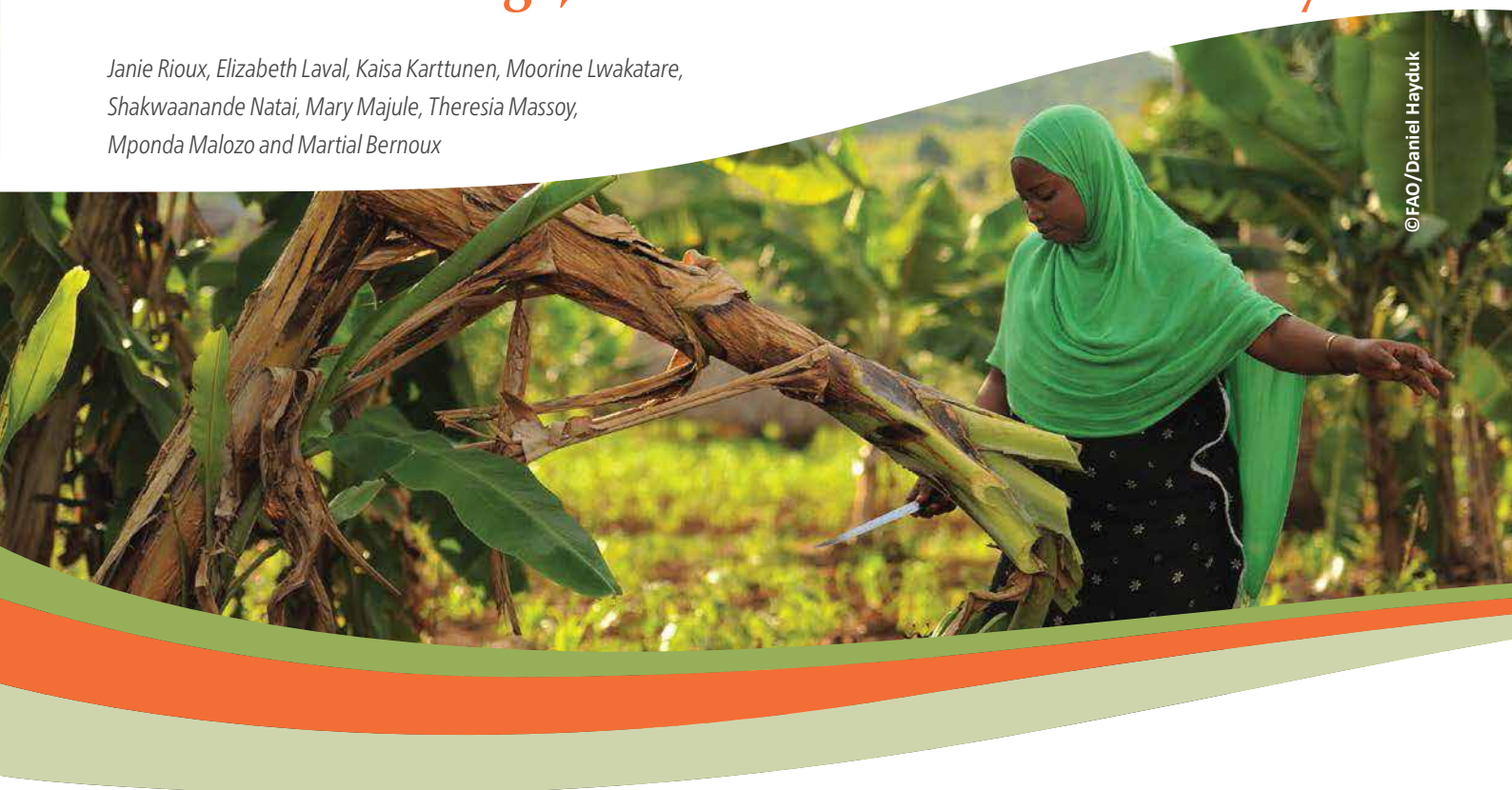




Food and Agriculture Organization  
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# Climate-smart agriculture Guideline for the United Republic of Tanzania: A country-driven response to climate change, food and nutrition insecurity

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## Mainstreaming Climate-Smart Agriculture in Development Projects

Agriculture is an essential pillar of The United Republic of Tanzania's economy, and a key driver of rural development. In fact, the sector employs 78 percent of the population; it contributes to approximately 95 percent of the national food requirements; it provides livelihood to more than 70 percent of the population; and it accounts for about half of the gross domestic product and export earnings. However, the majority of households still produce at subsistence level, and agriculture is mainly rain fed, hence more susceptible to climate change impacts. Specifically, the United Republic of Tanzania is already experiencing the adverse impacts of climate change, which is suppressing and distorting the country's efforts to improve productivity of the agriculture sector as a whole, and having long-term implications if no adaptation measures are put in place.

