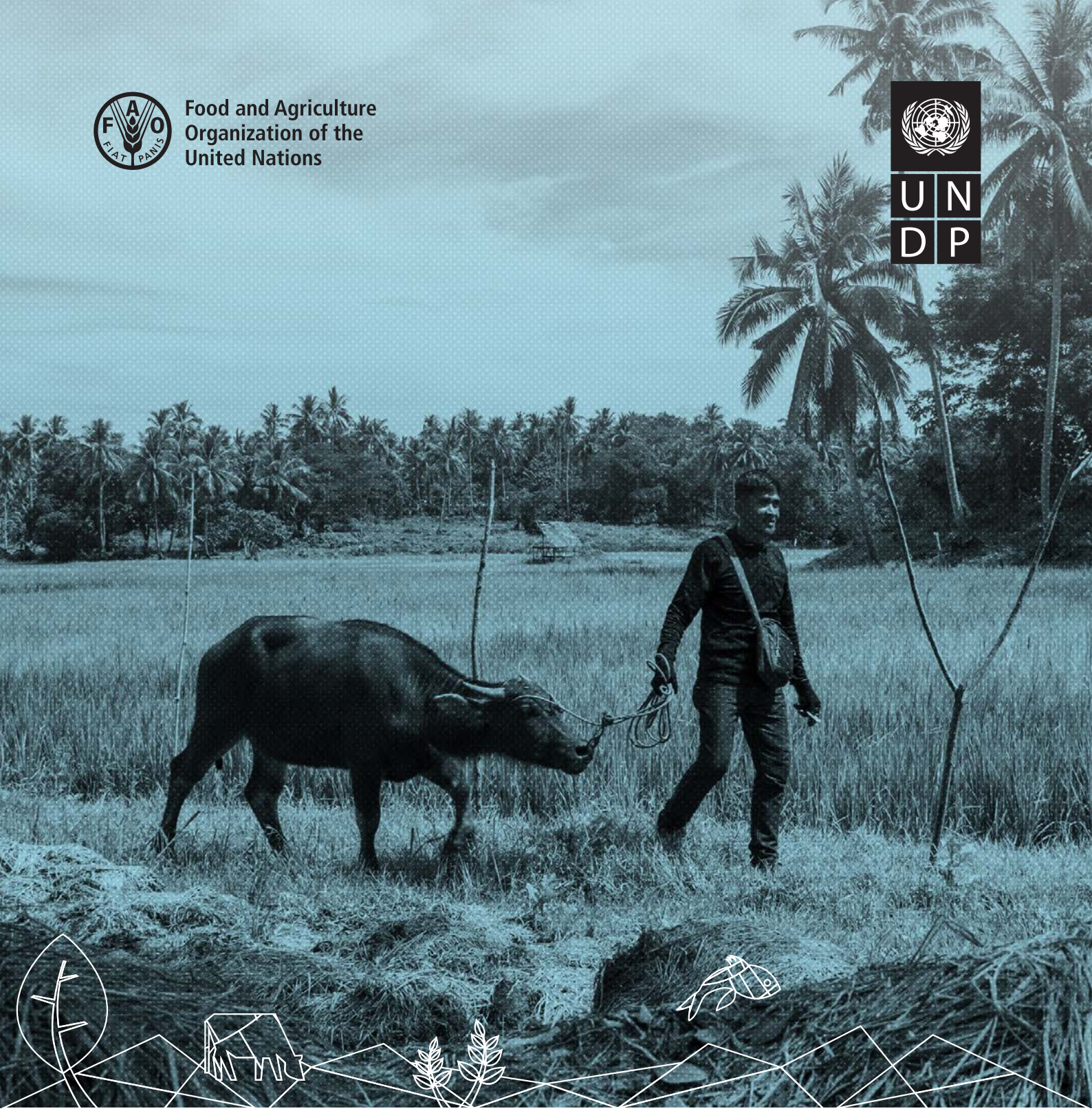

Food and Agriculture Organization of the United Nations

Integrating agriculture in National Adaptation Plans (NAP–Ag) Programme

Progress in developing a national monitoring and evaluation system for adaptation in the agriculture sector: a multi-country case study

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Overview and key messages

- This case study aims to provide an overview and analysis of lessons learned from different approaches used in nine countries in Africa, Asia and Latin America, in which the NAP-Ag programme was implemented, to promote monitoring and evaluation (M&E) of adaptation in the agriculture sectors and as part of National Adaptation Plan (NAP) and NDC processes.

- Under the NAP Ag programme, nine countries in Africa, Asia and Latin America have made progress on M&E systems for adaptation in the agriculture sectors, including through M&E of a specific climate change strategy or agricultural strategy; or M&E of adaptation in a portfolio of programmes in the agriculture sector

- The countries applied a stepwise approach to designing adaptation M&E systems: a desk review and identification of policy entry points; definition of a focus and objective for the M&E system through workshops and consultations; design of the M&E system, its indicators and data sources; early implementation, including piloting and capacity building.

- Challenges have included lack of implementation of adaptation plans and strategies, to which M&E systems are tied; difficulty in defining institutional roles and responsibilities for data collection and management; harmonization of different data systems; and defining a set of comprehensive indicators that are easily measured.

- A supportive policy and/or legal framework enables the development of M&E frameworks that respond to government priorities, report on adaptation actions of NAPs and NDCs and enable integration of M&E into broader national planning and budgeting processes.

- Adaptation M&E frameworks need to have broad stakeholder buy-in from the design stage onwards, including across sectors, at the local level and with relevant stakeholders such as research institutes and private sector. Participatory design and local piloting of M&E systems respond better to local adaptation needs and can strengthen local practices whilst allowing for a "learning-by-doing" approach. Training on M&E of adaptation builds ownership and strengthens skills for carrying out adaptation action.

- Building on existing M&E systems, indicators and data systems strengthens the systems and ensures fewer resources are needed to operationalize adaptation M&E.

- Operationalising M&E frameworks will require financial resources and budgeting should be a key part of M&E plans.

- Next steps include piloting and rolling out adaptation M&E systems at the sub-national level; including them as part of NDC and NAP revisions; and fully integrating them into broader planning processes.

Background

Agriculture is prioritised in the majority of NDCs (Crumpler *et al.*, 2021) and achieving goals for sustainable development, climate change and agriculture, in particular those set out in the 2030 Agenda for Sustainable Development and the Paris Agreement, are closely interlinked (FAO and UNDP, 2019; OECD, 2020). National Adaptation Plan (NAP) and Nationally Determined Contribution (NDC) processes under the United Nations Framework Convention on Climate Change (UNFCCC) are being increasingly aligned, with NAPs being used to validate NDCs, but also to enhance NDC goals and ambition on adaptation (GIZ, 2017; UNFCCC, 2021). The new or updated NDCs include, in comparison with the same Parties' previous NDCs, more information on time-bound quantitative adaptation targets and the associated indicator frameworks. Indeed, many countries have described in the adaptation component of their NDCs their efforts to enhance M&E, such as by focusing on tracking progress, applying global, national or sectoral quantitative indicators for monitoring the development of specific climate parameters and impacts, and monitoring progress of specific measures and/or sectoral performance, including towards targets linked to a specific baseline (UNFCCC, 2021). Designing M&E systems for adaptation in the agriculture sectors contributes to supporting these efforts and complying with the adaptation reporting requirements under the UNFCCC Paris Agreement (PA).

In fact, in the context of the PA and its Enhanced Transparency Framework (ETF), countries are encouraged, though not required, to submit and update an adaptation communication, as a component of or in conjunction with other communications, including a NAP, an NDC and/or a national communication. This information can also be submitted with a Biennial Transparency Report (BTRs). Adaptation communications will be synthesized for the Global Stocktake and contribute to the review of progress towards the Global Goal on Adaptation (GGA) (UNFCCC, 2021a). Adaptation M&E systems that are designed to serve the scope of learning on adaptation, validate whether adaptation processes and outcomes are on track in achieving the targets stated in NAPs and NDCs, ensure accountability to national decision-makers and donors, compare adaptation achievements across localities and regions, align with existing national M&E systems can also serve the scope of complying with global reporting requirements under the ETF.

Over the last few years, an increasing number of countries have been developing national adaptation M&E systems, although progress is mixed; according to the 2021 Adaptation Gap Report, 26 percent of countries have M&E systems in place, another 36 percent are in the process of developing a system, while only 8 percent of countries have evaluated their adaptation plans (UNEP, 2021). Countries face several challenges in doing M&E of adaptation, including the long time scales over which climate change impacts unfold; the uncertainty of climate impacts; context specificity and lack of common indicators; attribution of impact to adaptation and/or development interventions; and access to and availability of relevant climate data (GIZ, 2014; Dinshaw *et al.*, 2014; Bours et al, 2014; Spearman, and McGray, 2011). However, progress is ongoing and there is recognition that it is essential to link M&E systems to broader adaptation planning and implementation processes, including NAPs and NDCs.

