

Mitigation of Climate Change in Agriculture (MICCA) Programme  
Background Report 2

# Capacity Development Guiding Report for the MICCA Programme in the United Republic of Tanzania

Capacity Needs Assessment







# Capacity Development Guiding Report for the MICCA Programme in the United Republic of Tanzania

## Capacity Needs Assessment

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### **MICCA Programme**

#### Pilot Project:

Enhancing agricultural mitigation within the CARE Hillside Conservation Agriculture for Improved Livelihoods in the South Ulugurus (HICAP) project in the United Republic of Tanzania

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December 2011

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## ACKNOWLEDGEMENTS

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The MICCA Programme is grateful to the many people involved in the preparation of this assessment, and especially the FAO country office in the United Republic of Tanzania and project partners CARE and ICRAF. The Programme would also like to thank everyone from government ministries, UN-agencies, research institutions and civil society organizations who participated in the workshop and shared their knowledge on the capacity development needs to integrate climate change mitigation in agriculture. At project level, thanks are extended to the CARE project staff, the district officers and the many farmers encountered during the field visit, who participated to this assessment. The Programme also would like to acknowledge the support of the FAO Capacity Development Toolkit, which was used to develop the assessment's methodological approach. The generous support of the Government of Finland, which provided funding for the assessment, is greatly appreciated.



## INTRODUCTION

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The capacity needs assessment was conducted by the MICCA Programme in partnership with the FAO country office, CARE Tanzania and the World Agroforestry Centre (ICRAF) under the MICCA-CARE pilot project in the Morogoro Region. The HICAP project is promoting conservation agriculture (CA) through the Farmer Field School (FFS) approach in 15 farming communities in the Uluguru Mountains.

The assessment identified entry points and recommendations for the capacity development activities and the promotion of climate-smart agricultural practices and their implementation under the MICCA-CARE pilot project.

## Methodology and approach

The capacity needs assessment was conducted at three levels.

- I. National level: stakeholder and context analysis with stakeholders working on climate change related issues from the Ministries of Agriculture, Livestock, Environment, non-governmental organizations (NGOs), research institutions and UN agencies;
- II. Pilot project and district level: consultative workshop with project staff, extension officers, and district staff from the Ministries of Agriculture, Livestock, Water, Forestry, and Environment; and
- III. Pilot project area: focus group discussions with farmer groups, interviews with farmers and local leaders and field visits.

The assessment at national and district levels aimed to identify the stakeholders working on climate change issues and the main policies, plans and strategies related to climate change. Also, through open discussions and working groups, the participants were asked about their organization and individual capacity needs in relation to their climate change work. A check list of questions at the national and local levels, developed by the FAO Capacity Development's team and tailored for climate change adaptation and mitigation in agriculture, was used to identify these needs.

A one-day consultative workshop was organized by FAO in Dar es Salaam under the MICCA Programme to assess the existing situation and related gaps for building capacities to mitigate climate change in agriculture and identify the stakeholders involved and the main policies, plans and strategies related to climate change. The participants present were from the Ministries of Agriculture and Livestock, FAO, ICRAF, CARE Tanzania, United Nations Development Programme-United Nations Reducing Emissions from Deforestation and Forest Degradation (UNDP/UN-REDD), Heifer International, Sokoine University and the NGO, Tanzania Traditional Energy Development Organization (TaTEEDO).

