

Info Note

Measurement, reporting and verification of climate-smart agriculture: Change of perspective, change of possibilities?

Findings from a country-driven assessment of needs, systems & opportunities

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Key messages

- As countries integrate climate-smart agriculture (CSA) into their sector policies and international climate change commitments, there is increased need for coherent strategies for monitoring and evaluation (M&E) of CSA.
- Based on a country-driven assessment, we find that: (i) Many stakeholders have significant unmet information needs, and often these needs overlap across stakeholders; (ii) Results measurement frameworks, based on indicators of inputs-activities-output-outcome chains, provide a common foundation that underlies the M&E system used by all stakeholders; (iii) Satisfying domestic CSA M&E needs would greatly strengthen countries abilities to meet their international measurement, reporting and verification (MRV) obligations, while also delivering benefits for domestic policies and programs; and (iv) There are opportunities to build on existing national M&E systems, but there are often capacity and resource gaps that need to be addressed.
- This country-led assessment of stakeholders' information needs and the M&E systems that could meet those needs provides a practical approach to developing coherent national CSA M&E strategies.

Since 2009 billions of dollars have been invested in CSA programs that aim to help smallholder farmers increase productivity while also adapting to and mitigating climate change (figure 1). Recently, however, CSA has moved beyond donor and civil society circles, and countries are now adopting CSA strategies as integral parts of their agricultural development and climate change response policies and strategies, including National Determined Contributions (NDCs).

Measuring progress and the impacts of these programs, however, has proven difficult. Institutions use different approaches, and there are no agreed indicators or monitoring systems for CSA programs. This limits the ability of policymakers to adaptively manage interventions, leads to poor coordination of CSA projects at local, national and regional levels, and impedes the ability to draw lessons that might improve CSA activities around the world. The lack of adequate M&E means that most of the contributions of CSA toward national development and climate goals are not counted and that CSA is not integrated into budgetary processes, threatening its sustainability. Given the significant action by governments, donors and civil society, it is now paramount to develop coherent national approaches to M&E of CSA if it is to achieve its potential for improving lives, food and nutrition security in the face of climate change. Harmonization of approaches within and among countries could also contribute to greater international understanding of the contributions of CSA to the policy goals of developing countries.

A number of barriers stand in the way of effective M&E. Each project, implementer and country approaches CSA in a different way, and each is seeking measurement systems for a range of needs, from meeting project-level

