Capacity Development Guiding Report for MICCA in Kenya

Capacity Needs Assessment

MICCA Programme

Pilot Project: ***Enhancing agricultural mitigation within the East Africa Dairy Development Project in Kenya***

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Introduction

The Capacity Needs Assessment was conducted by the MICCA program in partnership with ICRAF and EADD under the MICCA-EADD-ICRAF pilot project in the Kaptumo Division in the Rift Valley Province of Kenya. The EADD project is promoting zero grazing and improved feeding practices in association with quality breed as a way to increase milk productivity and income.

The capacity needs assessment identified entry points and recommendations for the capacity development activities and the promotion of climate smart agricultural practices and for their implementation under the MICCA 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, NGOs, research institutions, and UN agencies
II. Pilot project/district level: Consultative workshop with project staff, extension officers, and district staff from ministries of agriculture, livestock, water, forestry, and environment
III. Pilot project area: Focus group discussions with farmer groups, interviews with farmers, and field visits

The capacity needs 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 capacities needs in relation to their climate change work. In the field, the capacity needs assessment aimed to understand the range of current land uses and management practices associated with dairy production, as well as climate and environmental related problems to analyse capacities and needs in relation to the adoption of improved feeding and climate smart practices.

In Nairobi, a one day workshop was organized to assess the existing situation and related needs for building capacities to address climate change issues in agriculture in Kenya. The participants present were from the Ministry of Agriculture, Ministry of Livestock, FAO, ICRAF, EADD, CARE, GIZ, Egerton University, and Land O' Lake.

In Nandi South district, a one day consultative workshop was hold with the EADD team leader, the representatives of Kapchumo dairy, the extension officers, and district and

division representatives from the Ministry of Agriculture, Water, Environment and Livestock.

During fieldwork, focus group discussions were organized with the management of Kapchumo dairy, a group of dairy farmers, and a women's group. Moreover, interviews with innovative farmers- practising zero-grazing, improved feeding practices, biogas- and farm visits were conducted.

Findings of the Capacity Needs Assessment

EADD-MICCA Project Overview

EADD is active in Rwanda, Uganda and Kenya. In Kenya, it has 21 sites, one of which (Kaptumo) is the site of the MICCA-EADD pilot project.

In the Kaptumo Division, each farmer has an average of 2 acres, and 3 cows. The milk production by farmer ranges from 2-10L with an average of 5-6L per day. *[The MICCA baseline survey Sep. 2011 reported that 92% of farmers practice cropping and keep livestock (most income come from family agriculture and livestock), that the average land size is 2.2 acres per farmer, average milk cows are 2.4 per farmer, and average milk production is 4-5L per day.]*

The Kapcheno dairy company (Kaptumo hub) is composed of 4315 member farmers, 2147 shareholders and 1600 active milk suppliers, of which 50% are women. There are 155 dairy management groups (10-15 members each), with the objective to work together on the milk packaging and bulking, through EADD support (access loan, agro-vet services, breeding services, field demonstrations, transport, and access to pulverisers for chopping fodder).

Extension officers working with EADD mentioned that 40% of EADD members/farmers have improved their grazing area with fodder plants such as Rhodes grass, and Napier grass*. [The results from the MICCA baseline survey reported that 64% of farmers keep their cattle on paddocks, 2/3 farmers feed Napier grass to cows, and 1/3 feed crop residues. The results from the EADD baseline survey Sep. 2009 shows that 50% of surveyed farmers in Kenya feed their animal on dry maize stove, and Napier grass.]*

The full adoption of zero grazing is currently very low (<1%), but many farmers are practicing stall feeding in complement to natural pasture grazing (50%). The current livestock feeding practices in the Kaptumo Division are split in four categories and estimated:

- Only grazing (natural pasture all year): 34%

- Mainly grazing with some stall feeding (9 months pasture): 50%
- Mainly stall feeding and some grazing : 15%
- Zero-grazing (stall feeding only): <1%

Moreover it was possible to see rotational grazing paddocks during field visits. This practice however is limited to few farmers.

