

# Climate-smart agriculture measurement, reporting and verification in the United Republic of Tanzania



## KEY MESSAGES

- With its coordinated policy and programmatic actions, Tanzania is becoming a leader in climate-smart agriculture (CSA);
- However, outcomes of the country's CSA programmes are rarely monitored or reported and therefore do not count toward national development and climate goals;
- Stakeholders from governments, donors and non-governmental organizations (NGOs) agree that an inclusive, integrated monitoring & evaluation (M&E) system would provide a broad picture of national progress on CSA; and
- Investment in M&E of CSA would have specific benefits for improvements in the design of government support for CSA and its effectiveness.



Photo credit: S Kilungu, CCAFS

## Introduction

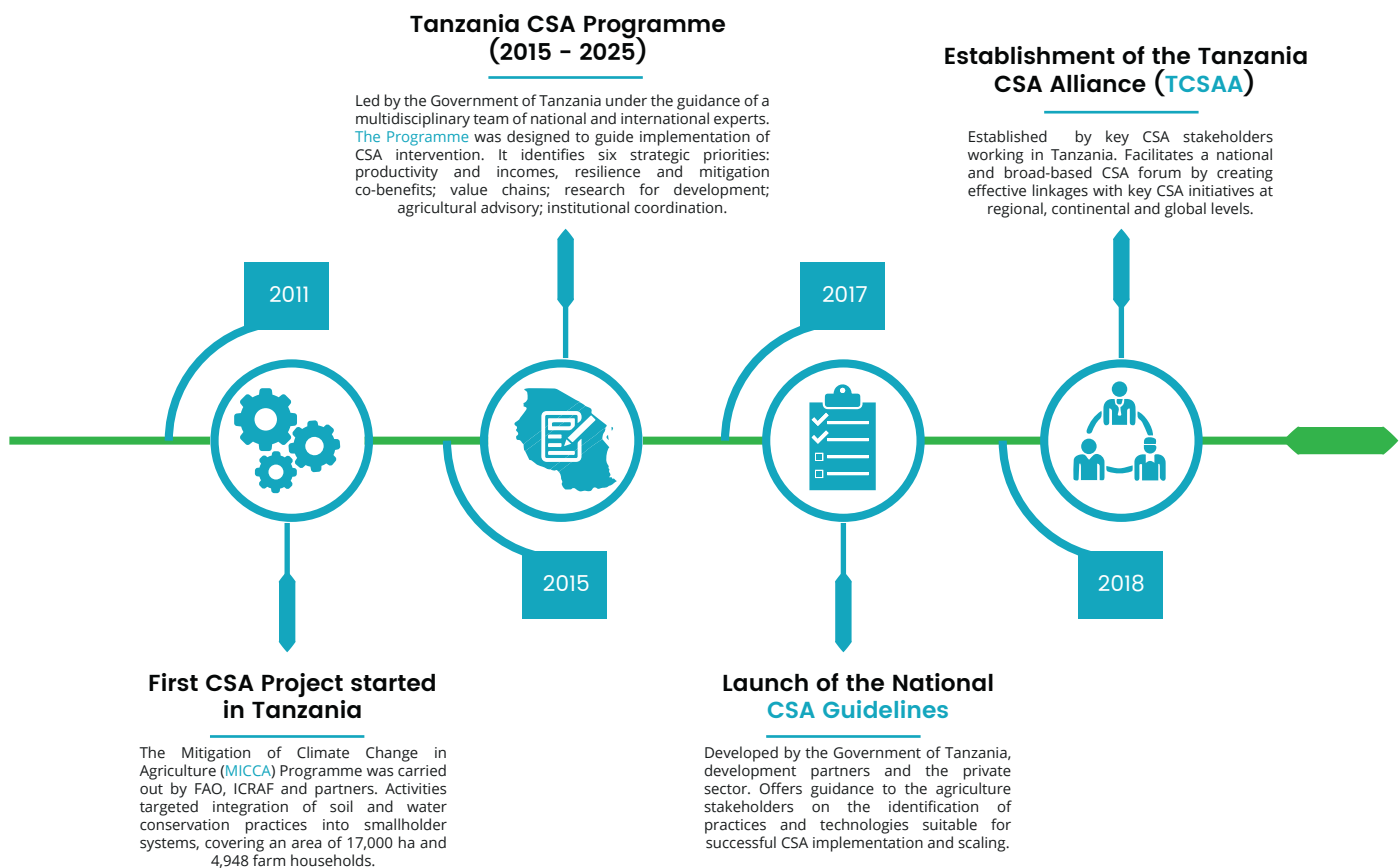
In the United Republic of Tanzania, CSA has rapidly become a key mechanism for addressing both climate change and food security. Since 2011 more than nine CSA-related policies, programmes and projects have been implemented by the government and development partners (figure 1 and table 1). Outcomes from CSA projects, however, have not yet been tracked or reported on. As a result, policy makers receive limited feedback on the effectiveness of these programmes; outcomes do not count toward national development and climate goals; and CSA is not explicitly integrated into budgetary processes.