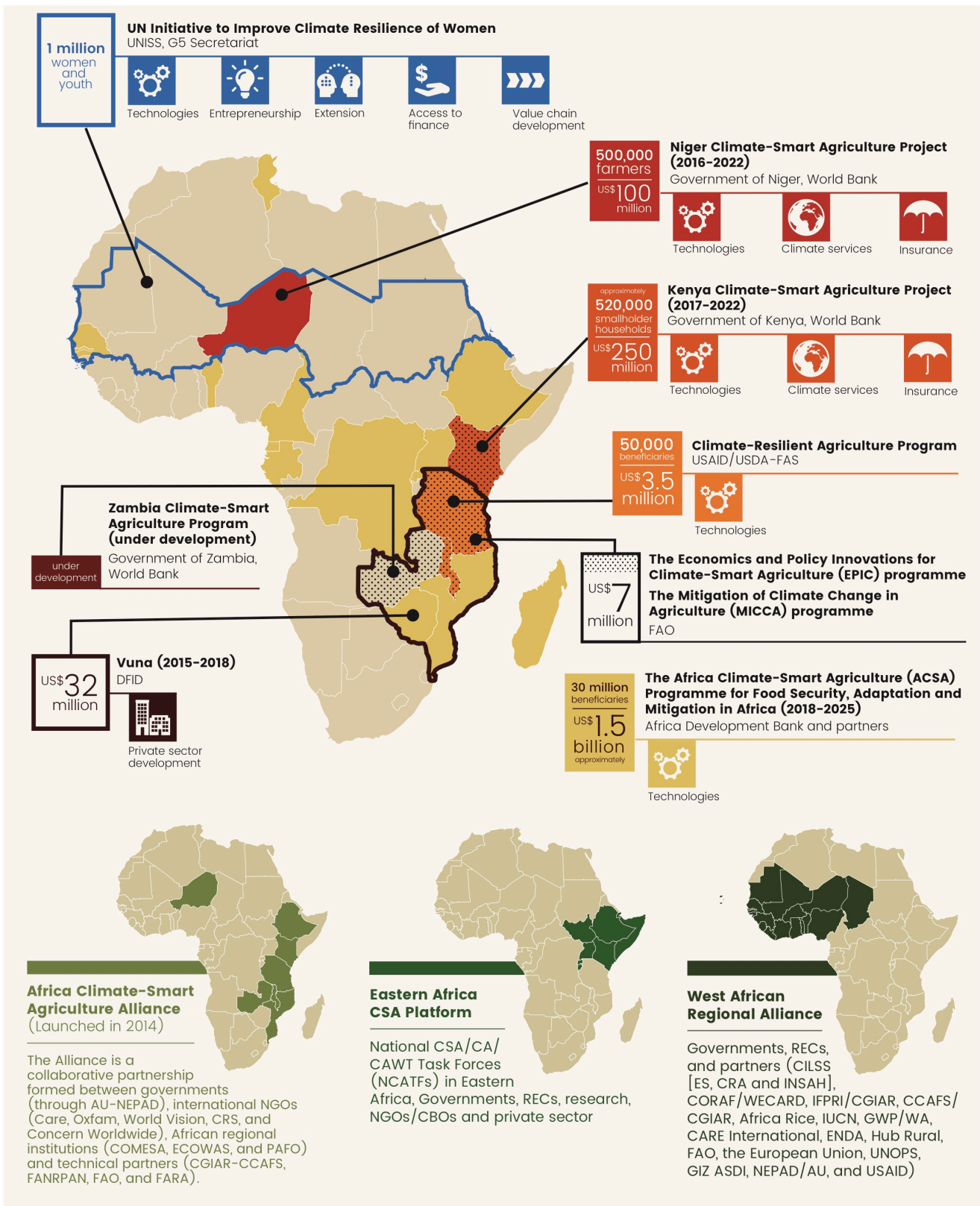


Figure 1. Selected investments and alliances on CSA in Africa. Source: Rosenstock et al. in press. The CSA Papers.

Acronyms: AU-NEPAD=African Union New Partnership for Africa's Development; CRS=Catholic Relief Services; COMESA=Common Market for Eastern and Southern Africa; ECOWAS=Economic Community of West African States; PAFO=Pan African Farmers Organization; CGIAR-CCAFS=CGIAR Research Program on Climate Change, Agriculture and Food Security; FANRPAN=Food, Agriculture and Natural Resources Policy Analysis Network; FAO=Food and Agriculture Organization of the United Nations; FARA=Forum for Agricultural Research in Africa; CA=conservation agriculture; CAWT=conservation agriculture with trees; NCATFS= National CA Task Forces; NGOs/CBOs=non-governmental organizations/community-based organizations; RECs=regional economic communities; CLISS=Permanent Interstate Committee for Drought Control in the Sahel; CRA=AGRHYMET Regional Centre (French acronym); INSAH=Institute of Sahel; CORAF/WECARD= West and Central African Council for Agricultural Research; IFPRI=International Food and Policy Research Institute; IUCN=International Union for Conservation of Nature; GWP/WA=Global Water Partnership West Africa; ENDA= Environment and Development Action in the Third World; UNOPS=United Nations Office for Project Services; GIZ-ASDI=German Agency for International Cooperation-Sweden cooperation; USAID=United States Agency for International Development.

requirements to satisfying international reporting frameworks. Moreover, each stakeholder has a distinct measurement approach, which sometimes overlap and sometimes contradict each other.