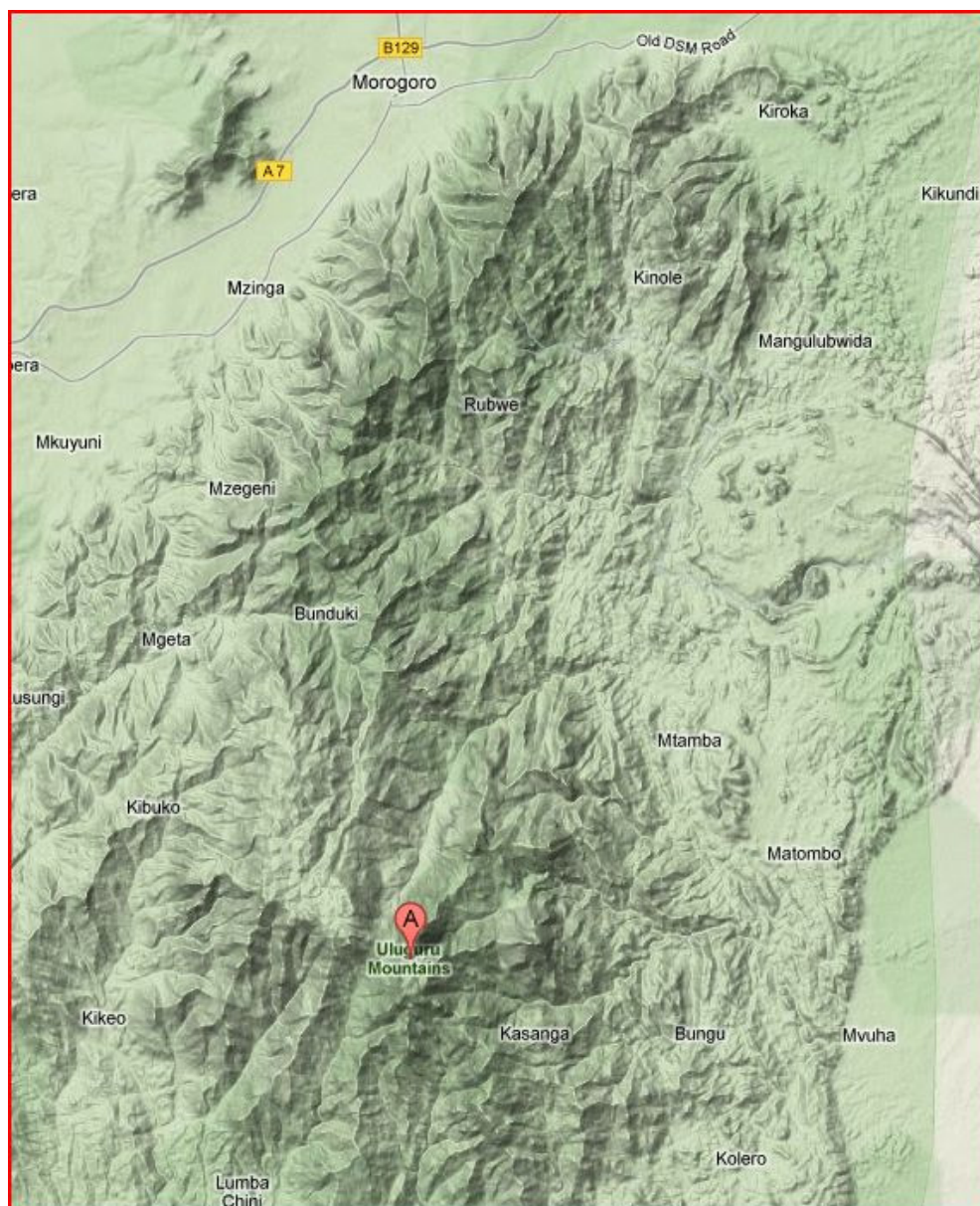
In Morogoro, a one-day consultative workshop was held with the HICAP project team, district representatives from the Ministries of Agriculture, Livestock, and Forest and extension officers.

During the fieldwork, a focus group discussion with ward and farmer representatives was organized in Kolero as were field visits and interviews with contact farmers, CA adopters and other farmers. The objective was to understand the range of current land uses and management practices, including CA practices and climate and environmental problems, and to analyse capacities and needs in relation to the adoption of conservation agriculture and other climate-smart practices.

## FINDINGS OF THE CAPACITY NEEDS ASSESSMENT

### MICCA-CARE pilot project overview

The pilot project is active in 15 villages in the wards of Kolero, Kasanga, and Bungu, which are in the Morogoro Rural District of the Morogoro Region.



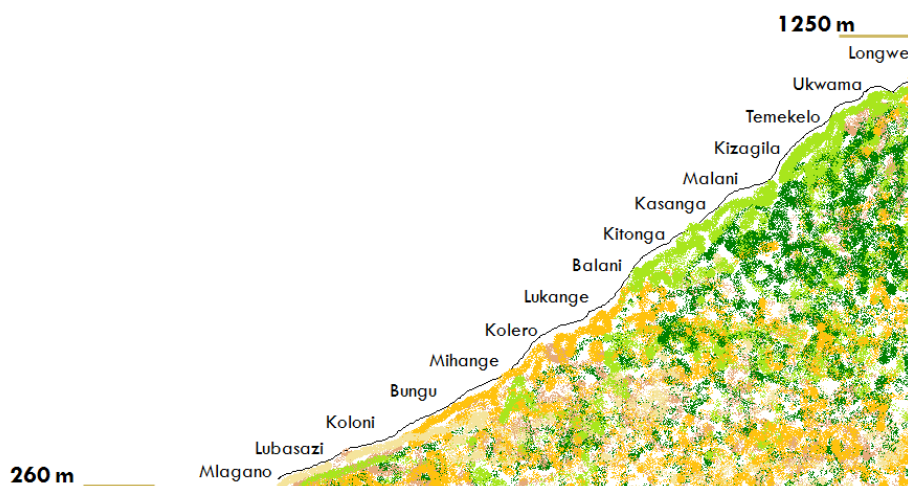
**Map:** The Uluguru Mountains, and some of the villages where the HICAP project is active. The CARE team is based in Morogoro, around 3-4 hours from Kolero.

The HICAP project is active in an area of 17 000ha with 4 948 households. On average, each farmer has 1 acre of land. The main land uses are agriculture (70 percent), forest (10 percent), steep hills and settlements (10 percent) and rice paddy (5 percent). The average tree density is estimated at 10 trees per 100m<sup>2</sup>, although no survey has been conducted by the forest department in the Morogoro District. *[The MICCA baseline survey reported that mean size for cultivated land is 2.5 acres and the median is 2 acres per farmer. However, figures range from 0.25 to 10 acres].*

**Table:** The project communities by ward and their total land area (ha). [The five villages where the MICCA baseline survey took place are underlined.]

| WARD    | VILLAGES        | TOTAL LAND AREA (Ha) |
|---------|-----------------|----------------------|
| Kolero  | <u>Kolero</u>   | 622.1                |
|         | Lubasazi        | 3100.4               |
|         | Lukange         | 2419.12              |
|         | Malani          | 649.97               |
|         | <u>Mlagano</u>  | 1865.08              |
|         | Temekelo        | 1045.8               |
| Kasanga | <u>Kasanga</u>  | 805.23               |
|         | Kitonga         | 884.55               |
|         | <u>Kizagila</u> | 439.05               |
|         | Longwe          | 477.42               |
|         | Ukwama          | 627.26               |
| Bungu   | Bungu           | 1737.87              |
|         | <u>Balani</u>   | 1284.35              |
|         | Koloni-Mihange  | 853.31               |
| TOTAL   |                 | 16,811.51            |

The 15 villages are in the Uluguru mountains where elevation varies between 260m and 1250m. More than half of the villages are very isolated and accessible only by hiking.



