritisation of adaptation options; implementing adaptation practices; and monitoring, review and evaluation, as part of an iterative, continuous cycle. This is shown in Figure 2.

Figure 2**Adaptation as part of national planning and budgeting cycle**

Source: UNDP et al., forthcoming.

As mentioned above, the NAP Technical Guidelines (LDC Expert Group, 2012) provide some guidance on the relevance of M&E throughout the NAP process. For example, early preparatory stages of NAP processes often include launching the NAP process, as well as carrying out stocktaking and capacity assessments. During stocktaking, available data and knowledge on climate risks, vulnerability and adaptation are assessed. This is the same data that will inform what can be monitored and evaluated. Stocktaking exercises also identify existing policy frameworks and help frame entry points for adaptation M&E. These exercises often assess whether a comprehensive M&E system is in place for development, whether there is a system

in place for climate change actions, and how these are or could be linked. They can also scope out existing indicators, which could potentially be used for monitoring adaptation. Capacity assessments may consider the capacity to carry out M&E as part of the adaptation planning process.

When integrating adaptation into existing plans and policies, or formulating new ones, M&E should be included as part of the iterative adaptation planning and implementation process. Once adaptation options have been appraised and prioritised, adaptation indicators need to be identified as part of an M&E system (GIZ, 2013).

NAP processes can allow for the monitoring of a range of adaptation actions at an aggregated level, thereby allowing for portfolio, sectoral or national monitoring of adaptation results provided due M&E systems with goals, indicators, data and resources are implemented (see later sections of this note for details). Monitoring and review of budget formulation and allocation and use of tools such as budget tracking can be key components of adaptation budgeting and ensure implementation of planned adaptation actions.

The results of monitoring need to feed into evaluations that in turn can provide due analysis for decision-making. Adaptation remains a “learning-by-doing” practice, in which M&E should not be the final step of the planning cycle, but should rather be considered from the outset and continuously feed into consecutive, iterative adaptation planning cycles. This also allows for the scaling up of successful adaptation practices. This guidance note aims to support the design of adaptation M&E Frameworks for the agriculture sector, which are applicable and can be implemented throughout the adaptation planning cycle.

1.5. Purpose and objectives of monitoring and evaluation of adaptation

M&E of adaptation can be carried out for a number of reasons, including enhancing learning on adaptation, including in the long term, and assessing effectiveness of what works and what doesn't; establishing flexible management and adjustment of adaptation under climate uncertainty; for accountability to national decision makers and donors; or to encourage compliance with national and international reporting requirements, including under the UNFCCC (GIZ, 2014; Vallejo, 2017; Spearman, and McGray, 2011). M&E of adaptation can also be focused on different aspects, including in the agriculture sectors, such as:

- measuring the **process of adaptation**, including advances in implementing policies and plans (e.g. assessing the effectiveness of the policies, decisions and systems that are being put in place to support adaptation such as Climate Smart Agriculture Strategies) or building individual and institutional capacity;
- measuring **adaptation outcomes**, for example increases in water availability during drought at national or sub-national level as a result of employing technologies such as rain water harvesting to water conservation techniques, incurring limited crop and economic losses;
- measuring the increases in **adaptive capacity**, for example assessing the percentage of farmers, disaggregated by sex, that have the capacity and means to better respond to drought events or other climate-related hazards;

- measuring changes in the **impacts of climate change, quantifying damages and losses** (e.g. crop losses) and assessing **vulnerability** to climate change (e.g. degree of exposure of fish nesting, fishing grounds and fish processing facilities to cyclones); and
- measuring occurrence and frequency of **climate hazards** (e.g. floods, droughts, heavy rainfall events).

It is important to recognise that developing the necessary M&E and statistical systems under the different global agendas discussed above represents an unprecedented challenge for many countries, which could lead to widespread duplication of effort or double counting in reporting outcomes for development and adaptation. To maximise the benefits of a functioning national and/or sectoral M&E system, governments should build upon or adapt existing national planning and evaluation systems. This will streamline workflow and reduce reporting burdens. Integrating development and adaptation M&E systems can be facilitated by:

- Integrating adaptation information into planning and M&E cycles: Joint metrics and data collection tools will allow countries to use existing databases to assess progress against different framework agreements (SDGs, climate and disaster risk reduction). For example, Cambodia's national M&E for climate change is embedded within its National Strategic Development Plan (See Case Study 4).

- Using common development data and evidence to assess progress: Some development indicators are also relevant to adaptation M&E. These include indicators of climate-sensitive aspects of development such as those relating to water, agriculture, losses from (and people affected by) climate-related disasters, and health (such as incidences of climate-sensitive diseases) (IIED, 2018).

A challenge remains whether to distinguish national investments in, and results from, adaptation only, or to integrate adaptation investments and results with

development. It is often difficult to make the distinction between development and adaptation to climate change since good development contributes to adaptive capacity (Brooks *et al*, 2013; Spearman, and McGray, 2011). There is no easy answer, and in the case of countries seeking to develop an adaptation M&E system, it is important to clearly define what is to be measured from the outset. Section 2 provides some guidance on this process.

1.6. Challenges for monitoring and evaluation of adaptation

Although M&E for adaptation should have a long-term programmatic or national focus, for many years M&E for adaptation has mainly been performed at programme or project level. Often, countries design M&E systems to report on expenditure and outputs over outcomes and impact. This is largely because of the challenges associated with measuring adaptation results at the national level and across sectors. The following potential barriers should be considered when developing relevant adaptation M&E systems (GIZ, 2014; Dinshaw *et al*, 2014; Bours *et al*, 2014a; Spearman, and McGray, 2011).

- The long time-scales over which climate change impacts unfold may make it hard to measure the impacts of adaptation actions and policies.
- Uncertainty over actual climate impacts affects how and when the effectiveness of adaptation responses can be measured.
- Long-term strategies and plans for adaptation are not formulated, which makes it difficult to develop cross-cutting, longer-term M&E frameworks for climate change adaptation.
- The context specificity makes it hard to find common indicators and more difficult to define what to measure and how (as opposed to, for example, measuring GHG emissions for mitigation).

- It can be challenging to attribute impacts to an adaptation intervention, both due to the broader socio-economic context that drives vulnerability (in addition to climate change), and the range of responses required to reduce overall vulnerability. As mentioned above, adaptation and development are often closely interlinked and results can be hard to differentiate.
- While climate data is increasingly available, it may not be sufficiently analysed in a format that is useful to decision makers.
- Data on climate trends or climate risks may change over time, so trends in indicators need to be interpreted in the context of a shifting baseline.
- The lack of centralised climate data and information systems makes the gathering, storing, use and analysis of M&E data challenging, in particular when moving from project to portfolio or sector and national level M&E of adaptation.

Creating flexible, long-term, learning based M&E frameworks founded on robust theories of change can help address some of these challenges (see Section 2, Step 2).

1.7. Monitoring and evaluation of adaptation at national and sectoral level: experiences to date

M&E for adaptation can be carried out on a variety of scales: national, sectoral, sub-national, project portfolio or project level. National adaptation M&E systems need to be tailored to national circumstances (Price-Kelly *et al*, 2015; Vallejo, 2017). Only a few countries have developed national adaptation M&E systems, and even fewer have completed evaluations applying these systems (UNEP, 2017; Vallejo, 2017). Table 2 provides some early examples. The majority of existing systems have been framed at national level around an adaptation strategy or plan, as is the case with almost all countries presented in the table with the exception of Morocco and Nepal. These countries vary in how they aggregate data. Some have developed overall adaptation priorities, which are monitored across sectors and scales (e.g. Germany, Norway, United Kingdom). Some, like Morocco, have focused on a specific geographic scale (local or sub-national). Some have focused on specific programmes, as in Nepal. The majority include agriculture as a prioritised sector, thematic area or national indicator (see Table 2).

Certain countries like France, Kenya, and the Philippines have built their M&E systems around prioritised sectors. Of these, all have included agriculture as a prioritised sector (see Table 2). These countries have developed M&E frameworks that have aggregated data by sector, and, in most cases, have developed specific M&E frameworks for each sector complete with separate sectoral indicators (see Section 2). The data from each sector is then fed into an overall national adaptation M&E system.

Research by GIZ (2014) on these early experiences in national adaptation M&E systems indicates they have been developed mainly for accountability and decision-making, but few of them actually measure adaptation outcomes. These systems have monitored some or all of the following: climate change hazard and impacts; vulnerability/resilience; progress in implementing adaptation actions (process); and results (outcomes) of adaptation actions. Understandably, there has been a stronger focus on monitoring over evaluation. Most systems had a policy mandate, and in several cases they were built around existing M&E structures and processes, to which adaptation was integrated. National adaptation M&E frameworks took anywhere from 18 months to five years to establish. The diversity of the systems exemplifies the necessity of systems specially tailored to the needs of each country. There is no “one size fits all” model (see also UNEP, 2017, chapter 4).



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Table 2

Overview of existing national-level adaptation monitoring systems

Country	Approach
Australia	Identifies climate change risks to essential services (e.g. energy and water supply) and allocation of responsibilities to persons or organisations best placed to address the risks. Indicators of adaptation drivers, activities and outcomes. Sensitivity of agricultural production is one of twelve proposed national indicators.
France	Process indicators and some outcome indicators for 20 priority sectors, which include agriculture, forestry, fisheries and aquaculture.
Germany	Climate change impacts and response indicators for 15 actions and cross-sectional fields to monitor adaptation including agriculture, woodland and forestry, and fisheries. Periodic evaluation of the German Adaptation Strategy.
Kenya	Indicator-based system using outcome and process-based monitoring, reporting and verification (MRV) of actions under the indicators measured at the national and county levels. Proposes prioritised adaptation actions to be monitored for livestock and agriculture sectors.
Morocco	Using indicators to monitor changes in vulnerability, adaptation progress and adaptation impacts. Around 30 indicators in each of the two pilot regions focused on priority sectors agriculture, water and biodiversity/forestry.
Mozambique	Monitor climate change impacts and inform national budget allocations and international climate finance.
Nepal	Programme level indicators (based on Pilot Programme for Climate Resilience (PPCR) core indicators). Indicator system piloted for eight climate change projects and indicators linked to National Adaptation Programmes of Action (NAPA) priorities; matched by individual project-level indicators. Qualitative documentation of lessons learnt. 149 sub national "environmentally friendly" indicators for different sectors (including climate) and scales (household to district).
Norway	Process and impact monitoring using repeated surveys of exposure and adaptive capacity.
Philippines	Indicators linked to results chains for seven strategic priority sectors, including food security. Climate Change Vulnerability Indices for measuring, monitoring and evaluating local vulnerability and adaptation.
South Africa	Established outcome-based system will be used to monitor climate change impacts at appropriate spatial densities and frequencies. Report progress on the implementation of adaptation actions.
United Kingdom	Mixture of approaches: regular, detailed climate change vulnerability assessments; indicators to monitor changes in climate risks; uptake of adaptation actions and climate impacts; decision-making analysis to evaluate whether degree of adaptation is sufficient to address current and future climate risks. Agriculture and forestry is one of seven policy themes of the NAP to which M&E is applied.

Source: Naswa et al., 2015 and GIZ, 2014

This guidance note focuses on M&E of adaptation at the sectoral level. It recognises that measuring adaptation at this level needs to inform national adaptation planning and implementation processes, as well as national adaptation M&E systems, where these exist. M&E of adaptation at sectoral level may also require aggregation of data from sub-national, community and project levels.

To date, there is some experience in building M&E systems for adaptation planning and implementation

at sectoral level, including for the agriculture sectors, in the context of an overall national M&E system for adaptation. Therefore, this guidance note draws primarily on literature and experiences from the national level that can be applied in a sectoral context. It aims to increase understanding on how M&E of adaptation can be achieved in agriculture sectors and how it can be fed into national level planning, implementation, M&E and decision-making processes.

1.8. Monitoring and evaluation of adaptation in agriculture sectors

For many developing countries, increasing climate variability and change is impacting agricultural productivity and adding pressure to fragile food and ecological systems (FAO, 2017). The rural poor in developing countries are particularly vulnerable due to the limited resilience and diversity of their production systems, coupled with their high dependence on agricultural production. Increasingly, agriculture is being integrated into national and sectoral policies, planning frameworks and budgets through mechanisms such as National Adaptation Plans (NAPs) (see Box 4), with the goal of sustaining development in a changing climate.

In the agriculture sectors (agriculture, livestock, forestry, fisheries and aquaculture), adaptation can be pursued through policies, planning and investments that address the challenges and potential opportunities that climate impacts currently present, or will present in the future. This includes stand-alone adaptation interventions as well as integrating adaptation considerations into agriculture sector policy, sectoral planning and overall development planning.

Adaptation interventions in the agriculture sectors include conservation agriculture, piloting new crop varieties, water saving technologies, reforestation and integrated coastal management (FAO, 2013). Countries are implementing these interventions to enhance

food security and national adaptive capacity. Such interventions often have their own M&E frameworks at the project or programme level.

Within this context, it is important to understand whether a range of implemented adaptation actions, policies and plans are achieving desired results, across a broader scale. This is where adaptation M&E frameworks for the agriculture sectors become relevant.

This technical guidance note aims to support the development of M&E systems for adaptation planning in the agriculture sectors. These systems track two types of progress:

1. Progress in **implementing adaptation programme portfolios or policies** in the agriculture sectors; and
2. Progress towards **achieving adaptation outcomes** in the agriculture sectors, i.e. how these interventions and policies are reducing vulnerability, improving adaptive capacity, and supporting the overall well-being of different populations affected by the impacts of climate change.

1.9. Measuring progress on gender equality in adaptation planning and implementation

Many countries are committed to achieving positive gender equality and women's empowerment in the context of adaptation in the agricultural sectors. The 2017 Gender Action Plan adopted by the Conference of Parties to the UNFCCC, gender-related commitments in NDCs, and national level policies reflect this commitment. The commitments to tackling underlying social inequities in tandem with climate change challenges in the agriculture sectors have come about based on an increasing understanding of the following:

- Pervasive gender-based inequalities keep agricultural sectors from achieving their full potential. Left unaddressed, the gender gap in access to resources and services reduces agricultural productivity, hinders economic development and inhibits the achievement of social development goals (FAO, 2011).
- Gender roles and responsibilities shape how different members of agricultural communities experience the impacts of climate change (Jost *et al*, 2016; World Bank, IFAD, FAO, 2015; Carr and Thompson, 2014).
- Adaptation efforts can be strengthened when women are actively included and their needs are addressed, as their knowledge and social capital can make them key agents of change.
- As explained by the UNFCCC Least Developed Countries Expert Group (2015:17), the unique adaptation-relevant knowledge women hold is crucial to ensuring that adaptation responses to climate change impacts are effective and sustainable. Therefore, women's full and effective participation is essential to the adaptation process.

There are numerous benefits to addressing gender issues in the National Adaptation Plans (NAPs). As summarised by the NAP Technical Guidelines (LDC Expert Group, 2012), in addition to leading to better adaptation and more resilient communities, "integrating

a gender perspective into the NAP process can help to ensure that there is equal participation of men and women in the decision-making processes, as well as in the implementation of adaptation activities. Furthermore, it can help to ensure that the NAP process and the activities it entails will not exacerbate gender inequalities."

While commitments to address gender inequalities continue to be made, oftentimes progress toward gender equality is hindered by a lack of systematic gender mainstreaming, including consistent monitoring and evaluation of real change in gender equality (Huyer *et al*, 2015). As the Asian Development Bank points out, "identifying clear indicators to measure gender equality results is essential to measure and improve performance" (ADB, 2013:3).

This guidance note will provide advice on how to conduct gender-sensitive monitoring in order to measure progress on gender equality and women's empowerment within adaptation planning and implementation for the agricultural sectors. It gives explanations on how to use gender-sensitive indicators and sex-disaggregated data.

Box 6

In detail: Gender and adaptation in the agriculture sector

The adaptive capacity of both men and women depends on opportunities that are governed by the complex interplay of social relations, institutions, organisations and policies. Adaptation actions should follow gender-responsive and participatory approaches. In the agriculture sectors this means, among other things, collecting and analysing sex- and age-disaggregated data on access to and use of resources, including information; addressing women's strategic needs, such as insecure land and resource tenure, to facilitate the adoption of climate-smart agricultural practices; examining how institutions may perpetuate inequalities, involving men and women in the conservation of biodiversity; and providing training on agricultural extension for both women and men.