This brief focuses on concrete country experiences in advancing adaptation M&E in the agriculture sector. The value of the sectoral focus stems from the strategic importance of agriculture for adaptation in most developing countries.

Monitoring and evaluation of adaptation in agriculture sectors in Integrating agriculture in National Adaptation Plans programme countries

The nine countries studied under this brief (see Table 1) all took part in the *Integrating Agriculture in National Adaptation Plans Programme* (NAP-Ag) (see Box 1). The NAP-Ag Programme provided technical support to nine countries to conceptualize M&E frameworks for adaptation. These were a core part of the countries' efforts to design and implement a NAP (or an adaptation planning process) for the agriculture sectors, and to incorporate adaptation tracking into government's existing M&E systems and indicators. Global-level activities complemented the country-level backstopping, including the publication of a Guidance Note on "*Strengthening monitoring and evaluation for adaptation planning in the agriculture sectors*" (FAO and UNDP, 2019).

Box 1

The NAP-Ag and SCALA Programmes

The "**Integrating Agriculture in National Adaptation Plans Programme (NAP-Ag)**" supported 11 developing countries across Asia, Africa and Latin America between 2015-2020 in integrating agriculture-sector priorities into adaptation planning and budgeting and in integrating climate change concerns into agriculture planning. The NAP-Ag Programme was funded by Germany's Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUV) through the International Climate Initiative (IKI), and implemented jointly by the Food and Agriculture Organization of the United Nations (FAO) and the United Nations Development Programme (UNDP).

Based on the experiences and lessons learned from NAP-Ag, FAO and UNDP are currently implementing the "**Support Programme on Scaling up Climate Ambition on Land Use and Agriculture through NDCs and NAPs (SCALA)**" to support transformative climate action in the land use and agriculture sectors to reduce greenhouse gas (GHG) emissions and/or enhance removals, as well as strengthen resilience and adaptive capacity to climate change in participant countries. The EUR 20 million programme – funded by IKI – is providing in-depth support to 12 countries in Africa, Asia and Latin America from 2020-2025 (Argentina, Cambodia, Colombia, Costa Rica, Côte d'Ivoire, Egypt, Ethiopia, Mongolia, Nepal, Senegal, Thailand, and Uganda). It will also simultaneously promote sharing across a wider selection of countries through a technical facility set up under the programme focused on private sector engagement and public-private collaboration.

Source: Author.

The focus of work varied in each country, depending on national circumstances, institutional arrangements, policy and planning priorities and potential entry points for M&E of adaptation in the agriculture sectors, as shown in Table 1. This included M&E of adaptation in the context of a specific climate change strategy or agricultural strategy; M&E of adaptation across the agriculture sector in general; or M&E of adaptation in a portfolio of programmes in the agriculture sector.

Table 1

Monitoring and evaluation of adaptation in the agriculture sector in nine NAP-Ag programme countries

Country	M&E approach
Colombia	M&E of adaptation in agriculture sector to monitor key national priorities and form part of a national, cross-sectoral adaptation M&E system.
Guatemala	Adaptation Monitoring, Evaluation and Review system for agriculture (MER-agriculture) to monitor key policies and programmes. To be integrated into agriculture sector planning process and databases.
Kenya	M&E system to monitor the implementation of the Kenya Climate Smart Agriculture Implementation Framework (KCSAIF).
Nepal	Agriculture Sector Climate Change Adaptation Result Monitoring and Evaluation Framework to monitor adaptation elements of the Agriculture Development Strategy.
Philippines	M&E of a set of plans and policies, including agriculture and fisheries plan.
Thailand	M&E of Agriculture Sector Climate Change Strategy, associated with the Thailand NAP M&E Framework.
Uganda	A Performance Monitoring and Evaluation Framework for the National Adaptation Plan of the Agriculture Sector.
Uruguay	M&E and indicators for Uruguay´s NAP for the Agriculture Sector.
Viet Nam	An adaptation M&E system for the agriculture sector to be integrated into the information and M&E system of the Ministry of Agriculture and Rural Development.

Source: **FAO and UNDP.** 2019. *Strengthening monitoring and evaluation for adaptation planning in the agriculture sectors*. Rome, Food and Agriculture Organization of the United Nations and United Nations Development Programme (also available at: https://www.fao.org/3/ca5271en/ca5271en.pdf).

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The guide on "Strengthening monitoring and evaluation for adaptation planning in the agriculture sectors" (FAO and UNDP, 2019) proposes a seven-step process for developing an M&E framework and M&E plan for tracking and measuring adaptation in the agriculture sectors (see Table 2). While the steps follow a logical sequence, they may be followed in a different order or in parallel, depending on country circumstances. This approach was, by and large, piloted in the NAP-Ag programme countries. Each of the steps, and how they were applied at country level, will be discussed in the next section.

Table 2

Steps for developing a monitoring and evaluation framework and plan for adaptation in the agriculture sectors

Country	M&E approach
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

Source: **FAO and UNDP.** 2019. *Strengthening monitoring and evaluation for adaptation planning in the agriculture sectors.* Rome, Food and Agriculture Organization of the United Nations and United Nations Development Programme (also available at: https://www.fao.org/3/ca5271en/ca5271en.pdf).

Results and outcomes

The steps that NAP-Ag programme countries carried out for developing an M&E framework for adaptation in the agriculture sectors are summarised in Table 3. Colombia, Guatemala and Viet Nam advanced most in the development and operationalisation of an M&E framework for adaptation in the agriculture sectors, whilst processes were initiated in the Philippines and Thailand.

Step 1 – Understanding the policy context

Step 1 identifies the entry points for developing an M&E system for adaptation in the agriculture sectors. This entails analysing the policy context in country, identifying key climate change risks and mapping existing M&E systems.

Most of the studied countries hired an expert, or team of technical experts, to carry out an initial in-country mapping, in some cases also interviewing key stakeholders (see Table 3). The exercise was key to acquire a common understanding of key policies, goals and targets; existing M&E frameworks and indicators relevant for tracking agriculture and adaptation; availability and gaps of data; institutional set-up for M&E; and challenges in the operationalisation of the existing M&E frameworks. For example, in Viet Nam, the review encompassed M&E systems and indicators used by the government and in projects, as well as a review of global adaptation indicators (FAO, UNDP and MARD, 2019). In Colombia, a full climate risk and vulnerability analysis for the agriculture sector was conducted to identify indicators for the sector (FAO, 2022).

Most countries identified a **set of policies**, based on which priorities, goals and objectives for M&E frameworks on adaptation in the agriculture sectors could potentially be built on (see Steps 2 and 3), which included national development plans, climate change policies and laws, agriculture sectoral plans, NAPs and NDCs (see Table 4).

Where they existed, specific climate change or climate change adaptation strategies in the agriculture sector were the most common framing document. For example, in Kenya, this was the Kenya Climate Smart Agriculture Strategy, in Uganda the National Adaptation Plan for the Agriculture sector (NAP-Ag) and in Uruguay the National Adaptation Plan to Climate Variability and Change for the Agriculture Sector: 2050 Strategy and 2025 Action Plan. In Nepal, the M&E framework is designed in line with the objectives and priorities set out in the overall sectoral strategy, the Agriculture Development Strategy. In the Philippines and Thailand work on adaptation M&E in the sector is only initiated but is equally planned to be framed around the Agriculture and Fisheries Modernisation Plan of the Philippines and Agriculture Strategy on Climate Change (2017-2021) of Thailand. Where a National Adaptation Plan (NAP) process is underway, the M&E frameworks have sought to align with priorities of the NAPs, notably in Nepal, Thailand, and Viet Nam. In Colombia, Guatemala and Viet Nam, a broader array of laws and policies have been used to frame the M&E work, including some or all the following: Climate Change laws; national climate change strategies; Nationally Determined Contributions (NDCs); and development plans. In Viet Nam, specific attention has been given to framing the M&E work around national SDG targets.

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Table 3

Steps in developing a monitoring and evaluation framework for adaptation in the agriculture sectors in NAP-Ag countries

M&E system design steps	Step 1 Policy context		Step 2: Adaptation goal and pathways Step 3: Purpose and focus		Step 4 Developing an M&E Framework		Step 5 Identifying indicators		Step 6 Identifying data sources		Step 7 Operationalisation		
Activities	**Desk review**	**Technical experts hired**	**Workshop**	**Research**	**Consul-tations**	**Design**	**Identifi-cation**	**Baseline**	**Identi-fication**	**Database/ platform**	**Piloting**	**Training**	**Implem-entation**
Colombia	■	■	■	■	■	■	■		■				
Guatemala	■	■	■	■	■	■	■	■	■	■	■	■	
Kenya		■	■		■	■	■		■		■		
Nepal	■	■		■	■	■	■				■	■	
Philippines		■	■		■		■		■				
Thailand	■	■	■				■						
Uganda	■	■				■	■	■	■	■			
Uruguay	■	■		■	■	■	■	■	■		■		
Viet Nam	■	■		■	■	■	■		■	■	■		

Source: Author.

