# Measurement and reporting of climate-smart agriculture: technical guidance for a countrycentric process

Working Paper No. 274

CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

Andreea C. Nowak Andreas Wilkes Todd S. Rosenstock







**Working Paper** 

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### Abstract

Given the extent of climate-smart agriculture (CSA) initiatives at project, national, regional and global levels, there is increasing interest in tracking progress in implementing CSA at national level. CSA is also expected to contribute to higher-level goals (e.g., the Paris Agreement, Africa Union's Vision 25x25, and the Sustainable Development Goals [SDGs], etc.). Measurement and reporting of climate-smart agriculture (MR of CSA) provides intelligence on necessary the status, effectiveness, efficiency and impacts of interventions, which is critical for meeting stakeholders' diverse management and reporting needs. In this paper, we build the case for a stakeholder-driven, country-centric framework for MR of CSA, which aims to increase coordination and coherence across stakeholders' MR activities, while also aligning national reporting with reporting on international commitments. We present practical guidance on how to develop an integrated MR framework, drawing on findings from a multi-country assessment of needs, opportunities and capacities for national MR of CSA. The content of a unified MR framework is determined by stakeholders' activities (how they promote CSA), needs (why MR is useful to them) and current capacities to conduct periodic monitoring, evaluation and reporting (how ready are institutions, staff and finances). Our analysis found that explicit demand for integration of data systems and active engagement of stakeholders throughout the entire process are key ingredients for building a MR system that is relevant, useful and acted upon. Based on these lessons, we identify a seven-step framework for stakeholders to develop a comprehensive information system for MR of progress in implementing CSA.

### Keywords

Climate-smart agriculture; measurement; monitoring; sustainable development goals

### About the authors

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# Acronyms

| APES   | Agriculture Production Estimates Survey                  |
|--------|--|
| ARDS   | Agricultural Routine Data System                         |
| ASWAp  | Agriculture Sector Wide Approach Project                 |
| CSA    | Climate-smart agriculture                                |
| DCCMS  | Department of Climate Change and Meteorological Services |
| ESA    | East and Southern Africa                                 |
| GACSA  | Global Alliance for Climate-Smart Agriculture            |
| M&E    | Monitoring and evaluation                                |
| MR     | Measurement and reporting                                |
| MRV    | Measurement, reporting and verification                  |
| NDC    | Nationally Determined Contribution                       |
| PA     | Paris Agreement  |
| SDG    | Sustainable Development Goal                             |
| UNFCCC | United Nations Framework Convention for Climate Change   |
| WBCSD  | World Business Council on Sustainable Development        |

### Introduction

Ambitious and explicit targets have been set globally, regionally and nationally to facilitate scaling of climate-smart agriculture (CSA), driving several billion dollars of investment in CSA over the past decade. The Global Alliance for Climate-Smart Agriculture (GACSA), comprised of more than 170 members, was established to support 500 million farmers worldwide to adopt CSA practices by 2030 (GACSA, 2015). The New Economic Partnership for Africa's Development aims to enable 25 million smallholder farms to practice CSA by 2025, as key strategy to improve food security and nutrition across the continent (NEPAD, 2014). The World Business Council on Sustainable Development (WBCSD) now coordinates ambitious private sector commitments to increase food availability by 50%, increase resilience and adaptation to climate change and reduce agriculture-related emissions by 50%, all by 2030 (WBCSD, 2017). Countries are setting their own roadmaps, outlining CSA-specific targets and key performance indicators in national CSA investment plans and strategies and in broader development policies. Assessing the extent to which these commitments are being met is a first step towards increasing ambition and impact.

There is a clear case for measurement, monitoring, evaluation, learning and reporting of CSA (herein after MR of CSA)<sup>1</sup>. Governments, non-profits, development partners and private actors promoting CSA at all levels—local, regional, national, and international—need information to manage their projects/ programmes and show accountability. Accurate evidence-based reporting is required to demonstrate effectiveness in achieving desired objectives and impacts; to improve learning and decision-making about implementation and future programming; to ensure transparency towards citizens, partners and donors with regards to the funds used; and to improve resource mobilization.

<sup>1</sup> For practical purposes, we use measurement and reporting (MR) of CSA as an overarching term to cover all aspects of results-based management: developing metrics, conducting periodic monitoring and evaluation of processes, outcomes and impacts, learning and reporting on achievements related to CSA interventions.

MR of CSA is also relevant in the context of reporting and alignment requirements under global frameworks such as the Paris Agreement (PA) and the 2030 Agenda for Sustainable Development, which share a set of commonalities with CSA goals and targets (Box 1). As signatory countries, governments are expected to show progress and results<sup>2</sup> and align national objectives to global goals. For instance, the PA requires regular submission of reports on greenhouse gas (GHG) emissions and removals and on progress towards mitigation targets set under the Nationally Determined Contributions (NDCs). Moreover, countries are to periodically report progress on climate adaptation action, capacity building, climate finance support provided, needed and received<sup>3</sup>. Aligning CSA measurement to global targets can help reduce the cost and burden of data reporting for stakeholders and improve the relevance of interventions (i.e., measure what matters locally, nationally and also globally).

In this paper we offer practical guidance on conceptualizing and planning a unifying MR framework for CSA, which allows aggregation of information from multiple data systems and responds to the different management and reporting needs of stakeholders in a country (see Table 1 for a synthesis of possible uses of MR of CSA). We integrate concepts of monitoring, evaluation and learning (MEL) and measurement, reporting and verification (MRV), to suggest a framework that measures progress and impacts on CSA across the three pillars (food security, resilience and mitigation). MRV is used in reference to climate mitigation goals articulated in the NDCs (Singh *et al.*, 2016), while MEL is mostly referred to in the context of adaptation action, which is complex and context-specific (Christiansen *et al.*, 2018).

Typical discussions on MR of CSA have focused on the design and use of project- and programme level metrics aimed to help institutions guide their decision-making on implementation, evaluation, scaling, and reporting. Recent analyses show that development partners track over 380 indicators in various CSA-relevant activities (Quinney *et al.*, 2016), adding to hundreds of indicators used by governments and local organizations to assess

<sup>2</sup> Reporting is voluntary under the 2030 Agenda and the Sendai Framework.

<sup>3</sup> Even though there is no agreed format of the Adaptation Communication, governments agreed to set a global goal to enhance adaptive capacity, resilience and reduce vulnerability under Article 7 of the PA.

processes, achievements and outcomes related to food security, resilience and mitigation. Project designers and managers now have access to long lists of readily-available indicators that they can choose from to identify their own context-relevant indicators.