The World Agroforestry Centre (ICRAF), Unique Forestry and Land Use and Vuna have been working with stakeholders in four countries in eastern and southern Africa (Tanzania, Malawi, Zambia and Zimbabwe) to assess the current state of national CSA M&E and to set out country-specific roadmaps for developing systems for monitoring and reporting on CSA. The project took a country-driven approach to documenting stakeholders' information needs, exploring how to build on and align with existing M&E systems and international reporting frameworks, and encouraging cross-country comparisons. Though the research was grounded in southern Africa, these lessons are applicable to CSA and other topic-driven initiatives (such as land restoration and the Bonn Challenge) across similar environments and social contexts on the continent and around the world. Here we detail three key findings from the assessment.

Identifying diverse stakeholder needs

Many different stakeholder groups have an interest in M&E of CSA. In each of the countries, we interviewed between 10 and 27 government institutions, development partners, NGOs, institutions of higher learning and research, and the private sector¹. Stakeholders in each country expressed between 21 and 78 different needs that a CSA M&E system would help address. Some of the needs are met by existing M&E systems, but most are not (figure 2). The Ministry of Lands, Agriculture and Rural Resettlement in Zimbabwe, for instance, primarily needs information for shaping domestic policies and expressed concern about its current availability. This type of information could immediately lead to improvement in policy formulation and implementation. Even where one stakeholder's needs are met, a lack of coordination and information sharing means that often there are other stakeholders within the same country with the same information need that is not being met. Complementarities among stakeholders' needs point towards the potential for a coordinated CSA M&E system that would satisfy multiple needs.

M&E systems are used for a range of purposes. Government ministries, for instance, use M&E for making policy, providing support or finance, planning, guiding implementation, and reporting, while donors, research institutes and NGOs use information for tracking progress and designing new interventions. Meeting unmet needs can support the functioning of stakeholders' programs

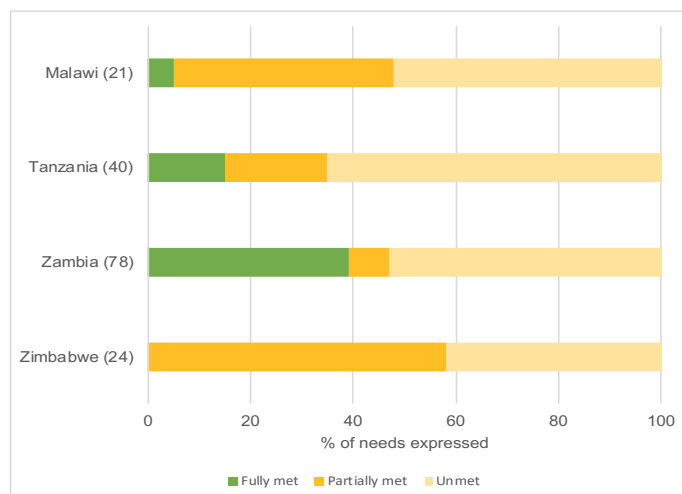


Figure 2. Percentages of expressed needs that were met, partially met or unmet by existing M&E systems in the country. Numbers in parentheses are the total number of needs identified in the interviews.

and policies. For example, the Ministry of Gender in Zambia suggested that knowing the number of farmers practicing CSA would help to enhance support for technology adoption for target groups. In Tanzania, the Ministry of Agriculture suggested that knowing the average income earned by farmers using CSA practices and technologies could contribute to assessing the economic impacts of CSA. Similar programmatic advancements were thought possible by each group.

Governments, NGOs and donors all use results measurement frameworks to evaluate success. Thus, there is a clear opportunity to have CSA M&E build on common and well-known structures. Identifying stakeholders' information needs and categorizing them according to results measurement framework logic is a user-relevant way to identify indicators and ensure alignment and coordination (table 1).