From: Submission by FAO to the UNFCCC on Issues relating to agriculture: adaptation measures (March 2016)



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Gender-sensitive monitoring and evaluation

- helps assess whether the policy or programme's planned activities are achieving gender equality and women's empowerment goals, including tracking the support provided to women and men as well as their participation in adaptation projects;
- provides feedback on how activities affect the various target groups, including the benefits provided to women and men, disaggregated by age, ethnicity, caste, education, employment and geographical location; and
- should be based on a gendered participatory approach (male and female beneficiaries and stakeholders all contribute to the M&E process) and use gender-sensitive indicators.

Resources for Section 1

[Addressing agriculture, forestry and fisheries in National Adaptation Plans – Supplementary guidelines](#) (FAO, 2017)

[Developing national adaptation monitoring and evaluation systems: A guidebook](#), (Price-Kelly et al., GIZ and IISD, 2015)

[Gender in Climate-smart Agriculture](#) – Module 18 of the Gender in Agriculture Sourcebook. (World Bank, FAO, IFAD, 2015)

[Handbook on Planning, Monitoring, Evaluation for Development Results](#) (UNDP, 2009)

[Insights from national adaptation monitoring and evaluation systems](#), OECD Climate Change Expert Group, Paper No.2017(3), Vallejo, L. (OECD), 2017

[Monitoring and Evaluating Adaptation at Aggregated Levels: A Comparative Analysis of Ten Systems](#) (GIZ, 2014)

[National Adaptation Plans: Technical Guidelines for the National Adaptation Plan Process](#) (UNFCCC LDC Expert Group, 2012)

SECTION 2. Designing an adaptation monitoring and evaluation framework and plan for the agriculture sectors

The primary focus of this guidance note is to look at M&E of adaptation at the sectoral level, examining either M&E of a key sectoral policy or strategy related to climate change adaptation in the agriculture sectors, or the M&E of adaptation in a portfolio of sector-wide adaptation programmes and projects.

This section provides a step-by-step guide on the process needed for developing an M&E framework and M&E plan for tracking and measuring adaptation in the agriculture sectors.

Several tools and approaches for national adaptation monitoring and evaluation systems have been created by development support agencies. For example, a guidebook prepared by GIZ in cooperation with the LDC Expert Group and the Adaptation Committee proposes key steps or building blocks to develop national

adaptation M&E systems (Price-Kelly *et al*, 2015). This provides a useful starting point, however greater elaboration is required when preparing sector-specific guidance.

The present note provides additional and elaborated practical steps, including with regards to adaptation goals, Theory of Change and defining M&E frameworks (see Table 3) to be applied at the sectoral level. These steps are coterminous with the elements of the NAP process and other national level adaptation planning processes (not explicitly designated as the NAP process). In fact, Step 1 and Step 2 are major aspects of the NAP process and as such are not specific only to M&E. However, these steps provide the framework in which M&E needs to be developed.

Table 3

Steps for developing an and plan for the system for adaptation in the agriculture sector

Step 1	Understanding the policy context
Step 2	Developing a shared adaptation goal and pathways for integrating adaptation in the agriculture sector
Step 3	Defining the purpose and focus of the M&E framework
Step 4	Developing an M&E Framework for adaptation in the agriculture sector
Step 5	Identifying indicators to track adaptation in the agriculture sector
Step 6	Identifying the sources and type of data and information required for each indicator
Step 7	Operationalising adaptation M&E for decision-making in the agriculture sector

This note identifies the key stakeholders who should be engaged at each step of the process, and provides guiding questions for reflection among those stakeholders. All steps are targeted for M&E units and technical staff working on adaptation in Ministries of Agriculture, engaging other stakeholders where relevant.

Steps 1, 2 and 7 of the process for designing an adaptation M&E system should involve the engagement of a broader range of key stakeholders, including those working on adaptation planning and implementation at national level. This is to ensure that M&E of adaptation in the agriculture sectors

provides relevant information and lessons learned back into national and cross-sectoral adaptation and development planning. Steps 1 and 2 would usually build upon ongoing national adaptation planning processes, such as the NAPs, which already provide an adaptation policy context and have defined adaptation goals. In some cases this also involves sector-specific adaptation goals and priorities. From Step 1 onward,

M&E should be seen as an integral part of such an ongoing, iterative planning process.

This note also suggests a set of possible actions and outputs for each step. At the end of each step, the note proposes a list of resources for further reading. While the steps follow a logical sequence, they may be followed in a different order or in parallel, depending on country circumstances.

Step 1: Understanding the policy context

Key questions for Step 1:

Understanding the policy context

When considering M&E of adaptation in the agriculture sectors, key questions to consider may include:

1. What are the **key climate change risks** and related adaptation challenges in the country (at national and sub-national levels) that affect the agricultural sectors? What are the **barriers** to adaptation?
2. What are the **key policies and plans** relating to national sustainable development (including gender and other social equity goals)? To climate change? To the agriculture sectors (agriculture, forestry and fisheries)?
3. What are the **key adaptation targets and outcomes** outlined in national climate change policies? Do these include targets that promote gender equality?
4. To what extent does **agriculture policy capture issues of adaptation**?
5. Is there an **existing M&E framework for adaptation** (national or sectoral)? Is there a mandate to do one? Does it integrate agriculture? (See Case Study 1 for an example on Kenya's national system).

Indicative actions

- ▶ Desk review and/or stocktaking of existing vulnerability assessments; key national plans and policies; and existing adaptation M&E frameworks; and

- ▶ Cross-sectoral discussion and mapping with key adaptation stakeholders (e.g. a workshop).
- ▶ Output: mapping of key policies and identified entry points.

Stakeholders to engage

- representatives of key Ministries (e.g. Planning, Environment) working on climate change adaptation and NAPs, and of climate change coordinating body;
- heads of Unit and technical staff working on climate change adaptation in Ministry of Agriculture;
- M&E staff from Ministry of Agriculture;
- representatives from national statistics bureaus; and
- representative of M&E unit working on national adaptation M&E (where relevant).

This step identifies the entry points for developing an M&E system for adaptation in agricultural sectors. First, assess the main climate change impacts the country expects to face, focusing on impacts in the agriculture sectors (Question 1). This may include reviewing existing vulnerability assessments (see Box 7) or other key documentation (such as National Communications to the UNFCCC and national or sectoral vulnerability assessments) as part of a desk review or stocktaking exercise, for example under a NAP process.

Then, analyse and become familiar with the policy context and policy objectives articulated in various existing policies and plans, such as development plans; climate change adaptation policies and strategies, incl. NAPs and NDCs; agriculture development strategies or climate smart agriculture strategies; and environment policies and strategies (Question 2). This can be done as part of a desk review or stocktaking. The intended goals of these plans and policies can guide the design and content of the adaptation M&E framework by helping to define the overall adaptation challenges or goals that national and sectoral adaptation planning processes are trying to address in agriculture sectors (Questions 3 and 4). It may also help inform how adaptation investments and actions in the agriculture sectors feed into broader adaptation goals at the national level. Policies may also include mandates to develop M&E systems for adaptation, including adaptation M&E in the agriculture sectors (Question 5).

The type of available entry points and the extent of the existing, supportive adaptation policy framework will largely depend on where the country is at in terms of its adaptation planning process. For example, where countries have undertaken NAP processes, stocktaking reports and assessments may be readily available to aid in the identification of climate change impacts and policy objectives. Policies or NAP roadmaps may have already established an M&E system for adaptation, paving the way for further development of sector-specific adaptation M&E frameworks. M&E frameworks should act as integral parts of adaptation planning from the outset of the planning cycle, as was described in Section 1.4 above. They should also be aligned with set policy goals and objectives.

Case Study 1 uses Kenya's MRV+ system as an example of the policy context for M&E of adaptation in the agriculture sector in Kenya. The study shows how M&E of adaptation in the agriculture sectors interacts with a range of existing national (NCCAP, NAP) and sectoral (KCSAFP) policy processes, which can help to define goals and objectives for an adaptation M&E system in the agriculture sectors. Sectoral adaptation

M&E in Kenya is also tied to an existing national adaptation M&E Framework in Kenya, MRV+. The system aims to build on existing institutional arrangements and data management systems.

Resources for Step 1: Understanding the policy context

- Key national policies: development plans; climate change adaptation policies and strategies, incl. [NAPs](#), [NDCs](#) (and [INDCs](#)); agriculture development strategies or climate smart agriculture strategies; environment policies and strategies;
- [National Communications](#);
- [Developing national adaptation monitoring and evaluation systems: A guidebook](#) (Price-Kelly et al., IISD and GIZ, 2015); and
- Vulnerability assessments carried out in country.



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Case Study 1: MRV+ system in Kenya

Kenya has a National Performance and Benefit Measurement Framework (NPBMF), or MRV+ system, to measure, monitor, evaluate, verify and report the results of mitigation action, adaptation actions and the synergies between them, including with regards to agriculture. The MRV+ system was set up under Kenya's National Climate Change Action Plan 2013-2017 (NCCAP), which supports the implementation of Kenya's 2010 National Climate Change Response Strategy.

The NCCAP recommended the establishment of a National Climate Change Law (2016), which further strengthens institutional arrangements and data management systems for adaptation, which are also of relevance for M&E. Kenya's NAP 2015-2030 further developed a Theory of Change and refined existing indicators from the MRV+ system. The MRV+ system is in an advanced stage, but is not yet fully operational due to constraints in capacity and financial resources to implement the MRV+ system.

The MRV+ system is a national framework supported by sectoral and sub-national M&E activities. The agriculture sector has a Kenya Climate Smart Agriculture Strategy 2017-2026, which is further operationalised through the Kenya Climate Smart Agriculture Framework Programme (KCSAFP). The NAP-Ag Programme is looking to support the development of an M&E system for the KCSAFP.

Source: National Climate Change Action Plan 2013-2017; Kenya National Adaptation Plan 2015-2030; Kenya Climate Smart Agriculture Strategy 2017-2026.

Box 7

Climate change risk and vulnerability assessments

Climate change risk and vulnerability assessments are often carried out at the beginning of adaptation planning in a country, and help guide identification of vulnerable geographic areas and sectors. Assessments provide a useful baseline against which future adaptation interventions can be measured. Vulnerability assessments can also be applied on a regular basis to measure changes in the risks and vulnerability of a given country, sector or local area. Norway provides a good example of this approach (GIZ, 2014). Vulnerability and risk assessments performed at the national level facilitate the identification of indices used to evaluate adaptation success. These indices examine both how widely and how well countries or institutions manage climate risks (e.g. institutional readiness for climate change) and the success of adaptation interventions and investments in reducing climate vulnerability, keeping development on course, and reducing losses from climate hazards (e.g. community vulnerability indices, families affected by floods, storms and drought) (IIED, 2015a).

Vulnerability assessments are often applied at a sectoral level. For the agriculture sector, this could enable the identification of particularly vulnerable farming systems, crops and livestock as well as help identify appropriate adaptation responses.

Limitations: Risk and vulnerability assessments provide an analysis of vulnerability at a given point in time. They do not always measure how changes in vulnerability were achieved, nor are they well equipped to monitor ongoing progress.

A range of vulnerability assessment tools are available on-line. The UNFCCC/NWP database provides search functions to help narrow down VA tools for the agriculture sector.

- **Baseline Survey:** Data and methods of Research Program on Climate Change, Agriculture and Food Security (CCAFS) of CGIAR. Provides agriculture-specific examples for creating a baseline at household, village and organisational level.
- **Participatory Capacity and Vulnerability Analysis: A Practitioner's Guide** (Oxfam, 2011). A practical tool for community level vulnerability analysis.
- **The Vulnerability Sourcebook: Concepts and guidelines for standardised vulnerability assessments** (GIZ, 2014; and its risk assessment supplement, GIZ, 2017). A comprehensive guide on carrying out VIAs.
- **PROVIA Guidance on Assessing Vulnerability, Impacts and Adaptation to Climate Change** (PROVIA, 2013). Chapter 3 with practical tools, including those dealing with vulnerability and capacity assessments.

Source: OECD, 2015; Oxfam, 2011; GIZ, 2014/2017; PROVIA, 2013; IIED, 2015a.

Step 2: Developing a shared understanding of the adaptation goal and pathways for integrating adaptation in the agriculture sector

Key questions for Step 2:

Adaptation goals and pathways

- 1 What is/are the **adaptation goal(s)** you wish to achieve in the agriculture sectors? What is the role of the agriculture sector in achieving national adaptation goals?
- 2 What are the **different pathways towards the final adaptation goal(s)**? Note that some may already be articulated in e.g. the Agriculture Development Strategy, Climate Smart Agriculture Strategy, National Climate Change Strategy, NAP or other development or sectoral policies. Determine the level of the goal (national or sectoral).
- 3 How can the **current policies, plans and programme portfolio** within the agriculture sector help achieve the goal(s)?
- 4 What are the **barriers**? What **assumptions** are you making?

Indicative actions

- ▶ Establish cross-sectoral working session with key adaptation stakeholders (e.g. in a workshop); and
- ▶ Develop a Theory of Change for adaptation in the agriculture sector, or an agreed joint adaptation goal.
- ▶ Output: Theory of Change narrative and diagram; or an agreed adaptation goal.

Stakeholders to engage

- heads of Unit and technical staff working on climate change adaptation in Ministry of Agriculture;
- M&E staff from agriculture Ministry;
- representatives of key Ministries (e.g. Planning, Environment) working on climate change adaptation; and
- representative of M&E unit working on national adaptation M&E (where relevant).



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2.1. Identify shared adaptation goal(s) and pathways

It is important to have a shared understanding of long-term adaptation goals or changes for the agriculture sectors, and how you hope to achieve those goals.

The adaptation goal may be informed by current policies (see Step 1), for example an Agriculture Development Strategy, Climate Smart Agriculture Strategy, National Climate Change Strategy, NAP or other development or sectoral policies (Question 1). These strategies may also identify pathways, such as priority thematic areas or programmes to achieve the defined adaptation goal(s) (Question 2). Where they exist, NAP processes are likely to define both the overall adaptation goal that is sought and the prioritised pathways and means to achieve that goal.

If not already articulated in existing policies, the goals and pathways can be defined as part of a Theory of Change exercise (see below). You should consider which specific policies, plans and programmes will help you achieve your set goals (Question 3 and 4). You should be clear about the underlying assumptions inherent in the causal pathway (Question 4).

2.2. Methods and tools for adaptation monitoring and evaluation

A range of methods, tools and approaches are available for developing M&E, including some that are specifically tailored for adaptation. These methods and tools can be applied throughout the design process, from defining the context and goal of an M&E framework to conducting ex-post evaluations and audits of adaptation programmes or policies. This section provides a brief overview of some of these methods and tools, including links to online resources, with particular attention paid to those that may be of use when developing an adaptation M&E framework for agriculture sectors. A more comprehensive list of adaptation M&E tools and methods is available from the UNFCCC Adaptation Committee inventory of M&E tools and methods (2016), available at http://unfccc.int/files/adaptation/groups_committees/adaptation_committee/application/msexcel/ac10_5b_inventory_m_and_e.xls.

Theory of Change

When designing an adaptation M&E Framework for the agriculture sectors, a Theory of Change (TOC) is a useful tool, and can help to collectively define goals, steps and causal pathways that link outputs, outcomes and impacts, as well as the assumptions required to reach those goals. A TOC is especially useful during Step 2 of this guidance note, if such a TOC has not already been defined as part of existing policy and planning documents and frameworks.

Theory of change: An explanation of how a group of stakeholders expects to reach a commonly understood long-term goal. (*The Aspen Institute, 2005:3.*)

Using a TOC allows stakeholders to describe the causal sequence used to achieve desired results (FAO, 2016b). It is often represented in a diagram or chart, as seen below in Case Study 2 for Morocco and Case Study 3 for Uganda. However, a full TOC process involves more than a diagram; it requires full consideration of barriers, a problem tree analysis, and identification of different pathways and indicators. This type of analysis should be completed for each different level of adaptation and planning that are being considered, including at the national and sectoral level. A proper TOC should help you consider and articulate the underlying assumptions in your reasoning and explain how the suggested activities and early accomplishment will lead to the intended outcomes and long-term results. The TOC should be applied to: i) tracking the performance of adaptation at the national level; ii) tracking the performance of adaptation within a particular sector; and iii) evaluating the impacts of particular policies (IIED, 2015a). Tools are available for carrying out the TOC exercise with the guidance of an M&E expert (see resources in Box 8 below).