Table 4

Policies guiding adaptation and agriculture monitoring and evaluation goals and objectives in NAP-Ag countries

Country	Key framing policy	Other laws and policies
Colombia	NDC Politica Nacional de Cambio Climatico, 2017 Plan nacional de adaptación al cambio climático, 2012 Plan Integral de Gestion del Cambio Climatico del Sector Agropecuario, 2020	Law on Climate Change
Guatemala	Plan Estratégico de Cambio Climático del Ministerio de Agricultura, Ganadería y Alimentación 2018-2027; Plan de Acción 2018-2022 Plan de Acción Nacional de Cambio Climático - PANCC, 2016 NDC	Set of 14 development, agriculture and climate change plans, policies and strategies
Kenya	Kenya Climate Smart Agriculture Implementation Framework (KCSAIF) 2018-2027 and approved Kenya Climate Smart Agriculture Strategy	Kenya Vision 2030 National Climate Change Action Plan
Nepal	Agriculture Development Strategy	NAP
Philippines	Agriculture and Fisheries Modernisation Plan	Strategic Plan of Action for Disaster Risk Reduction and Management in Agriculture and Fisheries National Climate Change Action Plan Climate Change Adaptation, Mitigation and Disaster Risk Reduction Roadmap for 2018-2022
Thailand	Agriculture Strategy on Climate Change (2017-2021)	NAP; 20 years National Strategy and Master Plan (2018 - 2037); 20 years Agriculture and Cooperative Strategy (2017 - 2036)
Uganda	National Adaptation Plan for the Agriculture sector (NAP-Ag)	National Climate Change Policy National Agricultural Policy Vision 2040
Uruguay	National Adaptation Plan to Climate Variability and Change for the Agriculture Sector: 2050 Strategy & 2025 Action Plan	National Climate Change Policy NDC
Viet Nam	NAP	NAP

Source: Author.

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Initial scoping in countries paid specific attention to **existing M&E systems** and how M&E is currently being carried out in the agriculture sectors, but also, where relevant, to how M&E of adaptation is tracked at the national level. The agriculture sectors often have their own monitoring, evaluation and reporting systems in place, which tend to tie to and report up to, national level M&E systems often set out and outlined in National Development Plans. For example, in Nepal the Ministry of Agriculture and Livestock Development (MALD) uses the monitoring and reporting formats of the National Planning Commission, whilst in Uganda, the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) provides key performance and budget data to the Government Annual and Bi-Annual Performance Report (GAPR), under the Office of the Prime Minister. Such existing M&E systems then provide an entry point into which climate change adaptation, in some cases mitigation, M&E in the agriculture sectors can be integrated into.

Colombia, Guatemala, Kenya, Thailand and the Philippines also have emerging or recently developed M&E systems for climate change adaptation and mitigation. In these cases, it becomes relevant to ensure that any additional input, in terms of indicators that are specific to the agriculture sector, builds on and ties into such national systems. For example, in Colombia the selection of agriculture sector adaptation indicators ties into the Climate Change Information System (*Sistema Nacional de Informacion sobre Cambio Climatico – SNICC*). In Thailand and Viet Nam, specific M&E systems are being developed under a National Adaptation Plan (NAP), into which the agriculture sector needs to be integrated.

Steps 2 and 3: Goal, purpose and focus of adaptation monitoring and evaluation systems for agriculture sectors

Step 2 aims for a shared understanding between key stakeholders of what they are hoping to achieve in terms of a long-term adaptation goal or change for the agriculture sectors, and how they hope to achieve it. The adaptation goal may be informed by current policies, for example an Agriculture Development Strategy, National Development Plan or NAP. This is closely tied to Step 3, which aims to understand the purpose of the adaptation M&E framework for the agriculture sectors, tailoring it to the context with regards to what aspects of adaptation are to be measured (process, outcomes or impacts) and who will make use of the M&E results.

Multi-stakeholder workshops were held in Colombia, Guatemala, Kenya, the Philippines and Thailand to kickstart the M&E process on adaptation, to define a joint goal, focus and objective (Table 3). The workshops were usually convened by ministries of agriculture, who had already garnered institutional support for initiating work on M&E of adaptation. Participants included, for example, different departments and units in ministries of agriculture and environment, including those in charge of planning and climate change; agricultural research institutes; and, in some countries, private sector representatives. The workshops provided a technical overview of the reporting requirements under the UNFCCC, SDGs and Sendai Framework to set the national ambition for M&E; identifying the challenges of implementing existing M&E systems; identifying, reviewing, and validating key indicators to track the implementation of adaptation policies and programmes; and defining a plan to operationalize the M&E system. In Kenya, Nepal and Uganda, the goal, focus and objective of the M&E systems were defined based on existing climate change strategies for the agriculture sectors. As such, they were integrated into the draft design of M&E systems by expert teams (Step 4) and were reviewed and consulted in workshops or consultations at a later stage.

As was discussed above, policies or plans were usually used as framing documents, based on which **adaptation priorities and goals** were defined for the agriculture sectors. The achievement of these goals would then be measured by the developed M&E framework and its indicators (see steps 4 and 5, below). Further, in some countries, these policies and plans go to the detail of outlining priority adaptation actions, which will then also be measured under the M&E system at an objective, and even output level.

The **purpose and focus**, of Step 3, for doing M&E of adaptation in the agriculture sector varied across the countries. Short descriptions of the objectives and focus of each country are provided in Table 5.

Table 5

Policies guiding adaptation and agriculture monitoring and evaluation goals and objectives in NAP-Ag countries

Country	Purpose and focus of M&E system/framework for adaptation in the agriculture sector
Colombia	Colombia´s work on adaptation M&E in the agriculture sector is developed to form part of the M&E system under the National Climate Change Information System, SNICC. SNICC aims to monitor: NDC commitments; implementation of the National Policy on Climate Change as well as sectoral and territorial strategies; efficiency of implemented actions and projects; impact of adaptation measures; and effectiveness of investments.
Guatemala	The MER-agriculture is a results-based system that defines indicators for measuring policy goals and actions taken by MAGA that contribute to adaptation within the agriculture, livestock and food security sectors. The purpose of MER-agriculture is to monitor ongoing adaptation-relevant actions; guide current and future institutional programme development and investments; as well as monitor the achievement of policy goals and targets set out in key sectoral and national plans and strategies. MER-agriculture will give evidence for programme management and decision-making, by providing a single annual planning and reporting system for adaptation.
Kenya	The M&E framework will measure, report and evaluate the implementation of the Kenya Climate Smart Implementation Framework (KCSAIF) 2018-2027. It is meant to provide guidance in mainstreaming Climate Smart Agriculture (CSA) actions, strategies and technologies in Kenya. KCSAIF is designed to be implemented in two layers: i) to address climate smart issues in already planned and funded ongoing interventions in sector ministries at both levels of government and private sector initiatives that require climate smarting; and ii) to develop new or additional interventions to address gaps and to guide investors and development partners on how to engage and partner within the KCSAIF framework.
Nepal	The Climate Change Adaptation M&E Framework aims to integrate climate change adaptation into the current Agriculture Development Strategy M&E Framework. It identifies how the achievement of the goals and outcomes of the Agricultural Development Strategy (ADS) (2015 to 2035) can be undermined by climate change impacts whilst, on the other hand, implementing adaptation measures are essential for achieving all ADS goals and outcomes.
Philippines	Work was initiated to develop an integrated M&E framework for adaptation in the agriculture sector, to measure results of adaptation measures and to improve design and implementation of future interventions. It would focus on the Agriculture and Fisheries Modernisation Plan, whilst also considering linkages to other key policies including the National Climate Change Action Plan.
Thailand	Work was initiated to develop a framework for monitoring and evaluation of adaptation to climate change in the agricultural sector of Thailand in the following aspects: i) monitoring of climate change and its impact on the agricultural sector; ii) tracking progress on specific policy areas such the Agriculture Strategy on Climate Change; and iii) monitoring and evaluation of the results and/or the impact of operations in agriculture such as investment decisions for future projects or Flagship projects. The work would tie into the cross-sectoral NAP M&E Framework being developed by the Office of Natural Resources and Environmental Policy and Planning.
Uganda	The Performance and Monitoring Framework will support the assessment of NAP for agriculture (NAP-Ag) and guide documentation of achieved impact at national and subnational levels. The framework presents the overall performance indicators (at output and outcome levels), mechanisms to capture and manage data (and with gender lenses); and estimates of the implementation cost.
Uruguay	The develop indicators aim to measure prioritised adaptation actions put forward in the NAP for Agriculture Sector, and its four dimensions: production systems; ecosystems and natural resources; rural livelihoods; institutional capacities.
Viet Nam	The M&E system for Viet Nam´s agriculture sector adaptation plan aims to measure progress of public investment projects and programmes of MARD that respond to climate change. MARD Action Plan for responding to Climate Change.