**Diagram:** Visual representation of the altitudinal hierarchy of the villages in the project area. Not all villages are accessible by road.

The HICAP team is composed of five people (Programme Initiative Manager, Monitoring and Evaluation Officer, Conservation Agriculture Technical Officer, Enterprise Development Officer, MICCA Programme Project Field Coordinator and 2 field extension officers) and there are 30 contact farmers and 30 community based Village Savings and Loans (VSL) trainers. There are 48 FFS groups of 25-30 members and 45 VSL groups. The HICAP team, extension officers and contact farmers were trained on CA by Selian Agricultural Research Institute (SARI) during one-week field training in Arusha. There is also a manual on the FFS training modules developed by CARE.



**Picture:** Extension officers in front of FFS demonstration plots in Kolero.

CA is composed of a set of practices, including planting in rows, permanent soil cover, minimum soil disturbance, intercropping and improved seed varieties. It is proposed as an alternative to traditional slash and burn, tillage and random planting type of agriculture. In the project area, there are around 1 300 adopters of CA (three-quarters of these are in FFS), which is around 10 percent of the total population of the project area. Extension officers reported that farmers practicing CA have doubled their maize yields after the first year of adoption. However, this considerable increase in yield should be taken cautiously, as other factors such as good rainfalls and improved seeds have a strong influence on yields. *[Based on the MICCA baseline survey's villages in five villages, 18 percent of households have adopted CA.]*



Most of the VSL members use the money for paying children school fees, purchasing seeds and other agricultural inputs, hiring labour, family use (food, clothing, medical expenses), creating small enterprises (selling and buying crops at larger markets), retailer shops (clothes, soap) and improving existing small businesses. One group visited had bought a milling machine to make maize or cassava flour and has started an irrigated vegetable garden with channeled water.



**Pictures:** VSL group's milling machine and irrigated vegetable garden.

Based on the workshop participants in Morogoro, the main challenges in the Uluguru Mountains are related to increasing productivity and income and sustainably managing natural resources and the environment. The state of the land is moderately degraded, and there are reported problems of soil erosion, sedimentation and lack of soil fertility. A rough estimate from the project team indicates that slash and burn is practiced by 90 percent of farmers, although less by those in the project area (around 60-70 percent). Soil erosion is mainly on the cultivated slopes (sometimes more than 50 percent of the slopes are cultivated). The expansion of agriculture on forest and sloping land is caused by a lack of productive land, but also by the type of low-productivity traditional agriculture that is practiced. Over the last 10-20 years, the forest has declined due to fire use and expansion of agricultural lands. Another problem is increasing pests, for which farmers blame deforestation (as rats and monkeys come to their farm for food). *[Agricultural problems reported in the MICCA baseline survey are disease (27 percent of households), low yields (19 percent), low rainfall (14 percent), prolonged dry season (10 percent) and lack of equipment (5 percent). Considering only farmers not practicing CA, the main problems related to agriculture are low yields (31 percent), diseases (21 percent), unpredictable rainfalls (12 percent), lack of equipment (8 percent) and prolonged dry season (7 percent).]*



**Pictures:** Slash-and-burn agriculture and planting on slope lands.

Water availability is decreasing over space and time. Rivers are losing depth, and previously permanent water sources are becoming seasonal. Also, water quality is being affected by erosion. This is evidenced by water turbidity and sediment load. Water turbidity could become an even greater problem, as the Morogoro watershed provides drinking water to Dar es Salaam, Morogoro, and the Bagamoyo areas.

Extension officers and CARE staff mentioned there is a problem of food insecurity in the project area. They estimate most households are food insecure for five months of the year. The VSL groups help farmers increase their income and food security by investing in milling machines, vegetable gardens and granaries. The HICAP project is also hoping to support the cultivation of new crops (cardamom, sesame, sunflowers, green peas), which would bring additional income to farmers. The center for sustainable living in Kolero is meant to be a center for outreach activities on sustainable development, including agriculture and related issues.

The land uses in the area have evolved in the last 10 years towards more agricultural lands. Forested and wood lands have been cleared for cropping, mainly maize production. Project staff reported that new varieties of maize, sesame and pigeon peas have been cultivated in the last three years, and rice cultivation has slightly increased. Lab lab was introduced two years ago by the project team. The implications of land uses changes in relation to climate change mitigation will be explored using the Ex-Ante Carbon-balance Tool (EX-ACT).

Communities and farmers have noticed climate change and variability, such as less predictable rainfalls, longer dry periods, shorter rainy seasons, increased temperatures, reductions in water availability and decreasing productivity. More farmers are now planting early maturing maize and cultivating twice a year to compensate for the shorter rainy season. They also plant more cassava, which they consider drought-tolerant.