Case Study 2: Sectoral monitoring and evaluation at sub-national level in Morocco

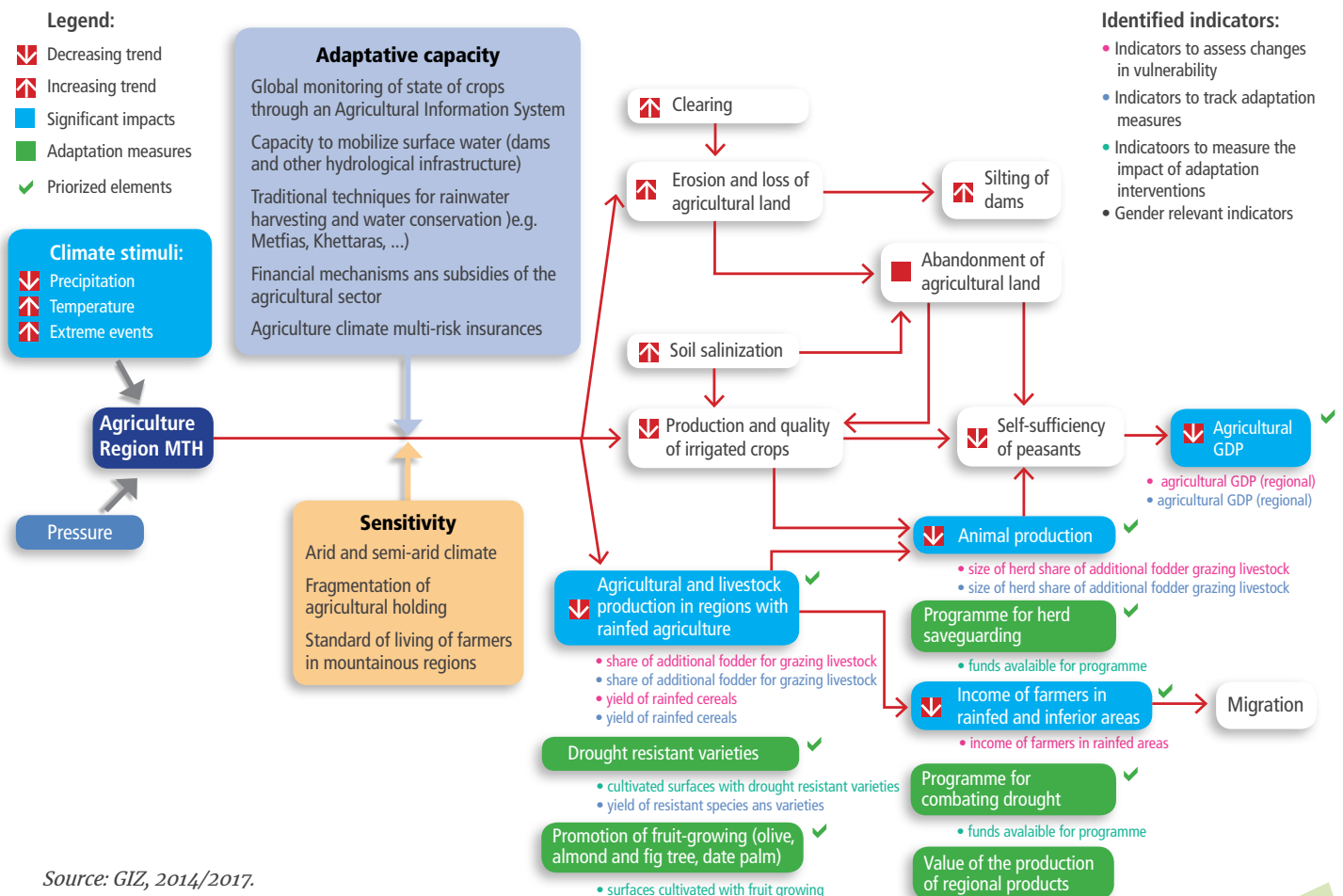
Morocco has a system of Regional Observatories on Environment and Sustainable Development (OREDDs), which are established in each region. The OREDDs are responsible for the Regional Environmental Information Systems (SIRE) which produce and disseminate environmental information. Sector representatives, including ones from agriculture, support the OREDDs with regard to data collection, analysis and communication of monitoring information. Existing environmental monitoring systems will integrate mechanisms to monitor vulnerability and adaptation.

The indicator-based system has established climate change vulnerability and impact chains, which is a type of TOC. Figure 3 below shows an impact and vulnerability chain developed for the agriculture sector of one region.

This example shows which climate change stimuli and impacts make the Marrakech Tensift Al Haouz region vulnerable. It identifies objectives that will enhance adaptive capacity (e.g. capacity to mobilise surface water). It also shows how specific adaptation actions (e.g. drought resistant varieties) can increase adaptive capacity, and identifies indicators to measure these changes.

Figure 3

Example of a climate change impact and vulnerability chain for the agricultural sector in the region Marrakech Tensift Al Haouz which served as the basis for the indicator development.



Source: GIZ, 2014/2017.

Case Study 3: Theory of change for Uganda’s agriculture sector NAP

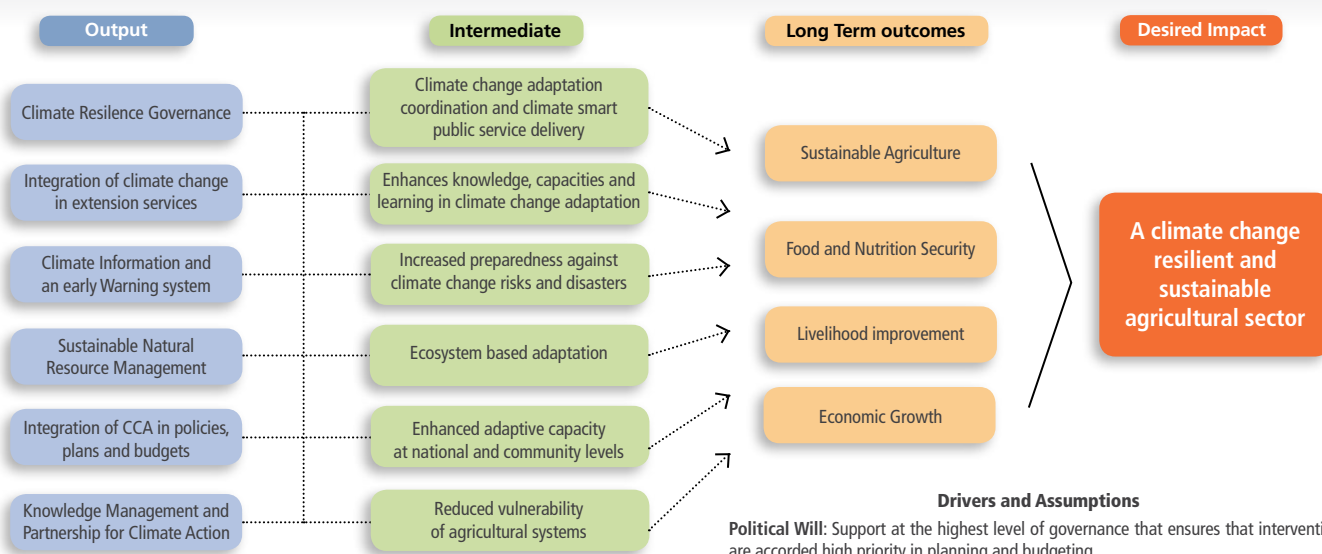
In Uganda, a Performance Monitoring and Evaluation Framework has been developed for the sector-specific NAP for Agriculture (NAP-Ag) under the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF). A stakeholder discussion and consultation formed the basis for developing the TOC.

As shown by the diagram, the desired overall impact of this TOC is a sustainable, climate resilient agricultural sector. To achieve this long-term goal, a series of interventions is required to generate both intermediate and long-term outcomes that will result in sustainable agriculture, food and nutrition security, livelihood improvement, and economic growth. To begin this process the MAAIF will enhance knowledge, capacities and learning on adaptation; integrate adaptation in agricultural extension services to ensure resilient value chains; invest in sustainable natural resource management for Ecosystem-based Adaptation; and increase uptake of climate smart agricultural technologies.

The adaptation-specific M&E will feed into the MAAIF M&E system and the National Public Sector M&E Policy (2013). The Ministry of Finance and Government annual and bi-annual performance review (GAPR) under Office of the Prime Minister will capture key performance data using budget performance reporting.

Figure 4

Uganda Theory of change for Agriculture Sector NAP



Source: Performance Monitoring and Evaluation Framework, MAAIF Uganda, 2017 (draft).

Box 8

Resources for theory of change

- [The Theory of Change approach to climate change adaptation programming \(Bours et al., 2014b\)](#)
- [The Community Builder’s Approach to Theory of Change: A Practical Guide to Theory Development \(Andersson, 2005\)](#)
- [Hivos ToC Guidelines: Theory of Change Thinking in practice \(van Es et al., 2015\)](#)
- [Creating your Theory of Change: NPC’s Practical Guide \(Harries et al., 2014\)](#)
- **Theory of Change examples:** <http://www.theoryofchange.org/library/toc-examples/>

Adaptation monitoring and evaluation tools

A set of adaptation-specific M&E tools provide step-by-step guidance for developing an M&E framework for adaptation at the programme, local, sectoral and/or national level. These tools can easily be applied to agriculture sectors. Table 4 below provides a short list of available adaptation M&E methods and tools particularly relevant to agriculture sectors. Most of these tools are set up to support the design of an adaptation M&E Framework, including assessing the context in which M&E Frameworks are developed and developing of a TOC. Case Study 4 provides an overview of the application of the TAMD tool to track adaptation in Cambodia's agriculture sector.

The choice of relevant M&E tools should be based on certain criteria, including the M&E context and purpose (Leiter, 2017). Stakeholders can simultaneously apply these tools and the steps in this guidance note.

Table 4

Examples of adaptation monitoring and evaluation tools relevant for agriculture sectors

<p>Making adaptation count Spearman <i>et al.</i>, 2011</p> <p>Adaptation made to measure GIZ, 2012/2013 (2nd ed.)</p>	<p>This framework provides steps for the design and development of an M&E framework for climate change adaptation programmes at the national level. It could be applied to large-scale agriculture programmes.</p> <p>The GIZ guidebook “Adaptation made to measure” operationalises the framework for application at the project-level, including the use of a TOC approach.</p> <p>http://www.adaptationcommunity.net/monitoring-evaluation/project-level-adaptation-me/</p>
<p>Tracking adaptation and measuring development TAMD Brooks <i>et al.</i>, 2014.</p>	<p>TAMD evaluates adaptation success based on how widely and how well countries or institutions manage climate risks (Track 1) and how successful adaptation interventions are in reducing climate vulnerability (Track 2). The step-by-step guide can be applied at all levels, and has been used in countries like Kenya to develop national adaptation M&E systems. It can also be used to track the performance of adaptation within a particular sector. In an agriculture sector, the guide would focus on climate risk management in the agriculture sector; resilience of agriculture to climate change; adaptation actions in the agriculture sector; and resilience of agriculture-dependent people and communities. See Case Study 4 for an example of the application of TAMD in Cambodia.</p>
<p>AdaptME Toolkit Pringle, 2011.</p>	<p>This step-by-step, questions-based tool kit is a flexible resource that asks guiding questions to help practitioners design an M&E framework or integrate adaptation into existing M&E frameworks. It provides links to additional M&E resources. It would be most relevant for an agriculture and adaptation programme, but the questions can also guide reflection on development of an M&E adaptation framework at the agriculture sector level.</p>
<p>Developing national adaptation M&E systems: A guidebook Price-Kelly <i>et al.</i>, 2015</p>	<p>The guidebook provides a series of questions that can guide decision-making on the purpose, design, operationalisation and use of national systems for M&E of adaptation. While the questions are aimed primarily for the national level, they can be applied for a sectoral context, as has been done in Section 2 of this document.</p>

Case Study 4: Cambodia's climate change monitoring and evaluation framework

Cambodia's recently released Climate Change Strategic Plan (CCCSP) 2014–2023 recognises the importance of building a national M&E framework that measures and tracks how well the country is managing climate risks and meeting development targets. The Ministry of Agriculture, Forestry and Fisheries' (MAFF) has engaged in a participatory process and expert stakeholder workshop to apply the Tracking Adaptation and Measuring Development (TAMD) model to support M&E of agriculture sector responses to climate change and collect baseline data for tracking progress of adaptation within MAFF. This is part of the implementation of the MAFF's Climate Change Action Plan (CCAP).

TAMD was created by the International Institute for Environment and Development (IIED) as a national level approach to M&E of climate change adaptation. It encompasses two parallel approaches; measuring institutional readiness (Track One) and sectoral impacts (Track Two). Selected ministries have bridged their sectoral M&E systems to form a direct link to the overarching inter-ministerial CCCSP and associated adaptation M&E framework. TAMD was first applied at the national level and then at the sectoral level. It includes the selection of indicators for each of the five pillars of programming in MAFF's CCAP, namely: agriculture, rubber, livestock, fisheries and forestry. Four process indicators were identified to understand how MAFF is integrating climate risk management into its policy and programming and enhancing institutional capabilities to respond to climate change. These indicators are:

- Status of climate change integration into sectoral planning: Level of inclusion of climate change adaptation into MAFFs long-term, medium-term and short-term planning;
- Status of coordination: Status and functionality of sectoral coordination mechanism for climate change response and implementation of a Climate Change Action Plan;
- Status of climate information: Status of production, access and use of climate change information at the sectoral level; and
- Status of climate integration into financing: Status, availability and effectiveness of a financial framework for climate change response at the sectoral level.

The M&E framework will regularly measure impact indicators for the agriculture sector, including rice yield per hectare, cassava yield per hectare, maize yield per hectare and mung bean yield per hectare. The framework will also measure impact indicators in the fisheries sector, including national yield from inland fishing, national yield from marine fishing, national yield from aquaculture and hectares of planting in inundated/mangrove forest. In the forestry sector, the framework will measure forest protection and wildlife conservation areas and forest replanted areas.

Source: IIED, 2016. Climate Change Adaptation: An M&E framework for Cambodia's Ministry of Agriculture, Forestry and Fisheries

Performance and impact evaluations

Appraisals or evaluations carried out before implementation (ex-ante) and evaluations carried out at a given point in time, or after completion of an adaptation policy or action (ex-post), can help identify which approaches are most effective in achieving desired goals. They can also help understand which conditions are more conducive to successful adaptation.

Performance evaluations tend to be carried at the end of the adaptation planning, implementation and M&E cycle, when looking to measure the effectiveness of programmes or policies. Evaluations can be either theory-based or empirically-based. Impact evaluations could be carried out either at the beginning (ex-ante) of the planning and implementation cycle, for example when choosing which adaptation options to prioritise, or at the end (ex-post) of the cycle to measure effectiveness of adaptation programmes or policies.

Performance Evaluations: Performance evaluations are carried out to assess the effectiveness of an action or policy in achieving set goals. Projects and programmes usually include performance evaluations to measure relevance, effectiveness, efficiency, impact and sustainability. Evaluations can also be applied to

policies to review progress and make needed course adjustments.

Impact evaluations: Impact evaluations help understand if an adaptation programme has achieved the desired impact on target groups or regions. They can inform decision-making regarding which interventions are most effective and investment worthy. Impact evaluations are especially useful when testing new innovative interventions that seem promising in theory but with little hard evidence either at the local level or because of new uncertain threats of climate risk. To date, impact evaluation has primarily been applied to adaptation programmes rather than adaptation policies (see Case Study 5) (GIZ, 2015).

Both performance and impact evaluations have been applied to agriculture sector adaptation programmes and used as a means to inform adaptation decision-making in that sector. Box 9 includes additional resources.

Limitations: Performance evaluation can be complex if the scale of activities is large. Impact evaluation requires strong technical skills, can be very time-consuming and costly.

Box 9

Resources on performance and impact evaluation

Performance Evaluation

- [Evaluation of the Implementation of Finland's National Strategy for Adaptation to Climate Change](#) (MMM, 2009). An example of one of the few evaluations carried out on a National Adaptation Plan or Strategy, and used to feed into and revise an updated Strategy.

Impact evaluation

Initial guidance is emerging on the application of impact evaluation for adaptation focused on the project/programme level. The NAP-Ag Programme is working on impact evaluation for adaptation and agriculture, and is developing further case studies and guidance materials.

- [Impact Evaluation Guidebook for Climate Change Adaptation Projects](#) (GIZ, 2015): Provides an overview of impact evaluation methodologies and how they could be applied to climate change adaptation projects. The methodologies can be applied to adaptation and agriculture projects.
- [Handbook on Impact Evaluation](#) (World Bank, 2010) and [Impact Evaluation in Practice](#) (World Bank, 2011): Practical step-wise guides for doing impact evaluation in general (not focused on adaptation).
- [Using impact evaluation to improve policymaking for climate change adaptation in the agriculture sectors. Briefing Note](#) (FAO and UNDP, 2018)

Case Study 5: Impact evaluation of climate change adaptation: The case of flood-tolerant rice in India

Climate change is projected to increase the likelihood of extreme weather such as floods. Rice farmers in Odisha, India are subject to flooding on an annual basis. The risk of floods makes farmers conservative in their cultivation in that they do not cultivate as much land as possible, nor do they use the full extent of their available land. Moreover, they often refrain from investing in their land because of the risk of floods, and deploy fewer inputs and fewer land improvement investments. To address this issue, researchers tested a new flood resilient rice variety (called Swarna-Sub1) while measuring impacts on yields, profit and farmer behaviour.