Source: Author.

In most countries, M&E systems for adaptation in the agriculture sector were set up to measure results of current policies and programmes as well as to guide future decision-making and investments in adaptation actions. The M&E frameworks in Kenya, Uganda and Uruguay are designed with the purpose of measuring the achievement of a specific plan or policy, described above, and the set of priority actions put forward in them. The adaptation M&E frameworks in Colombia, Guatemala and Viet Nam will measure achievement of both policy goals, as well as a range of adaptation programmes, both current and future. Measuring investment in climate change in the sector was included in the M&E framework in Kenya (FAO and MALD, 2019), Uganda (FAO, UNDP and MAIFF, 2017) and Viet Nam (FAO, UNDP and MARD, 2019).

The M&E framework in Colombia is unique in that it is focused on measuring vulnerability and risk in the country in six priority areas (food security; water resources; biodiversity; health; human habitat; infrastructure), across all departments (FAO, 2022). Although it fits in line with policy goals, the starting point has been research and a theoretical assessment of vulnerability and risk. The M&E system for the CSA Strategy and Implementation Framework in Kenya stands out in that it is designed with a community-based, bottom-up focus, capturing best practices, and learning on adaptation applying quantitative and qualitative participatory approaches (FAO and MALD, 2019).

In terms of **target users**, the work on adaptation M&E in the agriculture sector was initiated and led, in most countries, by the ministries of agriculture. Often, work was done in close liaison with the ministries of environment, in particular where the latter plays a role at national level in developing an overall, cross-sectoral, M&E framework for climate change. This was the case, for example, in Colombia, Guatemala, the Philippines and Thailand. Certain countries also gave special emphasis to engaging local level authorities in the development, and later use, of the M&E systems, as in Guatemala, Kenya, Nepal, Uganda and Viet Nam.

Step 4: Developing and designing a monitoring and evaluation framework

Under Step 4, an M&E framework is developed to understand how the agriculture sector as a whole, including its programmes and/or policies, will work to achieve its agreed goal(s). The M&E framework often provides a logical picture between outputs, activities, and results in a practical manner. In the NAP-Ag programme countries, the detail of these frameworks varies from a list of indicators, for the case of Guatemala (FAO and MAGA, 2019), Uruguay (FAO and SARAS, 2018) and Viet Nam (FAO, UNDP and MARD, 2019), accompanied by operational guidelines; to a detailed logframe down to activity level, as for the case of Uganda (FAO, UNDP and MAIFF, 2017) and Kenya (FAO and MALD, 2019). The development of the M&E framework was often a lengthy process, which relied heavily on the previous steps of background research and defining a focus (steps 1-3), and the subsequent steps of identifying indicators and data sources (steps 5 and 6).

The process for developing the M&E frameworks also varied. For example, in Guatemala, a set of climate change adaptation practices, the majority of which were already being implemented, were identified and prioritised based on consultations. These actions served as a basis for identifying indicators (see Step 5) and "tagging" current activities for adaptation. In Colombia, the adaptation M&E framework is based on a vulnerability and risk analysis for the agriculture sector (FAO, 2022), which was used to develop a set of indicators, maps and data. Further information is available in separate country case studies on developing M&E frameworks in Colombia[1] and Guatemala.[2]

The draft M&E frameworks were often reviewed through consultations. In Viet Nam, consultation workshops were held at national (with MARD and ministries, non-governmental organization, research institutes) and sub-national level (in 15 provinces with projects, civil society organizations and local government). In Uruguay, a total of 52 adaptation dialogues were held to design the NAP for the agriculture sector and included consultations on its M&E component. In Nepal, a perception survey was carried out with 108 officers across all seven provinces and agriculture professionals at central level to identify adaptation relevant activities, and indicators, in the Agricultural Development Strategy (ADS) Result Chain, which was used to design the M&E framework.

1 Colombia: advancing monitoring and evaluation of adaptation in the agriculture sector-Experiences of integrating agriculture in sectoral and national adaptation planning processes- case study available at: https://www.fao.org/in-action/naps/resources/detail/fr/c/1607505/

2 Guatemala´s progress in developing a national monitoring and evaluation system for adaptation in the agriculture sector- case study available at: https://www.fao.org/in-action/naps/resources/detail/en/c/1366085/

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

Indicators are a key component of an M&E system and determine its practical applicability. Most of the countries performed a stocktake of relevant indicators in policies and related M&E frameworks (Step 1), as well as the modalities for their tracking. This was done often simultaneously with the stocktaking of existing indicators, and their modalities of monitoring, in ongoing programmes and projects in country, with the aim of tapping into existing indicators, that are either already being measured (for example Guatemala) or have been developed but not yet measured (for example Nepal). Often these were complemented with new indicators (for example Kenya and Uganda).

Indicators were identified and categorized around priority areas, as shown in Table 6, Annex 1. For most countries, the priorities were defined in line with a specific plan or policy, as in Guatemala, whilst in Colombia, it was based on a sector-wide vulnerability and risk analysis (FAO, 2022), and in Viet Nam on a combination of a set of policies and analysis of relevant programmes (FAO, UNDP and MARD, 2019).

The indicators are usually organized and classified into priority areas (see Table 6). Colombia and Guatemala have frameworks built around the different dimensions of adaptation: hazard, sensitivity, adaptive capacity, risk and vulnerability for Colombia; climate variability, risk, vulnerability, food security and adaptation practices for Guatemala. The system in Nepal is based around key areas of agricultural development (improved governance; enhanced productivity; profitable commercialization; increased competitiveness), and adaptation-relevant indicators are "tagged" under these areas. In Uruguay, the system is also built around key dimensions of the NAP for agriculture sector: production systems; ecosystems and natural resources; rural livelihoods; institutional capacities (FAO and SARAS, 2018a). The systems in Kenya and Uganda are designed more specifically around the concept of climate-smart agriculture in the first case (FAO and MALD, 2019), and the agriculture sectors´ adaptation responses in the second case (FAO, UNDP and MAAIF, 2017), and the enabling elements needed to plan and implement these.

The total number of indicators varies a lot, from ten general, cross-cutting indicators in Viet Nam to 210 output-level indicators in Uganda (see Table A1.1, Annex 1).

Table 6

Description of adaptation indicators in the agriculture sector

Country M&E system	Description of content/ thematic priorities
Colombia M&E of adaptation in agriculture sector, to monitor key national priorities. To form 13 adaptation M&E systems Sistema Nacional de Evaluación de Gestión y Resultados (SINERGIA)[3]	Indicators are based on vulnerability and risk analysis and build on studies under the Third National Communication to UNFCCC. Divided into three dimensions: food security, water and biodiversity. Indicators classified by type: hazard, sensitivity and adaptive capacity. Relies on analysis of indicators for calculating composite indexes for risk and vulnerability. Indicator values are provided on a scale of very low; low; medium; high; and very high. Hazard data is produced in maps and downscaled to municipal level.
Guatemala MER-agriculture adaptation M&E system for agriculture sector to monitor key policies and programmes. To be integrated into agriculture sector planning process and databases Plan Estratégico de CC MAGA Plan de acción 2018-2022[4]	Goals and targets for individual level indicators are taken from prioritized plans and policies. Focus on existing indicators. MER-agriculture is divided into five sub-systems: • climate variability: rainfall and temperature • vulnerability: physical, economic, social and cultural vulnerability • risks and threats: such as threats to bio-physical systems such as deforestation • food security and nutrition: indicators on income, health and production to measure such as production of crops, food security by household, access to water • adaptation practices: adaptation-relevant actions by Ministry of Agriculture, Livestock and Food (MAGA) to address • adaptation such as soil conservation, agroforestry and irrigation Indicators will be measured on four scales: i) shows improvement; ii) inconsistent trend; iii) shows deterioration; iv) stable or not relevant.