This Tanzania Climate-Smart Agriculture Measurement, Reporting and Verification (MRV) Profile ('The Profile') seeks to improve this situation. To produce it, a research team composed of staff from Tanzania's Ministry of Agriculture and the World Agroforestry Centre (ICRAF) interviewed more than 50 stakeholders from government institutions, development partners, NGOs and institutions of higher learning and research.

The Profile's goal is to explain how CSA aligns with existing M&E systems in the country, and then lay out an action plan to strengthen M&E to meet stakeholders' information needs. Once proper systems are in place, policy makers will be better able to account for the contribution of CSA to national development goals and have better access to funding. This will further support the contribution of CSA to increasing food security and responding to climate change.

The Profile is written for three audiences: (i) government institutions seeking to improve M&E and obtain more comprehensive and accurate data at reasonable costs; (ii) development partners targeting support to specific capacity needs; and (iii) CSA programmes collecting data on indicators relevant to national objectives and needs. The Profile is also relevant more broadly to actors working in the agricultural development and environment sectors who seek insight on M&E of development initiatives.

Figure 1. Selected major Climate-Smart Agriculture (CSA) events in Tanzania.



Policy and institutional context

Tanzania is at the forefront of the countries of East and Southern Africa in developing policy for CSA promotion and scaling. The most recently developed policy, the [Climate Smart Agriculture Guidelines](#), supports the implementation of the [Tanzania Climate Smart Agriculture Programme](#) and contributes to the country's efforts to fulfill commitments under the Comprehensive Africa Agriculture Development Programme (CAADP) and the 23rd Ordinary African Union Assembly Decisions and Declaration ([Malabo Declaration](#)). The CSA Guideline outlines CSA practices and technologies suitable for each agroclimatic zone in the country, offers a roadmap for tracking implementation and impacts, and suggests roles and timeframes for M&E action.

There are many other policy initiatives that are relevant for CSA action in Tanzania (table 1). Each sets out various measures relevant to at least one of the CSA pillars. Explicit links to CSA are evident only in policy efforts that follow the [Agriculture Sector Development Strategy Phase II](#) (ASDS II), which sets out clear sectoral targets aligned to CAADP, and the [Agriculture Sector Development Programme Phase II](#) (ASDP II), which represents a basket fund to coordinate development partners towards ASDS II objectives.

Except for the ASDS II, the ASDP II, the CSA Guideline, and the [National Environmental Action Plan](#) (NEAP), policies and plans lack specific M&E systems, or their M&E systems have been only partially developed. Of all the M&E systems listed in table 1, stakeholders interviewed for this study highlighted the importance of the Agriculture Routine Data System (ARDS) (linked to ASDS II and ASDP II; see below).

Responsibilities for implementing and monitoring these policies rest with various ministries, departments and agencies (MDAs) in the country, including agriculture sector lead ministries (ASLMs). The national climate change focal point (NCCFP) is the Division of Environment (DoE) in the Vice President's Office (VPO). The NCCFP, in collaboration with the National Climate Change Technical Committee (NCCTC) and the National Climate Change Steering Committee (NCCSC), is responsible for overseeing national implementation of the National Adaptation Programme of Action (NAPA), the National Climate Change Strategy (NCCS) and the Tanzania CSA Programme. The NCCCFP also has responsibilities for M&E related to the NCCS, while the National Climate Smart Agriculture Task Force (NCSA-TF) is the designated institution to lead M&E for the Tanzania CSA Programme.