Picture: Rotational paddock grazing

In regard to land quality, the land is estimated to be moderately degraded. Main problems are low soil pH, loose soil and poorly structured soil causing soil erosion, poor soil fertility and yield decline. Moreover, farmers apply the same fertilizer for tea (specific for foliage development) to maize, and don't incorporate crop residues. Previous maize yield was around 20 bags/acre, and is now only 5-7 bags/acre. Farmers are blaming seeds. Decline in crop yield, caused mainly by land degradation, is also affected by climate variability. *[The MICCA baseline survey reported that the main agricultural related problems to be: 35% seed diseases from fungus, 20% lack of seeds, 9% expensive inputs, 8% lack of knowledge and training and 5% weather related.]*

Based on opinions from the agricultural and extension officers (to be verified with climate data), changes in climate and variability can be seen in the drying up of (previously permanent) streams for 3 months, more rainstorms, and colder temperature, which are affecting crop and milk production and causing disappearance of plant and animal species. Moreover, farmers now grow early maturing seeds (3

months instead of 6 months) to adapt to shorter or more variable growing season. *[In the MICCA baseline survey, the households mentioned that the main three changes in climate are 62% more rainfalls, 15% longer dry season, and 11% no change. Focus group discussions raised issues of rivers drying up, erratic rainfalls, problems with watering cattle, soil fertility decrease.]*

Discussions with extension officers and farmers highlighted the land use changes expected to be seen such a diminution of grasslands, more tea plantations (if price remains good), more fodder production, more deforestation (if more tea plantations), reduction in food crops (maize), increase in high value crops like passion fruit, and diminution of slash and burn. These land use changes have implications for climate change mitigation, and this will be explored through the ex-ante carbon balance tool (ex-act). In terms of deforestation, the agricultural officers estimated the actual forest cover at 4%, while it was 10% in 2002.

Picture: Deforestation driven by expansion of tea plantations

Policies and Stakeholders

At national level there is a Climate Change Strategy (April 2010) but no policy, as first the environmental policy must be reinforced. At present, agriculture and livestock policies emphasize natural resources management, not climate change per se. Moreover, participants mentioned: "that policies don't reflect what is happening on the ground, where there are lots of climate change projects and initiatives". The government has

planned to mainstream CC in Kenya vision 2030, and focus on adaptation for the midterm priority 2013-2017.

Key policies and plans (to be completed):

- NAEP (National Agricultural Extension Policy)
- NALEP (National Agriculture, Land, Environment Plan)
- NEAP (National Environmental Action Plan 2009-2013)
- Draft NAPA (National Adaptation Programme of Action)
- NAMA (National Appropriate Mitigation Actions)- to be launched in Durban

Box: List of (some) stakeholders related to climate change mitigation in agriculture:

- Government: Climate change secretariat at the Prime minister office, Ministry of Agriculture, Ministry of Livestock, Climate change units, Kenya forest service, National Environment Management Authority, Ministry of Forest and Wildlife, Kenya bureau of standard and statistics
- Network: Kenya climate change working group
- Research: Kenya agricultural research institute, ICRAF, ILRI, Kenya forest research institute
- UN and donors: FAO, UNDP, UNIDO, UNEP, IFAD, Agriculture and rural development donor group, GIZ
- NGOs, and civil society organizations and networks: WWF, VI-agroforestry, Green belt movement, KENFAP (biogas)
- Private: Tea companies

At district level, the different Ministries of agriculture, environment, livestock, water, forest are represented; however at the division level, only agriculture, livestock and forest. The climate change issues are not yet incorporated into agricultural strategies, but are considered when dealing with environmental issues.

Deforestation issue is under the Kenya Forest Service at the Ministry of Forestry. There is a current policy by the Ministry of Agriculture that requires all crop farmers to set aside 10% of their land under tree cover. The policy should be implemented by the Ministry of Agriculture through its extension officers under the NAEP. However, there is no operational implementation measure in place to support farmers adopting and share a part of the initial investment required. Training and seedlings are sometimes provided. In Kaptumo Division, there is an estimate 50% of farmers that have 10% tree cover on their land, and only 10% have received support.