3 Access available here: https://sinergia.dnp.gov.co/Paginas/Internas/Sinergia.aspx
4 Access available here: https://issuu.com/karensolares/docs/plan_estrategico_cc_maga_v2

Kenya M&E system to monitor the implementation of the Kenya Climate Smart Agriculture Implementation Framework (KCSAIF)[5]	Results framework tied to the KCSAIF and its priority four outputs: • Institutional coordination of CSA policy and implementation strengthened • Agricultural productivity through value chain integration improved • Resilience to climate change vulnerabilities strengthened • Uptake of CSA practices enhanced Focuses on CSA. Provides a wide range of indicators for processes and outcomes that enable the design and implementation of CSA practices. Some gender-focused and gender-disaggregated indicators.
Nepal Agriculture Sector Climate Change Adaptation Result Monitoring and Evaluation Framework to monitor adaptation elements of the Agriculture Development Strategy[6]	Climate change adaptation is integrated and "tagged" in the M&E Framework of the Agriculture Development Strategy. Focuses on agriculture indicators, covering a range of areas. Climate change adaptation mainstreamed across the four outcomes of the ADS: • improved governance • enhanced productivity • profitable commercialization • increased competitiveness
Uganda Performance Monitoring and Evaluation Framework for the National Adaptation Plan of the Agriculture Sector[7]	Designed around eight overall objectives of the NAP for Agriculture Sector, packaged into eight components: cropping systems; livestock development; fisheries and aquaculture; climate information, early warning and disaster preparedness systems; natural resources management; research and knowledge management; partnerships; and gendered approach to climate change adaptation. Provides a set of outcome and output level indicators, for short term as well as for medium- to long-term. Set of gender-focused indicators.
Uruguay M&E and indicators for Uruguay´s NAP for the Agriculture Sector[8]	Set of result and process indicators at output level, divided into four dimensions, as outlined in the NAP for the agriculture sector. Covers a range of dimensions: • production systems • ecosystems and natural resources • rural livelihoods • institutional capacities Focuses on CSA. Provides a wide range of indicators for processes and outcomes that enable the design and implementation of CSA practices. Some gender-focused and gender-disaggregated indicators.
Viet Nam An adaptation M&E system for the agriculture sector to be integrated into the information and M&E system of the Ministry of Agriculture and Rural Development (MARD)	Focus on climate change specific indicators for institutions, policymaking, capacity, investment, and adaptation practices. Focus on easy-to-measure indicators. Set of ten overall indicators, including on the following themes: policy frameworks; provincial action plans; climate change committees; trainings on climate change; funds invested in cc; adaptation practices; forest area; climate change tolerant varieties; climate change tolerant breeds; cooperatives and enterprises applying adaptation. Set of gender-disaggregated indicators.

Source: Author.

Despite different approaches to framing priority areas for M&E of adaptation in the agriculture sectors, there are some common patterns in the categories of indicators used across the countries. Annex 1 provides a categorization of adaptation indicators for the agriculture sectors, developed by FAO (2017), adapted to the context of this study, and lists the categories of indicators used in each country. The FAO categorization is summarised in Annex 2 and contains the following main categories, which will be discussed below: natural resources and ecosystems; production systems; socioeconomics; and institutions and policymaking.

Annex 1 shows that, unsurprisingly, countries with the highest number of indicators, Kenya and Uganda, also included the greatest spread of indicators across the different categories.

5 Access available here: https://www.adaptation-undp.org/sites/default/files/resources/kenya_climate_smart_agriculture_strategy.pdf
6 Access available here: http://nnfsp.gov.np/PortalContent.aspx?Doctype=Resources&ID=325
7 Access available here: https://www.agriculture.go.ug/wp-content/uploads/2019/09/National-Adaptation-Plan-for-the-Agriculture-Sector-1.pdf
8 Access available here: https://www4.unfccc.int/sites/NAPC/Documents/Parties/NAP%20Agriculture%20Uruguay.pdf

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Countries tended to focus a greater number of indicators in one or two of the categories. For example, ecosystems and natural resources are a particular priority area for agriculture development in Colombia and in Uruguay. In Viet Nam, on the other hand, there was a strong focus on institutions and policymaking – likely to be indicators that are readily measured across the sector, from provincial to national level (FAO, UNDP and MARD, 2019).

In terms of **natural resource and ecosystem indicators**, most countries had indicators on water use, irrigation and forest cover. In Colombia, more detailed indicators on ecosystem functions were included. In Guatemala, these indicators were categorised as risk and threat indicators.

In terms of **production systems**, all countries (except Viet Nam) had indicators on agricultural production and/or productivity. All countries had a wide number of indicators on "sustainable management agricultural production systems", which encompasses practices such as soil conservation and agroforestry. Indicators in this category may build on measurement of existing no regret natural resource management and agricultural practices, but most often were "new adaptation indicators" – which would specifically measure adaptation actions for the agriculture sectors such as use of climate-resilient crop varieties.

Colombia, Uganda and Uruguay included indicators to track damage and losses in agricultural production due to climate change. In Uruguay, a specific loss and damage assessment method is being developed. In Colombia, indicators that encompass medium-term projected impact of climate change on agricultural production in the future were also considered.

Socioeconomic indicators are included as proxy of vulnerability, relying on indicators already measured at country level (for example in Guatemala and Nepal). Most countries included an indicator of food insecurity and on coverage of agricultural insurance. Several countries also had indicators around agricultural value addition.

Indicators on **institutions and policymaking** were common in countries that had M&E systems designed more heavily on project/programme level indicators – such as Kenya, Uganda and Viet Nam. Most countries had an indicator measuring capacity building and training provided on climate change. Measuring integration of adaptation in policies was included for Kenya, Uganda, Uruguay and Viet Nam. Three countries – Kenya, Uganda and Viet Nam – included an indicator for tracking funding in climate change at sector level.

Colombia and Guatemala included indicators on climate variability and extreme events (for example number of floods and landslides; rainfall and temperature). Gender-specific indicators

were considered in Colombia, Kenya, Nepal, Uganda, Uruguay and Viet Nam, in addition to having some gender-disaggregated data under certain indicators (for example around capacity building).

In some countries, indicator development included identifying sources of data, means of calculation, and frequency of measurement. This was the case in Colombia, Guatemala, Uganda and Uruguay. Setting baselines and targets for indicators is a critical step before indicators can be measured. Baselines were developed in Guatemala (FAO, UNDP and MAGA, 2019) and Uganda (FAO, UNDP and MAIFF, 2017a) and Uruguay (FAO and SARAS, 2018b).

Step 6: Data and information sources for indicators

The data and information need of the M&E framework must be defined in accordance with the indicators (Step 5). Most countries aimed to select indicators for which data is already being gathered from existing data sources, to optimize human and financial resources. This is the case of Guatemala, where the MER-agriculture relies on data already collected by the Ministry of Agriculture; and of Viet Nam, where the information for an estimated eight out of ten indicators is already available at national level. Common data sources included, for example, statistics, agricultural census data and agricultural reports already being developed by the ministries. New data was required for new adaptation practices, which form part of the broader scaling-up of adaptation planning and action in the agriculture sectors.

The M&E systems designed for Kenya, Nepal and Uganda consider the use of participatory approaches for data collection. In Kenya, the M&E strategy includes participatory monitoring missions, and applying quantitative and qualitative tools and methods for data gathering. These will be used to collect new information, in addition to using existing data on, for example, environmental degradation, nutrition, productivity and GHG emissions. The Ugandan M&E system focuses on community-based adaptation and proposes the application of participatory data-gathering tools, such as [Community-based Risk Screening Tool – Adaptation and Livelihoods (CRiSTAL)], as well as participatory questionnaires and sampling from various agroecological zones at community or municipal level.

In Guatemala, an online web-based platform for MER-agriculture has been designed, with the aim of it being integrated into the sector-wide MAGA Planning, Monitoring and Evaluation System (SIPSE). In Viet Nam, the indicators were designed to feed into a web-based reporting platform of the Ministry of Agriculture and Rural Development. For both countries, guidelines on data collection and use of the IT platforms have been developed, aimed at national and local level government staff who would be in charge of collecting and entering data. Uganda also developed a digitalized IT system for the M&E Framework.

New data gathering will require institutional and individual capacity strengthening and is mentioned in the M&E plans of, for example, Colombia, Guatemala (FAO, UNDP and MAGA, 2020), Uganda (FAO, UNDP and MAIFF, 2017) and Viet Nam.

Step 7: Operationalising monitor and evaluation for adaptation in the agriculture sector

Step 7 is the operationalisation phase of the M&E systems. This includes identifying human and financial resources needed for implementing the M&E framework, including institutional agreements; defining how M&E findings will be reported and communicated; and defining how information will be used in decision-making. None of the countries have fully undertaken critical steps, and this will be further discussed in the following section. However, some countries have initiated activities to enable implementation of the M&E systems, including in terms of reporting, piloting M&E systems and capacity building for implementation.

Operationalising M&E systems will include defining into which **reporting** cycles and processes M&E results feed into nationally, as well as how they will be used for national and international reporting.