**Table 1.** Policies relevant to CSA action in Tanzania.

YEAR	POLICY	ARE ACTIVITIES PROMOTED IN THE POLICY RELEVANT TO CSA PILLARS?			DOES THE POLICY PROMOTE CSA MEASURES?	IS CSA MENTIONED?	DOES THE POLICY / PROGRAMME HAVE AN M&E SYSTEM	IS THE POLICY RELEVANT TO M&E OF CSA ACCORDING TO STAKEHOLDERS
		PRODUCTIVITY	RESILIENCE	MITIGATION				
2017	National Environmental Plan (NEAP) Climate-Smart Agriculture (CSA)							
2017	Tanzania Climate Smart Agriculture Programme Climate-Smart Agriculture (CSA)							
2016	Agriculture Sector Development Plan Phase II (ASDP II) AGRICULTURE DEVELOPMENT; POVERTY REDUCTION							
2014	Intended Nationally Determined Contributions (INDC) CLIMATE CHANGE							
2014	Agriculture Sector Development Strategy Phase II (ASDS II) AGRICULTURE							
2014	Agriculture Climate Resilience Plan (ACRP) CLIMATE CHANGE; AGRICULTURE							
2012	National Environmental Plan (NEAP) ENVIRONMENT; CLIMATE							
2012	National Climate Change Strategy (NCCS) CLIMATE CHANGE							
2007	National Adaptation Programme of Action (NAPA) CLIMATE CHANGE							

yes / fully relevant
  partially / not always
  no / not at all

## Roles, needs and capacity

The analysis identified 54 stakeholders in CSA, of whom 26 had a high influence on implementation of the national CSA Guideline and a high level of interest in M&E. These 26 represent government, donors, NGOs and research institutes. Most government agencies use M&E for making policy, providing support or finance, planning, guiding implementation and reporting. Donors, research institutes and NGOs also use information from M&E systems for a range of purposes (see [annex 1](#)). High-quality M&E therefore serves a number of purposes for government and other stakeholders.

## Needs for CSA M&E

Government stakeholders identified 40 specific information needs that should be met through M&E (see [annex 2](#)). To date, these needs have been met to varying degrees:

**Fully met needs:** Only 15% of the needs are fully met by existing M&E systems, such as ARDS, expert reports, agro-ecological zone mapping and crop calendars, and farmers associations records. The information already available through these systems mostly relates to the contribution of CSA to food security, the crops and animal breeds used in different agro-ecological zones, and details about aquaculture and beekeeping.

**Partially met needs:** Eighteen out of 40 (45%) of the identified information needs are partially met. In most cases, data is available but is not as useful as it could be (see capacities section below). For example, to assess the economic impacts of CSA, the government has the Poverty Monitoring System (PMS) for 2016–2021, which has a set of economic development indicators that could be used for monitoring the impact of CSA. However, the link between these indicators and climate

change is currently missing. Some NGOs and development partners—such as CARE International, the Food and Agriculture Organization of the United Nations (FAO), International Fund for Agricultural Development (IFAD) and Japan International Cooperation Agency (JICA)—reported good data in certain areas but less on other topics, including CSA adoption rates and outcomes.