Box: Key Documents and Studies

- National Climate Change Response Strategy (2010)
- Vision 2030 (2008)
- Kenya capacity needs assessment on technologies for CC mitigation and adaptation (2007)
- Climate Change thematic report on the national capacity needs self-assessment (2006)
- Draft National Adaptation Action Plan currently (2011)
- The economic impact of CC on Kenyan crop agriculture, WB (2007)
- Economics of CC in Kenya, SEI (2009)
- DFID Economic impacts of climate change: Kenya, Rwanda, Burundi (2009)

Capacity Needs Identified

National

Few ministries' staff working on climate change related issues (agriculture, livestock, environment, water) are knowledgeable and skilled on climate change, especially in regard to climate change mitigation. Moreover, knowledge and data on GHG emissions and carbon sequestration for different land uses and management practices are limited.

Some suggestions of capacity development interventions were proposed during the workshop:

- Revision of current policies to integrate climate smart agriculture
- Sensitization of policy makers to understand climate change mitigation, and supportive policy options
- Bring together knowledgeable and skilled people in a climate change forum
- Create climate change regional networks under the climate change working group
- Create a climate change department, so it has more power and authority to push for climate change mainstreaming and interventions
- Training on GHG data collection
- Centralized system to store data on GHG
- Adapt the early warning system to address the new/potential impacts of climate change

To complete the capacity assessment at national level, it is recommended to discuss capacity needs and priorities with: i) the climate change focal point at the prime

minister office on: support for identifying entry points for integrating climate change mitigation in existing agriculture, forestry and livestock policies, and training policy makers and high level professionals on climate smart agriculture and related policy options (through successful case-studies from other countries); and with ii) the Kenya climate change working group.

Overall it seems there is a need to build sub national/regional climate change networks to link practionners together and ensure coordination of climate change projects. Moreover, the NAPA and NAMA are in development (just being finalized), so it could be an opportunity to highlight links between mitigation and adaptation practices.

Project Area

Considering the problems of soil erosion and decrease in soil fertility, the misuse of fertilizers, and the potential for manure management through dairy production, there is a real need for training on the uses of organic and inorganic fertilizer and soil conservation. Moreover many farmers mentioned the need to access good quality seeds. Few farmers are currently producing seeds to sell to others.

Some others skills and supports needed for farmers to adopt good agricultural practices mentioned during the workshop:

- Awareness and training on climate change mitigation and its co-benefits
- Field visits, and farmers exchanges between sites (demonstration and information sharing)
- Training of trainers (similar to the FFS model)
- Cost sharing or micro-credit mechanisms

Zero grazing involves high investment during the construction phase: excavation, and materials (poles, roof) costs. Moreover the low water availability on farm is another limitation of stall feeding.

Box: Zero-grazing farm

The farmer has started practicing zero grazing as he had a small land on a slope. He constructed a stall with cement floor and a roof, and some compartments for feeding each cow. He feeds them with pulverized maize stove (given by other farmers), silage, and dry grass. He grows Napier grass in pit holes filled with manure. He has also a water tank to water the cows at the farm.

Pictures: Key elements of a zero grazing farm

The benefits and barriers of different "good" agricultural practices have been discussed and prioritized with the agricultural and extension officers. Based on these, capacity development needs could be identified (see table below).

Table: Barriers to adoption and related needs for the agricultural practices identified as priority

Agricultural practices	Benefits	Barriers to adoption	Farmer Needs
Zero-grazing	- Reduce grazing pressure - Increase milk production - Good for small land size - Better manure management - Biogas production - Less diseases and contamination risk between animals	- Cost of construction and material for the shed and cement floor - Feeding management, labour costs - Need more water, cost of water tanks and water management - Need high quality breed for high milk production	- Need for loans to cover basic initial labour and construction costs (more milk produced more access to inputs) - Need for water tanks, and canalisation system (less than 10% farmers store water) - Need to facilitate artificial insemination (now 30% adoption rate) -
Agro-Forestry	- Fertilizer plants for fodder and soil N fixing (they do not compete with other crops for nutrients, and can be used for wood fuel) - High value crops e.g. passion fruit - Planting trees that are water conserving, no exotic trees	- Require manure management for tree establishment - Cost and investment: seedlings, labour, management. - Lack of awareness, perception that trees are wasting land - Wild animal and insect invasion, affecting the crops (animals can hide in the bushy area)	- Participatory and scientific assessment of different tree and legume fodder - Support passion fruits (or avocado) production with women's group - Create tree nursery for seedling production