## BOX

### CLIMATE CHANGE ADAPTATION PRACTICES USED IN THE AREA

- Cassava cultivation as drought tolerant crop
- CA to increase maize yield
- Early maturing and drought tolerant seeds
- Tree planting (fruit: citrus, mango, banana, avocado; wood: *cederela odorata*, *khaya* *anthotheca*, *gravelia robusta*, *eucalyptus* species, *tectona grandis*, *milcia excelsa*)
- Water and soil conservation measures (e.g. terraces of pineapples on slope lands, artisanal irrigation system with bamboo, and pit holes around trees)
- Intercropping with leguminous for nitrogen-fixing and soil cover

Some of the adaptation practices known by practitioners and applied by some farmers also have the potential to store carbon in soil and above ground vegetation, and reduce greenhouse gas emissions caused by slash-and-burn practices.

## Policies and stakeholders

The draft National Climate Change Strategy developed by the government with support from the World Bank and United Kingdom's Department For International Development (DFID) should be released soon. Coordination and creating synergies among stakeholders will be increasingly important to ensure the implementation of the climate change strategy. The United Republic of Tanzania has put in place strategies and programmes addressing environmental issues in agriculture. However, their implementation at the district level is a problem, as human and financial resources are lacking. Moreover, most of the agricultural policies are not explicitly considering climate change issues, so evidence-based initiatives are necessary to demonstrate how best to integrate them.

The National Adaptation Programme of Action (NAPA) aims to identify immediate and urgent climate change adaptation actions that are robust enough to lead to long-term sustainable development in a changing climate. It will also identify climate change adaptation activities that most effectively reduce the risks that a changing climate poses to sustainable development. Frequent and severe droughts in many parts of the country are being felt, as are the associated consequences on food production and water scarcity. Policies and practices should capture the need to adapt to climate change and variability as a means to reduce vulnerabilities. In the agricultural sector, the decline in crop production (exacerbated by environmental degradation) represents a serious climate change vulnerability. Climate change adaptation strategies include small-scale irrigation, research and development on drought tolerant seed varieties, agriculture extension activities, diversification of agriculture (growing different types of crops on different land units), CA, agroforestry and water harvesting.

The Rural Development Strategy (RDS) provides a strategic framework to facilitate coordinated implementation of various sectoral policies and strategies that focus on development of rural communities. Regarding the environment, the RDS recognizes the needs for improved capacity for environmental management and conservation by local authorities and local communities. In addition, the RDS outlines strategic interventions into various sectoral issues, including agricultural projects.

The Agricultural Sector Development Programme (ASDP) identifies the need to streamline crosscutting issues such as environment, HIV/AIDS and gender into multi-sectoral activities. The ASDP underscores the importance of promoting environmental research through a linkage with the Vice President's Office and the National Environment Management Council (NEMC).



The implementation of the national REDD+ strategy will conserve and enhance the country's unique biodiversity and forest ecosystems and their corresponding benefits, goods and services. It will also ensure they are equitably shared by all stakeholders for adaptation, mitigation and adoption of low-carbon development pathways as required by the United Nations Framework Convention on Climate Change (UNFCCC). A Draft National strategy for REDD+ was developed in September 2010.

#### BOX

#### LIST OF (SOME) STAKEHOLDERS INVOLVED IN CLIMATE CHANGE MITIGATION IN AGRICULTURE

- **Government:**  
Vice President Office UNFCCC focal point, Environmental units in each ministry, UN-REDD unit in Ministry of Natural Resources, Ministry of Agriculture, Ministry of Livestock, NEMC, National steering and technical committees on climate change (not active)
- **Research:**  
University of Dar es Salaam (Institute of Resource Assessment), Sokoine University (Morogoro), Uyoile Agricultural Research Institute (ARI), Economic and Social Research Foundation (ESRF)
- **UN and donors:**  
UNDP (UN-REDD and Africa Adaptation Programme), United Nations Environment Programme (UNEP - UN-REDD), World Bank, FAO (bioenergy project, climate change adaptation, UN-REDD and MICCA), DFID (capacity building and institutional framework), International Development Research Centre (IDRC) Climate Change Adaptation in Africa Program (CCAA)
- **NGOs, and civil society organizations:**  
International Union for Conservation of Nature (IUCN), WWF, Farmer associations (East African Farmer Association, Tanzanian farmer association and farmer groups for marketing - MVIWATA, TFCG –Tanzania Forest Conservation Group)

## Capacity needs identified

### National

One strong need is the increase the office of the climate change focal point from one person to a team of multiple people. Many requests are channeled through the focal point, creating a bottleneck that causes delays in the delegation of responsibility and decision making. It is important to strengthen the capacities of the government to participate in climate change negotiations and improve their knowledge on the issues under discussion. There are two government bodies on climate change, a steering committee and technical committee, but they are inactive and have met only once. The climate change technical committee should be enlarged to include the civil society and private sector.

The draft National Climate Change Strategy is being finalized by the government and supported by the World Bank and DFID. There is a need to involve other organizations in the review of the climate change strategy. Practitioners present suggested that a coordination mechanism should be put in place to ensure the implementation of the strategy. In addition, some guidance is needed on practical options for enforcing policies related to climate-smart agriculture.