For example, Kenya´s M&E system plans to report to committees on agriculture, to the National Climate Change Commission and the Climate Change Directorate (in the Ministry of Environment and Fisheries). In Nepal, entry points could include the monitoring and reporting formats from the National Planning Commission, or trimestral and annual progress reviews of agriculture sector programmes at ministerial, departmental and provincial level. Several countries are looking to feed results of M&E of adaptation in agriculture sectors into international reporting on NDC

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progress under the UNFCCC, as in Colombia, Guatemala and Uruguay. In Viet Nam, the M&E results would feed into both national and international reporting on SDGs.

Initial activities for operationalising M&E frameworks have included **piloting**. In Viet Nam, the designed M&E framework was initially piloted in two projects. This included training, provision of materials, application and consultations, followed by revision of the M&E framework. Further piloting is planned for seven provinces. **Training** is another critical component for the operationalization of the M&E systems. Some initial training has taken place in Guatemala and in Viet Nam. Nepal has carried out extensive training for government ministries in agricultural sector Climate Change Adaptation (CCA) planning and budgeting, including M&E. A total of 150 government stakeholders were trained on climate change adaptation planning in agriculture sector: 30 at national level and 120 at provincial level, in all seven provinces.

The final section of this document will discuss further some of the opportunities, challenges and next steps for operationalising the M&E systems in countries. One key issue is identifying financial and human resources for operationalisation.

Recommendations and lessons learned

The development of M&E systems for adaptation is country specific. However, when discussing successes, lessons learned, challenges and next steps, some commonalities can be drawn. The discussion below focuses on these similarities, whilst also mentioning a few country-specific lessons learned.

Successes

In terms of successes, practically all the countries adopted a stepwise approach to designing M&E systems for adaptation in the agriculture sector, as shown in Table 3 above. This tended to begin with a desk review and identification of policy and institutional entry points. It was followed by a definition of a focus and objective for the M&E system, often through workshops and consultations. This was then followed by the design of the M&E system, its indicators and data sources, identification of institutional roles. Piloting and capacity building were key initial steps in the final, implementation phase of the M&E systems. A stepwise approach to developing M&E of adaptation in the agriculture sectors is a first lesson learned from the NAP-Ag programme.

Having a supportive policy and/or legal framework is an important starting point for designing M&E of adaptation, as was the case in several of the studied countries. It enables the development of M&E frameworks that respond to government priorities, whilst also contributing to reporting on the achievement of set goals and priorities. This also enables the integration of the M&E systems into broader sectoral or adaptation planning and budgeting processes.

Adaptation M&E frameworks need to have broad stakeholder buy-in from the design stage onwards, including, within ministries of agriculture, including across different departments;

at local level, where data gathering and use often takes place; and at national level, in terms of recognising the importance of adaptation planning and action in agriculture across sectors and with relevant stakeholders, including research institutes and the private sector. Colombia, Guatemala, Kenya, Nepal and Uruguay all applied extensive consultation processes in the design of M&E frameworks to ensure that eventual operationalisation of the systems would have buy-in across the board and build on, and enhance, cross-sectoral, bottom-up knowledge and learning.

Building on existing M&E systems, indicators and data systems was a key consideration in the design of M&E systems of adaptation in agriculture in Colombia, Guatemala and Viet Nam. These are also the countries that have advanced most towards operationalisation of their M&E systems on adaptation (see Table3). This type of approach can ensure that less additional and financial resources are needed to operationalise M&E of adaptation in the sector, and therefore it becomes more likely that these are put into practice. It further strengthens existing M&E systems, by integrating adaptation monitoring, a government priority, into them.

On the other hand, the participatory design of M&E systems in Kenya, Nepal and Uganda builds strongly on bottom-up knowledge and is likely to use more data that is relevant for community-level adaptation action and learning. It can ensure the strengthening of local practices whilst allowing for a "learning-by-doing" approach that capitalises on best practices. Community-based monitoring in Nepal at community, municipal and district levels can play an important role in adaptation M&E, especially as adaptation impacts, actions and learning usually take place at the local level. The challenge, as will be discussed in the next section, becomes that such systems are less likely to be implemented until there are sufficient financial resources in place to implement the planned adaptation actions.

Gender considerations were taken on board in the design of indicators in Uganda, Uruguay and Viet Nam. Ensuring a gender-sensitive approach from the beginning of M&E system design ensures that the M&E system is supportive, and an integral part of broader gender-sensitive planning and decision-making on adaptation.

Viet Nam piloted the M&E system on the ground in two provinces, whilst piloting is currently planned also in Guatemala and Kenya. Testing out the application of the designed M&E frameworks and indicators at local level is a valuable means of adjusting and revising the framework, where needed, before applying it at scale and ensuring it responds to local adaptation needs.

The number of indicators varied a lot between countries and there is no one answer as to what is an appropriate or manageable number. On the one hand, having a lower number of indicators, as in Viet Nam, may make it likelier that the indicators are measured in practice. Whilst, on the other hand, the more detailed list of indicators developed in Kenya or Uganda may give more valuable information on practices on the ground and be more useful in identifying best practices.

Extensive training on M&E of adaptation was carried out from the outset in Nepal, as part of training on the broader adaptation planning process. This builds ownership and strengthens

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skills for carrying out adaptation action. Including capacity assessments and capacity building throughout the design of M&E systems is valuable, and a key next step identified by most programme countries (see the next section below for more details).

Operationalising M&E frameworks will require financial resources, in addition to human resources. Uganda (FAO, UNDP and MAIFF, 2017) has developed a detailed budget for the M&E system. Budgeting should be a key part of M&E plans for operationalising designed M&E frameworks.

Challenges

Adaptation M&E forms part of the broader cycle of adaptation planning, implementation and monitoring. The ability to operationalise an adaptation M&E framework in the agriculture sector is therefore dependent on broader policies and plans around adaptation being budgeted for and for actions being implemented. In the cases of Kenya and Uganda, for example, while adaptation strategies for the sector have been developed, they are yet to be implemented, as are the M&E systems linked to them. In Nepal, the Agriculture Development Strategy, to which the M&E framework is tied, also needs to be operationalised. Scaling-up adaptation planning, investment and implementation in the agriculture sectors provides a challenge, but also an opportunity for all the countries.

Defining institutional arrangements, roles and responsibilities has been a key challenge in designing the M&E frameworks for adaptation in several countries, for example, with regards to data gathering, data storage, sharing and analysis, as well as with allocation of human and financial resources. Institutional mandates may not be clear with regards to M&E of adaptation, which is by nature a cross-sectoral topic. M&E of adaptation in the agriculture sector needs to feed into broader national adaptation M&E, where it exists, and vice versa. Further, within ministries of agriculture, different departments and units will need to be engaged. Roles and responsibilities between national and local level also need to be clarified. For example, in Viet Nam, the role of the Department of Agriculture and Rural Development at provincial level (DARD) in adaptation M&E will be confirmed and clarified through official decision.

A related challenge is with regards to different existing information systems and how, and where, to feed in adaptation M&E data from the agriculture sector. For example, in Colombia MADR has its own M&E system, whilst there is also a national climate change M&E system, SNICC. Content and management of the systems may need integration and harmonisation. In Guatemala, integrating MER-agriculture adaptation indicators and systems into the sectoral SIPSE M&E

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system requires a number of revisions, institutional agreements and decisions, which need to undergo internal processes of discussion and consensus.

All countries have faced challenges in defining appropriate indicators for measuring adaptation. There were few examples of directly relevant adaptation indicators already being measured in the agriculture sectors. As there are no commonly agreed indicators or metrics for adaptation, each country has gone about their definition in slightly different ways. The complexity of measuring adaptation results and outcomes means that most countries have defined a set of indicators in different focal areas which, when combined through analysis, provide a more solid basis for measuring, for example, adaptive capacity. However, this also means that data will need to be gathered from numerous sources, from numerous institutions, which in turn leads to the coordination issues described above.

Measuring indicators will require setting baselines and targets. Of the countries studied, Guatemala and Uganda had developed baselines for adaptation indicators in the agriculture sectors. Even there, in the case of Guatemala, it was found that having a sectoral vulnerability and impact assessment could provide better information to define and prioritise adaptation actions and set more comprehensive baselines. In Uganda, baseline development was based on secondary data and would require more comprehensive gathering of primary data.

Institutional capacities were identified as a challenge in most of the countries with regards to adaptation planning, implementation and M&E. This is linked to the need to also harness political and institutional leadership and support in delivering adaptation M&E in the agriculture sectors, as well as allocating human resources. Finally, mobilising financial resources for implementing adaptation actions, as well as operationalising the M&E systems to accompany them, remains a challenge in all countries.