In order to test the impact of Swarna-Sub1, researchers designed an impact evaluation. Impact evaluations offer a rigorous method of quantifying the impact of an intervention. There are several types of impact evaluation designs, including experimental and quasi-experimental. Experimental designs select program beneficiaries at random (as if by lottery), thereby ensuring no bias in selection between those who receive the intervention (the treatment group) and those who do not (the control group). If instead, beneficiaries select themselves into a program, there may be concerns about the validity of the intervention's impact since those potential beneficiaries who think the program would be most useful to them will apply. This simply means that the types of people who receive, or do not receive, the program intervention are different. Quasi-experimental designs are employed when randomly selecting beneficiaries is not possible due to political, institutional and other reasons. Quasi-experimental designs aim to minimise the bias of self-selected beneficiaries through statistical techniques.

In this case, the researchers designed a randomised controlled trial using an experimental evaluation design. This meant that they randomly allocated 64 villages to the treatment group and six villages to the control group, and farmers in the eligible treatment villages were offered the new resilient variety to plant: "By comparing treatment farmers with farmers in villages where Swarna-Sub1 was not distributed, researchers measured the impact of the improved seeds on rice yields, the amount of land cultivated, planting techniques, use of credit products, and savings habits."

The new flood resilient variety was successful in reducing farmer losses due to flooding and increasing farmer investment in their land and farmer profitability. This makes the new variety a promising candidate for scaling-up to other farmers in this flood-prone area of India. The adaptation option that was tested (flood resilient rice) improved farmer outcomes in relation to current climate variability and change, making farmers more resilient. As the climate continues to change, program managers and policymakers must continue to experiment with new varieties and scale up the varieties that improve farmer outcomes. More generally, program managers and policymakers must continually test and evaluate farmer adaptation options. Impact evaluation methods are essential tools to rigorously test new adaptation options and generate evidence with which program managers and policy-makers can make rational choices when identifying the best options to adopt.

Source: Dar, M. H., De Janvry, A., Emerick, K., Raitzer, D., & Sadoulet, E. (2013). Flood-tolerant rice reduces yield variability and raises expected yield, differentially benefitting socially disadvantaged groups. Scientific reports, 3

Step 3: Defining the purpose and focus of the monitoring and evaluation framework

Key Questions Step 3: Purpose and focus of M&E framework

1. What is the **purpose of an M&E framework for adaptation in the agriculture sector**? What are you trying to measure? For example, is the purpose to learn about the effectiveness of adaptation actions in the agriculture sector, and adjust course of future interventions? To monitor and evaluate the implementation of agriculture plans and strategies? To report on adaptation spending in the agriculture sector? For adaptive management of existing agricultural practices and sectoral priorities? The purpose should be defined in your theory of change exercise, if you did one (Step 2).
2. Who are the **target users of the M&E results**, both within and outside the Ministry of Agriculture? (E.g. Ministry of Agriculture sectoral experts and decision-makers; planning units and/or M&E units; national development planners or Ministry of Planning; national climate change coordination body; Ministry of Environment; local level authorities implementing agricultural activities; or global stakeholders such as UNFCCC?) This will determine the kind of information to collect and how to package the results of the M&E exercise.
3. Are you looking to **monitor changes in climate risk and vulnerability over time** and what **the impacts** are on the agricultural sector, as well as on different actors?
4. Are you aiming to **monitor the advancement of a specific policy, plan or intervention** and how this contributes to adaptation on the ground? (E.g. a NAP, an Agriculture Development Strategy or Climate Smart Agriculture Strategy?)
5. Are you looking to **monitor and evaluate** the outputs/outcomes and/or impact of a **portfolio of adaptation programmes in the agriculture sector**, evaluating what works, what doesn't? Is this done to inform future investment decisions?
6. Are you looking to **monitor and evaluate increased capacity** of key (agricultural) stakeholders in delivering policies, plans and programmes related to adaptation?
7. Do you wish to **monitor and evaluate adaptive capacity** in the agriculture sector in terms of e.g. changes in agricultural practices that make them and dependent people less vulnerable to climate change?
8. Are you looking to **monitor where and how adaptation funding** is used, and by whom?

Indicative activities

- ▶ Agriculture Ministry working session (e.g. in context of workshop).
- ▶ Output: agreed focus and purpose of M&E and agreement on stakeholders to keep involved.

Stakeholders to engage

- Agriculture Ministry: policy makers on adaptation (Heads of Unit);
- Agriculture Ministry: technical staff working on adaptation; and
- Agriculture Ministry: M&E unit.

Understanding the purpose of your adaptation M&E Framework for the agriculture sectors will allow you to tailor the framework to the right context and will also help to narrow down the types of indicators and data that need to be collected. You should ask what aspects of adaptation are you trying to measure (process, outcomes or impacts) and who will make use of the M&E results. Finally, it is important to understand how M&E results feed into decision-making (this will be discussed in further detail under Step 7).

The purpose of the M&E system can help define its focus on one or more of the following aspects:

1. M&E of **climate change hazards, impacts and associated vulnerabilities** in the agriculture sectors;
2. M&E of **adaptation processes** in the agriculture sectors: how policies or plans to address climate change adaptation have advanced in the agriculture sectors, and how the capacity to deliver these has enhanced; and
3. M&E of **adaptation outcomes** in the agriculture sectors: changes brought about by the implementation of adaptation actions in the agriculture sectors, for example reduced losses and vulnerability to climate change or enhanced adaptive capacity at the community, sub-national or national level.

To date, most national systems which have included a section on agriculture sectors have focused on a combination of the above aspects, as shown in Case Study 4 for Cambodia and Case Study 6. for Kenya and Morocco. This means that they looked at how climate change is impacting the agriculture sector; the progress of adaptation processes including policies, plans and programmes; and outcomes of adaptation. The first two elements are easier to measure than outcomes, and are usually part of ongoing assessments. Adaptation outcomes, on the other hand, are often measured at specific intervals and as part of evaluations. Continuous monitoring and periodic evaluations can also help inform future investment decisions.

Box 10 provides some examples of the different ways in which countries under the NAP-Ag Programme are looking to focus their adaptation M&E systems in the agriculture sector.

Once stakeholders define a focus, they can begin to develop a framework which sets indicators for the different elements to be measured (see Steps 4 and 5).



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Box 10

Focusing adaptation monitoring and evaluation for the agriculture sectors in NAP-Ag countries

The NAP-Ag Programme countries working on adaptation M&E in the agriculture sectors are taking different foci depending on the country context and potential entry points. This work is ongoing, however the list below summarises potential entry points and the varied foci undertaken by these countries.

- **Kenya:** Kenya is looking to develop an M&E System to monitor the implementation of the Kenya Climate Smart Agriculture Framework Programme.
- **Nepal:** Nepal has proposed an adaptation M&E framework to monitor adaptation elements of the Agriculture Development Strategy. This could include monitoring both the ADS process, as well as the outcomes and processes of ADS related programs.
- **Uganda:** Uganda is developing a Performance Monitoring and Evaluation Framework for the National Adaptation Plan of the Agriculture Sector. The draft Framework seeks to measure both adaptation processes and outcomes in the agriculture sector.
- **Viet Nam:** Viet Nam is testing an adaptation M&E system which it could then integrate into the information system of the Ministry of Agriculture and Rural Development (MARD) to monitor MARD investment projects at the national and sub-national (province) level. This is likely to include monitoring both outcomes and processes, and informing future investment decisions.

Case Study 6: Measuring adaptation processes and outcomes in Kenya and Morocco

The Kenya MRV+ system uses an indicator-based approach to measure progress in adaptation. Kenya used the Tracking Adaptation and Measuring Development (TAMD) approach to develop a set of ten national, process-based indicators that reflect institutional adaptive capacity (measuring top-down adaptation) and ten outcome-based indicators that measure vulnerability (measuring bottom-up adaptation).

In Morocco, the regional M&E system focuses on measurement of adaptation process and adaptation outcomes. Indicators were chosen to measure vulnerability, adaptation measures, results of adaptation actions, climate finance and governance. See case studies 7, 8 and 9 for more detailed examples of agriculture indicators.

Source: Kenya National Climate Change Action Plan 2013–2017; GIZ, 2014/2017.

Box 11

Monitoring gender-responsiveness of adaptation planning in agriculture

Increasingly, countries are committing to implementing gender-responsive adaptation policies and plans. In order to validate the extent to which these commitments are reflected in adaptation practices, the NAP Global Network established three key criteria which a plan or policy must meet to be considered gender-responsive. Depending on the purpose of a stakeholders' M&E system, they may be able to apply one, two or all three of these criteria:

- Recognition of gender differences in adaptation needs, opportunities and capacities
- Equitable participation and influence by women and men in adaptation decision-making processes
- Equitable access to financial resources and other benefits resulting from investments in adaptation between women and men

When looking at the different focuses of an adaptation M&E system, you may wish to consider:

1. How climate change hazards, impacts and associated vulnerabilities in the agriculture sectors affect men and women differently;
2. In adaptation processes, whether there is equitable participation and influence by women and men in adaptation decision-making processes; and
3. For adaptation outcomes: how men and women benefit from the changes brought about by the implementation of adaptation policies and interventions in the agriculture sectors, for example in terms of reduced losses and vulnerability to climate change or enhanced adaptive capacity at community, sub-national or national level.

Source: adapted from "A Framework for Gender-Responsive National Adaptation Plan (NAP) Processes", NAP Global Network, 2017.

Resources for Step 3: Defining the purpose and focus of the monitoring and evaluation framework

- [Developing national adaptation monitoring and evaluation systems: A guidebook](#), (Price-Kelly *et al.*, 2015).
- [Defining the Type of M&E System: Clients, Intended Uses and Actual Utilization](#). (Briceño, World Bank, 2010)
- [Making Adaptation Count Concepts and Options for Monitoring and Evaluation of Climate Change Adaptation](#). (Spearman, and McGray, World Resources Institute and GIZ, 2011)
- [Adaptation made to measure. A guidebook for the design and results-based monitoring of climate change adaptation projects](#) (GIZ, 2013).

Step 4: Developing an monitoring and evaluation framework for adaptation in the agriculture sector

Questions for Step 4:

Developing an adaptation M&E framework

1. *What is the overall goal that you want to achieve through adaptation in the agriculture sectors? (as defined in the TOC exercise, Step 2, where there is one). How will you **verify the achievement of these goals**?*
2. *What are the **short-term to medium-term adaptation outcomes** you wish to achieve? Are these articulated in specific policies (see Step 1. And 2.)? How can you achieve your adaptation goals and outcomes through specific programmes, policies, plans etc.? How do you measure the achievement of these outcomes? Are there direct measurements you can take or do you use a proxy?*
3. ***What outputs need to be produced or provided** through these adaptation programmes or policies to achieve short- and medium-term outcomes? What are the outputs of the adaptation actions in agriculture?*
4. ***What specific activities** can help you achieve the desired outputs? How will you measure or monitor these activities?*
5. ***What inputs** do you need to conduct the various activities (include all resources, physical, human and financial)?*

Indicative activities

- ▶ Working sessions of M&E staff to develop an M&E Framework

Stakeholders to engage

- Agriculture Ministry: technical staff working on adaptation; and
- Agriculture Ministry: M&E unit.

An M&E or results framework provides a logical picture of how any project, programme or policy will work to achieve its goal(s). It addresses the relationship between inputs and results in a focused, practical manner and determines how these results feed back into decision making. Approaches vary, and for many an M&E framework will be in the form of a table that describes the goal(s), outcomes, outputs, activities, inputs and indicators that are used to measure whether a programme or policy is successful. An M&E or results framework is an explicit articulation (graphic display, matrix or summary) of the different levels, or chains, of results expected from a particular intervention; an adaptation programme or policy. Box 12 below outlines key results-based M&E terminology and provides an example of a results chain. This results chain can form the basis of the information that is further elaborated upon in an M&E (or results) framework.

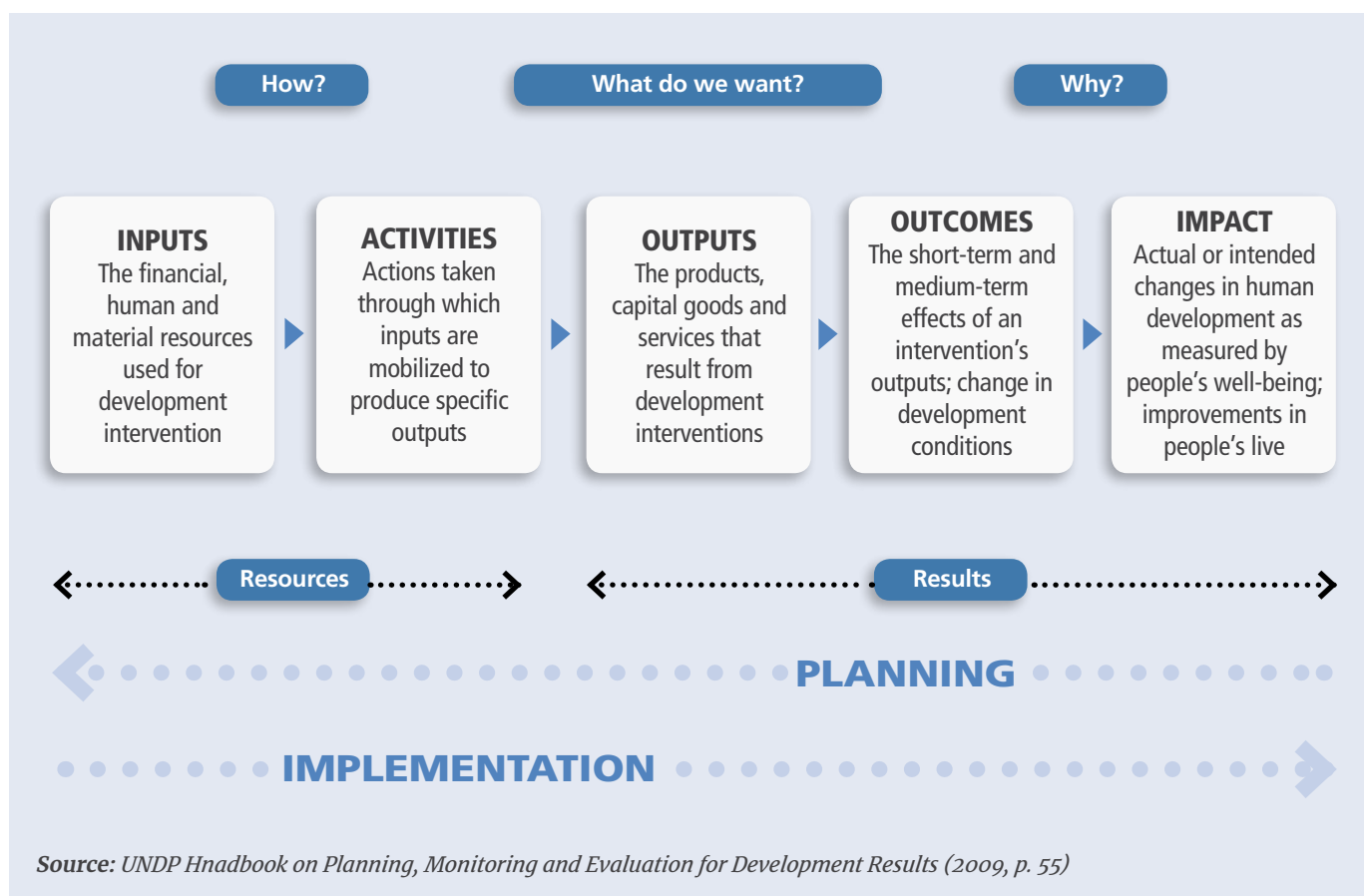
Box 12

Results-based M&E terms and concepts

M&E or results frameworks are widely used in programme planning, although they can also be applied to a policy context. Key results-based M&E terms and concepts include:

- Impact, Goal or Purpose: Evidence on whether outcomes are actually changing beneficiary behaviour or longer-term conditions of interest (e.g. A food secure population under changing climate conditions);
- Outcome: Benefits of that particular good or service to the target population (e.g. Increased adaptive capacity in X institutions, communities etc; increased crop productivity in drought prone areas);
- Output: The particular goods or services provided by an intervention (e.g. increased crop yield, improved forest management); and
- Activities: Such as trainings on climate change planning, sowing drought resistant varieties etc.
- Inputs: For example, drought resistant seeds.