There is a lack of access to forecast information and little understanding about how to use it at local level. Similarly, there is the need to adapt the early warning system so that it integrates climate change impacts and adaptation measures by agro-ecological zones. Climate change projections and vulnerability assessment are also needed to identify appropriate adaptation strategies.

The NAPA is supposed to be implemented in specific districts, so more awareness and training on climate change and NAPA would be needed in those districts. Moreover, gender should be integrated in the NAPA, as adaptation strategies between men and women will differ as they have different level of vulnerabilities to different climate change impacts.

The skills to develop good climate change proposals are missing; both in terms of climate change knowledge and funding requirements). Some data on greenhouse gases emitted by farming systems exist, but they are in different institutions and not centralized. The University of Dar es Salaam (Institute of Resources Assessment) has data on the greenhouse gas emissions for different land uses in the drier part of the country. In addition, under the UN-REDD+ process and Tanzania-Norway partnership (CCIAM), a national carbon monitoring centre for forest lands will be established. However, the centre could also include other information. There is a need to build capacity for collecting and processing data on environment and climate change at the National Bureau of Statistics.

It is important to support more collaboration between organizations outside governments to better capture funds and between government institutions to influence policy decisions. Indeed, civil society organizations can access funds more easily than government bodies, which are too bureaucratic. It is also important to share information between organizations and within organizations to improve collaboration, disseminate information to a wider audience and avoid a duplication of efforts. An online platform like AfricaAdapt or a forum like the Tanzania Natural Resources Forum (TNRF) would be useful to link all stakeholders involved in climate change activities.

## Project Area

The project area is located in the Morogoro district within the wards of Kolero, Kasanga and Bungu. At the district level, the Ministries of Agriculture, Forest, Water, and Environment are represented. However, at the ward levels, only the Ministries of Agriculture and Forest are present.

### BOX

#### HILLSIDE AGRICULTURE AND LAND TENURE ISSUES

The United Republic of Tanzania's current national agricultural strategy focuses on the commercialization of agriculture as a solution to rural poverty and food insecurity. The strategy lacks initiatives tailored to the needs of hillside agriculture, despite the fact that over one-third of the country's districts are mountainous and populated by farmers practicing hillside agriculture without proper conservation measures in place. Another concern is the poor implementation of the land policy. Most rural areas are not aware of their rights in relation to the land. Indeed, out of 146 villages in the Morogoro District, only 9 villages have been trained on the land policy. Most villagers do not have titles for their land, or rent the land, so they don't feel secure enough to invest in land management practices requiring investment and labor.

Extension officers and farmers have noticed climate change and variability. However, more knowledge on the causes and impacts of climate change should be provided through interactive training in local communities. Considering the subsistence nature of the farming in the Uluguru Mountains, it would be appropriate to promote climate-smart practices beneficial for production, adaptation and mitigation. Moreover, while collecting data for EX-ACT, it seems that some data on land use changes, deforestation

and fire use are missing. *[The MICCA baseline survey reported that the lack of awareness about the impact of slash and burn and possible alternatives is one of the main reasons for not giving it up. For 74 percent of the households interviewed, climate change impacts, such as prolonged dry season and changes in rainy season, result in shortages of food, as crops are drying up or being destroyed. In the face of the impacts of climate change, most farmers (57 percent) are doing nothing, some (16 percent) are planting cassava and only 6 percent are adopting CA. This shows the lack of awareness of the benefits that CA can bring in terms of improved soil moisture and fertility.]*

Among the 1 300 farmers who reported to have adopted CA in the HICAP project area, most have adopted it on a part of their land. Several have adopted it only partially or incorrectly in some cases. Some problems with the actual implementation and practice of CA could be seen during the field visits and interviews with farmers. For example, one farmer practicing CA is intercropping maize with pumpkin, which is not a nitrogen-fixer (see others examples in the pictures below). Intercropping with leguminous crop is central to improving soil fertility. This shows the needs for strengthening the training on CA, by increasing the number of villages with demonstration plots, the number of demonstration plots in the villages and the number of contact farmers, as well as supporting farmers in the implementation of CA on their lands. *[The MICCA baseline survey reported that there is no difference between farmers practicing CA and the others in regard to intercropping. Fifty percent of farmers plant only one plant per plot. For many interviewed households, even for project participants, CA means planting in rows and avoiding slash and burn. Only 25 percent of farmers attending a training session on CA decided to change their agricultural practices, illustrating the importance of further demonstration plots and follow up by contact farmers and extension officers. In addition, 68 percent of farmers are interested in CA to improve their yield, compared to only 6 percent interested in increasing soil fertility, which illustrates a lack of knowledge about the benefits of CA.]*



**Pictures:** Maize cultivated in rows with little mulch (upper left); maize cultivated under CA but with many weeds (upper right); maize cultivated with peas but on the same rows (bottom left); intercropping of maize and peas but limited soil cover (bottom right).



