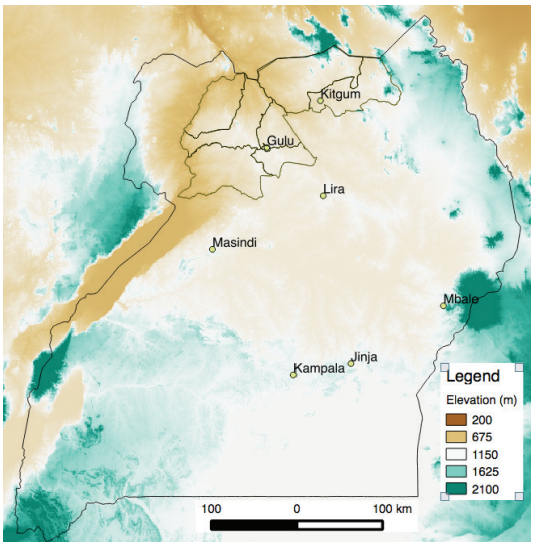
Social-Ecological Assessment of Landscapes in Uganda

Preliminary update on Nwoya site activities for the CIAT-led, IFAD-funded project, "Increasing food security and farming system resilience in East Africa through wide-scale adoption of climate-smart agricultural practices"

Team Members: Leigh Winowiecki, Caroline Mwongera, Peter Laderach, Jennifer Twyman, Kelvin Mashisia, Wendy Okolo, Anton Eitzinger, Beatriz Rodriguez, Juliana Muriel (CIAT); Edidah Ampaire, Piet Van Asten, Lipsey Ojok (IITA) -Jan 2015



Overall Project Objectives

The overall project goal is to improve food security and farming system resilience of mixed crop-livestock smallholder farmers in East Africa. Specific project objectives are: Assess the extent of use of Climate-Smart Agriculture (CSA) practices; Conduct spatially explicit monitoring and modelling of land health and agronomic suitability as well multi-dimensional trade-off analysis to identify locally appropriate CSA practices; Implement and appraise the most promising CSA practices at the local level to identify perceived benefits and barriers to adoption as well as if/how these vary by socially differentiated groups; and Up-scale and out-scale CSA activities in East Africa through strategic policy and development partnerships. Most notably, the project aims to inform and collaborate with PRELNOR as the outcome pathway for these activities.

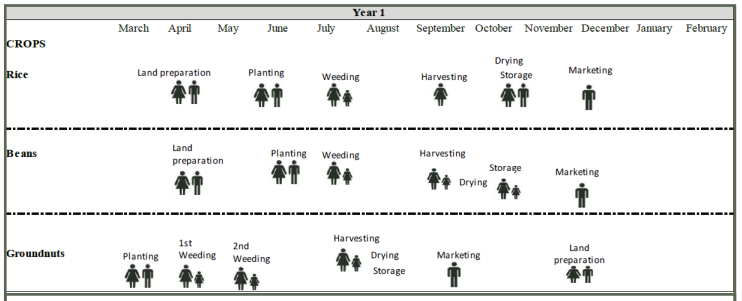
Visit our blog: http://ciatblogs.cgiar.org/support/finding-the-right-mix-of-climate-smart-solutions-in-east-africa/

***Our Approach** is to integrate participatory and systematic methodologies to establish baseline assessments and conduct interdisciplinary analysis to identify barriers, constraints and opportunities for CSA practices across diverse landscapes in order to implement and out-scale locally appropriate practices.*

Climate-Smart Agriculture Rapid Appraisal (CSA-RA): A Prioritization Tool for Locally Appropriate CSA Practices

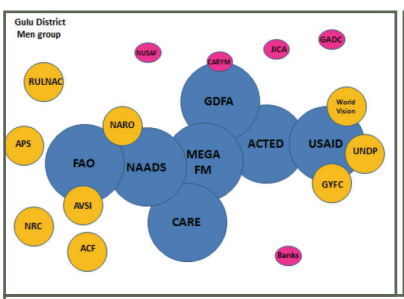
The CSA-RA was conducted across four districts in the Acholi subregion in Northern Uganda (see above figure) in February 2014. Objectives of the CSA-RA included: 1) To obtain a preliminary understanding of the farming systems, household characteristics, land tenure, and other important agriculture-related features; 2) To assess major challenges and constraints faced by farmers (i.e., climate variability, land health, specific cropping and/or livestock issues, markets, etc.); 3) To identify current CSA, agronomic, and land management practices; 4) To identify farmers' perceptions of weather patterns (e.g., climate variability) and its perceived impact on agricultural production; 5) To inform site selection of and health surveys and demonstrations of CSA practices.