Aligning needs across scales

International MRV and domestic M&E are distinct but closely related. MRV, the term used within the United Nations Framework Convention on Climate Change (UNFCCC), refers to information on countries' progress in meeting the objectives of the Convention. M&E, a more general term, refers to national statistical systems and other measurement systems used by a country for its own governing and policy purposes. Data drawn from domestic M&E systems (such as statistical systems and program M&E systems) often serves as a basis for international MRV under the UNFCCC.

More than 80 stakeholder institutions in the four countries were interviewed as part of our assessment process. Surprisingly, less than 10% of the interviewees mentioned

¹ Mozambique already has aligned its CSA M&E with government programs. Thus, we only provided feedback on indicators per request.

reporting to international conventions as a driving reason to strengthen and develop CSA MRV. Thus, in the effort to improve MRV of CSA, it makes sense to start by ensuring that the information needs of domestic policymakers are met first, and then to determine how the information collected for national M&E can contribute to international MRV reporting.

Table 1. Example of M&E needs categorized by results framework logic and stakeholder group across four countries.

Domain	Need expressed	Group	Benefit
Inputs	No. of available CSA techniques	Government	Design locally-relevant solutions
	Percentage of budget for CSA	Government	Track climate finance
Activities	No. of CSA demonstration plots and extension officers	Research, government, NGOs	Track progress and capacity in CSA
	No. of CSA projects	Government, NGOs	Track progress in implementation
Outputs	Area under CSA	Research, government, NGOs	Results tracking and intervention design
	No. of farmers adopting CSA	Research, government, NGOs	Results tracking and intervention design
Outcomes	Socioeconomic status of CSA farmers	Research, government, NGOs	Assess resilience, plan for upscaling
	Percentage of land/crop under CSA not affected under adverse weather	Government	Track climate change resilience

For example, in Zimbabwe, extension workers collect standardized data for the country's Annual Crop and Livestock Assessment/Survey Reports. Tanzania's Ministry of Agriculture relies on its Agricultural Routine Data System (ARDS), an easy-to-use web-based system that tracks implementation of agriculture projects at monthly, quarterly and annual intervals and can integrate information from the village and ward levels into national databases. In Malawi, there is both a national M&E system for government programs and the Agriculture Sector Wide Approach Project (ASWAp), which monitors the country's major multi-donor investment in an effort to harmonize agriculture-sector development among many

stakeholders. Thus, there are opportunities to use existing systems to align domestic and international information needs. For example, UNFCCC Guidelines for national communications² require that countries provide information on the steps taken towards formulating and implementing national programs containing measures to facilitate adaptation to climate change, and countries are encouraged to provide information on the evaluation of strategies and measures for adapting to climate change. As a key response to climate change in developing countries, building national capacities for domestic M&E of CSA programs can also provide the information needed to meet related international reporting obligations.

But the need for alignment extends beyond domestic and international needs. Development and climate change goals will be achieved by projects and programs that will often be implemented on a subnational basis. Thus, for CSA M&E to be effective, it must also align with subnational programs that may come with their own M&E requirements. These requirements often depend on the source of funding, whether it is the government, a bilateral donor, the private sector or an international finance institution.

Further complicating CSA M&E is a fourth level of reporting. Countries in sub-Saharan Africa also must report at the continental level to the African Union against their Comprehensive African Agricultural Development Program (CAADP) Results Framework. For the Southern African Development Community (SADC), there is also a fifth reporting level, to the Centre for Coordination of Agricultural Research and Development for Southern Africa (CCARDESA). Thus, CSA M&E systems need to take into account subnational (projects), national, regional, continental and international reporting requirements during the design and implementation phases.

The many competing frameworks can in part explain the relative inattention to CSA M&E despite political and programmatic action. The limited previous work on CSA M&E has focused on indicators and their relevance to the CSA pillars of productivity, resilience and mitigation. This provides a first step towards relevance. Equally important in indicator selection may be building coherence among programs, so that data collected can serve multiple purposes and reporting needs.