| Table 1. Possible ob | jectives of measuremen | t and re | porting | of CSA |
|----------------------|------------------------|----------|---------|--------|
|----------------------|------------------------|----------|---------|--------|

| Objective  | Explanation and example questions  |
|--|--|
| To track progress on implementation  | To collate information on ongoing projects and their implementation status and<br>assess whether planes actions and outputs are being delivered. E.g., What are<br>the ongoing projects/programs focusing on CSA? To what extent have activities<br>of the CSA intervention been implemented?  |
| To evaluate outcomes and<br>impacts (incl.<br>effectiveness and<br>efficiency) | To identify whether an intervention has achieved the planned outcomes and<br>impacts; to assess the costs and benefits of the actions implemented. E.g., Has<br>the intervention achieved the desired expectations? Are some CSA interventions<br>more effective than others, under which conditions and why?  |
| To strengthen<br>accountability (reporting)                                    | To ensure that implementation agencies/units are performing their mandated tasks, as outlined in institutional/national strategies; to guarantee transparency and accountability to stakeholders (including international frameworks), through information sharing. E.g. Is the agency/unit implementing the tasks set out in the strategy/national policies? Are the targets set in the NDCs met? |
| To track CSA finance   | To understand resource allocation for CSA interventions, to identify gaps in financing (under-funded areas) and coordinate resources more effectively and efficiently. E.g.: Who invests in CSA interventions and by how much?   |
| To enhance coordination<br>(of efforts, of<br>stakeholders)                    | To understand what CSA initiatives are promoted and by whom, so as to<br>maximize resource allocation and minimize duplication of efforts. E.g., Who is<br>carrying out CSA-related initiatives in the country? What CSA initiatives are<br>being promoted?  |
| To encourage learning<br>(adaptive project<br>management)                      | To improve understanding of the intervention (what works and why) so as to<br>adjust activities, expected outputs and goals. E.g. What can be learned from<br>the implementation of the intervention? What can be done better, how?  |
| To inform future interventions (scaling)                                       | To identify best practices and create evidence for informing or strengthening (new) future interventions. E.g., What best practices can be scaled and how?   |

Source: adapted from Pringle (2011). Many of these objectives are interrelated (e.g., learning for adaptive management and scaling) or provide feedback loops from one to another (e.g., tracking progress, outcomes or impacts helps in strengthening accountability and reporting).

However, in the context of increased need for collaboration and coordination to tackle global issues and maximize collective impact (Stibbe *et al.*, 2018; Bowen *et al.*, 2017), dispersed CSA metrics and MR systems may inhibit system-wide action. They limit opportunities to coordinate initiatives at different levels (local, national, regional) and to create systematic feedback loops, all of which are critical for learning, avoiding duplication and increasing impact. With information spread across dozens of projects and programmes, articulating a common vision for achieving impact becomes a gargantuan, if not impossible task.

A data system that integrates various MR frameworks can ease some of these challenges and help address multiple needs simultaneously. Since MR is already a burden for many project managers and implementors, simplifying processes and metrics can be beneficial to all parties. For instance, by agreeing on common measures for tracking progress and impacts and on standardized reporting mechanisms, stakeholders can ensure more effective, targeted use of resources, and avoid duplication of effort in data collection and reporting or maximize the complementarity between data reported from different initiatives. Development partners are empowered to tell a coherent story on CSA, which is aligned to a national vision and wider global and regional goals. Governments can keep track of the diverse interventions carried out in the country, having access to the needed information to report on aggregate CSA outcomes and impacts (Christiansen *et al.*, 2018).

Integrating MR frameworks can be challenging, especially in the context of complex concepts such as CSA. Governments alone use a variety of ad-hoc data systems to track interventions in agriculture (e.g., routine program monitoring, sectoral surveys, national surveys, field reports, data from implementing partners) and these are rarely harmonized across ministries. Costs of integration can be high, and, in some cases, restrictive data management protocols may inhibit opportunities for integration. Additionally, national metrics for CSA may become irrelevant in a context where adaptation action is highly localized and contingent upon uncertain climate impacts (GIZ, 2014). Yet experiences<sup>4</sup> also show that these are not insurmountable obstacles. Explicit demand for integration and alignment, as well as practical guidance on unifying frameworks, can provide valuable stimuli for action.

In this paper, we offer insights into the methodology of a participatory assessment of needs, capacities and opportunities for MR of CSA in east and southern Africa (ESA) and present lessons learned (Chapter 1). Based on these lessons, we present a generic process for aligning and integrating MR frameworks (Chapter 2) and provide several recommendations. Research findings are aimed to inform discussions on measuring progress and impact on CSA objectives in a coordinated manner, while encouraging action towards collaborative

<sup>4</sup> See case studies on developing integrated monitoring systems for adaptation in France, Germany, Kenya, the Mekong region, Morocco, Nepal, Norway, The Philippines, and United Kingdom (GIZ, 2014).

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information systems that are stakeholder-led, nationally harmonized and, to the extent possible, globally-aligned.

### Box 1: Relevance of CSA in global and regional reporting frameworks

CSA is relevant to various international commitments. Targets are formulated globally and/or regionally, and countries are expected to set national ambitions in the light of different national circumstances. Even though most frameworks presented are based on voluntary commitments and reporting processes, they provide unique opportunities for the agriculture sector to play a proactive role in their implementation and in strengthening global efforts for food security, resilience, and sustainable development.

- The Paris Agreement: Country-level commitments (through NDCs) to reduce agricultural emissions and enhance carbon sequestration in soils, as efforts towards a larger goal of keeping global temperature rise well below 2°C above pre-industrial levels in this century.
- The 2030 Agenda on Sustainable Development: By 2030 end hunger, achieve food and nutrition security and promote sustainable agriculture (SDG #2), ensure sustainable production and consumption by reducing food loss at production and in supply chains (SDG #12), take urgent action to combat climate change and its impacts (SDG #13), sustainably manage forests, combat desertification, and halt and reverse land degradation (SDG #15).
- The Aichi Biodiversity Targets (ABT): By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity (ABT #7), genetic diversity on farms is maintained (ABT #13), and at least 15% of degraded ecosystems are restored contributing to climate change mitigation and adaptation (ABT #15).
- The Bonn Challenge: Restore 150 million hectares (ha) of the world's deforested and degraded lands by 2020 and 350 million ha by 2030.
- The Sendai Framework 2015-2030: Increase the number of countries with national and local disaster risk reduction strategies by 2020 (Target 35).
- The Malabo Declaration: Double current agriculture productivity levels and halving post-harvest loss across Africa.
- The African Forest Landscape Restoration initiative (AFR100): Bring 100 million hectares of deforested and degraded landscapes across Africa into restoration by 2030.

Source: authors compilation.

# Needs and capacities for measurement and reporting of climate-smart agriculture

### Study scope and methods

Guidance on planning a unified framework has been developed based on findings and lessons learned from a participatory assessment of needs, opportunities and capacities for MR of CSA in East and Southern Africa (ESA). The assessment was carried out in Malawi, Tanzania, Zambia and Zimbabwe between January-April 2018, where Vuna<sup>5</sup> had been working with stakeholders to improve evidence and understanding of CSA and to strengthen the enabling environment. Vuna supported each government to develop CSA frameworks that guide the promotion of CSA, helped establish coordinating mechanisms and produced CSA manuals for extension.

To this end, Vuna supported ICRAF, CCAFS, UNIQUE Forestry and Land Use and partners to work with in-country stakeholders towards the development of nationally-tailored frameworks for MR of CSA, departing from information needs and opportunities expressed by potential MR users. The research project was based on the premise that a stakeholder- and country-driven approach would enable MR improvements to build on explicit demands and already-existing efforts, which would increase national ownership of the framework. It would also ensure that the recommendations for MR of CSA will be relevant to and acted upon by country stakeholders, as they would be the result of a participatory assessment, validation and planning process.