**Table 2.** CSA information needs that are currently not met by existing M&E systems.

Domain	Suggested indicators to cover unmet information needs	Stakeholders interested	Benefits of having better data from M&E
<b>Inputs</b>	Percentage of budget set aside for CSA from Local Government Actors (LGA) own source	President's Office–Regional Administration and Local Governments (PORALG), Ministry of Agriculture (MoA)	Track financing of CSA activities in district budgets
	Percentage of budget disbursed for CSA in Tanzania	Ministry of Finance and Planning (MoFP), National Bureau of Statistics (NBS)	Track budgetary support to CSA
<b>Activities</b>	Number of CSA projects in the country	National Environment Management Council (NEMC), PORALG	Publicize CSA, report to higher authorities
	Number of districts with CSA interventions	National Bureau of Statistics (NBS), President's Office–Regional Administration and Local Governments (PORALG)	Set strategies to cover as many LGAs as possible
	Number of CSA training and awareness events conducted	National Environmental Management Council (NEMC)	Track progress in promoting CSA
	Number of extension officers trained on CSA practices and technologies at district level	Ministry of Agriculture (MoA)	Track capacities to promote CSA
	Number of farmers adopting CSA practices in different agro-ecological zones		
<b>Outputs</b>	Number of CSA practices adopted (e.g. water-efficient technologies)	NEMC, PORALG, Ministry of Agriculture, Natural Resources, Livestock and Fisheries (MANRLF), National Irrigation Commission (NIRC)	Understand the magnitude of efforts required; encourage other farmers to use CSA
	Area under CSA (e.g. irrigation) (in ha)	National Irrigation Commission (NIRC)	Plan irrigation
	Weather forecasts of varying length	Tanzania Meteorological Agency (TMA)	Track and improve use of forecasts by farmers
<b>Outcomes</b>	Number of practices in CSA guidelines that are adopted at district level	Ministry of Agriculture (MoA)	Track CSA practices and technologies streamlined in the DADPS (District Agricultural Development Plans)
	Average income earned by farmers using CSA practices and technologies at the district level	Ministry of Finance and Planning (MoFP), Ministry of Agriculture (MoA)	Assess economic impacts so as to inform GDP computations
	Amount of carbon sequestered using CSA practices and technologies at the district level	Ministry of Agriculture (MoA)	Track carbon sequestration through implementation of CSA practices
	Contribution of CSA to resilience	Ministry of Agriculture (MoA)	Track climate change resilience in agriculture sector
	Productivity (kg/ha) under CSA practices	Ministry of Agriculture, Natural Resources, Livestock and Fisheries (MANRLF)	Track food security
	Challenges in implementing CSA	National Environmental Management Council (NEMC)	Report to higher authorities and develop solutions