The list of indicators produced for this research can be overwhelming long, with hundreds or even thousands of indicators, suggesting that needs and programs may be too diverse, allowing little convergence across scales. We examined this hypothesis in Tanzania by compiling indicators from existing agriculture and climate change

² <https://unfccc.int/resource/docs/cop8/07a02.pdf#page=2>

M&E systems, as well as from donors/ implementing agencies of CSA programs including World Bank, UN Food and Agriculture Organization (FAO), International Fund for Agriculture Development (IFAD), United States Agency for International Development (USAID), Germany's Gesellschaft für Internationale Zusammenarbeit (GIZ) and the United Kingdom's Department for International Development (DFID); regional programs such as the African Union's Africa Agricultural Transformation Scorecard; and international programs such as the Sustainable Development Goals. We found 599 indicators that specifically address one of the three pillars and could be used. However, we also found opportunities to create coherence and to meet stakeholders' expressed needs. For example, data on the number of actors using CSA is relevant for nearly all stakeholders (table 1), and there are already indicators being used to track resilience, one of the key needs identified in the UNFCCC's Koronovia Work on Agriculture. These types of results are encouraging, but much more analysis of indicators within and across countries is needed to inform guidelines for aligning needs across scales.

Strengthening capacity

Building on existing M&E systems is the most practical way to move forward. However, this is not always possible. In many cases (especially for more recent policies), the M&E systems are only in conceptual phases of development or have not been developed at all. A vast majority of the 33 national policies and programs examined in the four countries provided only vague statements that comprehensive M&E systems would be developed. Documentation was available for only one to three M&E systems in each country, where clear indicators, reporting schedules, roles and responsibilities were fleshed out. When stakeholders were asked about the relevance of the existing systems for CSA M&E, only six of 33 (about 18%) were thought to be relevant to CSA M&E (such as the M&E systems of the Agriculture Sector Development Strategy II (ASDS II) in Tanzania, or the Zambia National Agriculture Investment Plan). This finding is consistent with the widespread interest in developing CSA-specific M&E systems that stakeholders often expressed.

However, that interest should be set against the widespread use of existing systems for M&E. For example, in Malawi, government departments, NGOs and national research institutes already use a small set of existing M&E systems (4) for information in addition to developing their own (figure 3). In Tanzania, a greater number of M&E systems were accessed. Therefore, while it may indeed be beneficial to develop CSA-specific M&E systems, it would make sense to build on systems that stakeholders are already using.

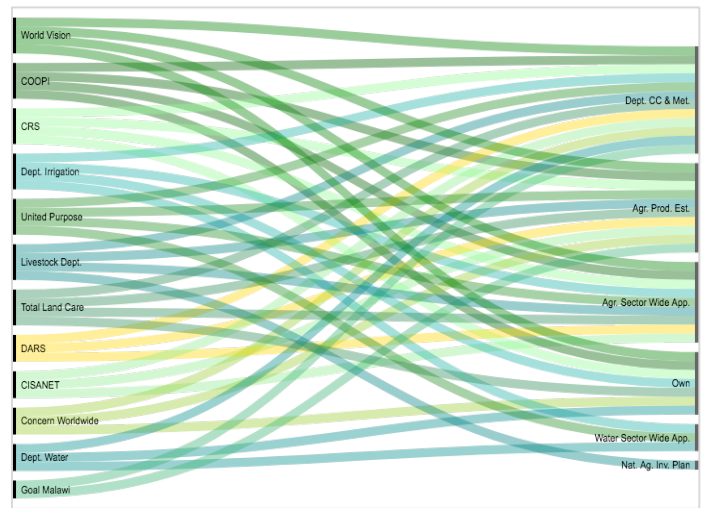


Figure 3. M&E systems identified as sources of information (right side) for 12 institutions interviewed (left side) in Malawi. Colors represent stakeholder groups: green (NGOs), blue (government) and yellow (research).