The assessment was based on a mixed methods approach, were document review, individual interviews and workshops were used to collect information on existing policies, MR systems and supporting institutional structures, gaps in required CSA information, among others. The study was divided into six stages, each articulating the needs and perspectives of the stakeholders interested in engaging in the consultation and validation processes: i) study

<sup>&</sup>lt;sup>5</sup> Vuna was a three-year regional programme of the United Kingdom's Department for International Development (DfID) mandated to promote CSA in Africa.

scoping; ii) mapping and analysis of country policies relevant to CSA; iii) identification and analysis of stakeholders engaged in CSA; iv) identification of stakeholder information uses and needs; v) documentation of existing data systems and capacities for MR of CSA; and (vi) collation and validation of findings and elaboration of an action plan (Appendix 1).

Interviews and meetings were facilitated by ICRAF staff and Vuna country representatives. In each country, the team engaged between 10 and 27 government institutions, development partners, NGOs, institutions of higher learning and research, and private sector. Stakeholders were selected based on their interest in MR of CSA and their level of influence on the CSA agenda in each country (See Appendix 3 for an example of a stakeholder mapping matrix). As the study was driven by governments' explicit need for integration and alignment of CSA metrics, there was a prevalence of ministerial representatives (particularly agriculture and environment) throughout the process. The next section presents key findings and lessons learned from the study. Although the research was grounded in the ESA region, insights and emerging guidance are applicable to CSA and other topic-driven initiatives (e.g., the Bonn Challenge, Sustainable Land Management) in Africa and around the world.

### Insights and lessons learned

### Possible uses of measurement and reporting of CSA

As stakeholders play many different roles in promoting CSA—policy making, implementation of projects and programmes, finance provision, research, etc.—they use CSArelated information for many different purposes. We grouped the identified information uses into seven categories adapted from Pringle (2011) and found key priorities common across stakeholder groups, such as learning, adaptation and planning (i.e., using evidence to inform decision-making and adaptive management) and tracking implementation progress (i.e., monitoring activities against a set plan to determine whether implementation is on-/off-track) (Figure 1). This pattern is not surprising. CSA programming is mostly in its early stages in many countries, and empirical evidence of its effects is still limited. Hence stakeholders often expressed strongest interest in using CSA data for planning, implementation and learning. Coordination and scaling are more complex, resource-intensive processes, while reporting is typically only a fraction of programming. Priorities for using CSA information vary across stakeholder groups and countries (Figure 1). For instance, higher education and research institutions and NGOs are primarily keen on using information for designing scaling strategies; accountability and reporting weigh relatively high on donors' agendas, as they usually seek to demonstrate good use of funds and added value to global goals (e.g., SDGs); governments are burdened with many reporting obligations towards citizens and development partners, which largely explains their interest in diversified information uses. These findings suggest two important issues. One, that MR of CSA has different uses to different stakeholders, and therefore an integrated system needs to encompass distinct and complementary information needs, so as to be useful to many different users. Second, that regional or global recipes for uniform MR systems for CSA are counterintuitive, as stakeholders in each country have different ambitions and priorities.





### Availability of CSA-related information

In each country, stakeholders expressed between 21 and 93 concrete information needs related to CSA, which they identified as critical for achieving previously expressed objectives. Some of these needs are met by existing project-, organization- or national-level information systems, but most are not (Figure 2). In general, higher learning and research institutes and development partners struggle to find the information they need through existing systems, while the NGOs group fares slightly better, with less than 40% of their needs being unmet. Aggregate country-level results follow the same pattern, with most information needs being unmet or met only partially, meaning that the data available is of insufficient quality or not

fully in line with stakeholders' information needs. Insufficient information hampers decisionmaking processes, both at project/programme and higher policy levels.



# Figure 2. Percentage of expressed needs that are met, partially met or unmet by existing systems, by stakeholder group and country.

Note: Total number of needs identified is expressed in parenthesis

Results-based management is an approach commonly used by both government and non-government stakeholders to measure and report progress the effects of policies, projects and programmes. We grouped all unmet and partially met needs by a results framework based on inputs, activities, outputs and outcomes as a first step in outlining a MR framework that integrates different stakeholders' information needs (Figure 3). We found that the most frequent information gaps across the four countries relate to input-level indicators (e.g., existing/potential CSA practices to promote, types and numbers of stakeholders engaged in CSA, etc.) and immediate outputs (e.g., farmers adopting CSA, area under CSA, access to climate information, etc.). In general, outcome-level information (e.g., impacts on CSA pillars) only represents a small portion of all gaps identified. This probably reflects the focus of most stakeholders on implementation of CSA in the countries involved. More generally, these findings confirm the value of including different indicator types (impact, outcome, output, activity, input) in an integrated national data system for CSA, as this categorization makes explicit the relationship between information needs, users and the uses of improved information availability.

Whether information needs are met or not is only part of the story. Mechanisms to exchange data already collected are often missing, leading to deficiencies in planning and implementation and/or duplication of efforts. Even when one stakeholder's needs are met entirely or partially, lack of coordination and information sharing means that there are other stakeholders within the same country with the same information need that remains unmet. Illustrative examples of this situation were found across all countries, most predominantly in relation to information on existing initiatives and institutions related to CSA, funding disbursed for CSA, adoption rates and contributions of practices/technologies to resilience goals (Appendix 2). Overlaps and complementarities among stakeholders' objectives further highlight the potential for a coordinated MR framework that would satisfy multiple needs.

# Figure 3. Unmet and partially met information needs grouped by a results framework



### **Existing MR systems**

Established MR systems could represent an important starting point for integrating CSA information. In each country, stakeholders mentioned between 8 and 19 existing national and project/programme-level systems (e.g. frameworks, plans, surveys) that already incorporate some information relevant to CSA or that could be adapted to provide the needed information that is currently missing. 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 Zambia, the government uses annual agricultural reports, while NGOs have their own frameworks. In Malawi, there are national data systems 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.

With a few exceptions, actors use their own systems for measuring and collecting CSArelated information, which poses additional challenges for coordination and/or integration of systems across users. NGOs, development partners and higher learning and research institutes mostly use their own field visit reports and project/programme information systems that track activities, outcomes and impacts. Governmental authorities largely rely on national systems linked to specific policies. However, there are exceptions. In Malawi, the institutional overlap in data collection is more obvious, as governmental institutions and NGOs interviewed rely primarily on three governmental information systems for programming and policy-making, namely: The Agriculture Production Estimates Survey (APES), ASWAp and the M&E system of the Department of Climate Change and Meteorological Services (DCCMS) (Table 2). In each country studied, there are opportunities to strengthen existing institutional structures, so as to fill information gaps. The key would be to build on those systems with the highest likelihood of being used by a large number of users, so as to maximize benefits.

While widespread use of existing systems for MR is highly recommended, this may not always be straightforward. In many cases (especially for more recent policies), the systems mentioned by stakeholders are 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 of intent that comprehensive MR systems would be developed. Documentation was available for only one to three systems in each country, where clear indicators, reporting schedules, roles and responsibilities were already fleshed out. When stakeholders were asked about the relevance of existing systems for MR of CSA, only six of 33 (about 18%) were thought to be highly relevant (such as the systems of the Agriculture Sector Development Strategy II in Tanzania, or the Zambia National Agriculture Investment Plan).