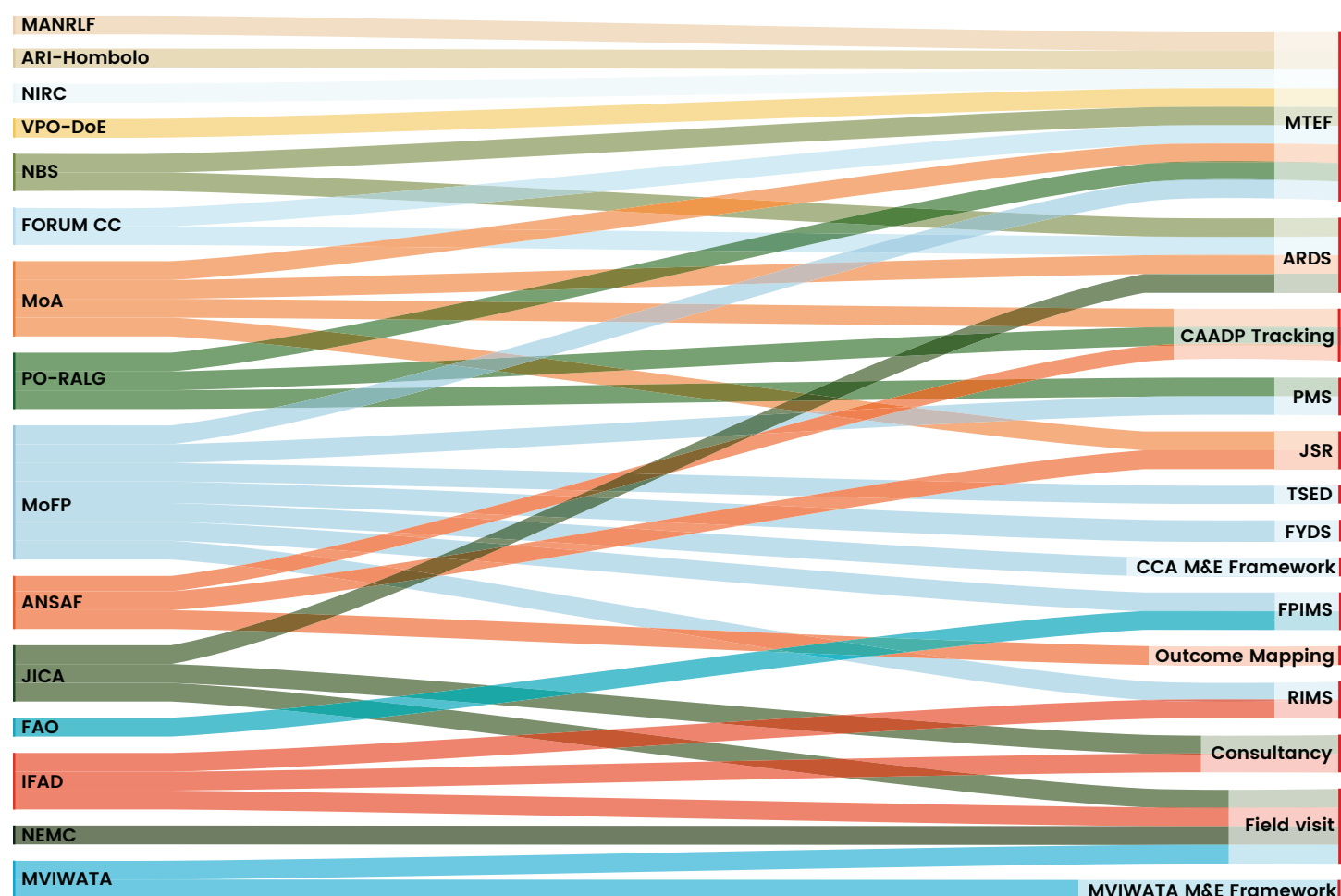
**Unmet needs:** Nearly half (18 out of 40) of the information needs are entirely unmet (see table 2). Government stakeholders primarily need M&E for domestic policy purposes, so improvements in the availability of data on CSA could directly lead to policy improvements. The consultations in Tanzania also involved donors (or donor projects), NGOs and research institutes (see annex 4). In comparison to government agencies, a greater proportion of donors' information needs relate to inputs into the CSA promotion process, such as current funding sources and who is involved in CSA activities.

Donors also express a strong interest in evidence on the outcomes of CSA. Better availability of M&E data collected by government would therefore help donor agencies to build the case for and target their investment support. Many of the M&E needs expressed by government agencies were also cited by the non-government stakeholders. In particular, all need better data regarding who is doing what to promote CSA, and the extent of adoption among farmers.

## Existing systems for M&E of CSA

Tanzania's CSA Guideline proposes a set of performance indicators, data collection methods and roles and responsibilities for M&E of the Guideline (see annex 6). However, that system was designed specifically for the CSA Guideline and does not meet all stakeholders' information needs. It may be necessary to integrate that system with other M&E systems in order to better meet stakeholders' needs. The Profile identified fourteen different tools currently used for tracking progress and outcomes related to CSA (figure 2, annex 5). These include the ARDS and the medium-term expenditure framework (MTEF), both used primarily by key government ministries. M&E systems specific to other development actors include IFAD's Results and Impact Management System (RIMS); FAO's Field Programme Integrated Management System (FPIMS); CARE's Programme Implementation Information Report (PIIR); Outcome Mapping (OM, used mainly by NGOs such as Forum Climate Change (ForumCC) and Agriculture Non-State Actors Forum (ANSAF)); and Empowered

**Figure 2.** The relationship between stakeholders and M&E systems. Each line represents an interview where a CSA stakeholder (left) mentioned using an M&E system in the country (right).