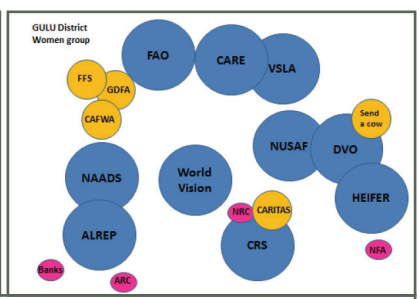
Visit our blog highlighting gender:
http://ccafs.cgiar.org/research-highlight/initial-research-highlights-importance-gender-food-security-innovations#.U9in2RaxHyc



Crop management activities for the three most important crops identified by the men's group in Nwoya district Uganda. Symbols indicate who undertakes the activity. This highlights that women provide most labour for agricultural activities.

Key findings of the CSA-RA included: Gendered differences in institutional mapping of resource and information flows (see figures below); gendered differences in cropping systems for home consumption and cash crops; as well as climate variability perceptions over time. Demonstration plots were visited and assessed informing processes for future agricultural activities.





Institutional mapping and information flows produced by male and female groups in Gulu district highlights gendered differences. Blue = high, yellow=medium,and pink = low importance, as ranked by participants.

High labour cost and demand (see figure above), decreasing interest of youth in agriculture (as youth are opting for off-farm employment) have negative impacts on post-conflict recovery and agricultural growth.

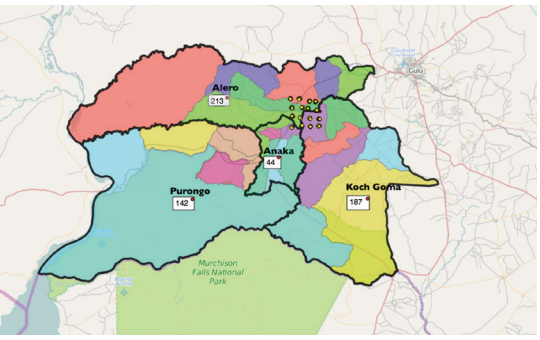
The CSA-RA manual,reports and data areis available for download on the Harvard Database under CIAT-CCAFS Adaptation Projects

OPEN ACCESS HERE: http://dx.doi.org/10.7910/DVN/28703

Co-location of Land Health and Household Surveys

In order to assess social-ecological processes in landscapes to better understand opportunities for CSA outscaling, we co-located biophysical field surveys with gender dis-aggregated socio-economic household surveys.