# Table 2. Examples of data systems from where stakeholders typically get the needed information or that could be adapted to cover identified needs (Malawi)

| Stakeholder<br>(green=government;<br>yellow=NGO)<br>/<br>M&E System | APES reports | DCCMS M&E system | NAIP M&E plan | MoAIWD M&E system | Water SWAp M&E | Dol M <del>û</del> E | MoF system | ASWAp reports | DoAHLD reports | COOPI M&E system | TLC M&E system | CW M&E system | CRS M&E system | World Vision M&E system | DCAFS M&E system |
|---|--------------|------------------|---------------|-------------------|----------------|----------------------|------------|---------------|----------------|------------------|----------------|---------------|----------------|-------------------------|------------------|
| LD  |              |                  |               |                   |                |                      |            |               |                |                  |                |               |                |                         |                  |
| DARS  |              |                  |               |                   |                |                      |            |               |                |                  |                |               |                |                         |                  |
| DoW   |              |                  |               |                   |                |                      |            |               |                |                  |                |               |                |                         |                  |
| Dol   |              |                  |               |                   |                |                      |            |               |                |                  |                |               |                |                         |                  |
| DoAHLD  |              |                  |               |                   |                |                      |            |               |                |                  |                |               |                |                         |                  |
| СООРІ   |              |                  |               |                   |                |                      |            |               |                |                  |                |               |                |                         |                  |
| United Purpose  |              |                  |               |                   |                |                      |            |               |                |                  |                |               |                |                         |                  |
| Total LandCare  |              |                  |               |                   |                |                      |            |               |                |                  |                |               |                |                         |                  |
| Concern Worldwide   |              |                  |               |                   |                |                      |            |               |                |                  |                |               |                |                         |                  |
| CRS   |              |                  |               |                   |                |                      |            |               |                |                  |                |               |                |                         |                  |
| World Vision  |              |                  |               |                   |                |                      |            |               |                |                  |                |               |                |                         |                  |
| CISANET   |              |                  |               |                   |                |                      |            |               |                |                  |                |               |                |                         |                  |
| GOAL Malawi   |              |                  |               |                   |                |                      |            |               |                |                  |                |               |                |                         |                  |

Note: Dark green indicates systems cited and used by governmental actors, gold systems cited and used by non-governmental entities (NGOs, development partners) and blue indicates systems used by both governmental and non-governmental actors. Acronyms: Vertically: LD=Livestock Department of the Ministry of Agriculture, Irrigation and Water Development (MoAWID); DARS=Department of Agricultural Research Services of MoAWID; DoW= Department of Water of MoAWID; DoI=Department of Irrigation of MoAWID; DoAHLD=Department of Animal Health and Livestock Development of MoAWID; COOPI= Cooperazione Internazionale; CRS= Catholic Relief Services; CISANET= Civil Society Network; Horizontally: APES=Agriculture Production Estimates Survey; DCCMS M&E system = Department of Climate Change and Meteorological Services Monitoring and Evaluation system; NAIP=National Agricultural Investment Plan M&E; MoAIWD=Ministry of Agriculture, Irrigation and Water Development; Water SWAp= Water Sector-Wide Approach; MoF=Ministry of Finance; ASWAp=Agriculture Sector-Wide Approach; DCAFS= Donor Committee on Agriculture and Food Security.

### Indicators for CSA

Already-defined and operationalized indicators can often be used to meet stakeholders' information needs. In an attempt to understand the range of possibilities to measure CSA-related information in a country, we compiled indicators from existing agriculture and climate change M&E systems, from donors/ implementing agencies of CSA programs, regional programs (e.g., the Africa Union Africa Agricultural Transformation Scorecard), and

international frameworks (i.e., the SDGs). In Tanzania, we found that more than 600 indicators that specifically address one of the CSA pillars could be used to fill information gaps previously identified by stakeholders (Table 3). This is nearly double the amount found by Quinney *et al.* (2016) when looking at donor organizations alone. Most of these indicators are included in well-established systems, with clear data collection and reporting protocols, indicating opportunities to leverage existing knowledge and experience on measurement, collection and reporting of different types of information. Thus, potential indicators could be mapped against stakeholders' information needs and prioritized using pre-agreed agreed criteria (e.g., SMART+ criteria, Box 2). For this to happen, clear guidance is needed for stakeholders to quickly get a grasp of where and how different information types can be sourced from.

| Vertically: Indicator/  |      |      |      |       |    |      |      |     |    |     |      |       |      |       |      | sed         |
|---|------|------|------|-------|----|------|------|-----|----|-----|------|-------|------|-------|------|-------------|
| Horizontally:   |      | =    |      | uide  |    | ط    | ပ္ပ  |     |    |     |      | ~     |      | ll ar | וומו | s-ba<br>ach |
| Source (M&E system), CSA Pillar alignment,<br>Logical Framework (LFA) | ARDS | ASDP | ASDS | CSA G | AU | CAAD | UNFC | SDG | WB | FAO | IFAD | USAID | DFID |       |      | Result      |
| Agricultural actors adopting CSA practices                            |      |      |      |       |    |      |      |     |    |     |      |       |      | Ρ,    | R, M | OP          |
| Land area under CSA   |      |      |      |       |    |      |      |     |    |     |      |       |      | Ρ,    | R, M | OP          |
| Households with ownership/secure land                                 |      |      |      |       |    |      |      |     |    |     |      |       |      | R     |      | I           |
| Household Dietary Diversity Score                                     |      |      |      |       |    |      |      |     |    |     |      |       |      | Ρ,    | R    | oc          |
| Performance of practices on CSA pillars                               |      |      |      |       |    |      |      |     |    |     |      |       |      | Ρ,    | R, M | ос          |
| Public budget lines for CSA activities                                |      |      |      |       |    |      |      |     |    |     |      |       |      |       |      | I           |
| Risk reduction actions at local level                                 |      |      |      |       |    |      |      |     |    |     |      |       |      | R     |      | OP          |
| Coping Strategy Index   |      |      |      |       |    |      |      |     |    |     |      |       |      | R     |      | OP          |
| Social Safety Nets (type and beneficiaries)                           |      |      |      |       |    |      |      |     |    |     |      |       |      | R     |      | I           |
| Access to basic services (availability)                               |      |      |      |       |    |      |      |     |    |     |      |       |      | R     |      | I           |
| ICT tools (availability, use)   |      |      |      |       |    |      |      |     |    |     |      |       |      | Ρ,    | R    | I           |
| Diversification strategies  |      |      |      |       |    |      |      |     |    |     |      |       |      | Ρ,    | R    | OP          |
| Extension services & info (availability, use)                         |      |      |      |       |    |      |      |     |    |     |      |       |      | Ρ,    | R, M | A           |
| Capacity to generate & use statistical data                           |      |      |      |       |    |      |      |     |    |     |      |       |      |       |      | I           |

Table 3. Examples of indicators and systems relevant to CSA in Tanzania

Note: Colored cells (dark green to light bluegreen) suggest that indicator is included in the respective M&E system. The dark green to light bluegreen gradient (left to right) suggests systems at national, regional, international and project level, respectively. Source: ARDS=Agriculture Routine Data System; ASDP II=Agriculture Sector Development Programme Second Phase; ASDS II=Agriculture Sector development Strategy second Phase; 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 of the United nations; IFAD=International Fund for Agricultural Development; USAID=United States Agency for International Development; DFID=UK Department for International Development; CSA Pillar: P=Productivity; R=Resilience; M=Mitigation; Results-based approach: A=Activity; I=Input; Op=Output; Oc=Outcome.