A results chain can then be fed into the M&E or results framework.

Figure 5**Key elements of a results chain and of a result matrix**

Whilst there are many ways to lay out an M&E Framework, all methods will have similar thinking behind as outlined in the set of questions above. The first question proposed builds on the Theory of Change (TOC) exercise from Step 2, which identifies the overall goal. You must then consider how to verify the achievement of these goals. You should define indicators and means of verification (sources of data) for all levels of the M&E Framework.

Question 2 focuses on short-term to medium-term adaptation outcomes. These should be outcomes that are a result of the agreed programme pathways developed in a TOC exercise or in a results chain. This includes considering how adaptation goals can be achieved through specific programmes, policies and

plans. It should also consider how the achievement of outcomes can be measured. Question 3 looks at specific outputs produced or provided through adaptation programmes or policies. These are the most immediate things you are trying to change. These outputs should be the result of specific activities already defined in the TOC or in a results chain. They need to be clearly attributable to immediate actions within the control of the sector.

Questions 4 and 5 narrow down on specific activities and inputs needed to conduct various activities, including physical, human and financial resources.

When looking at M&E of adaptation in the agriculture sector, a logical framework results matrix may become quite complex, covering multiple elements from

different contributing adaptation programmes and/or policies for the diverse subsectors (e.g. crop, livestock, fisheries and forestry, among others). The M&E framework should illustrate the direct relationships between adaptation activities all the way to how they feed into the overall outcomes and objectives of the sector. An M&E Framework for adaptation in the sector should also outline how different adaptation activities and objectives relate to one another and help achieve the shared adaptation goal for that sector. Only then can an M&E framework guide the monitoring and evaluation of adaptation within the sector.

Table 5 provides some guiding questions for creating an M&E results framework for adaptation in the agriculture sector. It also introduces some key results-based M&E terms and concepts, as well as some example outcomes, outputs, activities and inputs relevant to agriculture and adaptation (adapted from UNDP, 2009). Several results frameworks may be needed to reflect the diverse agriculture subsector strategies, policies, programmes or projects. There should be a single shared goal or impact, but there may be several outcomes (e.g. guided by policy priorities), and outputs and activities may need to be defined for a range of programmes within the sectoral portfolio.



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Table 5

Elements of an monitoring and evaluation framework for adaptation in the agriculture sector

Questions	Results-based terminology
<p><i>What is the overall adaptation goal? What are you trying to achieve in the agriculture sector with regards to adaptation? Why are you working on this problem?</i></p> <p>The TOC in Step 2 should already include this information. Impacts are the long-term consequences of the program and may be positive or negative (e.g. improved standard of living, improved national nutrition levels under climate change)</p>	Goal/impact
<p><i>Where do you want to be in five years in terms of adaptation in the agriculture sector? What are the most immediate things you are trying to change? What must be in place first before you can achieve your goals and have impact?</i></p> <p>The outcomes are the likely or achieved short-term and medium-term effects or changes of an intervention's outputs, for example application of increased skills, new employment opportunities or increased incomes in the agricultural sector. Reflect back on your Theory of Change in Step 2, and the purpose and focus defined in Step 3. These may be guided by pre-defined policy objectives.</p>	Outcome
<p><i>What are the things that need to be produced or provided through adaptation programmes or policies to achieve short-term and medium-term results? What are the things different stakeholders must provide?</i></p> <p>Reflect on the specific products, capital goods and services that result from a development intervention (improved policies, enhanced capacity, infrastructure built, tons of food produced etc.). This can include the direct results of policies and programmes you are working on to achieve your goals and outcomes.</p>	Output
<p><i>What needs to be done to produce the desired outputs?</i></p> <p>Reflect on the concrete actions and activities you will be undertaking (trainings on adaptation, planting of drought resistant varieties etc.)</p>	Activities
<p><i>What are the financial, human, and material resources needed for the development intervention?</i> (Include technical expertise, equipment etc.)</p>	Inputs
<p><i>How will we know if we are on track to achieve what we planned?</i></p> <p>Please see Step 5 on identifying indicators. Indicators will need to be defined and determined for all levels (impact, outcome, output and activity).</p>	Indicators
<p><i>What is the desired level of change? By when should it be achieved?</i></p> <p>Once indicators are identified, the stakeholders should establish baselines and targets for the level of change they would like to see. The baseline and target should be clearly aligned with the indicator, using the same unit of measurement (See step 5).</p>	Baseline and target
<p><i>What information is needed to measure progress? How will you obtain this information?</i></p> <p>Please see Step 6 on data gathering. Identify the sources of the information at every level (impacts,outcome, output and activity).</p>	Means of verification

Case Study 7 for the Philippines outlines a results Framework developed for the food security component of the national adaptation M&E system. It illustrates how the Results Matrix (M&E Framework) for food security feeds into an overall Results Matrix for Climate Change. The results matrix is broken down into four separate results matrices corresponding to the four outputs for the food security sector.

No intervention is gender neutral. Since all societies are gendered, any kind of intervention that promotes some sort of adaptive change will always be affected by existing gender relationships and roles. Therefore, stakeholders should review their M&E framework to make sure the programmes, policies and activities they are monitoring capture the types of social change

that adaptation demands and/or triggers. This can be done by reviewing the components of the framework and asking, “for whom?”. For example, stakeholders should ask questions like: Who will be at the trainings? Are we tracking men’s and women’s views on adaptation? Will we understand how different groups of people are differently impacted by and able to respond to climate change?

The M&E framework becomes the basis for the M&E plan, which describes how to operationalise the whole M&E system for the sector, including designating responsibilities, identifying indicators to be tracked and timelines for tracking, identifying the proper tools, dissemination of data, and who will make decisions using the data (See Steps 5-7).

Resources for Step 4: Developing an adaptation monitoring and evaluation framework

- [Case studies of national adaptation M&E systems](#) (GIZ, 2014/2017)
- [Handbook on Planning, Monitoring, Evaluation for Development Results](#) (UNDP, 2009)
- [Making Adaptation Count Concepts and Options for Monitoring and Evaluation of Climate Change Adaptation](#). (Spearman, and McGray, World Resources Institute and GIZ, 2011)
- [National Climate Change Action Plan 2011-2028](#) (Climate Change Commission, Republic of the Philippines)
- [The Logframe Handbook](#) (Team Technologies, World Bank, 2005)



Case Study 7: The Philippines results-based monitoring and evaluation system

The Philippines has a Results-Based Monitoring and Evaluation System (RBMES) to monitor progress toward the implementation of the (NCCAP) 2011 across seven priority areas including agriculture. The RBMES focuses on both adaptation and mitigation.

The RBMES uses results chains (see Step 4) for each of the seven priority areas. Each result chain identifies the objective, the planned immediate outcome, the planned outputs, and the major activities from 2011 to 2028. The Philippines has also developed an accompanying results matrix. There is an overall goal and a joint results matrix for the seven priority areas, with intermediate and immediate outcomes.

The RBMES further developed results matrices for each of the seven priority areas, including food security, with corresponding ultimate and immediate outcomes. For food security, two immediate outcomes were identified, each of which has two output areas. There are in total four results matrixes for food security (one for each output area) with related indicators, activities and timelines.

The results matrix in Table 6 shows the ultimate and intermediate outcomes for food security. It also shows an example for the immediate outcome on agriculture and fisheries production and distribution, and an example of the output area on climate-sensitive policies, plans and programs, along with related activities and timeline.

Table 6

National Climate Change Action Plan in Kenya and Philippines Food Security Matrix

Ultimate outcome	Enhanced adaptive capacity of communities and resilience of natural ecosystems to climate change			
Intermediate outcome	Ensured food availability, stability, access, and safety amidst increasing climate change and disaster risks			
Intermediate outcome	1. Enhanced resilience of agriculture and fisheries production and distribution systems from climate change			
Output area	1.2. Climate-sensitive agriculture and fisheries policies, plans and program formulated			
Indicators	1.2.1.1. Climate change responsive agriculture and fisheries policies, plans and budgets developed and implemented 1.2.1.2. Number of CC-responsive agriculture-fisheries policies formulated and implemented 1.2.1.3. Climate change actions- DRR Performance Monitoring Indicators developed and implemented 1.2.1.4. Number and type of risk transfer (e.g., weather-based/index insurance) and social protection mechanisms developed for agriculture and fisheries			
Activities	Outputs	2011-2016	2017-2022	2023-2028
	1.2.1. Integrate and harmonise climate change actions and DRR in national and local agriculture and fisheries policies and plans, including the Philippine Development Plan			
a. Review and harmonise existing policies on food production and distribution	Existing policies reviewed and harmonised. (climate-responsive PDP, AFM Plan)			

Source: National Climate Change Action Plan 2011-2028; GIZ, 2014/2017.

Step 5: Identifying indicators to track adaptation in the agriculture sector

Questions for Step 5: Identifying indicators to track adaptation in the agriculture sector

1. *How will you know if you have **achieved your projected goals and outputs**? What can **measure** the resultant change or progress towards each output/outcome and goal?*
2. *What category of indicators are most relevant; **process indicators or impact indicators**?*
3. *Is there an **existing national adaptation M&E Framework** (see Case Study 1 for an example of Kenya)? Does it include indicators relevant to the agriculture sector? What are they and how are they monitored? Are they relevant to the sectoral M&E framework being set up?*
4. *Is there an **existing M&E Framework for the agriculture sector**? Which of the existing agriculture indicators might be relevant for adaptation (see Case Study 6 For an example on the use of existing indicators in Morocco)? Are they process or outcome indicators? What is missing?*
5. *Are there **adaptation indicators in agriculture programmes**? Are they process or outcome indicators? Could they be scaled-up to sectoral level? Is the capacity and data there to scale up?*
6. *Which of the **global climate impact, vulnerability, process and/or outcome indicators** might be relevant for the M&E Framework being developed?*
7. *Are there **data and resources** to measure the relevant indicators over the required timeframe?*

Indicative activities

- ▶ Stocktake of existing adaptation indicators in policies, programmes and projects in-country;
- ▶ Working sessions of M&E staff to develop and agree upon relevant indicators;
- ▶ Selection of indicators through a TOC exercise.
- ▶ Output: Draft indicators applied to M&E Framework.

Stakeholders to engage

- Agriculture Ministry: technical staff working on adaptation; and
- Agriculture Ministry: M&E unit

5.1. Introduction

The next step in completing the M&E framework is using the questions outlined above to select indicators for each level of the framework: impact, outcomes, outputs and activities. This chapter describes the process of developing indicators for adaptation at sectoral level.

Defining an indicator: An indicator is a specific, observable and measurable characteristic that can be used to show changes or progress a programme or policy is making toward achieving a specific outcome. There should be at least one indicator for each outcome, output or activity. The change measured by the indicator should represent the predicted progress of the programme or policy. An indicator should be defined in precise, unambiguous terms that clearly describe what is being measured. Where practical, the indicator should give a relatively clear picture of the data required and the population among whom the indicator is measured. Further, the importance of including gender-sensitive indicators within the M&E framework should always be recognised. These indicators capture the numbers of men and women involved in a particular activity, and can measure changes in gender-related issues, such as women's and men's access to resources and levels of participation in decision-making processes. See Box 13 for examples of gender-sensitive indicators.

Box 13**Gender-sensitive indicators**

Here are a few examples on how to construct gender-sensitive indicators:

- Include measurement, number, opinion or perception of a gender-related change in a condition or situation over time.
- Design indicators to measure benefits to males and females as well as changes in relations between males and females.
- Base the indicators on quantitative and qualitative data disaggregated by sex, age and other socio-economic variables.
- Examples: levels of adoption of drought-resistant varieties amongst male-headed compared to female-headed households; proportion of female compared to male workforce in adaptation committees; percentage of male and female trainees who feel their knowledge of adaptation practices has increased

In addition, Table 7 provides examples of gender-sensitive indicators designed in response to gender issues relevant to the NAP process.

Source: Murray, U. 2019b. *Gender Responsive Indicators*. New York, USA, UNDP. 11 pp. (also available at <https://www.ndcs.undp.org/content/dam/LECB/events/2019/20190423-global-gender-workshop/undp-ndcsp-global-gender-workshop-gender-responsive-indicators-briefing-note.pdf>)

Table 7**Examples of gender-sensitive indicators developed to track gender issues in NAP process**

Gender issues relevant to NAPs process	Possible implications for the NAP process	Recommended gender-sensitive activity	Recommended gender-sensitive indicator	Means of verification
"Insufficient budget, training and staffing were consistently mentioned as the main reasons for ineffective implementation of gender and climate change policies."	By targeting gender issues in the content of training activities, the Programme can improve implementation of climate change policies.	Training session on adaptation, gender sensitive planning and budgeting for representatives from ministries and relevant institutions.	Number and percentage of training sessions that cover equality and gender mainstreaming in policymaking. [process] Percentage of trainees, disaggregated by sex, who report the use of gender-related knowledge in their work following training. [outcome]	Records of training events. Post-training survey of training attendees.
"Even as more women are being represented in district programs and meetings... they tend to remain quieter and less participative than men, due to embedded cultural norms and assumptions."	Counting women's attendance at trainings and meetings may not reflect the quality of their participation; attention should be given to whether women have an equal voice as men in proceedings.	Hold national NAP orientation sessions bringing together UNFCCC focal point, parliamentarians, ministries and other relevant organizations including community based organizations and women's group.	Number of women's groups engaging in developing NAP roadmap. Participant perception of fairness in participation	Records of attendees at meetings, disaggregated by sex and affiliation. Post-event survey of participants, disaggregated by sex and affiliation of respondent.

Source: Sibyl Nelson, 2017. "Measuring Progress on Gender Equality in the Integrating Agriculture in National Adaptation Plans NAP-Ag Programme". Draft Guidance Note, internal document.

Indicators can be found in existing data sets, for example existing agricultural or development indicators. Certain output or outcome level adaptation indicators may already be articulated in climate change plans and policies, such as NAPs, or in development or sectoral plans and policies, such as Agriculture

Development Plans and Strategies. In other cases, new adaptation indicators need to be developed at the national or sectoral level and sources of information identified for measuring them.

5.2. How to select indicators

Selecting indicators requires a clear vision of the desired result at any level of the M&E Framework (goal/Impact, outcome, output, activity). This should already be well articulated in the Theory of Change and M&E framework. Selecting indicators requires that stakeholders have identified what will be measured, and have agreed upon the information that will be used to measure achievements. This is the indicator. Indicators must be SMART (see Box 14).

Box 14

Characteristics of good indicators (SMART)

Specific: Is the indicator specific enough to measure progress towards the results?

Measurable: Is the indicator a reliable and clear measure of results?

Attainable: Are the results in which the indicator seeks to chart progress realistic?

Relevant: Is the indicator relevant to the intended outputs and outcomes?

Time-bound: Are data available at reasonable cost and effort?

(UNDP, 2009)

An M&E Framework (or a TOC) contributes to determining the result (impact/outcome/output) indicators. When identifying these indicators, stakeholders should ask: what indicates the expected goals, objectives or results have been achieved? What are the parameters that can be measured?

Process-based and outcome-based indicators can be considered. Process-based indicators measure progress in implementing adaptation policies, plans, projects or changes in institutional decision-making capacity that create an enabling environment for adaptation (e.g. extent of implementation of national strategies, plans or processes). Outcome-based indicators are used to assess whether or not the

intervention, plan or policy achieved the intended goals, objectives or results (e.g. degree of achievement of adaptation targets). Generally, most process-based indicators are qualitative, and most outcome-based indicators are quantitative (FAO, 2017c). Indicators should also be developed for efficiency such as targets set within timeframes, costs, and time allocations, as well as indicators for effectiveness such as defining immediate outputs and milestone achievement.

A stocktake or review of existing M&E Frameworks will help identify potential indicators. A review of literature and indicators used by similar adaptation programmes and projects elsewhere may also be useful to this end. Stakeholders should identify the indicators that already exist, and ask: What are their strengths and weaknesses? How credible and reliable is the data behind the indicator? How often is the data collected, and by whom? Once you have identified an indicator, you should perform an initial screening of the indicator to determine if it is relevant to the proposed M&E Framework, and discard those that are irrelevant. See section 5.4. below for some examples of indicators used for agriculture and adaptation in other countries.

Once a number of relevant indicators have been selected, you should consider the balance between quantitative and qualitative indicators. You should also consider if you will need a mix of direct and indirect indicators in order to collect information that accurately reflects progress. Box 15 outlines the different types of indicators. Priority indicators may also need to be selected, because often time and financial resources limit the amount of information that can be effectively collected and monitored. M&E should include both quantitative and qualitative information in order to be comprehensive.