Deforestation for wood fuel is a problem. Since most people are using wood as fuel, it would be important to support reforestation and agroforestry in the project area. Reforestation of hill sides would be beneficial to reduce soil erosion, ensure habitats for animal species and sustain future energy needs. Soil erosion is caused by cultivating on slopes and accentuated by slash-and-burn agriculture. There is a need to improve soil conservation and increase soil fertility through soil conservation measures and agroforestry. *[Currently, only 13 percent of households in the MICCA baseline survey are planting or protecting trees, of which 52 percent are indigenous trees.]*



**Picture:** Expansion on agricultural lands on forested and slope lands.

Considering the prevalence of subsistence farming, there is a need to improve food security and income generating activities including: improved livestock breeds of chicken, goats and pigs (however, not all tribes are traditional livestock owners); aquaculture and fish pond cultivation; new 'cash' crops in association with the four staple crops (maize, rice, cassava and banana); and honey and bee production. The HICAP project team in association with the extension officers has proposed to integrate green beans and cardamom trees in the high lands; cardamom trees and pineapple in the middle lands; and sesame, sunflower, lab lab (legume) and nurseries of native trees in the low lands. Cardamom trees and bee production at forest borders would reduce burning, and pineapple terraces are good for soil conservation on slopes. Any income generating activities could indirectly reduce the selling of wood and charcoal. *[The MICCA baseline survey reported that 70 percent of households own chicken, and 20 percent own pigs and goats.]*

Land use plans and environmental by-laws would be beneficial in the project area, as most farmers are renting their land from clans. This situation makes it risky for farmers to invest in the land and plant trees. Some environmental by-laws could be developed with the communities and their leaders in regard to tree cutting, water pollution, fire use, the creation of village forest reserves for conservation, sustainable timber production and honey production. *[The MICCA baseline survey stated that around 50 percent of farmers cultivate their own land, more than 33 percent on rented land, and 18 percent on clan-owned land from the same clan (no renting fees). This shows that around half the farmers are cultivating on land that is not theirs.]*

| Agricultural Practices | Conservation Agriculture   | Tree planting and Agroforestry  |
|------------------------|--|---|
| <b>Benefits</b>        | <ul style="list-style-type: none"> <li>Improved soil fertility and increased yield</li> <li>Maintains crop residue in the field and decreases soil erosion</li> <li>Decreased slash-and-burn practices</li> <li>Combined maize with legume</li> </ul>  | <ul style="list-style-type: none"> <li>Fertilizer trees for fixing nitrogen in the soil</li> <li>Provides income from fruits or wood</li> <li>Less risk of burning field</li> <li>Improved microclimate</li> <li>Increased carbon and biodiversity</li> <li>Reduced deforestation of natural forests</li> </ul> |
| <b>Barriers</b>        | <ul style="list-style-type: none"> <li>Difficult to start with as it requires knowledge and practice</li> <li>Labour intensive (hard for women to do the double digging), it is hard to break the hard pan</li> <li>Problem with weed management (if not there is no proper soil cover)</li> </ul>   | <ul style="list-style-type: none"> <li>Cost and investment: seedlings, labour, management.</li> <li>Lack of knowledge</li> <li>Issue of land ownership (80% of farmers are renting their land from clans)</li> </ul>  |
| <b>Needs</b>           | <ul style="list-style-type: none"> <li>Better quality training on CA</li> <li>More CA demo plots in more villages</li> <li>Support during implementation</li> <li>Farms visits by contact farmers, extension officers and by interested farmers</li> <li>Agricultural tool to facilitate the double digging and breaking the hard pan</li> <li>Training on control plant diseases</li> </ul> | <ul style="list-style-type: none"> <li>Participatory and scientific assessment of different trees</li> <li>Create tree nursery for seedling production</li> <li>Training on tree planting</li> </ul>  |

# CAPACITY DEVELOPMENT STRATEGY AND PROPOSALS

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## Entry points and partnerships for the MICCA Programme

### National Level

The capacity needs assessment at the national level was exploratory at this stage and should be completed by a more in-depth review of the enabling environment and by individual interviews with relevant key stakeholders working on climate change in the country. However, some entry points and potential partnerships could be identified.

### Collaboration and training

It would be useful to collaborate with UN-REDD to highlight the linkages between agriculture and deforestation in the United Republic of Tanzania. UNDP is organizing an extensive capacity needs assessment for REDD in 2012. A Measurement, Reporting and Verification (MRV) system will also be established.

The University of Dar es Salaam has developed a short course on climate change targeting policy makers and master students. In addition, with funds from the Rockefeller foundation, the University has organized a one-week seminar for researchers to develop proposals on climate change issues in their zones (10 researchers by zone) and areas of expertise (climate change impacts, modeling, statistical downscaling, participatory action research, REDD, mitigation, adaptation and vulnerability).

To foster collaboration on climate change between stakeholders, it may be worthwhile to participate in the creation of an online platform or forum to map and document the climate change projects in the country and facilitate discussion between practitioners on technical and policy options for climate change mitigation in agriculture.

### Technical support and training

The MICCA Programme, in collaboration with the World Bank and DFID, could provide support to the government in the finalization of its climate change strategy through a consultative process with the civil society. The MICCA Programme and ICRAF could also provide advice and technical support to the government on collecting and storing data on greenhouse gases and carbon.

Training on climate-smart agriculture could be organized through the climate change steering and technical committees, farmers associations, key technical staff in government ministries and agricultural research institutes to build capacity and knowledge. Another important entry point for the MICCA Programme would be to support the training of climate change practitioners on gender mainstreaming in their activities.