Organic Farming (Or conservation agriculture)	- Improve soil fertility and decrease soil erosion - Soil conservation: maintain crop residue in the field - Decreased slash and burn practices - Additional income as niche market for organic products	- Issue of awareness about fertilizer and pesticide uses - Accumulation of manure - Cost to lime the soil and apply calcium - Issue of value chain	- Training on the use of organic agriculture from animal manure and green manure from agro-forestry - Training on soil conservation practices, and conservation agriculture to increase yield and maintain soil fertility (only 10-15% maintain crop residues in the field, others use them to feed livestock) - Water and soil conservation structures - Analysis of value chain for organic products

Capacity Development Strategy and Propositions

Entry Points and Partnerships for MICCA

National Level

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

NAPA and NAMA:
More work (and emphasis/interest) is on CC adaptation. Considering this, it would be essential to highlight the linkages between adaptation and mitigation in order to show that some mitigation practices are also helping farmers to adapt to climate change and increase the resilience of the agricultural production system. A starting point could be to review the NAPA and NAMA and make a policy brief on the linkages between proposed adaptation strategies and practices, and mitigation practices under the umbrella of climate smart agriculture.

Moreover, it would be crucial to partner with UNDP on their EU-UNDP climate change capacity building programme for Kenya. The programme will strengthen national capacities to 1) develop/establish green house gas inventory management systems; 2) measure, report on, and verify green house gas emission inventories; 3) identify opportunities for National Appropriate Mitigation Actions (NAMAs) in the context of national development; and 4) design low emission development strategies (LEDS). The project document for Kenya shall be ready early 2012, and the programme will operate for four years.

Network for climate change mitigation:
There are multiple projects and stakeholders working on climate change in Kenya, which seem uncoordinated and implemented by different stakeholders. There is a need for a more coordinated approach and sharing of knowledge and information. An online forum, or as a sub-network under the climate change working group could help:

- Enhance exchange of experiences on climate change mitigation among stakeholders and policymakers
- Improve inter-sectoral coordination between environment, agriculture and livestock
- Enhance the access to information generated by different stakeholders

An interesting application of Google (funded through the Google Foundation) is the Google Earth Adaptation Layer developed for Kenya. The adaptation layer is part of the weADAPT platform for climate change adaptation. The objectives are to increase practionners' access to information and capacity to share their work with the climate adaptation community at different scales, from practitioner to decision-maker as well as to donors and the media.

Training and knowledge generation:

Different training suggestions are proposed (these shall be discussed with the climate change focal point for their precision and priority):

- Provide training on climate smart practices to the climate units in Ministries and to the Kenya working group on climate change
- Support the government in collecting/storing data on GHG and carbon sequestration
- Develop climate change seminars/short courses for policy makers in partnership with a national university (using some of the EC/FAO e-learning modules on climate change and food security)
- Make an inventory and mapping of climate change projects in the country (similar to the Google Earth Adaptation Layer)
- Showing the climate change mitigation potential of different sustainable land management practices to convince policy makers of co-benefits using the FAO ex-ante carbon balance tool (Ex-act)

A main component of MICCA concerns the measurements of GHG emissions and carbon sequestration, which is led by ICRAF. This requires capacity building, and ICRAF has started training national and local experts on GHG emissions measurements, and land health survey respectively. These experts will then monitor GHG emissions for different land uses and management practices (in the pilot project area, but the methodology developed will be standard for replication), and also measures carbon sequestration. These trained experts will increase in-country capacity to measure GHG emissions and carbon sequestration. Moreover, the land health survey requires the training of experts on soil sampling and GPS.