Acronyms: COOPI=Cooperazione Internazionale; CRS=Catholic Relief Services; DARS=Department of Agricultural Research Services; CISANET=Civil Society Agriculture Network; DCCM=Department of Climate Change and Meteorology; APES=Agriculture Production Estimates; ASWAp=Agriculture Sector Wide Approach; WSWAp=Water Sector Wide Approach; NAIP=National Agriculture Investment Plan.

Stakeholders identified many constraints with the existing systems. The most significant had to do with inadequate budgets, outdated technology and a shortage of trained staff. M&E activities are often relatively poorly funded, which jeopardizes the quality of data because the amount of information requested often exceeds what is financially feasible. Stakeholders in Zimbabwe noted that data collection procedures increase the likelihood of data quality problems, and that staff members lack the skills to collect information on mobile devices and to analyze it for M&E purposes. Malawi's ASWAp continues to use paper-based forms and is further hampered by an insufficient budget and under-trained staff. Throughout the region, capacity building should be targeted both to the front-line extension agents and others who collect field data, and also to the back-end staff who compile and analyze information. Technical capacity must include acquiring software and computers needed to store and analyze data. Building multi-stakeholder platforms for sharing data and experience may help to create institutional trust and collaboration.

With further analysis, we were able to identify some additional leverage points to improve capacity for CSA M&E. First, there are gaps in national systems. Many of the national systems contain indicators useful for monitoring productivity and adaptation (see table 2), but they likely would be of little use in mitigation reporting and suggests that without capturing impacts of CSA mitigation impacts will be underestimated.

Table 2. A selection from nearly 600 indicators being used in the M&E systems to which projects and national governments report. Examples were selected to illustrate the complementarities and divergences among project, subnational and international M&E systems.

Indicator	Source (protocol)													Alignment to CSA Pillars	Results Framework Domain
	National systems				Regional-level		International		Project-level						
	ARDS	ASDP II	ASDS II	CSA Guide-lines	AU	CAADP	UNFCCC	SDGs	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						R	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
No. 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

Source: x=indicator is mentioned in the protocol (implicitly or explicitly); ARDS=Agriculture Routine Data System; ASDP=Agriculture Sector Development Programme; AU=Africa 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; Pillar: P=Productivity; R=Resilience; M=Mitigation; Results framework: A=Activity; I=Input; OP=Output; OC=Outcome.

Additional details on farm activities could greatly reduce the uncertainty in greenhouse gas budgets and reporting. Second, there are likely data-sharing challenges. For example, the national information systems currently used for internal purposes—such as Tanzania’s—would have to make their data public so that other stakeholders could benefit from it. Forging data-sharing agreements is a non-trivial issue, given the need to ensure rights to privacy, and would need to be a foundational part of any program to improve CSA M&E across stakeholder groups.