Next steps and opportunities

The need to strengthen capacities for carrying out adaptation M&E has been highlighted. In Colombia, a rapid analysis of institutional capacities on adaptation of ten national producers' associations was carried out, as an input to the ongoing NDC revision and on request of government. The analysis found that M&E was one of the most challenging components of adaptation planning for several sub-sectors (FAO, 2020). Community-level capacity-strengthening activities are planned in both Colombia and Guatemala.

The developed M&E systems need to still be approved and validated by government in many of the countries. In Kenya and Guatemala, the M&E systems will be piloted at sub-national level with local government and agricultural extension workers. In Viet Nam, there are plans to broaden the piloting to seven ecological regions. The Philippines and Thailand have only initiated discussions on adaptation M&E in the agriculture sectors, and design of the M&E frameworks still needs to get underway.

Integrating the designed M&E frameworks into existing M&E systems, in particular in the agriculture sector, is a critical next step planned in several countries. Work on this is advanced and roles have been discussed in Colombia, Guatemala and Viet Nam, but integration is yet to fully happen. Other countries are further behind in this process and need to progress further with institutional approval first. Baselines need to be developed in most countries, and this was already performed both in Guatemala (FAO, UNDP and MAGA, 2019) and Uruguay (FAO and SARAS, 2018b).

Colombia, Guatemala and Viet Nam have been engaged in linking the work on adaptation M&E in the agriculture sector to the NDC revision process. For example, the MER-agriculture system in Guatemala is identified as a key component that can directly contribute to defining adaptation targets and better provision of data, especially from local and sub-national level, for enhanced M&E of adaptation in the prioritised agriculture sectors of the NDC.

Finally, all M&E systems will need to be fully integrated into broader, scaled-up adaptation planning and budgeting processes in the agriculture sectors in order to be fully rolled out. The agriculture sectors are critical to achieving broader sustainable development and climate change goals and M&E frameworks can play an important part in supporting learning and delivering scaled-up climate action that builds on best practices and brings change on the ground.

References

Bours, D., McGinn, C., and Pringle, P. 2014. *Twelve reasons why climate change adaptation M&E is challenging*. Oxford, Phnom Penh, SEA Change CoP and Oxford, UKCIP.

Crumpler, K., Abi Khalil, R., Tanganelli, E., Rai, N., Roffredi, L., Meybeck, A., Umulisa, V., Wolf, J. and Bernoux, M. 2021. 2021 *(Interim) Global update report – Agriculture, Forestry and Fisheries in the Nationally Determined Contributions*. Environment and Natural Resources Management Working Paper No. 91. Rome, FAO. https://doi.org/10.4060/cb7442en

Dinshaw, A., Fisher, S., Mc Gray, H., Rai, N. & Schaar, J. 2014. *Monitoring and Evaluation of Climate Change Adaptation: Methodological Approaches*. OECD Environment Working Papers, No. 74. Paris, OECD Publishing. https://doi.org/10.1787/5jxrclr0ntjd-en

FAO and Kenya Ministry of Agriculture and Livestock Development (MALD). 2019. *Monitoring framework of the Kenya Climate Smart Agriculture Implementation Framework*. Food and Agriculture Organizations of the United Nations. Unpublished.

FAO and South American Institute for Resilience and Sustainability Studies (SARAS). 2018. *Selección de matriz de indicadores para sistema de indicadores de vulnerabilidad, adaptación y resiliencia. Aportes para el Plan Nacional de Adaptación al Cambio y la Variabilidad Climática para el Sector Agropecuario en Uruguay.* Food and Agriculture Organizations of the United Nations. Unpublished.

FAO and South American Institute for Resilience and Sustainability Studies (SARAS). 2018a. *Mecanismo para el cálculo sistemático de los indicadores diseñado e implementado en base a las capacidades del MGAP. Aportes para el Plan Nacional de Adaptación al Cambio y la Variabilidad Climática para el Sector Agropecuario en Uruguay.* Food and Agriculture Organizations of the United Nations. Unpublished.

FAO and South American Institute for Resilience and Sustainability Studies (SARAS). 2018b. *Línea de base de los indicadores para monitorear la vulnerabilidad y adaptación del sector ganadero al cambio climático y la variabilidad climática. Aportes para el Plan Nacional de Adaptación al Cambio y la Variabilidad Climática para el Sector Agropecuario en Uruguay.* Food and Agriculture Organizations of the United Nations. Unpublished.

FAO and UNDP. 2019. *Strengthening monitoring and evaluation for adaptation planning in the agriculture sectors*. Rome, Food and Agriculture Organization of the United Nations and United Nations Development Programme (also available at: https://www.fao.org/3/ca5271en/ca5271en.pdf)

FAO, UNDP & Viet Nam Ministry of Agriculture and Rural Development (MARD). 2019. *Developing a set of indicators for monitoring and evaluation of climate change adaptation in the agriculture sector in Viet Nam*. Summary report. Food and Agriculture Organizations of the United Nations, United Nations Development Programme and Viet Nam Ministry of Agriculture and Rural Development. Unpublished.

FAO, UNDP and Ministerio de Agricultura, Ganaderia y Alimentación (MAGA) de Guatemala. 2019. *Elaboración de la Línea Base del Sistema de Monitoreo, Evaluación y Reporte (MER) del sector agricultura y seguridad alimentaria del MAGA; Unidad de Cambio Climático orientado al Plan de Acción Nacional de Cambio Climático (PANCC)*. Food and Agriculture Organizations of the United Nations and Unites Nations Development Programme. Unpublished.

FAO, UNDP and Ministerio de Agricultura, Ganaderia y Alimentación (MAGA) de Guatemala. 2020. *Manual del Sistema de Monitoreo, Evaluación y Reporte -MER- para el sector "Agricultura, ganadería y seguridad alimentaria" del Plan de Acción Nacional de Cambio Climático (PANCC)*. Food and Agriculture Organizations of the United Nations and Unites Nations Development Programme. Unpublished.

FAO, UNDP and Uganda Ministry of Agriculture, Animal Industry and Fisheries (MAAIF). 2017. *Performance Monitoring and Evaluation Framework for National Adaptation Plan for Agriculture (NAP-Ag)*. Food and Agriculture Organizations of the United Nations and Unites Nations Development Programme. Unpublished.

FAO, UNDP and Uganda Ministry of Agriculture, Animal Industry and Fisheries (MAAIF). 2017a. *National baseline report for the Performance Monitoring and Evaluation Framework for National Adaptation Plan for Agriculture (NAP-Ag)*. Food and Agriculture Organizations of the United Nations and Unites Nations Development Programme. Unpublished.

FAO. 2017. *Tracking adaptation in agricultural sectors: Climate change adaptation indicators*. Rome, Food and Agriculture Organization of the United Nations. 83 pp. (also available at: https://www.fao.org/3/i8145e/i8145e.pdf)

FAO. 2020. *Resultados preliminares del análisis de capacidades de adaptación en subsectores agropecuarios en Colombia*. Food and Agriculture Organizations of the United Nations. Unpublished.

FAO. 2022. *Análisis de vulnerabilidad y riesgo frente al cambio climático para el sector agropecuario en Colombia*. In: FAO. Colombia. [Cited 11 October 2022]. https://cambioclimatico.fao.org.co/analisis-vulnerabilidad/

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). 2017. *The Role of the NAP Process in Translating NDC Adaptation Goals into Action Linking NAP processes and NDCs*. Bonn and Eschborn, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). 2014. *Monitoring and Evaluating Adaptation at Aggregated Levels: A Comparative Analysis of Ten Systems*. Bonn and Eschborn, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

Organisation for Economic Co-operation and Development (OECD). 2020. *Common Ground Between the Paris Agreement and the Sendai Framework: Climate Change Adaptation and Disaster Risk Reduction*. Paris, OECD Publishing. https://doi.org/10.1787/3edc8d09-en

Spearman. M. & McGray, H. 2011. *Making Adaptation Count Concepts and Options for Monitoring and Evaluation of Climate Change Adaptation*. Bonn and Eschborn, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

United Nations Environment Programme (UNEP). 2021. *Adaptation Gap Report 2021: The gathering storm – Adapting to climate change in a post-pandemic world*. Nairobi, United Nations Environment Programme (UNEP), UNEP DTU Partnership and World Adaptation Science Programme (WASP).