Project Level

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

1. Tree and legume fodder;
2. Tree nurseries for trees, having an economic potential;
3. Soil conservation;
4. Water harvesting and storage at farmhouse
5. Biogas development for active milk suppliers to repay zero-grazing related investments.

Tree and Legume Fodder

To support EADD's efforts to improve feeding practices, while increasing trees in the farming system, MICCA could provide awareness raising on the benefits, and support technical training on integrating tree and legume fodder in dairy farming. These would bring multiple benefits: fodder, soil fertility, and firewood. *[From the EADD baseline survey results, the main reasons for not adopting fodder trees and legumes on farms, are: not aware of benefits (54%), lack of technical information (51%), unavailability of planting materials (32%). Moreover, the MICCA baseline survey focus group discussions highlighted that the quality of feed is low, because a lack of knowledge on production and storage of fodder, lack of seeds to produce more maize to feed surplus as fodder, and lack of knowledge on which crops they should and could apply manure to benefit production. It showed also that 1/3 of farmers plant and harvest trees, and ¾ plant and protect trees, mainly indigenous trees 37%, eucalyptus 19%, cypress 18%, and blue gum 17%, and that tree fodder such as gravelia, and fruit trees are very limited, 3% and 1% respectively.]*

Box: Agroforestry- Characteristics and uses of proposed tree and legume fodder

Tree fodder:
Grevillea: evergreen tree, fast growing tree, use for fence and furniture, stems used for honey production, drought resistant, can be grown along maize in agroforestry system.

Faidherbia Albida: tree legume, highly resistant to drought, use for raising bees, seed pods and foliage use for livestock fodder, wood use for construction, nitrogen fixation and erosion control, it sheds its leaves in the rainy season- good for agroforestry

Calliandra: pea family, shrub and small tree, can easily be pruned,

Leucaena: legume family, shrub and tree, uses for green manure, charcoal, soil conservation and livestock fodder.

Sesbania: pea family, use in alley cropping to increase soil nitrogen content,

Legume fodder:
Desmodium: herbaceous legume, tenacious plants, use as natural insect and weed repellent in maize and sorghum cropping, use as living mulch and green manure for their soil nitrogen fixing capacity, also use for animal fodder

Lucerne/Alfalfa: perennial fodder legume, rich in protein, highly digestible fiber, improves soil quality (fix nitrogen), resilient to drought.

Fruit tree nurseries

Fruit trees such as passion fruits (and avocados) could be a generating income activity within the diversified farming system, and support some of the improved dairy farming required investments.

The EADD extension officers supported the formation of the group to train them on improved feeding practices for dairy production. Once a group, these women have started to diversified their activities, and started a tree nursery where they grow seedling of tea and passion fruit. MICCA could provide training and support to the 1600 active milk suppliers and dairy management groups about seedling production, tree planting, forage production and storage, soil conservation, water storage and manure management

Picture: Women's group's tree nursery for tea and passion fruit seedlings

Soil conservation

Land degradation caused by soil erosion, decline in soil fertility, temporary drying of water sources, and overgrazing were mentioned as agri-environmental problems in the area. Considering the linkages between sustainable management of natural resources and productive farming system, it would be important to support soil and water conservation practices through conservation agriculture, soil cover, no tillage, crop rotation, intercropping, no farming on slope, no planting of exotic trees; and structures (terracing, or planting of pineapple in horizontal rows on slope, reforestation on hill top and slopes). *[The MICCA baseline survey reported that 90% of farmers know about conservation agriculture, and 84% practice crop rotation.]*

Moreover, the "impacts" of climate change perceived by farmers are related to agriculture and livestock production, which depend on the natural assets. Moreover, those farmers currently trying adaptation strategies to avoid soil erosion are building terraces. *[From the MICCA baseline survey, the impacts of climate change as experienced by farmers are 30% reduced production and yield, 15% death of livestock, 13% decrease of milk production, 12% destruction of crops, and 7% erosion. Farmers try to adapt to these impacts by 10% building terraces to avoid erosion, 10% reducing herd so less land and fodder and improve milk production of small herd, 8% changing type of crops, 7% changing in planting practice, 7% building shed for livestock to protect them, and 5% growing feed.]*

Water harvesting and storage at farmhouse

In association with stall feeding, farmers shall receive support and training for water harvesting and storage at the farmhouse.