Once you have agreed upon a set of indicators for each level of the M&E framework, you should determine the baseline value for each indicator and define your desired targets. This will allow you to assess progress and determine whether a set of actions are achieving their intended outcomes. Baseline information can often be gathered from existing documents,

sectoral or national statistics, and ongoing national surveys and data sets from universities or other organisations. However, in some cases surveys may need to be conducted to establish the baseline data for the proposed M&E framework (see Step 6 on data collection methods).

Box 15

Types of indicators

Results Indicators are used to evaluate whether or not the activity, plan or policy achieved the intended objectives or results. They can be developed at the output, outcome and impact levels and define the actual result.

- **Output indicators** illustrate the change related directly to the activities undertaken within the programme (e.g. percentage of cultivated surface area cultivated with drought resistant varieties).
- **Outcome indicators** relate to change that is demonstrated as a result of the programme interventions in the medium-to-longer term (e.g. percentage of poor people in drought-prone areas with access to safe and reliable water).
- **Impact indicators** measure the long-term effect of programme interventions (e.g. increase in adaptive capacity of farmers in community x, disaggregated by sex of household head).

Quantitative indicators – Quantitative indicators are the most commonly used. They provide information on “how much” or “how many” (e.g. how much water was conserved due to adaptation measures, how many people are classified as highly vulnerable according to vulnerability indices, how many households are affected by extreme weather events disaggregated by hazard types).

Qualitative indicators – Qualitative indicators provide information on how people feel about a situation, how things are done, how people behave, etc. When quantitative indicators of success cannot be identified, qualitative methods offer a valuable alternative. When it is difficult or not possible to measure benefits and risks in simple, quantitative terms, it is almost always possible to gather qualitative data, such as information on the perspectives of farmers on changes in agricultural practices under climate change. In many cases, qualitative indicators provide more relevant information with respect to the success and effectiveness of the intervention. Information on the perspectives of women and girls (rights-holders) and service providers (governmental duty-bearers or NGOs) is essential.

Adapted from: UN Women, 2013. Ending Violence against Women and Girls: programming essentials. Chapter IV Monitoring and Evaluation. Accessed online 4.12.2018 at <http://www.endvawnow.org/en/modules/view/14-programming-essentials-monitoring-evaluation.html#14>

Case Study 8: National adaptation indicators in Kenya

The MRV+ system in Kenya uses an indicator-based approach to measuring progress in adaptation. The Tracking Adaptation and Measuring Development (TAMD) approach was used to develop a set of ten national, process-based indicators that reflect institutional adaptive capacity (measuring top-down adaptation), and ten outcome-based indicators that measure vulnerability (measuring bottom-up adaptation). The overall goals are defined in the NCCAP, while the process and outcome indicators are measured across a portfolio of programmes. Examples of these priority indicators, which are particularly relevant for the agriculture sectors, are shown in Table 8 below.

Table 8

Adaptation Indicators of the Kenya MRV+ System

Top-down county-level institutional adaptive capacity indicators (process)	Bottom-up vulnerability indicators (outcome)
<ul style="list-style-type: none"> • Percentage of population by gender in areas subject to flooding and/ or drought in the county who have access to information on rainfall forecasts • Percentage of poor farmers and fishermen in the county with access to credit facilities or grants • Percentage of total livestock numbers killed by drought in the county • Percentage of area of natural terrestrial ecosystems in the county that have been disturbed or damaged • Percentage water demand that is supplied in the county • Percentage of poor people by gender in drought prone areas in the county with access to reliable and safe water supplies 	<ul style="list-style-type: none"> • Number of hectares of productive land lost to soil erosion • Percentage rural households with access to water from a protected source • Cubic meters per capita of water storage • Percentage of land area covered by forest • Number households in need of food aid

The Kenya National Adaptation Plan 2015-2030 is anchored to the MRV+ system, in addition to articulating a specific Theory of Change for the NAP. The NAP further refines the adaptation indicators put forward in the NCCAP, recognising that sectors and counties may need to adjust their own Theories of Change and indicators, the data of which should be aggregated to the national level. Specific indicators were put forward for measuring the performance of the NAP (see Table 9). In this sense, these indicators help measure a specific planning process, that of the NAP. The NAP also puts forward a set of priority actions in the short, medium and long-term for each sector, including agriculture, but does not identify sector-specific indicators.

Table 9

Kenya NAP indicators

National	Sector	County (examples)
<ul style="list-style-type: none"> • Human development index • Percentage of climate related national loss and damage in the public and private sectors • Population living below the poverty line • National vulnerability index 	<ul style="list-style-type: none"> • Number of sectors planning, budgeting and implementing climate change adaptation actions • National and county performance contracting systems integrating climate change adaptation targets • Amount of loss and damage from climate hazards per sector • Amount of private sector financing for adaptation 	<ul style="list-style-type: none"> • Number of counties budgeting and implementing adaptation programmes; • No of national and county level programmes incorporating adaptation • Number of households with timely access to climate information • Number of public servants trained on climate change adaptation

Source: National Climate Change Action Plan 2013–2017; Kenya National Adaptation Plan 2015–2030; GIZ, 2014.

Finally, you should develop a chart with a profile and definition of each indicator, including its unit of measurement, scale, the data source, frequency of updates and geographic coverage. This will ensure that there is a common understanding of the indicator, how it is to be measured over the lifespan of the M&E framework, and how it is to be used. Indicator charts or indicator factsheets have been used in the German and the Philippines' national adaptation M&E systems (GIZ, 2017).



5.3. Selecting indicators to measure adaptation in the agriculture sector

As discussed in Step 3, a range of elements of adaptation can be measured, including the process of adaptation and changes in adaptive capacity or adaptation outcomes. However, due to the context-specificity of adaptation there are no standard indicators (like tons of avoided GHG emissions for mitigation) that can simply be adopted (Leiter & Pringle, 2018). Therefore, indicators to measure adaptation outcomes, changes in vulnerability to climate change, and adaptive capacity need to be defined for a specific context and purpose. Case studies 8, 9 and 10 show examples of national and sectoral level process and outcome indicators developed in Kenya and Morocco.

Case Study 9: Selecting adaptation indicators in Morocco

Stakeholder dialogues were held to prioritise indicators, choosing only those for which data was already available for the first, A-list pilot phase. The B-list of indicators was kept for potential future use, provided resources became available. Indicators track changes in vulnerability, adaptation measures and adaptation outcomes, including indicators that address gender considerations. Examples of selected, A-list indicators are given in Table 10 below.

Table 10

Prioritised Process and Outcome Adaptation Indicators in Morocco

Process indicators	Outcome indicators
<ul style="list-style-type: none"> • Cultivated surface area with drought resistant varieties • Forested areas covered by territorial plans • Number of farmers involved in pilot irrigation services 	<ul style="list-style-type: none"> • Demand for water by sector • Share of additional fodder for grazing livestock • Poverty rate in rural areas

Source: GIZ, 2014/2017

Case Study 10: Drought early warning response system in Kenya with multi-sectoral indicators

The Kenyan Government has established a drought early warning and response system (EWRS) that targets ten arid districts and ten semi-arid districts, covering about 80 percent of the country. It uses multi-sectoral indicators, combining environmental, livestock and pastoral welfare indicators. These are regularly monitored by the members of pastoralist communities.

Table 11

Examples of multi-sectoral indicators for a drought early warning system in Kenya

Environmental indicators	Livestock indicators	Livestock indicators
Average monthly rainfall Pasture conditions	Body condition and milk production	Grain and livestock price ratio Children's nutritional status

Source: FAO, 2013

5.4. Review of existing indicators

Selection of indicators should build on, or at least consider, existing M&E frameworks and indicators in the country in question. When considering M&E systems for adaptation and agriculture at the national or sectoral level, these can include: existing agriculture sector M&E frameworks and indicators; M&E frameworks and indicators for climate change or development; or results frameworks and/or logframes for specific adaptation and agriculture policies or programmes.

Further, the review can also include a review of agriculture and adaptation indicators used in other

countries, used in adaptation tools, or developed as part of global climate funds. Experience is emerging on the use of specific indicators for adaptation and agriculture at different levels. Compilations of existing indicators for agriculture and adaptation at national, sectoral and programme level are provided in the references section of this chapter. Table 12 provides a summary of adaptation indicators used at the agriculture sector level, based on the review of 10 national adaptation M&E systems (Hammill *et al.*, 2014). Further resources are provided at the end of this chapter.

Table 12

Adaptation indicators in the agriculture sector in different countries (adapted from Hammill *et al.*, 2014)

Climate parameters	<ul style="list-style-type: none"> • Change in annual temperature • Mean monthly temperature • Number of hot days • Change in annual precipitation • Monthly precipitation • Extreme precipitation events
Climate impacts	<ul style="list-style-type: none"> • Number of households affected by drought, disaggregated by sex of head of household • Percentage of total livestock killed by drought • Number of surface water areas subject to declining water quality due to extreme temperatures • Number of hectares of productive land lost to soil erosion • Percentage of area of ecosystem that has been disturbed or damaged • Areas covered by vegetation affected by plagues or fires • Shift of agro-phenological phases of cultivated plants • Losses of GDP in percentage per year due to extreme rainfall
Adaptation action	<ul style="list-style-type: none"> • Percentage of farmers and fisherfolk with access to financial services, disaggregated by sex • Total sum of investments in programmes for the protection of livestock • Number of inventories of climate change impacts on biodiversity • Uptake of soil conservation measures • Percentage of treated wastewater • Percentage of agricultural land with improved irrigation • Number of farmers involved in pilot irrigation messaging projects, disaggregated by sex • Number of women organised in agricultural cooperatives • Cultivation of varieties of red wine which like warmth

Table 12 (Continued)

Adaptation results	<ul style="list-style-type: none"> • Percentage of poor people in drought-prone areas with access to safe and reliable water • Number of cubic metres of water conserved • Percentage of water demand for cash crops being met by existing supply • Percentage of water demand for home gardens and cooking being met by existing supply • Percentage of livestock insured against death due to extreme and slow-onset weather events • Percentage of farmland covered by crop insurance • Percentage of additional fodder for grazing livestock • Increase in agricultural productivity through irrigation of harvested land • Increase in the percentage of climate resilient crops being used • Percentage of cultivated surface cultivated with drought resistant varieties • Turnover generated by agricultural cooperatives
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Table 13**Main and subcategories of indicators to track adaptation in the agriculture sector**

Main categories	Subcategories	
Natural resources and ecosystems	1	Availability of, and access to, quality water resources for agriculture
	2	Availability of, and access to, quality agricultural land and forests
	3	Status of ecosystems and their functioning
	4	Status of the diversity of genetic resources in agriculture
Agricultural production systems	1	Agricultural production and productivity
	2	Sustainable management of agricultural production systems
	3	Impact of extreme weather and climate events on agricultural production and livelihoods
	4	Projected impact of climate change on crops, livestock, fisheries, aquaculture and forestry
Socio-economics	1	Food security and nutrition (vulnerability)
	2	Access to basic services
	3	Access to credit, insurance, social protection in rural areas
	4	Agricultural value addition, incomes and livelihood diversification
Institutions and policy making	1	Institutional and technical support services
	2	Institutional capacity and stakeholder awareness
	3	Mainstreaming of climate change adaptation priorities in agricultural policies, and vice versa
	4	Financing for adaptation and risk management

Source: FAO, 2017c

Although several frameworks and methods to monitor adaptation processes and their outcomes at national level exist, no agriculture-specific tools have been developed yet. To address this gap, FAO has developed a framework to monitor adaptation at national and local/project level. It captures the interlinkages

between adaptation processes and outcomes in agricultural sectors and their effects on food security and nutrition. It largely builds on existing sustainable development, CCA and DRR indicators, which are analysed in combination with comprehensive assessment of progress towards adaptation. Four

major categories of indicators are recognized, reflecting both the local and national context: (1) natural resources; (2) agricultural production systems; (3) socio-economics; and (4) institutions and policy. Four subcategories are also identified for each of the four main categories of indicators. Overall, these cut across all the major entry points for adaptation – vulnerability reduction, enhancing adaptive capacity and mainstreaming climate change concerns into policies, programmes and plans.



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5.5. Setting a baseline and targets

For indicators to be useful in tracking progress, stakeholders must develop a baseline which defines starting points and targets for the programme. Ideally, projects aimed at mainstreaming adaptation should include the following categories of data, which will be assessed before (baseline), during, and after (targets) project implementation:

- climate data (e.g. temperature, seasonal precipitation, start and length of the rainy season);
- coping strategies;
- socioeconomic data (e.g. including measures of “well-being,” demographics, access to basic services, migration);
- ecosystem services, including productivity of natural resources (e.g. agricultural yields, water salinity, coastal erosion); and
- data on institutional and policy processes (e.g. number of existing national agriculture policies that incorporate adaptation issues, level of enforcement of policy on land and water rights, level of knowledge regarding climate change within local institutions).

The choice of the baseline and related output and impact indicators is dependent on the types of data available in a country, as well as on what can be feasibly monitored given different project scales, resource restraints and capacity constraints. The process of selecting indicators should begin with an analysis of what is available and feasible. Indicators based on data not yet available should only be included in the monitoring system if setting up a mechanism to collect and analyse them is realistic.

Baseline data may already be available from ongoing national surveys, such as agricultural surveys. Another means of setting a sector level baseline for adaptation is carrying out a vulnerability and impact assessment (VIA) for the agriculture sector (see Box 7). VIAs may already have been carried out as part of a broader adaptation planning process, and provide useful baseline information for M&E (see Step 1). An important consideration when setting a baseline is data availability; what data sources are readily available to measure the indicators, how is data stored, and is it accessible for the relevant M&E personnel or decision-makers working on adaptation and agriculture. See Step 6 For further details.

In the complete absence of a baseline, the M&E team can consider these alternatives (adapted from World Bank, 2005):

1. At project/programme/policy completion, compare the value of indicators inside the project/programme/policy area (with adaptation) to those outside the project area (without adaptation) using areas that were similar at the time the project began. For example, using quasi experimental techniques and impact evaluation (see Case Study 5).
2. Collect the most critical data right after implementation begins if the adaptation activity or initiative is not yet fully in place (e.g. production during the first harvesting season after project/programme/policy implementation).
3. Look for existing local and national agricultural statistics to assess current vulnerabilities to climate risks. In some countries, authorities regularly collect data on farm and off-farm income sources, production data, farming practices, migration etc.
4. Look for other existing sources of data, such as:
 - Data collected by other projects (including NGO projects).
 - Training records—village or community and extension centre records on participation in recent training events, evaluations on training and field events focusing on climate change awareness and coping strategies, learning events on new crop varieties etc.
 - Data on input sales (e.g. specific crop varieties, fertilizers, pesticides, irrigation material) from government and private sector records.



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5.6. Considerations and challenges when selecting indicators

Ideally, indicators that stakeholders judge to be the highest quality and most useful should be the ones selected. However, in reality many other factors may intervene. Ideal indicators may not be practical; the feasibility of using certain indicators can be constrained by the availability of data and financial and human resources required to collect the data. For example, in Morocco (Case Study 6) two sets of indicators were chosen: a priority list building on existing data sources, and a secondary list of adaptation indicators to be used in the future, if feasible. Furthermore, the requirements and needs of the government, donors and others may also influence the formulation of indicators.

The better defined an indicator, the less room there will be for later confusion or complications. Therefore, indicator charts or factsheets should clearly define the indicator, its calculation method and its interpretation. Indicators that cannot be affected by activities, are too vague, do not currently exist and cannot realistically be collected, or do not accurately represent the desired outcome should be avoided (Gage and Dunn, 2009).

Select a set of indicators that pertain to the identified objectives of the programmes or policies, and to the sector's Theory of Change for adaptation.