### Acronyms:

ANSAF = Agricultural Non-State Actors Forum; ARI-Hombolo = Hombolo Agricultural Research Institute; ARDS = Agriculture Routine Data System; CAADP = Comprehensive Africa Agriculture Development Programme; CCA M&E = Climate Change Adaptation Monitoring and Evaluation; FAO = Food and Agriculture Organization of the United Nations; FORUM CC = Forum Climate Change; FPIMS = Field Programme Integrated Management System; FYDP = Five Year Development Plan; IFAD = International Fund for Agricultural Development; JICA = Japan International Cooperation Agency; JSR = Joint Sector Review; MANRLF = Ministry of Agriculture, Natural Resources, Livestock and Fisheries; MoA = Ministry of Agriculture; MoFP = Ministry of Finance and Planning; MTEF = Medium-Term Expenditure Framework; MVIWATA = Mtandao wa Vikundi vya Wakulima Tanzania; NBS = National Bureau of Statistics; NIRC = National Irrigation Commission; PMS = Poverty Monitoring System; PO-RALG = President's Office - Regional Administration and Local Governments; RIMS = Results and Impact Management System (IFAD); TSED = Tanzania Socio-Economic Database; VPO-DoE = Vice Presidents Office - Division of Environment.

Smallholder Farmers in Tanzania (ESFT), used by Mtandao wa Vikundi vya Wakulima Tanzania (MVIWATA). Of these, government stakeholders highlighted that ARDS and MTEF have the most promise for CSA.

Agricultural Routine Data System (ARDS) is the government's management information system (MIS) in the agriculture sector based on routine administrative data. It is used by key government ministries and some donors to track implementation of agriculture projects at the district level. It is web-based and can integrate information from the village and ward levels into regional and national databases. A dashboard enables policy makers to quickly gain an overview of topics of interest. The ARDS contains a wide range of information that is collected at monthly, quarterly or annual intervals. Since the system is already operational nationwide, it could become a sustainable system into which CSA indicators could be incorporated. The system, however, is an internal government MIS, so summary reports would have to be made public for broader stakeholders to gain access to the information. The system also sometimes suffers from budget constraints and a shortage of trained staff.

**Medium-term expenditure framework (MTEF)** is used by all government stakeholders for budget tracking and therefore is relevant for tracking CSA financed by government in all districts. The MTEF serves both to ensure accountability (by ensuring the conformity of revenues and expenditures) and to provide management with information on performance. The MTEF provides monthly reports on revenue and expenditures as well as quarterly and annual performance reports. It can also provide more specific reports based on user requirements. Because of its central role in government fiscal management,

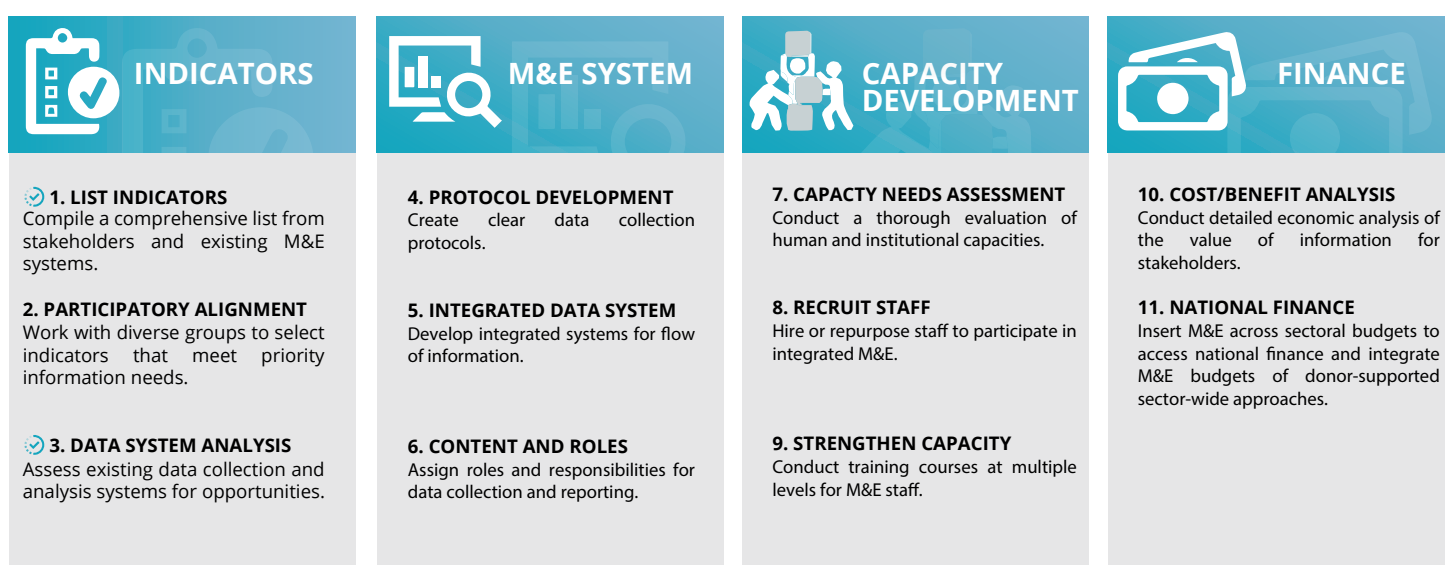
capacities to operate the MTEF are good. However, although the MTEF has been used to make ex post assessments of climate finance expenditures, refinements may be needed in order to introduce CSA or other climate-related budget codes. In addition, MTEF captures only government expenditure; if NGO private and other finance to support CSA are to be tracked, alternative data sources would be required.