Biogas and manure management

There is a strong synergy with zero grazing (fully or partial), and manure management for renewable energy production from biogas. One farmer interviewed demonstrated that biogas is technically feasible with 3 cows under semi zero grazing. Cost of investment in a small biogas digester can be repaid by the increased in milk production from improved feeding practices of dairy cows (and improved breed). MICCA through EADD extension officers, and local/national biogas service providers, could support training on biogas and manure management. Once more farmers are involved in stall feeding, a feasibility study could be conducted to target those farmers more able to engage in biogas. They could then become farmer models, and train others to ensure sustainability. [*The results from the MICCA baseline survey reported that 99% of households use wood as their main energy source.]*

Picture: Biogas production through manure management

Implementation approach:
In the EADD/MICCA pilot project, Kaptumo hub, there is one extension officer and 10 community extension service providers. These extension officers shall be trained on climate smart agriculture, and on specific climate smart practices such as tree and legume fodder on farms, and other proposed climate smart practices (see points above). Most probably, national and international consultants would support them in these trainings and technical implementation steps.

All the training provided by MICCA could be channeled through the active milk suppliers (1600 farmers) and dairy management groups (155 groups with 10-15 members each), as these have also access to loans and so they have the means to engage in agricultural investment activities. These groups can be used for training of trainers in a similar way of the Farmer Field School approach in which model farmers facilitate the learning process of their peers. *[From the MICCA baseline survey, it resulted that there are two zones and categories of farmers in the project area with different characteristics, assets and capacities. One group has more land, more cattle, they are poorer and less informed, while the other group has less land, less cattle, richer (cash from tea and dairy) and more informed.]* These differences in zones and farmer profiles shall be taken into account when promoting and implementing the proposed climate smart practices.

Moreover, it is important to consider gender in the capacity building activities and implementation of the selected climate smart practices, as 50% of EADD active milk suppliers are women. It is suggested to share the manual on integrating gender into climate change project with the extension officers involved in the EADD project for the Kaptumo site. They could then conduct a rapid field assessment with men and women to identify their respective capacities to engage in the selected climate smart practices promoted by MICCA. *[The MICCA baseline survey highlighted that 50% of decisions on agricultural practices are made by men, 25% by men and women, and 25% by women.]*

In terms of raisins awareness and promoting knowledge exchange, MICCA could support farmer exchanges and field visits (to visit farms of innovative farmers and model farmers). *[From the MICCA baseline survey, it seems that only 4% of households are involved in the project for training and gain knowledge, as their interest to join is for access to loan (37%) and improve income (24%).]* This known, it is important to connect the capacity building activities with the process of accessing loan, so that people can actually implement what they have learned, and also to ensure that the awareness raising and training highlight the linkage between the promoted climate smart practices and improved income.

Policy relevance and partnership:
The entry points proposed (1 and 2) would also support the implementation of the policy for increasing trees on farms (10% of farmland). In combination with scientific advices from ICRAF and the forest officers, consultations with farmers could be organized to identify preferences in tree and legume plants, mainly for fodder, but also considering needs in terms of construction materials, firewood, and the economic value of the fruits. Other important characteristics would be time for seedling establishment, growing time, water and manure requirement, tolerance to drought, complementary functionality with the existing cropping system.

Moreover, the Green Belt Movement is in the process of implementing a BioCarbon Fund Pilot Project in Kenya. Collaboration on access to carbon funds might be interesting, but especially to build on their knowledge and experience on reforestation, training and women empowerment. Another interesting partner is VI-Agroforestry working on reforestation and soil carbon monitoring in east Africa.

Conclusions

The capacity needs assessment at national and project levels, although rapid, draws 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 team with entry points and propositions for the capacity development component and related activities.

These results and propositions, in addition to the results of the baseline survey and the ex-ante carbon balance, will be the basis for discussions about the planning of the MICCA pilot project in Kenya.