Resources for Step 5: Identifying indicators

- [Pitfalls and potential of measuring climate change adaptation through adaptation metrics](#) (Leiter & Pringle, 2018)
- [Good practice study on Principles for Indicator Development, Selection, and Use in Climate Change Adaptation Monitoring and Evaluation](#). (Viggh *et al*, Climate-Eval, 2015).
- [Handbook on Planning, Monitoring, Evaluation for Development Results](#) (UNDP, 2009)
- [Gender in Climate-smart Agriculture](#) – Module 18 of the Gender in Agriculture Sourcebook. (World Bank, FAO, IFAD, 2015)
- [Developing Metrics for Climate Smart Agriculture](#) (FAO, 2016c)

Resources for Step 5.4: Reviewing existing indicators

- [The Repository of Adaptation Indicators](#) (Hammill *et al*, 2014: 47) provides a summary of indicators relevant for the agriculture sector, used in national M&E systems at different scales.
- A set of eight cross-sectoral indicators proposed for climate risk management (process) as part of the [Tracking adaptation and measuring development TAMD](#) (IIED, 2013) and related [indicator specific materials](#). Most of these can be applied to track adaptation at sector level.
- Several Climate Change Funds have specific guidance on the development of adaptation indicators at programme level, which are usually of cross-sectoral relevance. This information can be useful when considering the development of adaptation indicators for priority programs of the agriculture sector. Guidance includes: [CIF/PPCR](#); [Adaptation Fund](#); [Green Climate Fund](#); [GEF/SCCF and LDCF](#); [USAID](#).
- Emerging lessons learnt from M&E frameworks of a range of adaptation and agriculture programs. These are mainly relevant for sub-national level M&E of adaptation, which could potentially be aggregated to analysis at the agriculture sector level. Some examples include: review of adaptation indicators in bilateral projects by [OECD](#) (2012); [UNDP](#) supported projects (search function for agriculture projects, see log frames of project documents).
- Adaptation indicators in the agricultural sector reviewed in academic literature, e.g. Indicators to track environmental, economic, and sociocultural sustainability of agricultural commodity production (Rasmussen *et al.*, 2017)
- [Tracking adaptation in the agriculture sectors: climate change adaptation indicators](#): FAO has developed a flexible and consistent indicator framework for tracking adaptation in agricultural sectors (crops, livestock, forestry, fisheries and aquaculture) at national level. The adaptation tracking framework largely builds on existing sustainable development, adaptation and disaster risk reduction indicators, which are analysed in combination for comprehensive assessment of progress towards adaptation. Four major categories of indicators are recognised, reflecting both the local and national context: (1) natural resources; (2) agricultural production systems; (3) socio-economics; and (4) institutions and policy. These categories cut across all the major entry points for adaptation – vulnerability reduction, enhancing adaptive capacity and mainstreaming climate change concerns into policies, programmes and plans. (FAO, 2017c)
- [GCC Standard Indicator Handbook: Definition Sheets](#). (USAID Office of Global Climate Change, 2016.)

Step 6: Identifying the sources and type of data and information required for each indicator

Questions for Step 6:

Data and information for M&E frameworks

1. What **type of data and information** is required to fulfil the purpose of the M&E system? What indicators do you wish to use (see Step 5)?
2. What **data is available on climate change impacts and vulnerability**?
3. What **data is available on adaptation**?
4. What **data is available in the agriculture sector**? Which available data sets are relevant for adaptation?
5. What **development data sets** are relevant? Is data sex-disaggregated? How can the differential impacts on gender be understood?
6. **Who provides this data**? Who gathers this data? Who stores this data? What do they use it for? What is the capacity to analyse it? Who has access to it?
7. Is there **new data** that will need to be collected? How often?

8. **How will data from different sources be collected, aggregated and analysed, and by whom?** Do data-collection teams have capacity to use gender-sensitive methods?

Indicative activities

- ▶ Stocktaking and gap analysis of existing data sources;
- ▶ Working sessions of M&E staff to identify sources and type of data.
- ▶ Output: Sources and type of data fed into M&E Plan (see Step 7).

Stakeholders to engage

- Agriculture Ministry: technical staff working on adaptation;
- Agriculture Ministry: M&E unit; and
- Research institutes, academia and other Ministries gathering relevant data.



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The data and information needs of the M&E framework must be defined in accordance with the indicators (Question 1). How this data is collected should be integrated into an M&E plan (see Step 7.). Stakeholders must consider data that is already available on climate trends, vulnerabilities, economic and social dimensions, status of natural resources, and land use (Questions 2, 3, 4 and 5). Building on existing data sources, research initiatives and monitoring systems within the national statistics bureau, GIS Units, and national and international research centres will help ensure the sustainability of the M&E system (see Case Study 11 for an example of using existing data sources for adaptation M&E in Kenya). This step entails the identification and involvement of key stakeholders for ad-hoc data collection, storage and analysis (Questions 6 and 8).

Case Study 11: Existing data sources in Kenya

The MRV+ system is integrated into existing institutional M&E structures, such as the National Integrated M&E System (NIMES). The system is overseen by the M&E Directorate (MED) within the Ministry of Devolution and Planning. It will draw on information that has already been gathered by ministries, departments and agencies as part of its standard M&E.

Table 14

Examples of existing data sources in Kenya

Data source	Relevant sector	Description of data
Kenya Meteorological Department	All Agriculture	<ul style="list-style-type: none"> Climatic data (from upper air and rainfall stations, marine tidal gauges, etc.). Agro-meteorological stations collect data on climate & surrounding farms.
Kenya Agricultural Research Institute	Agriculture Livestock	<ul style="list-style-type: none"> Data on food, horticultural and industrial crops, animal production, animal health, soil fertility, vegetation, agroforestry, and irrigation. In future, data on household vulnerability and performance of various crops under changing climatic conditions will be collected.
Department of Resource Surveys and Remote Sensing	Forestry Wildlife Agriculture Livestock	Data on livestock/wildlife numbers and distribution, vegetation cover, forests, species composition, biofuel, biomass, crops, land degradation, and human settlements.
Water Resources Management Authority	Water	Data on flow volumes at river gauging stations; from hydro meteorological weather stations.
Kenya Forest Service	Forestry	National-level statistics on forestry, forest cover, land use change, timber and fuelwood consumption.
National Environment Management Authority	Water	Data on water quality.
Kenya National Bureau of Statistics	All	Socio-economic data.
Ministry of State for Planning, National Devt	All sub-sectors	Medium-term plan reports contain data on all sub-sectors.
Monitoring and Evaluation Directorate	All	Process-based indicators on expenditure on adaptation and related activities.

Source: Price-Kelly et al, 2015

Considerations and challenges when identifying sources and type of data and information

Data availability may be a problem. For example, some data could be considered 'privileged' information by agencies, projects, or government officials who will not readily share it with other stakeholders. Data may be available only on aggregated levels, or it may already be calculated into indicators that are not ideal for adaptation purposes at policy or sector level.

The chosen indicators might require collecting data to calculate an unknown denominator, gathering national data to compare with policy or sector level data, or tracking lifetime statistics for an affected and/or control population. The cost of collecting appropriate data for ideal indicators may be prohibitive. Human resources and technical skills act as another constraint.

Programmatic and external requirements may require that those not trained in monitoring and evaluation techniques will impose indicators from above. Reporting schedules may not be synchronised (e.g. fiscal vs. reporting year). Finally, the priorities of different stakeholders may diverge.

Data collection tools

There are many tools and methods for the collection of data, though they may differ from one type of data to another (e.g. quantitative or qualitative). Data collection methods will depend on the kind of indicators and the key questions identified.

The most common data collection method is a sample survey. This is a structured, systematic way of gathering factual data on a given population, for example project or policy beneficiaries, based on a sample of households or individual respondents. For various reasons, sample surveys often are considered the default method for M&E work.

Gathering data from the entire population (a census) is not always feasible or practical, especially if the project or policy area spans vast geographic areas, or

if time, resources, and funds are limited. Sample surveys are excellent at capturing factual data on the demographic characteristics of the target population such as age, sex, household size, educational attainment, lifestyle (consumption patterns, income sources, dependence on natural resources), as well as a population's beliefs, opinions, and attitudes. They provide comprehensive, vital information about the target population. The sample should be as representative as possible to confidently draw conclusions about characteristics of the whole population. If performed properly, sample surveys lead to accurate conclusions about the entire population based on trends and patterns of change within the representative sample.



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There are, however, many challenges that accompany the use of sample surveys for M&E work. Foremost is that they require enormous resources (time, staff, funds and expertise) to complete. Depending on the sample size and scope of the study, a survey may easily take three to six months to complete due to time constraints imposed by tasks like designing surveys, training interviewers, conducting the survey, data processing/analysis and report writing. There also is a tendency to collect more information than is warranted due to poor survey design, which contributes to the cost and the time required to complete the survey. In addition, some time may pass before the survey report becomes available, leading to a delay in recognising the significance of the findings or the urgency of issues identified in the survey.

With the advent of new technologies, countries are increasingly using innovative approaches to manage the performance of public policies, programmes and service delivery. These approaches are fostering more inclusive, collaborative and responsive processes across the development cycle; from planning, to implementation, to monitoring and evaluation. The two critical commonalities among these innovations are i) the increased frequency of input and feedback; and ii) the expanded definition of and outreach to

stakeholders, including those not traditionally part of the development process. Table 15 shows some technology-based data collection methods. It is crucial to harness existing data sources from relevant

ministries, statistical units and national planning departments so as to select the indicators on the basis of practical and feasible data collection methods while avoiding extra burden for the parties involved.

Table 15**Innovative data collection methods**

Innovations	Overview
1. Crowdsourcing	A large number of people actively report on a situation around them, often using mobile phone technology and open source software platforms
2. Real-Time, Simple Reporting	A means to reduce the formal reporting requirements for programme and project managers and free up their time to provide more frequent, real-time updates, which may include text, pictures, videos that can be made by computer or mobile devices
3. Participatory Statistics	An approach in which local people themselves generate statistics; participatory techniques are replicated with a large number of groups to produce robust quantitative data
4. Mobile Data Collection	The targeted gathering of structured information using mobile phones, tablets or PDAs using a special software application
5. The Micro-Narrative	The collection and aggregation of thousands of short stories from citizens using special algorithms to gain insight into real-time issues and changes in society
6. Data Exhaust	Massive and passive collection of transactional data from people's use of digital services like mobile phones and web content such as news media and social media interactions
7. Intelligent Infrastructure	Equipping all – or a sample of – infrastructure or items, such as roads, bridges, buildings, water treatment systems, handwashing stations, latrines, cook stoves, etc., with low-cost, remotely accessible electronic sensors
8. Remote Sensing	Observing and analysing a distant target using information from the electromagnetic spectrum of satellites, aircrafts or other airborne devices
9. Data Visualisation	Representation of data graphically and interactively, often in the form of videos, interactive websites, infographs, timelines, data dashboards, maps, etc.
10. Multi-level Mixed Evaluation Method	Deliberate, extensive and creative use of mixed (quantitative and qualitative) methods on multiple levels for complex evaluations, particularly for service delivery systems
11. Outcome Harvesting	An evaluation approach that does not measure progress towards predetermined outcomes, but rather collects evidence of what has been achieved, and works backward to determine whether and how the project or intervention contributed to the change

Source: *Innovations in Monitoring and Evaluating Results. Discussion paper prepared by the Knowledge, Innovation and Capacity Group. UNDP, 2013*

Resources for Step 6: Identifying the sources and type of data and information required for each indicator

- [Developing national adaptation monitoring and evaluation systems: A guidebook](#), (Price-Kelly et al., IISD and GIZ, 2015)
- [Handbook on Planning, Monitoring, Evaluation for Development Results](#) (UNDP, 2009)
- [Discussion Paper: Innovation in Monitoring and Evaluating Results](#) (UNDP, 2013)
- [Building Capacity for the Agriculture Sector's Response to AIDS Module 11: Programme Monitoring and Evaluation](#) (FAO, 2010)
- [Social and Environmental Sustainability of Agriculture and Rural Development Investments: A Monitoring and Evaluation Toolkit](#) (Punkari et al., World Bank, 2017)

Step 7: Operationalising monitoring and evaluation for adaptation decision-making in the agriculture sector

Key questions for Step 7:

Please see Table 16 outline below for detailed questions.

Indicative activities

- ▶ Adaptation M&E capacity assessment;
- ▶ Agriculture Ministry working sessions to draft a budgeted M&E Plan;
- ▶ Presentation of M&E Plan to adaptation decision-makers for review and inputs.
- ▶ Output: draft budgeted M&E Plan

Key stakeholders to engage Stakeholders to engage

- representatives of key Ministries (e.g. Planning, Environment) working on climate change adaptation; and NAPs, and of climate change coordinating body;
- heads of Unit and technical staff working on climate change adaptation in Ministry of Agriculture;
- M&E staff from Ministry of Agriculture;
- representatives from national statistics bureaux etc.; and
- representative of M&E unit working on national adaptation M&E (where relevant).

Once the M&E framework is established, it is time to make an M&E Plan to operationalise the framework. The M&E plan helps determine how chosen indicators will be observed and measured. This includes identifying the appropriate scale, knowing the points at which to make observations, and understanding the frequency with which to record and measure data as well as who is responsible for collecting the data.

So far, this guidance note has reviewed the purpose, scale and focus of an adaptation M&E framework. It has developed the actual M&E framework with indicators and identified data sources. This final step discusses the operationalisation of the adaptation M&E framework via an M&E Plan. This final step is often the responsibility of the primary stakeholders responsible for the M&E framework. The M&E Plan is a management tool that defines the measurements that will be used for data gathering to ensure that the M&E framework can be populated with that data (see Step 6 above). The plan should also reflect management tools such as the agreed annual and mid-term targets and milestones for each indicator at each level, making it easier to measure progress. The M&E plan helps determine how chosen indicators will be observed and measured. This includes the scale to use, the points at which to make observations, the frequency with which to record and measure, as well as who is responsible for collecting the data. The plan should identify the human and financial resources needed for successful delivery (see Element 3, Table 16), how information will be reported and communicated (Element 4, Table 16), and how information is used in decision making (see Element 5, Table 16). The potential elements of developing an M&E Plan, along with guiding questions for each step, are described in Table 16 below.

Table 16

Potential elements of an monitoring and evaluation plan for adaptation in the agriculture sector

Element	Outputs	Tasks
1. M&E Framework for adaptation in the agriculture sector	M&E Framework with defined goal, purpose and scope (based on the theory of change, where available) List of indicators for goal, outcome and output levels	As defined in Steps 2- 5 above
2. Data and information sources and gathering	Identify the key indicators, data sources and methods of data collection for each. Use an Indicator Tracking Template (ITT) to manage data collection (see Annex 4)	As defined in Step 6 above <ul style="list-style-type: none"> • Who are the key actors to involve for data collection and analysis, and in which roles? • What resources and capacity are needed to provide, store and analyse relevant data? • How will the information be managed? Write a brief job description for each observation task, for each indicator, for each area you want to address. Develop a work plan for data collection for each indicator including annual and mid-term targets and milestones. Possibly employ online or software tools to facilitate data collection (e.g. GIZ, 2016).
3. Financial and human resources	Indicative staffing levels and types, clear description of organisational structure of M&E, indicative budget including costing for data collection (surveys etc.) and costs for accessing secondary data.	<ul style="list-style-type: none"> • Which Ministries, units and departments work on M&E of adaptation? On M&E of agriculture? What is the level of capacity? What will be the nature of their contribution to the M&E plan? • How many staff are needed, what are their responsibilities and linkages? • What are the financial resources available and needed to deliver a functioning M&E framework? • How can the involvement of other relevant Ministries, units and departments be ensured? What level of coordination is required to operationalise the M&E framework leveraging all stakeholders? • What capacity is there to carry out gender-sensitive M&E? Develop specific deliverables for each stakeholder (M&E staff)
4. Reporting and communicating	Description of how results will be presented, in what format and at which frequency. Roles and responsibilities for information productions, with timeline. Budget for reporting and communication. Description of key audiences and key messages for each stakeholder.	Determine how information gathered from the previous steps will be used <ul style="list-style-type: none"> • Are evaluations planned (e.g. mid-term evaluations) and if so when? • How will the results of agriculture and adaptation M&E be presented? In what format/s? • How frequently? • Who will disseminate results? How and to whom (incl. at local, sectoral, national and international levels)? What are the key messages coming out of the M&E data? • Will they feed into national or international reporting? E.g. annual sectoral reports, adaptation reports to the UNFCCC, updates of NAP documents or contributions to the Enhanced Transparency Framework
5. Inform adaptation decision-making	Develop key policy messages (and evidence) that can feed into sectoral and national adaptation planning and implementation. General outline of key processes and events, who is responsible for feeding adaptation M&E results into them and timeline	<ul style="list-style-type: none"> • How will M&E results feed into planning and decision-making cycles? E.g. in terms of national development planning, NAP processes, agriculture sector planning and implementation processes etc. • Is there a process in place for revising adaptation plans, policies and programmes based on M&E results? What are the entry points for engagement? • Can M&E results help prioritise future adaptation investments? If so, how?

The M&E plan is a living document, however changes to programme indicators, targets and milestones should only be made at periodic intervals agreed upon by all stakeholders. Often this is at a mid-term point, as opposed to annually.

Assessing financial and human resources needs (Element 3, Table 16) should include reviewing the roles that different institutions will play in adaptation M&E, including in the agriculture sector. Institutions should also assess the different financial and human resources required for performing these functions and feeding back into national adaptation planning processes. This can include, for example, a review of which departments in Agriculture Ministries should be engaged, as well as partners in other Ministries and e.g. research institutes. The plan may include a capacity assessment (if not done already under Step 1), and will identify training needs.