## The Climate-Smart Agriculture Guideline in the United Republic of Tanzania

In response to climate change challenges on food and nutrition security, the United Republic of Tanzania has been undertaking various efforts at the national level, including the development of the National Adaptation Programme of Action (2007), the National Climate Change Strategy (2012), the Agriculture Climate Resilience Plan (2014–2019),

and the National Climate-Smart Agriculture Programme (2015–2025), together with the Nationally Determined Contributions (2016) submitted to the United Nations Framework Convention on Climate Change (UNFCCC). The Climate-Smart Agriculture (CSA) guideline was framed according to these existing documents, reiterating the

government's commitment to make the agricultural sector climate-smart by 2030.

This guideline is an instructive tool that highlights key climate change and agricultural risks in the United Republic of Tanzania and provides information on mainstreaming climate change adaptation and mitigation objectives within rural development. More particularly, it provides guidance on how this could best be achieved through the implementation of the CSA approach, in line with other policies related to agriculture sectors, food and nutrition security, and climate change. Its goal is thus primarily to inform on the implementation of the CSA framework and to describe the CSA practices and technologies best suited for different regions and agro-climatic zones of the country.

While it targets multiple stakeholders – including policy and decision makers; researchers from private and public sectors; farmers; civil society organizations (CSOs), including non-governmental organisations (NGOs), farmers' organisations and community-based organisations (CBOs); and the private sector engaging in issues related to agriculture sectors – the primary users of the guideline are the district development planners and extension agents. Planners can use it to plan and budget for climate-smart agricultural development, and to facilitate community level planning; and extension agents to sensitise, mobilise and train smallholder farmers to adopt agricultural practices considered climate-smart.

**Table 1. Main uses of the CSA guideline**

	<b>Inform policy makers</b> in formulating policies and regulations, and support strategies, programs, plans and related incentives for CSA implementation and scaling up.
	<b>Guide development actors, extension services, research institutions and the private sector</b> to promote CSA practices and technologies.
	<b>Create awareness, building knowledge and capacity on CSA</b> as an approach for climate change mainstreaming and environmental management in the agriculture sector.
	<b>Monitor CSA implementation and scaling up</b> in the country

## Methodology

The CSA guideline was developed between 2014 and 2016, based on a country-driven multi-sectoral, multi-disciplinary and multi-stakeholder approach, and was also the result of an extensive research, analysis and consultation process. Under the leadership of the Head of the Environment Management Unit of the Ministry of Agriculture Livestock and Fisheries, the task team comprised of agriculture, environment, climate and development experts from the public and private sectors as well as Civil Society Organizations (CSOs). A baseline survey was conducted to document current agricultural technologies and practices in the country, based on livelihood and agro-ecological zones.

The team interviewed 600 farmers, 25 extension agents, 6 CSOs, 2 program leaders, 12 research institutions, 9 private sector representatives and 35 district officers. The type of information collected were mainly on existing livelihoods, existing technologies and practices and their climate-smart potential, climate change impacts and climate information services available, and institutional framework that govern implementation of agricultural technologies and practices. The information gathered was then analysed and the findings compiled, to be formally discussed and validated in stakeholder workshops.

**Figure 1. Process towards the elaboration of the CSA guideline**



## Climate–Smart Agriculture: practices and technologies

Suitable CSA practices and technologies were identified on the basis of the information gathered during the baseline survey, combined with expert knowledge and literature review.