### Capacity for MR of CSA

Building or strengthening a system for MR of CSA is not only about identifying adequate indicators to meet information needs, but also about capacity to operationalize and maintain a system over time. When asked about challenges faced in existing MR structures, stakeholders often cited inadequate budgets, outdated technology and a shortage of trained staff. MR 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 MR 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. Strengthening capacity for CSA MR is essential for developing robust fully functioning systems.

# Towards a country-centric framework for measurement and reporting of climate-smart agriculture

A general consensus across government ministries, research, development partners and NGOs in the countries engaged in the study suggested that a comprehensive system for MR of CSA interventions 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: situation analysis, information needs and indicators, MR systems, capacity building and financing. Looking across the four countries, 11 steps emerged for developing an internally consistent national MR system that could also be aligned with regional and international reporting requirements. We then reduced these steps to seven, based on further discussions with partners.

In short, these steps would create effective systems by: understanding the policy and institutional context; identifying information needs and deciding on a limited set of key indicators to monitor; creating a database of indicators that could be integrated with existing systems; strengthening 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, as acknowledged by stakeholders, investment in improved systems for MR of CSA would bring significant benefits including: 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.

This section describes the seven steps for an integrated framework for MR of CSA, recognizing that such a process should reflect principles of national ownership and capacity development. The steps, inspired by findings from the capacity needs assessment described in the previous chapter, provide users with general guidance for preparing, designing and planning such systems. Some countries may already have made significant efforts on one or more of these steps, suggesting that the number of actions required will vary across countries. Moreover, the spectrum of activities described under each step is neither exhaustive nor definitive but gives an indication of the range of opportunities available and can be used (at users' discretion) as a basis for country-specific adaptation of the pathway towards integrated MR of CSA.

### Step 1: Situation assessment

Creating integrated approaches to MR of CSA can be an overwhelming task. CSA initiatives in a country involve a rich constellation of stakeholders (e.g., government ministries, NGOs, development partners), each with their own method of CSA support (e.g. through policies, projects, programs, finance, etc.), development objectives and implementation systems. Taking stock of this diversity is an important preparatory step in the development of integrated data systems. There are many possible elements to consider in the situation assessment. Below we suggest three key aspects that were included in the study in the ESA region: policy identification and analysis, stakeholder mapping, and analysis of MR data systems available and related capacities to maintain these. The level of detail of assessment is subject to resource availability.

*Policy mapping and analysis.* This component clarifies national policy-level commitments related to CSA objectives and the means to measure, report and verify progress on these objectives. Analysis of existing policies and governmental plans can also reveal valuable information on existing mechanisms to monitor implementation of commitment (i.e., M&E plans) and on which agencies play what roles in implementation and support (this will also help feed into the stakeholder analysis). Typically, CSA-specific policies and plans refer to those government-issued documents where CSA interventions are embedded either explicitly (using the term "CSA") or implicitly (using contents about CSA and CSA-related terminology, such as "adaptation", "resilience", "mitigation", etc.). CSA-related policies and plans may include, but are not limited to national agricultural investment plans, national agriculture sector development plans, national climate change strategies and plans, national adaptation policies, strategies and plans, NDCs, etc.

*Stakeholder mapping*. Each stakeholder has specific information needs, as well as knowledge of what data and data collection mechanisms are already available. Participatory design of the MR system can also serve as a tool for collective learning, negotiation and empowerment; it allows planners to better understand the context and manage potential risks, as stakeholder groups will likely have different (and sometimes competing) experiences and perspectives on the MR thematic areas, thus enriching the design (Porter and Goldman, 2013). In short, the system for MR of CSA needs to be designed based on extensive interactions with users of the information.

Identifying who the users of the MR process is can be defined through a comprehensive stakeholder analysis which diagnoses each actor's role in CSA, as well as their level of influence and interest in the implementation of a system for MR of CSA (see the influenceinterest matrix in Appendix 3). This "filtering" technique will not oust the less influential actors from the process but will assist in designing tailored engagement strategies that ensure a voice to the stakeholders and alignment of the process and results to users' needs. Engagement approaches may include stakeholder workshops to collectively assess interest

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and capacity for MR, *fishbowl* techniques to incentivize dynamic participation in controversial topics, informal or formal one-on-one meetings, among others.

*Current information systems relevant to CSA and related capacities.* Identifying available systems relevant to CSA measurement, evaluation and/or reporting can help ensure that the future MR system will be well integrated with existing process and procedures in the country. Existing systems can be linked to governmental policies and plans, donor/ development partner country strategies, or to individual projects and programs that have a CSA focus. A description of these existing systems will provide an important basis for understanding opportunities for integration and for identifying capacities and challenges related to their operation. A typical description of an existing MR system would cover aspects such as roles and responsibilities (who plays what role in MR), procedures (key characteristics of the data management process, frequency of data collection and reporting, etc.), capacities (organizational, human resources, financial resources), constraints, and areas for improvement (See Appendix 4 for a checklist for assessing capacity for MR of CSA). Findings from the assessment will inform the strategies for strengthening capacity (see Step 6).

### Step 2: Participatory scope setting: information uses and needs

As shown in previous sections, MR systems can perform different functions, depending on their purpose (Table 1, Figure 1). The contents of these systems (i.e., information captured by indicators and metrics) would then differ depending on stakeholders' information needs. For example, where community-based CSA is the main focus, stakeholders may prioritize identifying effective CSA activities as the main purpose of MR. At national level, MR may help track progress in implementing policies and plans, strengthen the accountability of policy implementers, or help provide evidence on the effectiveness of CSA policies. By aggregating information across different projects, MR systems may also provide information on who is doing what, and thus inform stakeholders about the CSA portfolio in the country. A clear scope indicates what stakeholders want to achieve through improved MR of CSA.

One way to clarify the purpose of the desired MR system is to map stakeholders' information needs and uses, that is, to understand what stakeholders need to know in order to make decisions or act and how would they use that information. This demand-driven participatory

assessment would help build a salient, legitimate and user-relevant process. The assessment of needs and uses could be focused on the stakeholders with high interest in MR of CSA and/or those with a large influence in the implementation of CSA interventions. Elements of the analysis would include but may not be limited to: a list of information needs; an assessment of the extent to which each of these needs is unmet/already met by existing frameworks or systems, as well as detailed account of how the information would be used.

### Step 3: Indicators mapping, alignment and prioritization

This step lays the foundations for the theory of change underlying the framework for MR of CSA. Developing universal indicators and metrics related to CSA is irrelevant and counterproductive. Uncertainties associated with climate variability and change, as well as context-specificity of solutions means that a consensus on a clear set of resilience/adaptation indicators is far-fetched (Christiansen *et al.*, 2018). Hence, a system that is specific enough to the national context and close to stakeholders' ambitions will be both legitimate and practical. The information needs identified in the previous step will guide the selection of stakeholder-relevant, viable indicators that are conceptually consistent with users' demands.

Long lists of CSA-relevant indicators are already available in existing national frameworks or in other project/ programme-level systems in the region or internationally (Christiansen *et al.*, 2018; Quinney *et al.*, 2016). For instance, global and regional agreements to which countries already have reporting commitments (e.g., PA, UNFCCC, African Union, etc.) contain hundreds of indicators that may be relevant to national users (Table 3). Behind such indicators there are elaborate methodologies, data collection protocols and guidelines readily-available to potential users. In this sense, aligning with existing, already-tested and validated information can be a useful way to avoid duplication of efforts and channel MR resources more effectively and efficiently. Depending on users' specific information needs, the list can be supplemented with new indicators to fill remaining gaps.