Overall, ARDS and MTEF appear to provide a starting point for M&E of CSA, especially given that using existing systems can significantly reduce costs. The limitations of each system, however, must be addressed. In addition to the two M&E systems described, ministries, donor projects and NGOs are implementing other M&E systems that could meet some specific needs.

## Towards a national integrated system for CSA MRV

A general consensus across government, development partners and NGOs suggests that a national integrated system would provide a broad picture of national progress and fill critical institutional information needs. The stakeholders suggested more than 60 discrete actions, most of which fit into one or more of the following categories: : indicators, M&E system, capacity building and finance. Key action areas emerging from stakeholder consultations would help to create effective systems by deciding on a limited set of key indicators that can be monitored; creating a database that could be integrated with existing systems to track progress; building the human capacity to collect the required data and operate the M&E systems; and securing reliable sources of financing so that the crucial information can be collected and analyzed (figure 3).

**Figure 3.** Steps toward nationally integrated CSA MRV in Tanzania. Activities can run simultaneously.



**Notes:**  = Steps where some progress is being made.

**Indicators:** Stakeholders recommended identifying specific indicators to inform decision makers about progress in CSA. Suggested indicators included activity data such as farm area under CSA, amount of irrigation water used and number of fishing vessels equipped with tracking devices. These indicators could be integrated with those identified in the Tanzania CSA Guideline, as well as with CSA-relevant indicators currently tracked under the ARDS and other M&E systems. Nearly 600 indicators were identified. There is a need to focus on a limited set of indicators for which (i) the data generated can directly contribute to better decision making and implementation, (ii) multiple stakeholders' information needs are met and (iii) capacities and feasibility of collecting reliable data are high. As illustrated in table 2, the selected indicators could be structured around a results framework to provide information on inputs, progress of activities, outputs and outcomes of CSA actions in the country.

**M&E system:** Stakeholders also suggested a tracking tool or database, perhaps online, that would capture CSA performance indicators related to investment, farmer use, productivity, etc. It would be important for such a system to be interoperable with existing government and project-level systems. Some concerns were expressed about using only existing systems given that the data is not publicly available. While there appears to be a need for some type of system to aggregate information, it is not yet clear how such a system would link with ARDS and MTEF, which appears to be critical for sustainability. There is a need to pinpoint how the information will be collected and made available. Further discussions involving stakeholders and information science experts are needed to define the technical opportunities and constraints as well as roles, responsibilities and financing options.

**Table 3.** A selection of more than 400 indicators being used in the 14 named M&E systems illustrates the complementarities and divergence among project, subnational and international M&E systems. Note this is only a selection; a full analysis is a critical next step for the country.