**Table 2.** Recommended CSA practices and technologies

Subsector	Subcategory	Climate-smart practices and technologies
<b>Crop subsector practices &amp; technologies</b>	• Rain water harvesting and storage	Rain water harvesting and storage structures; Chololo pits <sup>1</sup>
	• Irrigation	Drip/trickle irrigation; System of rice intensification; Irrigation canal lining
	• Soil and water conservation	Ridging, Tie-ridging; Water Retaining/Harvesting Pits
	• Terraces	Fanya juu <sup>2</sup> , Fanya chini <sup>3</sup> terraces, Bench terraces, Stone terraces
	• Agroforestry	Tree in crop land; Rotational woodlot; Improved fallow; Fodder bank; Tree planting / afforestation
	• Conservation agriculture	Cover cropping; Mulching; Crop rotation; Intercropping; Minimum / zero tillage; Crop residue management
	• Soil fertility management	Manuring (farm yard and compost manure); Efficient use of fertilizer (micro dosing); Integrated soil fertility management;
	• Crop management	Adapted crops and crop varieties (improved seeds, high yielding, fast maturing, drought tolerant, salinity tolerant, flood tolerant); Integrated pest and diseases management; Timely/ early planting
	• Crop Insurance	Introduction of Safety Net Programmes
<b>Livestock subsector practices &amp; technologies</b>	• Improved livestock breeds	
	• Adapted livestock	
	• Improved feeding	Traditional in-situ fodder conservation system; Ngitili <sup>4</sup> ; Olelii <sup>5</sup> ; Alternative source of water for livestock; zero-grazing; Pasture management
	• Manure management	
	• On-farm biogas production	On farm biogas production
<b>Fishing &amp; aquaculture enterprises</b>	• Pond aquaculture/fish ponds	
	• Mariculture	
	• Integrated aquaculture and cage culture	Integrated culture; cage culture
	• Sustainable fishing	Seaweed farming
<b>Other practices &amp; technologies</b>	• Bee-keeping	
	• Climate Information Services	
	• Improved Cooking Stoves	
	• Improved Post-Harvest	

<sup>1</sup> Chololo pit is an in-situ rain water (runoff) harvesting technology initiated by a farmer in Chololo village, Dodoma.

<sup>2</sup> Fanya Juu terraces are made by digging a trench along the contour and throwing the soil uphill to form an embankment.

<sup>3</sup> Fanya Chini terraces are made by digging a trench along the contour and the soil is put on the lower side of the contour trench.

<sup>4</sup> The Chagga agroforestry system is among the oldest and most sustainable forms of upland farming that has been able to support one of the highest rural population densities in Africa (FAO, 2013).

<sup>5</sup> This is a traditional fodder conservation system that developed by the Wasukuma agro-pastoralists (Shinyanga) as means of alleviating acute dry season fodder shortage.

<sup>6</sup> This is a traditional fodder conservation system developed by the Maasai pastoralists (Arusha) as means of conserving fodder for the dry season or for the calves, sick animals and/or milking herd.

## CSA implementation and scaling up: roles and approaches

**Table 3.** Approaches and methods for CSA implementation and scaling up

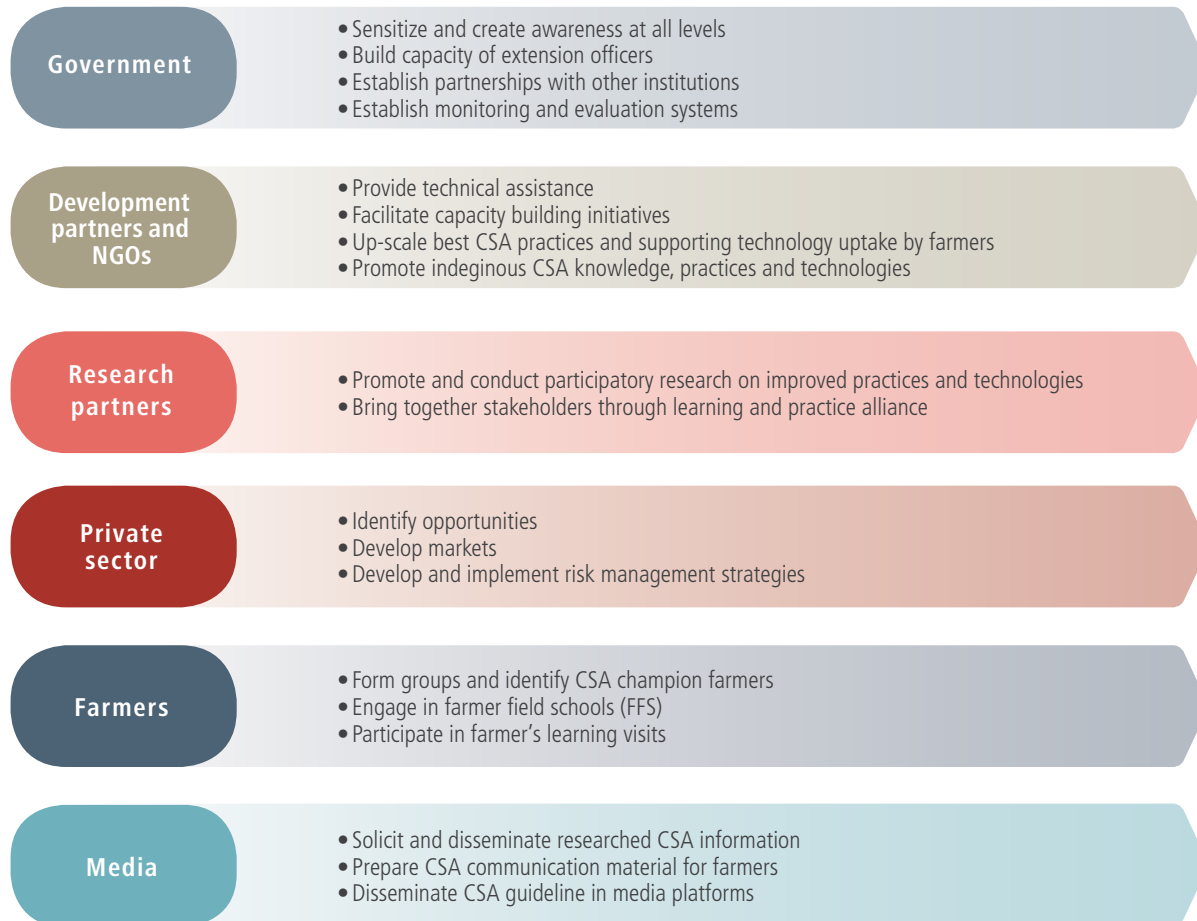
• Gender-responsive
• Community-based
• Farmer-centred research, learning and training
• Landscapes and ecosystems services
• Payment for ecosystem services
• Innovation platforms
• Information and knowledge generation and sharing
• Coordination forum
• Sustainable market linkage