Not all the information needs can be met, especially when MR resources are limited. Building a feasible, rather than an ideal system should be the priority. There are many possible criteria to filter the indicator list even further. Common approaches to indicator prioritization include linking indicators back to the theory of change (include only what is relevant to the expected changes and assumptions) and assessing indicators' characteristics in terms of their 'smartness' (Box 2). Those indicators who would not meet such pre-established criteria would be modified or omitted. However, since this is participatory, bottom-up process, the criteria for indicator selection should be discussed and validated with stakeholders.

#### Box 2: SMART+ criteria for choosing indicators for MR of CSA

- Specific: indicator addresses a single and sufficiently granular component;
- Measurable: indicator is objective and replicable;
- Attainable: the target attached to the indicator is achievable;
- Relevant: indicator has a clear relationship with an investment component;
- Time bound: there is a clear timeframe attached to the indicator;
- Useful: indicator captures information that help move investment implementation forward;
- Feasible: indicator data can be collected with reasonable and affordable effort;
- Credible: indicator upholds scientific standards and is trusted by stakeholders;
- Distinctive: indicator does not measure something already captured by other indicators.

### Table 4. Examples of indicators relevant to MR of CSA, by type

| Туре     | Uses  | Indicator (examples)  |  |  |  |  |  |  |
|----------|---|---|--|--|--|--|--|--|
| Input    | Track the resources                             | Budget disbursed for CSA activities at district/national level; |  |  |  |  |  |  |
|          | invested  | Number and type of institutions implementing CSA projects       |  |  |  |  |  |  |
| Activity | Determine whether                               | Number and type of CSA projects/programmes implemented;         |  |  |  |  |  |  |
|          | resources, processes are<br>managed efficiently | Number of farmers trained in manure management                  |  |  |  |  |  |  |
| Output   | Measure effectiveness of                        | Percentage of farmers implementing CSA practices;               |  |  |  |  |  |  |
|          | interventions                                   | Percentage of land area under CSA                               |  |  |  |  |  |  |
| Outcome  | Evaluate the envisioned                         | Enhanced resilience from implementation of CSA practice;        |  |  |  |  |  |  |
|          | change  | Reduced GHG emissions from CSA practice implementation          |  |  |  |  |  |  |

Since most government and non-government stakeholders use results-based management approaches in the design and implementation of CSA initiatives, categorizing the selected indicators using a results-based logic will not only help create a framework that articulates the different levels of expected change (results, outcomes) but would also provide a user-oriented approach to MR of CSA. In practical terms, this means including a variety of indicator types, depending on stakeholders' assumptions on how change will be manifested (Table 4). While individual indicators may relate to specific stakeholders' information needs, representing the indicators in a single results framework highlights the complementarities among indicators and the coherence provided by the integrated MR system.

### Step 4: Data systems analysis and integration

Most—if not all—stakeholders have data systems or frameworks to track progress and achievements relevant to CSA. The systems vary in complexity and comprehensiveness. Some systems are simple, with a limited number of indicators and straightforward guidelines for data management; others are more sophisticated and data-intensive, with data collected from multiple sources and with complex inter-institutional structures for coordination. Understanding what works and what does not in relation to available procedures for data collection, analysis and reporting can help identify opportunities for integration and areas that need improvement, so as to make the MR system as robust as possible.

Existing data systems can be assessed in relation to the indicators defined and validated by stakeholders in previous steps. Key aspects that could be included in the analysis are: available data source(s), data collection methods for the indicator, frequency of data collection and reporting, roles and responsibilities; quality assurance mechanisms, reporting procedures (See Appendix 5 for an example checklist for data system analysis). The depth of the assessment will depend on the scope of the MR system; the more comprehensive the analysis, the higher the chances to avoid duplication of efforts and create an enabling environment for coordinated efforts.

The second objective of data system analysis is to explore opportunities for integration. Many actors spend large amounts of money and time gathering data that is already being collected by other stakeholders<sup>6</sup>, but which may not be publicly available or is otherwise hard to access due to administrative protocols. Finding ways to share information and data across institutions and sectors—agriculture, environment, communications and technology—can help leverage and maximize existing structures, processes and resources and so improve effectiveness and

<sup>&</sup>lt;sup>6</sup> This may include information on household characteristics, farm systems, agricultural management practices, or development issues, among others.

efficiency of decision-making. For governments in particular, integrated data systems can foster public sector transparency and accountability to citizens, development partners and donors. When multiple projects and programs supported by a variety of institutions benefit the same population, integrated systems can help communicate collective impact and identify ways to improve outcomes together.

However, integration usually comes at high costs and may not always be possible, due to a combination of practical, technical and legal reasons. CSA-relevant data is usually scattered between actors operating at different levels (national, regional, local) and in different sectors, and may not be easy to consolidate without adequate, dedicated human and financial resources. Government, non-government and private sector institutions alike may use rigid protocols for data protection or data sharing, making collaboration an uphill battle.

Yet there are ways to overcome these challenges and to link data systems on a use case-basis, to reflect context specificities and needs. These can include complex initiatives, such as developing an online system to link individual records (data) from disparate projects and programs and to make that interconnected information available to researchers and public websites; this would require integrating both data and people (who take the decision) across institutions and the creation of a coordinating body/leadership team. Half measures may refer to the development of clear procedures and protocols for exchange of information and statistical data across institutions or a simple database that tracks who collects what type of information related to CSA, for future reference. Whichever option stakeholders prefer, participation and mutual trust are key ingredients for effective, beneficial collaboration.

### Step 5: Protocol design

Clear guidelines are needed to enable a functional, robust MR system that is embedded in institutional structures and processes. These could cover key aspects to ensure clarity of data management procedures (methods for collection, analysis, verification and reporting<sup>7</sup>), roles

<sup>7</sup> Methods for data collection could include: structured quantitative surveys, vulnerability analysis, economic analysis, expert judgements, hybrid methods, among others. For reporting, these could refer to strategies to make data publicly available and ready to use for decision-making.

and responsibilities, lines of communication and coordination mechanisms. Many of these details may already come up in previous phases (especially when assessing existing data systems and procedures), but additional guidelines need to be developed to cover newly added indicators, management processes and coordination structures. To ensure legitimacy of the process, ownership and buy-in, such guidelines would need to be developed with and validated by information users (stakeholders).

Establishing clear roles is important to ensure activities will be implemented and demonstrate accountability. In addition, to ensure that institutions, agencies and departments with a stake in the MR system communicate effectively and share information with each other, a coordination mechanism needs to be set up. This can be formed of one or two staff with a technical/research/policy background or a combination of these, specifically mandated to manage resources and information flows across institutions and levels (national, sub-national, local). In the context of an integrated MR system, agreement on roles may be a challenge, as institutions may have overlapping mandates, be accountable to different donors, and have complex institutional procedures for data management, as well as with competing interests in MR. Therefore, role negotiation may need to be factored into the process, so as to ensure that MR responsibilities and coordination guidelines are clear.

### Step 6: Capacity strengthening

MR systems cannot function without adequate human, institutional, technical and financial resources<sup>8</sup>. The situation assessment (Step 1) helps identify key opportunity and challenges to existing capacities for MR of CSA. Findings from this analysis inform the strategy to build or strengthen capacity of institutions and its staff to enable the MR system to perform in an effective, efficient and sustainable way. Strengthening human and organizational capacity requires systemic approaches that emphasize interdependencies between skills, human resources, organizational structures, roles, decision-making patterns, culture, and values. These approaches should be targeted at improving the processes and conditions under which data is collected, analyzed and reported.