Indicator	Source (protocol)													Alignment to CSA pillars	Results framework
	National systems				Regional systems		International systems		Project-level systems						
	ARDS	ASDP II	ASDS II	CSA Guidelines	AU	CAADP	UNFCCC	SDG	WB	FAO	IFAD	USAID	DFID		
Number of agricultural actors adopting CSA practices	x	x	x	x	x	x			x	x	x	x		P, R, M	OP
Land area where CSA practices are adopted	x		x	x					x					P, R, M	OP
Proportion of farm households with ownership or secure land rights					x			x						P	I
Household Dietary Diversity Score	x				x	x				x	x	x		P, R	OC
CSA Technology Index (performance of practices and technologies on CSA pillars)									x					P, R, M	OC
Public budget lines for CSA activities (existence and amounts)				x	x										I
Systems for promotion as well as coordination of CSA packages in agricultural plans and policies			x	x	x	x			x		x			P, R, M	I
Number and type of risk reduction actions or strategies introduced at local level	x		x					x					x	R	OP
Coping Strategy Index					x	x				x				R	OP
Social Safety Nets (type and beneficiaries)					x	x		x	x	x				R	I
Access to basic services								x		x				R	I
Availability and use of ICT tools	x							x						P, R	I
Diversification		x	x							x				P, R	OP
Availability and use of extension services and information	x	x	x		x				x		x		x	P, R, M	A
Capacity to generate and use statistical data and information		x	x		x	x		x							I

**Notes:** Source: x=indicator is mentioned in the protocol (implicitly or explicitly). Pillar: P=Productivity, R=Resilience, M=Mitigation; Results framework; A=Activity; I=Input; OP=Output; OC=Outcome. | **Acronyms:** ARDS= Agriculture Routine Data System; ASDP II= Agriculture Sector Development Programme Phase II; ASDS= Agriculture Sector Development Strategy Phase II; AU=African Union; CAADP= Comprehensive Africa Agriculture Development Programme; UNFCCC= United Nations Framework Convention on Climate Change; SDGs=Sustainable Development Goals; WB=World Bank; FAO= Food and Agriculture Organization; IFAD= International Fund for Agricultural Development; USAID= United States Agency for International Development; DFID=UK Department for International Development;



**Capacity building:** The next most widely cited need was for capacity building. This would involve both the broad human capacity to address climate change at the ministerial and field levels and precise training on data collection, record keeping and reporting. In the case of ARDS, there is a lack of extension staff to collect the data. In addition to government employees, technical staff of civil society actors also must understand M&E systems.

**Financing:** Nothing will happen without adequate financing. Budgets for M&E are typically squeezed. This is in part due to the amount of information requested. Prioritizing the information—for instance, according to the indicators noted above—could help in weighing the costs and benefits of improved data.

## Outlook

The assessment shows that there is political will and widespread interest in improved CSA M&E in Tanzania. However, significant steps must be taken to create effective systems. Stakeholders should:

- decide on a limited set of key indicators that can be monitored;
- create a database that could be integrated with existing systems to track progress;
- build the human capacity to collect the required data and operate the M&E systems; and
- secure reliable sources of financing so that the crucial information can be collected and analyzed.

Fulfilling all of these requirements will be a challenge, but investment in improved M&E can bring significant benefits to national stakeholders.

The benefits of improved M&E cited by stakeholders include:

- building the evidence base on CSA;
- better prioritization of CSA investments;
- promotion of CSA awareness among stakeholders; and
- improved information flows and coordination of CSA activities.

The situation in Tanzania offers a head start in achieving high-quality M&E of CSA. The nation is a regional leader in CSA, with an established base of solid projects and policy. Moreover, existing government systems—especially ARDS and MTEF—already collect a wealth of data that could be deployed and supplemented. If such actions (and others) are followed, Tanzania could become a model for MRV of CSA that nations across Africa and the world could follow. In the preparation of this profile, one interesting point stood out: stakeholders' information needs mostly focused on domestic policy, and international requirements came up only rarely. Thus, it will be critical to consider how international reporting demands can be met as a side benefit of improved data availability of domestic policy processes.

## Acknowledgements

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