The CSA guideline acknowledges that the successful implementation of the identified CSA practices and technologies ultimately depends on institutional and

behavioural change. Thus, the guideline highlights both the need for institutional support and coordination, and the importance of the approach adopted, which should be gender-sensitive and promote multi-stakeholder participation and community involvement in the full lifecycle of projects and programs.

In this regard, on the one hand, the guideline points to specific roles to be fulfilled by the government, the CSOs and development research partners, and the private sector, including the farmers and the media, for successful CSA implementation and scaling up. On the other hand it proposes a series of approaches and methods that should be considered based on local situation and the characteristics of the target group.

**Figure 2.** Roles for CSA implementation and scaling up



## Key requirements, challenges and recommendations

Agricultural practices and technologies, and their understanding, transfer and adoption are fundamental in increasing productivity, rural incomes and growth, and subsequently in contributing to poverty reduction as well as adapting to climate change. However, one of the major factors constraining sustainable agriculture development in the United Republic of Tanzania is the low investment and failure to support adoption of improved agricultural practices and technologies. For instance, inefficient extension services is caused not only by the shortage of extension staff and facilities, but also by the limited knowledge of the extension officers on CSA practices and technologies, leading to inadequate capacity to scale up technologies at village and ward levels. In parallel, the response of the private sector and CSOs in the United Republic of Tanzania



to provide extension delivery and create incentives for farmers to adopt CSA is still low. In this context, the CSA guideline identified a series of key requirements and challenges for implementation and scaling up of CSA practices and formulated recommendations accordingly.

### Recommendations

#### Capacity building needs (at all levels – national, local and farm)

- Facilitate effective awareness raising
- Undertake training based on the roles of the stakeholders at different levels
- Integrate climate change topics in the Syllabus
- Improve capacity and knowledge on M&E of CSA
- Enable access to resource provision, improved access (information packages) and dissemination of climate information services.
- Develop and improve risk management and insurance scheme in agriculture

#### Key requirements for implementation and up-scaling CSA

- Improved productivity, building resilience and associated mitigation co-benefits
- Value chain integration
- Research for development and innovations
- Improving and sustaining agricultural advisory services
- Climate and weather forecasting
- Effective institutional coordination
- Integration among practices
- Financing CSA
- Monitoring and evaluation plan



The operationalization of the CSA guideline is an important step towards achieving the global and national goals of sustainable agriculture production in a changing climate in the United Republic of Tanzania. Framed in community-based and gender-sensitive approaches, it will help harmonise and bridge the services and knowledge

provided by different stakeholders and support the governments' efforts to facilitate the implementation and scaling up of CSA, and hence the actions related to agriculture sectors in the NDC of the United Republic of Tanzania.

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