There is no tool (such as EX-ACT) used by the government to quantify emissions of different land uses and management practices and assess the climate change mitigation potential of different proposed interventions in agriculture.

### Project Level

Based on the findings from the capacity needs assessment at the local level, the five entry points for the MICCA Programme are to promote and provide support and training on:

1. CA and climate change awareness;
2. tree planting and agroforestry (including cardamon trees, and tree nurseries);

3. soil and water conservation (including pineapple planting on slopes);
4. energy saving cooking stoves; and
5. land use plans and environmental by-laws.

Another very important activity of the pilot project, which is being led by ICRAF, is the measurements of greenhouse gas emissions and carbon storage for different land uses and agriculture practices. To complete the lack of data on land uses and land use changes, it would be recommended (depending on available funds) to do a land cover map and a land use change analysis.

### Conservation Agriculture

The adoption of CA and the proper implementation of the technique in the project area is still low. As there is huge potential to increase the adoption of CA, it would be important to support HICAP in the improvement of the quality of CA training, increase the demonstration sites and fully support farmers adopting CA, so that they properly adopt CA and become mentors for each other. It is very important to emphasize that while some gains can be short term, others are long term, and that CA is beneficial for increasing productivity per unit area while also being a climate change adaptation and mitigation practice.

The MICCA Programme could also build capacities of the extension officers and district officers to improve their understanding of the causes and impacts of climate change, concepts related to climate-smart agriculture (adaptation and mitigation practices) and linkages between climate change and food security.

### Tree planting and agroforestry

The MICCA Programme can provide support and training on planting of multi-purpose trees (wood, fruit, soil conservation and soil fertility) and trees of commercial interest (like cardamom) as well as the establishment of tree nurseries. Integrating trees in the landscape would reduce field burning and increase carbon sequestration. It is proposed to plant trees along water streams to improve water quality.

The training on agroforestry could be associated with the trainings on CA. Tree nursery could be managed by FFS members or specific groups could be created. There is already one tree nursery in Kibongo taht could serve as a starting point. More details on this will be provided through the focus group discussions on agroforestry.

As 80 percent of farmers are renting lands, there is a serious issue of land tenure, and this should be discussed and addressed with local leaders.

### Soil and water conservation

Soil and water conservation measures would be beneficial for reducing soil erosion. ICRAF will conduct a land health survey that could inform the site selection for the soil and conservation measures to ensure the greatest environmental benefits are reached. Farmers would also be trained on soil conservation measures, such as pineapple terraces.



**Picture:** Contour cultivation using pineapples intercropped with groundnuts to prevent soil erosion on a steep slope.

#### Energy saving cooking stove and brick making

There is an opportunity for the MICCA Programme to promote energy saving stoves to reduce emissions from wood burning and carbon lost from deforestation. Also, some trees suitable for charcoal production could be planted for sustainable charcoal production.



**Picture:** An energy saving stove in Kolero.

Brick making is a factor in local deforestation as a great deal of wood is required to 'fire' the bricks. Brick making is quite a common livelihood activity in the project area, so it represents another entry point for the MICCA Programme to reduce greenhouse gas emissions and deforestation.



Training on more energy efficient brick making could be done through the VSL members following the example of the Mwanza Rural Housing Programme (MRHP). MRHP has trained local people in alternative brick-making and business management, and has provided loans through a savings-and-credit scheme. MRHP also run a programme of tree planting and reforestation and has trained entrepreneurs to make and sell efficient cooking stoves.



**Picture:** Traditional brick making

#### Land use plans and environmental by-laws

It would be valuable to do a village land use plan and reach agreements on environmental by-laws that would integrate climate change issues for one village in the project area. This would be done in partnership with the district officers. Presently there is no land use plan in the project area.

Another possibility is the establishment of a village forest reserve to promote bee-keeping activities and sustainable timber production. This could also be linked to the REDD+ Programme.



## CONCLUSIONS

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The capacity needs assessment at national and project levels provides a portrait of the existing situation in terms of capacities and stakeholders involved in addressing climate change mitigation in agriculture. Moreover, it provides the MICCA Programme team with entry points and proposals for capacity development and related activities.

These results and proposals, in addition to the results of the baseline survey, the EX-ACT analysis and focus group discussions on agroforestry will be the basis for discussions about the planning of the MICCA-CARE pilot project in the United Republic of Tanzania.

## ANNEX 1

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Checklist adapted from the FAO Capacity Assessment Toolkit

### Capacity Assessment Checklist Tailored to Climate Change Mitigation and Adaptation in Agriculture at the National Level

#### Where Are We Now? Where Do We Want To Be?

##### Dimension 1: enabling environment

###### Policy and legal frameworks

- What supportive policies and other national strategies exist for climate change and agriculture (addressing mitigation, adaptation and land use change)? Note the name of the Policies or Regulations that exist, year of enactment, year of the most recent revision, current status and planned developments.
- Do national climate change and/or agriculture policies define objectives, and priorities enabling the successful implementation of climate-smart agricultural practices<sup>1</sup>?
- Do the climate change and/or agriculture policies include outlines of measures for the implementation of climate change activities within the agricultural sector?
- Do climate change and/or agriculture policies define the institutional set-up for the implementation of climate change activities within the agricultural sector?
- Do climate change and/or agriculture policies define roles, responsibilities and rights for policy implementation?