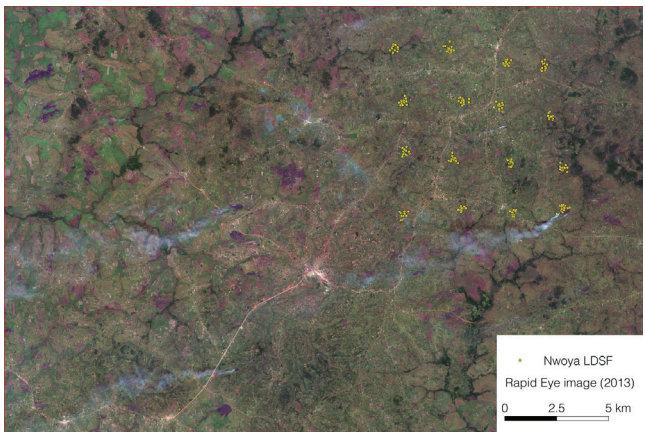
Ongoing: Intra-household Gender Survey



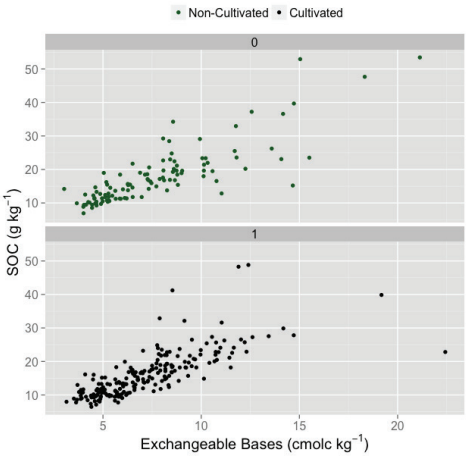
The main objective of the survey is to enhance the understanding of gendered climate change perceptions and impacts, as well as adaptation and coping strategies for agricultural across the Nwoya district. A randomized stratified (by sub-district and parish) sampling design was employed to assess the variability across the entire Nwoya District (see figure on the left). A total of 565 households will be surveyed (1130 persons). This survey is a modification of the IFPRI intra-household gender survey conducted in the CCAFS Climate Smart Villages, and can be used to quantify household characteristics within Nwoya, as well as conduct cross-site comparisons. Training of enumerators took place in Gulu in November 2014 and the ongoing surveys are planned to finish in February 2015. Data entry is ongoing.

Preliminary Results: Land and Soil Health Assessment

Land health surveys were conducted in Nwoya in 2014 using the Land Degradation Surveillance Framework (LDSF). The LDSF is a spatially stratified, randomized sampling design, developed to provide a biophysical baseline at landscape level and a monitoring and evaluation framework for assessing processes of land degradation and effectiveness of rehabilitation measures, over time. Each LDSF site has 160-1000m^2 plots that are randomly stratified among 16-1 km^2 sampling clusters (see figure on the right, RapidEye Imagery of the site, notice the smoke from local fires, over 64% of the sampled plots were impacted by fire). This hierarchical randomized sampling design allows for statistical modeling of key landscape variables in order to assess the health of the ecosystem.

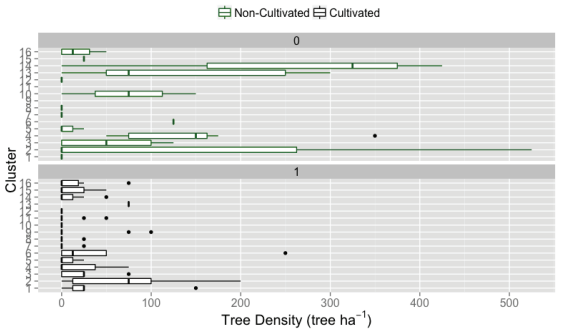


Maintaining soil fertility is important for overall productivity, including agricultural productivity. The graphic below left highlights the relationship between soil organic carbon (SOC) and exchangeable bases in cultivated (n=104) and non-cultivated plots (n=53). SOC is an important indicator of soil health as it integrates multiple soil parameters and responds to land use change and management strategies.



Soil erosion is an important indicator of land degradation. Modeled estimates show an average erosion prevalence of about 50 % for the site, but with large variations between sampling clusters. Relationships between erosion, soil fertility and management practices will be explored.

Tree (woody vegetation over 3 m tall) densities were measured for each plot in the site. Average tree densities were low overall across the site, with higher tree densities in non-cultivated plots (80 tree ha^{-1}) than in cultivated plots (19 tree ha^{-1}) (see graphic on the right). These data will be used to assess the feasibility of agroforestry systems within the district. LDSF data will be further explored and soil maps will be generated.



Stay tuned:

1. *PRELNOR Initiative in Uganda*
2. *Shamba ShapeUp episodes in 2015 will highlight resilient CSA farming systems promoted in the IFAD project*
3. *CSA-RA manual will be highlighted as a CCAFS Tools for CSA Prioritization*
4. *Project activities in Tanzania are highlighted here: http://www.ciatnews.cgiar.org/2014/12/05/down-to-earth-data*
5. *Linking indicators of land and soil health with key socio-economic metrics at the household level*