

# CIAT-CCAFS: Biophysical Field Survey Update

Playing out transformative adaptation in CCAFS benchmark sites in East Africa: When, where, how and with whom?



## Biophysical Survey at the Lushoto Benchmark Site, Tanzania

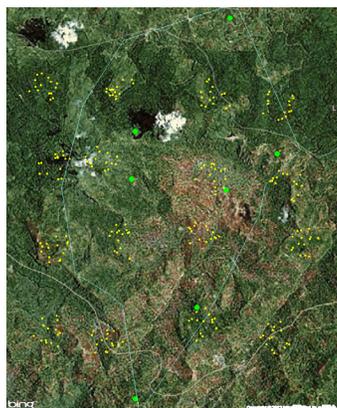
by Leigh Winowiecki, 10 October 2012

### Field training for biophysical baseline

Leigh Winowiecki, through CIAT-TSBF, hosted a field training in the Karura forest, Nairobi in September 2012. Participants included: ILRI-CCAFS technician Phillip Kimeli; CIAT intern, Maafaka Ravelona; Kenyan NGO technician, Samuel Shilajiro; and IITA driver, Moses Kamau (Photo right). Participants were trained in biophysical field survey methods including GPS navigation, tree and shrub measurements, as well as soil sampling.



Field training participants practicing soil sampling techniques.



The biophysical field survey in Lushoto, Tanzania began on 3<sup>rd</sup> October 2012 and is expected to finish by the end of the month.

In the current project, the Land Degradation Surveillance Framework (LDSF) is being adapted to assess ecological and soil metrics relevant for climate change adaptation and mitigation strategies. Due to the complex nature of ecosystems, multiple perspectives are needed to understand ecosystem processes and spatial variability across the landscape. A nested hierarchical sampling design is useful for developing predictive models of ecological and soil variables including: erosion prevalence, tree and shrub densities, infiltration capacity and dynamic soil properties such as, soil organic carbon and pH.

LDSF sampling plots (yellow circles (n=160) at the Lushoto Benchmark site. Green circles indicate the CCAFS village center points for the 140 household surveys.

The Lushoto site covers the majority of villages surveyed for the CCAFS household baseline assessment and a wide range of landforms and land cover typologies (Image left).

### Collaboration

This CIAT-CCAFS project is collaborating across CGIAR centres including CIAT, ICRAF and ILRI, as well as with the national agricultural research institute, Selian, (SARI), based in Arusha, Tanzania. George Sayula, SARI scientist, and Elizabeth Msoka from the Lushoto District Agricultural Office traveled to all 16 clusters within the Lushoto Benchmark site with the field team to introduce the project to local officials and farmers. Local farmers will be involved in the survey.



Leigh Winowiecki demonstrating field texture methods at the Lushoto site.

Interdisciplinary analysis linking household baseline survey data with the biophysical assessment will be conducted in order to better understand potential climate change adaptation and mitigation strategies within the Lushoto benchmark site.



George Sayula, SARI scientist describing the remaining forest fragments within the Usambara Mountains.

### Landscape Heterogeneity

The Lushoto site is located within the Usambara Mountains, which encompasses multiple land uses, including intensive vegetable production, subsistence maize, bean and cassava cultivation, as well as forest fragments. Understanding landscape-scale dynamics is essential when addressing soil and ecological constraints to agricultural productivity.



Landscape panorama from the Lushoto site in the Usambara Mountains, illustrating the multiple land uses, steep slopes, use of exotic trees on farms and native forest fragments.

Baseline household survey data indicate that farmers employ a diversity of land management strategies in response to shifts in climate as well as perceived changes in land productivity.