###### Policy commitment and accountability frameworks

- Which international agreements in the realm of climate change has the country subscribed to?
- To what extent are such international commitments in the area of climate change actively implemented?
- To what extent and how does the country participate in international fora or debates on climate change?
- How are political commitment and support to climate change and climate-smart agriculture (both mitigation and adaptation) demonstrated?

###### Economic framework and national public sector budget allocations

- Are there national sources of funding to support the implementation of measures for climate-smart agricultural practices?
- To what extent does the legislation reveal contradictions or areas of overlap in responsibilities among agencies involved in climate-smart agricultural practices?

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<sup>1</sup> Climate-smart agriculture is defined as: Agriculture that sustainably increases productivity, resilience (adaptation), reduces/removes greenhouse gases (mitigation), and enhances achievement of national food security and development goals.

## Dimension 2: organizations

### Motivation

- Which ministries/departments have the mandate to work on climate change and on agriculture/land use issues? Are their mandates clear?
- Which other important national and international institutions (multilateral, bilateral, civil society organizations (CSOs) and NGOs) exist in country working on climate change and climate change/agriculture/land use?

### Strategic, organizational and management functions

- To what extent and how do the concerned national agencies collaborate?
- Is there a mechanism for ensuring coordination, information exchange and effective policy implementation? If yes, please clarify it.
- Which ministries/agencies participate and at what level?
- What are the strengths and weaknesses of such mechanisms?

### Human resources

- Are the ministry/department staff at central level adequately prepared to deal with climate change and specifically climate change/land-use change issues?
- What is most needed at central level to improve knowledge and skills on climate change and specifically climate change/land-use change issues? (e.g. workshops on specific topics, training, guidebooks.)

### Knowledge and information

- To what extent are existing policies and regulations on agricultural mitigation accessible (in printed, online formats, etc.) and easy to understand?
- To what extent are the ministry staff, rural civil society and private sector knowledgeable about the existing legislation on climate change and agriculture/land-use change?
- Are there mechanisms for knowledge sharing at the Ministry levels?
- Are staff of relevant agencies adequately informed on global climate change issues?
- Which data is available at national level on emissions from the agriculture sector and more specifically on crops/livestock/agriculture production sectors for carbon/non-CO2/greenhouse gas inventories?
- Which Tier level is used for carbon accounting? Does reporting of carbon stocks from the agriculture/land-use sectors take place?
- Do any calculations at national level exist on the mitigation potentials of crops/livestock/agriculture productions sectors?

## Dimension 3: individual

### Job requirements and skill levels

- What types of skills are needed at central level to integrate climate change concerns into agricultural policies? (e.g. to attend international climate change negotiations)
- Which types of skills are missing at national level to support data collection on emissions from the agriculture sector and support the national greenhouse gas inventories?

### Competency development

- What types of learning opportunities and further education already exist and are needed to develop appropriate competences in the area of greenhouse gas accounting/climate change negotiations?

## ANNEX 2

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Checklist adapted from the FAO Capacity Assessment Toolkit

### Capacity Assessment Checklist Tailored to Climate Change Mitigation and Adaptation in Agriculture at the Local District Level

Where are we now?

Where do we want to be?

#### Dimension 1: enabling environment

##### Policy and legal frameworks

- What agricultural and forestry policies consider climate change mitigation and adaptation aspects and address land use change at the province/district /local level?
- Do climate change and/or agriculture policies include concrete measures at the local level for the implementation of climate change activities within the agricultural sector?

##### Policy commitment and accountability frameworks

- How is political commitment and support to climate change and agriculture mitigation demonstrated at the local level?

##### Economic framework and national public sector budget allocations

- Are there sources of funding to support the implementation of measures for climate smart agricultural practices at the local level?

#### Dimension 2: organizations

##### Motivation

- Which ministries/departments at local level have the mandate to work on climate change and on agriculture/land use issues? Are their mandates clear?
- Which other important national and international institutions (multilateral, bilateral, civil society organizations (CSOs) and NGOs) exist in the district working on climate change and climate change/agriculture/land use?

##### Strategic, organizational and management functions

- To what extent and how do the concerned agencies collaborate at the regional/local level, also with non-governmental institutions?

##### Human resources

- Are the ministry/department staff at local level adequately prepared to deal with climate change and specifically climate change/land-use change issues?
- What is most needed at decentralized level to improve knowledge and skills on climate change and specifically climate change/land-use change issues? (e.g. workshops on specific topics, training, guidebooks)

### Knowledge and information

- To what extent are the communities and farmers knowledgeable about climate change issues related to agriculture?
- Is there knowledge among farmers on mitigation and adaptation practices?
- Are there existing mitigation or adaptation practices at local level that should/could be scaled up within the local context?

### Dimension 3: individual

#### Job requirements and skill levels

- What type of skills are needed at decentralised/local level to integrate climate change concerns into agricultural policies? (e.g. to attend national climate change conferences/workshops, to analyse agriculture data relevant for mitigation and adaptation)
- What type of support or capacities are needed at local level for farmers to take up mitigation/adaptation best practices into their current activities?

#### Competency development

- What type of learning opportunities and further education already exist and are needed for communities and farmers to develop appropriate competences in the area of adopting adaptation/mitigation practices?