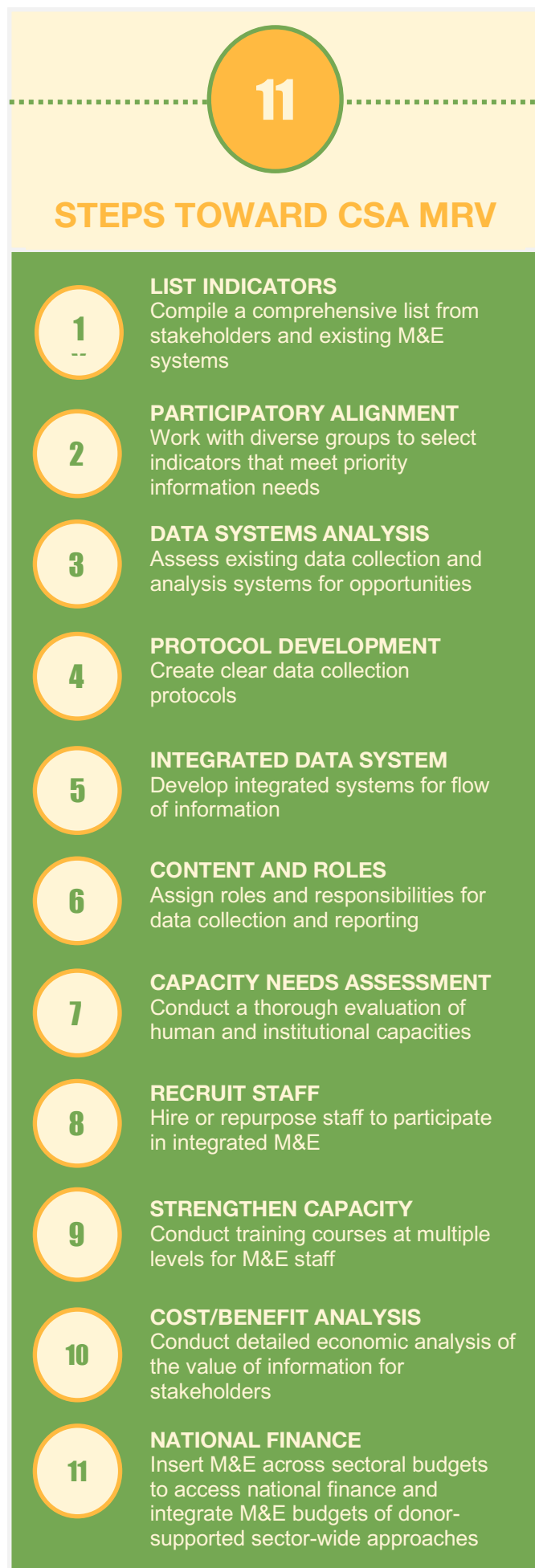
Regardless of the challenges, investments in stronger M&E capacity can have cascading benefits not only for MRV for international commitments but also for policymaking and other functions. Thus, while M&E is often viewed as an ‘unsexy’ part of program lifecycles—by comparison to planning or implementation—it is a necessary one.

A roadmap toward coherent CSA MRV

A general consensus across government ministries, development partners and NGOs in each country suggested that a national integrated system would provide a broad picture of national progress and fill critical institutional information needs. Stakeholders suggested more than 100 discrete actions across the four countries, most of which fit into one or more of the following categories: indicators, M&E systems, capacity building and financing. Looking across the four countries, 11 steps emerged for developing an internally consistent MRV system that could also be aligned with regional and international reporting requirements (figure 4). In short, these steps will 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.

Fulfilling all of these requirements will be a challenge, but investment in improved M&E would 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; improved information flows and coordination of CSA activities; and improved quality of information generated.

Figure 4. Eleven steps toward nationally integrated CSA MRV based on the lessons from four country assessments. The first three steps (1-3) correspond to work on indicators, the next three (4-6) M&E systems, the third set (7-9) capacity development and the final two (10-11) finance. Some countries have undertaken significant efforts on these steps, but much more work is needed.



Conclusions and policy implications

This first-of-its-kind country-led assessment uncovered new insights about existing systems and indicators and also reinforced expected results such as the lack of technical capacity. It also discovered that action toward development of a standard approach to MRV of CSA was welcomed by a wide range of stakeholders in all four countries. Development of fully functional monitoring systems will take time and money. It will be important to take a phased approach to iteratively design, develop and deploy necessary components in a participatory way. But the effort will more than pay for itself. A reliable, flexible MRV system could be used across CSA programs to collect cost-effective and robust evidence of progress toward adaptation and mitigation targets consistent with national, private-sector and farmer goals and in alignment with systems already in place. Our approach differed from most previous discussions on M&E of CSA that have focused exclusively on selection of indicators. Thus, a country-led assessment that considers stakeholder and institutional contexts and engages stakeholders in identifying their priority needs is well placed to enable stakeholders to develop a coherent approach to user-relevant M&E. When implemented, such a system will set the bar for evaluating how CSA programs are affecting livelihoods and landscapes, and also assist in identifying ways to improve programs through adaptive learning and management.

Further Reading

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The views expressed in this brief are those of the authors and are not necessarily endorsed by or representative of the National Governments interviewed, CPRC, or of the cosponsoring or supporting organizations.

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