The intended users of the information produced by the M&E framework should be involved in its design. Ideally, a consultation will be held at the start so that key stakeholders can gain an understanding of the process and make the case for adaptation. This will put the stakeholders in a position to make informed decisions and translate this knowledge into strategies and operations. In the case of adaptation planning

and implementation for agriculture, the consultation should include stakeholders at both national and sectoral level.

It is important to appoint a lead/coordinating institution to manage the M&E framework for adaptation. Usually, the lead will be within the Ministry of Agriculture, and will transmit key findings to relevant government decision-making bodies and processes on adaptation, such as NAPs, which may be coordinated by other Ministries.

Institutional arrangements should define roles and responsibilities of key actors involved in the production, packaging and dissemination of generated information (e.g. ministries of agriculture, environment, planning and finance, statistical departments, meteorological services, research institutes). These roles and responsibilities should be clearly defined and communicated.

An estimate and allocation of sufficient financial resources to allow each department and institution to perform its functions is needed, and in case of limits to resources the M&E Framework should be revised so as to remain operational (see Case Study 9 on the development of an A and B list of indicators in Morocco, depending on available finance).



7.1. Reporting and communicating results

There needs to be agreement on how results of the M&E Framework for adaptation will be presented, the frequency and timing of dissemination of the results, and the target audience (see Element 4 of the M&E Plan, Table 16 above). This might be tied to national development reporting; annual adaptation or climate change progress reports; or international reporting, and may be achieved through National Communications, Adaptation Communications or reports to the Enhanced Transparency Framework of the UNFCCC (UNEP, 2017, chapter 2).

The M&E team may develop a communications strategy which can be updated and adjusted over time. A communications strategy should map out key stakeholders that can utilise the generated information. It should also identify and utilise information dissemination tools, advocacy tools and methods such as reports, workshops and events, online or media channels. Once data has been collected and analysed it can also be used to develop a set of key messages, evidence and lessons from the

M&E system. Identifying which stakeholder to target for each message will help identify strategic entry points for policy dialogue and advocacy in national adaptation planning.

M&E data should be used to inform ongoing sectoral planning, national adaptation planning and implementation, and decision making at both operational and policy levels. In terms of decision making (Element 5, Table 16), M&E results will ideally feed back into an iterative planning and implementation process on adaptation at both sectoral (agriculture ministry) and national (e.g. NAPs) level and, where relevant, into national development processes. These national development processes may in turn feed into reporting on SDGs. Given the iterative nature of adaptation, these plans, policies and programmes should be revised based on the emerging lessons learnt from adaptation M&E. These actions can aid future decision making, including with regards to investments and prioritisation of adaptation options.

Resources for Step 7: Operationalising M&E for adaptation decision-making in the agriculture sector

- [Developing national adaptation monitoring and evaluation systems: A guidebook](#), (Price-Kelly et al., IISD and GIZ, 2015)
- [Managing for Impact in Rural Development: A Project M&E Guide](#) (IFAD, 2002)
- [Key considerations for monitoring and evaluation of community-based adaptation to climate change: lessons from experience](#) (Leiter, 2016)



Conclusion

This guidance note has presented the steps to developing an M&E system for tracking adaptation in the agriculture sector. It has built on emerging experiences and lessons learnt at global and national levels regarding development of national level adaptation M&E frameworks, and seeks to provide some guidance to strengthen M&E of adaptation at the sectoral level to ensure that the information being incorporated into national adaptation M&E has a solid sectoral grounding.

The Integrating Agriculture in National Adaptation Plans (NAP-Ag) Programme, implemented by UNDP with FAO and funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), is providing support to countries to ensure that they are developing M&E systems and selecting indicators to reflect the agriculture sector's contribution to national adaptation to climate change. The importance of tracking adaptation outcomes in the agriculture sectors results from the strategic importance of this sector for national adaptation in most developing countries. Therefore, it is important to link the M&E of adaptation in the agriculture sector to learning, planning and decision-making on adaptation planning processes and implementation outcomes at the national level, including NAPs, and consider how this may relate to overall sustainable development.

The operationalisation of adaptation M&E Frameworks remains a challenge in many countries and sectors. Lessons continue to be learnt, both in terms of tailoring M&E efforts to country and sectoral needs and capacities and understanding the types of indicators needed to track adaptation processes and outcomes. When integrated as part of comprehensive adaptation planning and budgeting processes, including NAPs, M&E of adaptation plays a critical role in enhancing adaptive capacity and ensuring food security in a changing climate. This guidance note provides a starting point for developing M&E frameworks for adaptation in agriculture sectors, and should be taken as a living document that can be updated over time to reflect new tools and techniques as they are developed.





Annex 1. Key questions for steps in developing an adaptation M&E framework and plan for the agriculture sector

<p>Step 1. Understanding the policy context</p>	<ol style="list-style-type: none"> 1. What are the key climate change risks and related adaptation challenges in the country (at national, and sub-national levels) that affect the agricultural sectors? What are the barriers to adaptation? 2. What are the key policies and plans relating to national sustainable development (including gender and other social equity goals)? To climate change? To the agriculture sectors (Agriculture, forestry and fisheries)? 3. What are the key adaptation targets and outcomes outlined in national climate change policies? Do these include targets that promote gender equality? 4. To what extent does agriculture policy capture issues of adaptation? 5. Is there an existing M&E framework for adaptation (national or sectoral)? Is there a mandate to do one? Does it integrate agriculture?
<p>Step 2. Developing a shared understanding of the adaptation goal and pathways for integrating adaptation in the agriculture sector</p>	<ol style="list-style-type: none"> 1. What is the adaptation goal(s) you wish to achieve in the agriculture sectors? What is the role of the agriculture sector in reaching national adaptation goals? 2. What are the different pathways towards the final adaptation goal(s)? Note that some may already be articulated in e.g. the Agriculture Development Strategy, Climate Smart Agriculture Strategy, National Climate Change Strategy, NAP or other development or sectoral policies. Determine the level of the goal – national or sectoral 3. How can the current policies, plans and programme portfolio within the agriculture sector help achieve the goal? 4. What are the barriers? What assumptions are you making?
<p>Step 3. Defining the purpose and focus of the M&E framework</p>	<ol style="list-style-type: none"> 1. What is the purpose of the M&E framework for adaptation in the agriculture sector? What are you trying to measure? For example, is the purpose to learn how effective adaptation actions in the agriculture sector are being, and adjust course of future interventions? To monitor and evaluate the implementation of agriculture plans and strategies? To report on adaptation spending in the agriculture sector? For adaptive management of existing agricultural practices and sectoral priorities? 2. Who are the target users of the M&E results, both within and outside the Ministry of Agriculture? E.g. Ministry of Agriculture sectoral experts and decision-makers, planning units and/or M&E units; national development planners or Ministry of Planning; national climate change coordination body; Ministry of environment, local level authorities implementing agricultural activities, global stakeholders such as UNFCCC? 3. Are you looking to monitor how changes in climate increase risk and vulnerability over time and what the impacts are on the agricultural sector, as well as on different actors? 4. Are you aiming to monitor the advancement of a specific policy, plan or intervention and how this contributes to adaptation on the ground? E.g. a NAP, an Agriculture Development Strategy or Climate Smart Agriculture Strategy 5. Are you looking to monitor and evaluate the outputs/outcomes and/or impact of a portfolio of adaptation programmes in the agriculture sector, evaluating what works, what doesn't? Is this done to inform future investment decisions? 6. Are you looking to monitor and evaluate increased capacity of key (agricultural) stakeholders in delivering policies, plans and programmes related to adaptation? 7. Do you wish to monitor and evaluate adaptive capacity in the agriculture sector in terms of e.g. changes in agricultural practices that make them and dependent people less vulnerable to climate change? 8. Are you looking to monitor where and how adaptation funding is used, and by whom?

<p>Step 4. Developing an M&E Framework for adaptation in the agriculture sector</p>	<ol style="list-style-type: none"> 1. What is the overall goal you wish to achieve through adaptation in the agriculture sectors? (as defined in a ToC, where there is one) How will you verify the achievement of these goals? 2. What are the short-term to medium-term adaptation outcomes you wish to achieve? Are these articulated in specific policies (see Step 1. And 2.)? How can you achieve your adaptation goals and outcomes through specific programmes, policies, plans etc.? How do you measure the achievement of these outcomes? Are there direct measurements you can take, or must you use a proxy? 3. What outputs need to be produced or provided through these adaptation programmes or policies to achieve short- and medium-term outcomes? What are the outputs of the adaptation actions in agriculture? 4. What specific activities can help you achieve the desired outputs? How do you measure or monitor these activities? 5. What inputs do you need to conduct the various activities (include all resources, physical, human and financial)?
<p>Step 5. Identifying indicators to track adaptation in the agriculture sector</p>	<ol style="list-style-type: none"> 1. How will you know if the desired outputs, outcomes and goals have been achieved? What can you use to measure the resultant change or progress towards each output/outcome and goal? 2. What category of indicators are most relevant: process or impact indicators? 3. Is there an existing national adaptation M&E Framework (see Case Study 1 for an example of Kenya)? Does it include indicators relevant to the agriculture sector? What are they and how are they monitored? Are they relevant to the established sectoral M&E framework? 4. Is there an existing M&E Framework for the agriculture sector? Which of the existing agriculture indicators might be relevant for adaptation (see Case Study 6 For an example on the use of existing indicators in Morocco)? Are they process or outcome indicators? What is missing? 5. Are there adaptation indicators in agriculture programmes? Are they process or outcome indicators? Could they be scaled-up to sectoral level? Is the capacity and data there to scale up? 6. Which of the global climate impact, vulnerability, process and/or outcome indicators might be relevant for the M&E Framework? 7. Do we have the data and resources to measure the relevant indicators over the required timeframe?
<p>Step 6. Identifying the sources and type of data and information required for each indicator</p>	<ol style="list-style-type: none"> 1. What type of data and information is required to fulfil the purpose of the M&E system? What indicators do you wish to use (see Step 5)? 2. What data is available on climate change impacts and vulnerability? 3. What data is available on adaptation? 4. What data is available in the agriculture sector? Which available data sets are relevant for adaptation? 5. What development data sets are relevant? Is data sex-disaggregated? How can the differential impacts on gender be understood? 6. Who provides this data? Who gathers this data? Who stores this data? What do they use it for? What is the capacity to analyse it? Who has access to it? 7. Is there new data that will need to be collected? How often? 8. How will data from different sources be collected, aggregated and analysed, and by whom? Do data-collection teams have capacity to use gender-sensitive methods?
<p>Step 7. Operationalising M&E for decision-making on adaptation in the agriculture sector</p>	<p>See M&E Plan/ Annex 3</p>

Annex 2. M&E Framework for adaptation in the agriculture sector

Questions	Results-based terminology
<p><i>What is the overall adaptation goal? What are you trying to achieve in the agriculture sector with regards to adaptation? Why are you working on this problem?</i></p> <p>This will have been articulated as part of the Theory of Change in Step 2. Impacts are the long-term consequences of the program and may be positive and negative effects, e.g. improved standard of living, improved national nutrition levels etc.</p>	Goal/impact
<p><i>Where do you want to be in five years in terms of adaptation in the agriculture sector? What are the most immediate things you are trying to change? What must be in place first before you can achieve your goals and have impact?</i></p> <p>The outcomes are the likely or achieved short-term and medium-term effects or changes of an intervention's outputs, e.g. Increased skills, new employment opportunities, increased incomes in the agricultural sector etc. Reflect back on the Theory of Change in Step 2, and the purpose and focus defined in Step 3. This might be guided by pre-defined policy objectives.</p>	Outcome
<p><i>What are the things that need to be produced or provided through adaptation programmes or policies to achieve short-term and medium-term results? What are the things different stakeholders must provide?</i></p> <p>Reflect on the specific products, capital goods, and services that result from a development intervention, e.g. number of people trained, number of workshops conducted, number of bridges build, tons of food produced etc. This can include the direct results of policies and programmes you are working on to deliver desired goals and outcomes.</p>	Output
<p><i>What needs to be done to produce these outputs?</i></p> <p>Reflect on the concrete actions and activities you will be undertaking, e.g. trainings on adaptation, planting of drought resistant varieties etc.</p>	Activities
<p><i>What are the financial, human, and material resources needed for the development intervention?</i></p> <p><i>(include Technical Expertise Equipment Funds etc.)</i></p>	Inputs
<p><i>How will we know if we are on track to achieve what we planned?</i></p> <p>Please see Step 5 on identifying indicators. Indicators will need to defined and determined for all levels (impact, outcome, output and activity)</p>	Indicators
<p><i>What is the desired level of change? By when should it be achieved?</i></p> <p>Once the indicators are identified, the stakeholders should establish baselines and targets for the level of change they would like to see. The baseline and target should be clearly aligned with the indicator, using the same unit of measurement.</p>	Baseline and target
<p><i>What information is needed to measure progress? How will you obtain this information?</i></p> <p>Please see Step 6 on data gathering. What are the sources of the information? This will also be at every level (impacts, outcome, output and activity)</p>	Means of verification

Source: adapted from UNDP, 2009.

Annex 3. M&E Plan for adaptation in the agriculture sector

Element	Outputs	Tasks
1. M&E Framework for adaptation in the agriculture sector	M&E Framework with defined goal, purpose and scope (based on the theory of change, where available) List of indicators for goal, outcome and output levels	As defined in Steps 2- 5 above
2. Data and information sources and gathering	Identify the key indicators, data sources and methods of data collection for each. Use an Indicator Tracking Template (ITT) to manage data collection (see Annex 4)	As defined in Step 6 above <ul style="list-style-type: none"> • <i>Who are the key actors to involve for data collection and analysis, and in which roles?</i> • <i>What resources and capacity are needed to provide, store and analyse relevant data?</i> • <i>How will the information be managed?</i> Write a brief job description for each observation task, for each indicator, for each area you want to address. Develop a work plan for data collection for each indicator including annual and mid-term targets and milestones. Possibly employ online or software tools to facilitate data collection (e.g. GIZ, 2016).
3. Financial and human resources	Indicative staffing levels and types, clear description of organisational structure of M&E, indicative budget including costing for data collection (surveys etc.) and costs for accessing secondary data.	<ul style="list-style-type: none"> • <i>Which Ministries, units and departments work on M&E of adaptation? On M&E of agriculture? What is the level of capacity?</i> • <i>What will be the nature of their contribution to the M&E plan?</i> • <i>How many staff are needed, what are their responsibilities and linkages?</i> • <i>What are the financial resources available and needed to deliver a functioning M&E framework?</i> • <i>How can the involvement of other relevant Ministries, units and departments be ensured? What level of coordination is required to operationalise the M&E framework leveraging all stakeholders?</i> • <i>What capacity is there to carry out gender-sensitive M&E?</i> Develop specific deliverables for each stakeholder (M&E staff)
4. Reporting and communicating	Description of how results will be presented, in what format and at which frequency. Roles and responsibilities for information productions, with timeline. Budget for reporting and communication. Description of key audiences and key messages for each stakeholder.	Determine how information gathered from the previous steps will be used <ul style="list-style-type: none"> • <i>Are evaluations planned (e.g. mid-term evaluations) and if so when?</i> • <i>How will the results of agriculture and adaptation M&E be presented? In what format/s?</i> • <i>How frequently?</i> • <i>Who will disseminate results? How and to whom (incl. at local, sectoral, national and international levels)? What are the key messages coming out of the M&E data?</i> • <i>Will they feed into national or international reporting? E.g. annual sectoral reports, adaptation reports to the UNFCCC, updates of NAP documents or contributions to the Enhanced Transparency Framework</i>
5. Inform adaptation decision-making	Develop key policy messages (and evidence) that can feed into sectoral and national adaptation planning and implementation. General outline of key processes and events, who is responsible for feeding adaptation M&E results into them and timeline	<ul style="list-style-type: none"> • <i>How will M&E results feed into planning and decision-making cycles? E.g. in terms of national development planning and implementation, NAP processes, agriculture sector planning and implementation processes etc.</i> • <i>Is there a process in place for revising adaptation plans, policies and programmes based on M&E results? What are the entry points for engagement?</i> • <i>Can M&E results help prioritise future adaptation investments? If so, how?</i>

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➤ Food and Agriculture Organization of the United Nations

www.fao.org/in-action/naps
FAO-NAPs@fao.org | Julia.Wolf@fao.org

➤ United Nations Development Programme

www.adaptation-undp.org/naps-agriculture
Rohini.Kohli@undp.org

➤ Germany's Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)

www.bmu.de/en
International Climate Initiative (IKI)
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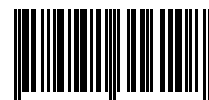
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