<sup>&</sup>lt;sup>8</sup> Financial capacity is discussed into more detail in the next steps.

### Box 3: Strategies to build systemic capacity for MR of CSA

The opportunities and constraints of monitoring and reporting of CSA will be unique to a country and each institution. Efforts to build and strengthen capacity should be tailored to the needs, resources available and circumstances (organizational culture, national policies, etc.). Below we list some common strategies for capacity strengthening for MR, based on our findings from the needs assessment (See Section 2).

- Establish core MR of CSA arrangements and procedures, harmonization of terminology, reporting formats and periodicity (See Step 5);
- Allocate dedicated staff (hire or repurpose) to participate in MR activities at all levels (based on protocol developed);
- Ensure clarity of MR goals, targets, performance indicators and actions among all staff engaged in managerial (office) and operational (field) activities;
- Designate an anchor for inter- and intra-institutional coordination on MR of CSA;
- Organize periodic trainings on managerial and planning skills to refresh existing knowledge and update staff with new tools available;
- Organize trainings of field staff in research methodologies (e.g., constructing baseline, monographic studies, data collection techniques, etc.) and using information and communication technology (ICT) for collecting data (mobile phones, tablets, GPS, etc.);
- Engage experienced research staff to share lessons and recommendations from past work;
- Update technologies and software for data collection and analysis aimed at replacing paper-based methods.
- Build/ enhance statistical literacy of staff, enabling to analyze and interpret statistical data;
- Establish structures and procedures for data reporting and sharing (See Step 5)

### Step 7: Financing CSA MR

Collecting and analyzing data, monitoring and reporting on processes, outcomes and impacts, comes at a cost. Discussion on MR tends to overlook financial aspects and assume that MR activities are covered by budgets originally targeted at project/programme implementation. However, planning, implementation, monitoring, evaluation, and reporting are distinct lines of action and require distinct budgets, to ensure sufficient resources to successfully complete each project/programme phase. As a rule of thumb, monitoring and evaluation takes up at

least five to ten percent of project/programme budgets; when considering adaptive management actions, the percentage can be even higher. Often implementors balk when considering this level of commitment. Yet, the value of accountability, learning and adaptation and programmatic efficiency created through monitoring and reporting more than pays for itself.

In the case of MR of CSA, costed work plans, budget estimates and commitments (i.e., institutionalization of MR in budgets) are essential for developing, implementing and maintaining MR activities. Budgets can be estimated for the typical duration of an MR plan (five years) and would cover the activities described in the previous steps, the related materials, facilitators and meetings necessary to achieve these steps (also understood as 'costs of participation'), but also additional activities required for the continued (annual) measurement and reporting activities.

Once the framework and costed work plan are in place, financial resource mobilization needs to be ensured. This can be done through institutionalizing MR in public and private budgets, but usually both are needed. Practically all policies have MR budgets. Where MR of CSA aligns with key performance indicators and data systems of existing agriculture and environment policies, processes should be paid for through these national budgets. Furthermore, where programs implement largescale CSA programs, the MR budgets included in these projects or programs can help reinforce data collection and capacity of national M&E systems. Thus, there is on-going relationship between national framework M&E systems and CSA MR systems that can produce cost-effective information for both.

## Conclusion

Measurement and reporting of CSA is not new. Hundreds of indicators and metrics are used by governments, development actors, local organizations, and private sector actors as tools to inform action programming, administration of expenditures, reporting on commitments and value for money. The real conversation piece is the need for greater integration of individual project-level frameworks and alignment of metrics to higher-level, established indicators, as mechanisms to achieve system-level change: increased collective impact, reduced data management costs and duplication of efforts, improved coherence, coordination and relevance of interventions, etc. In this paper, we argue for an integrated, collaborative framework for MR of CSA drawing on findings and lessons learned from an assessment of stakeholders' needs and capacities. Below we highlight key reflections.

An integrated framework for MR of CSA needs to be demand-driven, endogenous to the governance system. Identifying users' needs and priorities is a critical basis for ensuring relevance of the process and the system established. In Malawi, Tanzania, Zambia and Zimbabwe, the existence of overarching national frameworks and strategies on CSA informed dialogue around the need to build common understanding and structures for how CSA is understood, measured and communicated nationally and so satisfy various management needs. Reporting responsibilities to regional and international bodies further invigorated the interest of some actors—particularly governments—to align existing CSA-relevant data systems and metrics to global goals (e.g., PA, SDGs, etc.), as a way to reduce the reporting burden and avoid duplication of efforts. Such enabling environments gave stakeholders an impetus to identify possibilities for refining isolated project/programme-level results indicators and aligning these to reporting commitments. Where such an internal driver is lacking, a framework for MR becomes yet another instrument of external oversight, that is not perceived as meeting stakeholders' actual needs.

Participatory processes are key for ensuring ownership and buy-in of stakeholders. Integrated information systems depend on data collected by a variety of institutions, each with own objectives and rules. By engaging in early conversations about MR roles, needs, capacities and challenges, stakeholders are more likely to become advocates of the process and secure access to data and information needed to measure indicators. Participation and inclusiveness are also important for meaningful content development. Incorporation of different stakeholders' experiences and perspectives can enrich the framework and the process of building it.

Integrating frameworks for MR of CSA can be a lengthy and, most likely, a costly process. It takes time and resources to give voice to and negotiate between competing interests, to assess diverse data systems, build capacity in topics that may be new to some stakeholders (CSA,

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data management, etc.) and to ensure an inclusive process. Many stakeholders already collect and use information and knowledge relevant to CSA, while certain systems—particularly government-led—are already widely used by a variety of in-country stakeholders for management and reporting. Creating a new system from scratch for already overburdened managers, practitioners and researchers would be both counterproductive and costly. Using existing, effective structures is not only a way to acknowledge current progress on MR, but also to catalyze already-available resources and target finances to other key areas, such as building systemic capacity focused on individuals, processes and institutional set-up. The overarching goal of an integrated framework for CSA is then to develop new, collaborative rules of the game, rather than designing an entirely new game of the clear blue.

# Appendix 1: Study scope and methods

Table 1: Components, objectives and methods of the needs assessment in Malawi, Tanzania, Zambia and Zimbabwe

| Component   | Objective   | Method  |
|---|---|---|
| Study scoping   | Understand the needs for a robust national MR framework for CSA   | Regional workshop with government representatives   |
| Mapping and analysis of CSA-relevant policies   | Understand the country context on CSA   | Document review; Discussions<br>with national focal point for<br>CSA and Vuna country<br>representative |
| Identification and analysis<br>of stakeholders engaged in<br>CSA (influence and interest<br>matrix)                   | Determine who will be<br>engaged in the assessment<br>and how   | Document review; Discussions<br>with national focal point for<br>CSA and Vuna country<br>representative |
| Participatory identification<br>of stakeholder information<br>needs and uses  | Understand what different<br>users need to know and assess<br>whether their information<br>needs are already being met<br>or not          | Stakeholder interviews<br>(individual or group meeting)   |
| Documentation and<br>description of existing MR<br>system(s), including data<br>management process and MR<br>capacity | Map existing information<br>systems and understand how<br>they work, as basis for<br>assessing potential of<br>integration                | Stakeholder interviews<br>(individual or group meeting)<br>and document review                          |
| <b>©</b> Collation and validation of findings (recommendations) and elaboration of action plan                        | Prepare recommendations and<br>collectively design an action<br>plan for addressing unmet<br>information needs (including<br>integration) | Stakeholder validation and planning workshop  |