United Nations Framework Convention on Climate Change (UNFCCC). 2021. *Nationally determined contributions under the Paris Agreement. Revised note by the secretariat*. United Nations Framework Convention on Climate Change. Bonn, United Nations Climate Change. [Cited 11 October 2021]. https://unfccc.int/documents/307628

United Nations Framework Convention on Climate Change (UNFCCC). 2021a. *Draft supplementary guidance for voluntary use by Parties in communicating information in accordance with the possible elements of an adaptation communication*. United Nations Framework Convention on Climate Change. Bonn, United Nations Climate Change. [Cited 11 October 2021]. https://unfccc.int/documents/279284

Box 2

This publication was possible thanks to the reports, studies and analysis produced during the NAP-Ag program. We would like to recognize the effort in compiling these by our partners:

- Kenya Ministry of Agriculture, Livestock, Fisheries and Irrigation
- South American Institute for Resilience and Sustainability Studies
- Ministerio de Agricultura, Ganaderia y Alimentacion de Guatemala
- Uganda Ministry of Agriculture Animal Industry and Fisheries
- Viet Nam Ministry of Agriculture and Rural Development
- Thailand Ministry of Agriculture and Cooperatives
- Philippines Climate Change Commission

Annex 1

Despite different approaches to framing priority dimensions, there are some common patterns in the types of indicators used across the countries – even when categorised differently. Table A1.1 below provides a categorisation of adaptation indicators for the agriculture sectors, developed by FAO (2017), adapted to the context of this study, and showing the categories of indicators used in each country and additional categories from NAP-Ag countries (in blue).

Table A1.1

Steps in developing a monitoring and evaluation framework for adaptation in the agriculture sectors in NAP-Ag countries

Main categories	Sub-categories	Countries (indicators in category and example indicators)						
		Colombia	Guatemala	Kenya	Nepal	Uganda	Uruguay	Viet Nam
Natural resources and ecosystems	Availability of, and access to, quality water resources for agriculture	Estimated change in supply/demand of water for agricultural use	ha under irrigation, with MAGA support	ha under irrigation		Number of irrigation sites in river floodplains & underground water sources identified	Water use efficiency in agriculture	
	Availability of, and access to, quality agricultural land and forests	Agricultural areas with soil erosion		Ha of rehabilitated land	Land leasing regulations and practices expanded	New forest acreage established	Soil degradation	
	Status of ecosystems and their functioning	Change in forest cover	% Deforestation % ha Protected Areas	Deforestation rate		Number of water catchment areas conserved	Native forest area	% of forest area under SFM plans
	Status of the diversity of genetic resources in agriculture	% of coffee GDP of total departmental GDP	Ha of key crops	% of farmers keeping indigenous/ local adapted breeds		Biodiversity in ecosystem documented		
Production systems	Agricultural production & productivity	% of GDP from forestry and wood production	Annual production of key crops /kg	Yield per unit of production	Land productivity/ha	% increase in crop yields	Productivity trend by sector	
	Sustainable management agricultural production systems	Number of agricultural production units with soil conservation measures/crop rotation	Number of families applying soil conservation/ agroforestry	Acreage under good land management practices	Resilient crop varieties released	Ha in which sustainable natural resource management (NRM) practices used	Area of crop production under Soil Use and Management Plans	% of area with climate change tolerant varieties for rice/corn/ other
	Impact of extreme weather and climate events on agricultural production & livelihoods	Change in area of optimal agroclimatic zone for 18 priority crops and species				% reduction in crop losses resulting from climate change	Loss and damage due to climate events	
	Projected impact of climate change on crops, livestock, fisheries, aquaculture and forestry	Projections of above data for 2040, visualized in maps						
	Value chains and commercialization	Projections of above data for 2040, visualized in maps		% of value chain actors engaged in upgrading along the value chain	Value of the production and postproduction in each prioritized value chain			
	Private sector engagement	Change in surface area of optimal agroclimatic zone for 18 priority crops and species (1 per species/ crop)		Value (USD) of private sector's investment in CSA	Private and cooperative investment in commercial agricultural production and agribusiness	Number of public-private-partnerships management created		

Main categories	Sub-categories	Countries (indicators in category and example indicators)						
		Colombia	Guatemala	Kenya	Nepal	Uganda	Uruguay	Viet Nam
Socioeconomics	Food security and nutrition (vulnerability)		% of households with food insecurity	% of households that are food insecure	Improved food security and nutrition of disadvantaged groups	Increased households that are food secure as a result of CCA practices		
	Access to basic services		% Household with access to water		MW of renewable energy to farmers			
	Access to credit, insurance, social protection in rural areas	% of area covered by insurance	Number of families affected by extreme events receiving food rations	% of value chain actors with agricultural insurance	Number of farmers covered by agricultural insurance	Number of farmers accessing agricultural insurance	Climate insurance coverage in agriculture	
	Agricultural value addition, incomes and livelihood diversification		% of labour force in agriculture	Income (USD) derived from value added commodities	Value of post-production in prioritized value chains	Number of farmers adopting value addition	Employment in agriculture, forestry, fisheries by sex	
Institutions and policymaking	Institutional and technical support services	Degree of agricultural technical assistance received by agricultural production unit		Number of extension workers offering CSA services	Improved early warning system	% of farmers with access to climate change information and warnings	Climate information tools and early warning systems	% of province climate change Committees receive training (incl. by gender)
	Institutional capacity and stakeholder awareness		Number of men and women taking part in capacity building	Number of government staff trained on CSA	Enhanced capacity of key institutions on CCA	Number of farmers members of knowledge platforms on CCA	Capacity building on CCA	% of provinces with climate change committees
	Mainstreaming of climate change adaptation priorities in agricultural policies, and vice versa			Number of climate smart agriculture (CSA) policies implemented		% increase in policies on water use efficiency updated with CCA	Mainstreaming of adaptation in public policies	% of policy frameworks integrating climate change
	Financing for adaptation and risk management			Value (USD) CSA funding mobilized		Track funds that support adaption actions		% of agriculture sector funds invested in climate change
	Membership in associations and organizations	Number of producers who are not members of associations					Membership of rural organizations	% of provinces with Steering Committee on responding to climate change
Total number of adaptation indicators in M&E framework		66	112	31 macro level, 140 activity level	57	26 outcome level, 210 output level	32	10

Source: Author.

Annex 2

Table A2.1 below highlights the main and subcategories for tracking adaptation in agriculture (FAO, 2017), with additional categories (in blue) from NAP-Ag countries.

Table A2.1

Main categories	Sub-categories
Natural resources and ecosystems	Availability of, and access to, quality water resources for agriculture
	Availability of, and access to, quality agricultural land and forests
	Status of ecosystems and their functioning
	Status of the diversity of genetic resources in agriculture
Production systems	Agricultural production & productivity
	Sustainable management agricultural production systems
	Impact of extreme weather and climate events on agricultural production & livelihoods
	Projected impact of climate change on crops, livestock, fisheries, aquaculture and forestry
	Value chains and commercialization
	Private sector engagement
Socioeconomics	Food security and nutrition (vulnerability)
	Access to basic services
	Access to credit, insurance, social protection in rural areas
	Agricultural value addition, incomes and livelihood diversification
Institutions and policymaking	Institutional and technical support services
	Institutional capacity and stakeholder awareness
	Mainstreaming of climate change adaptation priorities in agricultural policies, and vice versa
	Financing for adaptation and risk management
	Membership in associations and organizations

Source: **FAO.** 2017.*Tracking adaptation in agricultural sectors: Climate change adaptation indicators*. Rome, Food and Agriculture Organization of the United Nations. 83 pp. (also available at https://www.fao.org/3/i8145e/i8145e.pdf)

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Further information

Guidelines:

- UNFCCC National Adaptation Plan – Technical guidelines for the National Adaptation Plan process (2012)
- Addressing Agriculture, Forestry and Fisheries in National Adaptation Plans – Supplementary guidelines (2017)

NAP-Ag:

- **Colombia:** advancing monitoring and evaluation of adaptation in the agriculture sector-Experiences of integrating agriculture in sectoral and national adaptation planning processes. https://www.adaptation-undp.org/nap-ag-case-study-colombia-advancing-monitoring-evaluation-of-adaptation-in-agriculture-sector
- Guatemala´s progress in developing a national monitoring and evaluation system for adaptation in the agriculture sector. https://www.fao.org/in-action/naps/resources/detail/en/c/1366085/
- **Guidance Note:** Strengthening M&E for adaptation planning in the agriculture sector. https://www.fao.org/in-action/naps/resources/learning/monitoring-and-evaluation-guide/en/
- **SCALA programme:** Tracking countries' progress within the Enhanced Transparency Framework. https://www.fao.org/in-action/scala/overview/thematic-areas/tracking-countries'-progress-within-the-enhanced-transparency-framework/en

↗ **Food and Agriculture Organization of the United Nations (FAO)**
www.fao.org/in-action/naps
FAO-NAPs@fao.org | Julia.Wolf@fao.org

↗ **United Nations Development Programme (UNDP)**
www.adaptation-undp.org/naps-agriculture
Rohini.Kohli@undp.org

↗ **German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV)**
www.bmuv.de/en/

↗ **International Climate Initiative (IKI)**
www.international-climate-initiative.com

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