# Appendix 2: Stakeholders' information needs

Table 2: Example of information needs related to CSA expressed by stakeholders in the four countries of the assessment.

| Information need                  | Availabilit<br>y | Malawi    | Tanzania   | Zambia   | Zimbabwe                     |  |  |
|-----------------------------------|------------------|-----------|--|--|------------------------------|--|--|
| CSA projects/                     | Met              | -         | -  | -  | -                            |  |  |
| programmes in the country         | Partially        | -         | MoFP, PORALG,<br>Forum CC                          | MoG  | FAO                          |  |  |
|                                   | Unmet            | -         | NEMC, USAID  | AGRITEX,<br>ZFU                                    |                              |  |  |
| Funding for CSA                   | Met              | -         | -  | -  | -                            |  |  |
| disbursed in the country          | Partially        | Dol       | MoFP,<br>Forum CC                                  | -  | -                            |  |  |
|                                   | Unmet            | DoWR      | MoA, NBS,<br>PORALG                                | -  | -                            |  |  |
| Institutions                      | Met              | -         | -  | CFU, MUSIKA  | -                            |  |  |
| engaged in CSA<br>in the country  | Partially        | -         | NBS,<br>Forum CC                                   | MoG  |                              |  |  |
|                                   | Unmet            | -         | PORALG,<br>ARI-Hombolo<br>AGRA, DfID,<br>USAID, WB | MoA, ZARI, CSA<br>Alliance, NWK-<br>Zambia         | -                            |  |  |
| CSA adoption                      | Met              | -         | -  | CFU, MUSIKA  | -                            |  |  |
| rate (by farmers<br>and/ or area) | Partially        | Dol, NGOs | MoA, NBS, TMA                                      | -  | DoM,<br>AGRITEX,<br>ZFU, FAO |  |  |
|                                   | Unmet            | -         | NEMC, NIC,<br>PORALG,<br>DfID, USAID               | MoFL, MoG,<br>ZARI,<br>CSA Alliance,<br>NWK-Zambia | MEWC                         |  |  |
| Contribution of                   | Met              | -         | -  | -  | -                            |  |  |
| practice/                         | Partially        | -         | MoFP   | MoG  | MEWC                         |  |  |
| resilience goals                  | Unmet            | Dol, NGOs | MoA,<br>JICA, DfID                                 | MoFL, ZARI,<br>CSA Alliance                        | AGRITEX                      |  |  |

Acronyms: Malawi: Dol=Department of Irrigation (Dol) in the Ministry of Agriculture Irrigation and Water Development (MoAIWD); DoWR=Department of Water Resources in MoAIWD; NGOs refer to: Concern Worldwide, Catholic Relief Services, Total LandCare; Tanzania: AGRA=Alliance for a Green Revolution in Africa; DfID=UK Department for International Development; JICA=Japan International Cooperation Agency; WB=World Bank; Forum CC=Forum Climate Change; MoA= Ministry of Agriculture; MoFP=Ministry of Finance and Planning; NBS=National Bureau of Statistics; NEMC=National Environment Management Council; NIC=National Irrigation Commission; NPORALG=President Office Reginal Administration and Local Governments; TMA= Tanzania Meteorological Agency (TMA); Zambia: CFU=Conservation Farming Unit; MoA= Ministry of Agriculture; MoFL= Ministry of Fisheries and Livestock; MoG=Ministry of Gender; ZARI= Zambia Agriculture Research Institute; Zimbabwe: DoM= Department of Mechanisation of the Ministry of Lands, Agriculture and Rural Resettlement (MLARR); MEWC= Ministry of Environment, Water and Climate; ZFU=Zimbabwe Farmers Union

# Appendix 3: Stakeholder influence and interest matrix



Figure 1: Influence and interest of CSA stakeholders in Zambia.

Level of interest in M&E of CSA

AfDB= African Development Bank; CFU= Conservation Farming Unit; CRS= Catholic Relief Services; FAO= Food and Agriculture Organization of the United Nations; PELUM=Participatory Ecological Land Use Management; UNDP= United Nations Development Programme; WWF=World Wildlife Fund

## Appendix 4: Checklist for assessing MR capacity

Organizational structures availability (structures, mechanisms, workplans)

- ☑ CSA MR Unit/Division/group in place
- ☑ Routine mechanisms for MR planning, management and monitoring performance
- ☑ Staff engaged generally support/ strongly advocate for MR activities

Human capacities (staff number; availability: full-time/part-time; competence)

- ☑ Staff and/or outsourced personnel dedicated to MR of CSA in any activity
- ☑ Staff dedicated to coordinate the CSA MR system
- ☑ Staff to collect data
- ☑ Staff to compile and manage related databases
- $\blacksquare$  Staff to carry out evaluation and research
- ☑ Staff to maintain the database and IT infrastructure
- $\blacksquare$  Staff in charge of data dissemination and use
- ☑ Clearly-defined MR responsibilities for institutions and staff
- ☑ Process to continuously build human capacity for MR

Planning, management and coordination mechanisms (availability; procedures; frequency)

- ☑ Clear procedures for recording, collecting, collating and reporting data
- ☑ Indicators to monitor progress & performance of projects clearly defined
- ☑ Indicators include data source, measurements, targets
- ☑ Frequency of collecting MR data for projects
- $\blacksquare$  Use of standardized data collection and data reporting forms
- Quality control mechanisms to ensure data are accurately captured and reported
- ☑ Inventory of MR data (electronic/ online database) available and updated constantly
- MR technical working group to ensure inter-institutional coordination
- ☑ Routine communication channel to facilitate information exchange among stakeholders
- ☑ Meetings of CSA MR committee/team to plan and revise MR activities

Dissemination of information (procedures; frequency)

- ☑ Information products for the public (reports, website, newsletters, maps) available
- $\square$  Frequency of communicating MR information to the public

Budget capacities (availability; amount)

- $\square$  Budget allocated to MR activities
- ☑ Financial resources committed to implement MR workplan

# Appendix 5: Checklist for data system analysis

Data sources and data collection

- ☑ What are key sources for the data (e.g., national agricultural survey, field reports, etc.)
- ☑ Who is responsible for collecting M&E data?
- $\square$  How is data collected (what methods)?
- ☑ How often is data collected (e.g. monthly, quarterly, annually, etc.)?

### Data management

- ☑ How is M&E data aggregated/compiled from different data collectors?
- $\square$  Who aggregates/compiles the data?
- How often is data aggregated/compiled (monthly, quarterly, annually, etc.)?

### Data quality control (verification)

- $\blacksquare$  Are there specific procedures for ensuring the quality of the data?
- $\square$  Who is responsible for quality control?
- $\square$  How is quality control done? (Describe the main data quality control procedures)

### Reporting

- $\square$  Who is the M&E data reported to?
- $\square$  Who is responsible for the reporting?
- $\blacksquare$  How is data reported?
- ☑ How often is data reported (e.g. monthly, quarterly, annually, etc.)?
- ☑ How is the data or resulting summary report disseminated? (E.g. is it publicly available?)

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