Project Title: Sustainable coffee-banana agro-forestry systems to adapt to climate change, enhance food security and alleviate poverty in Uganda

Researcher's Name/Organization: Dr. Godfrey H. Kagezi, NaCORI/NARO

Coffee-banana agroforestry systems

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Research Approach:

- Study aimed at: -
  - ✓ Characterize existing coffee-banana agro-forestry systems
  - ✓ Identifying major biotic & abiotic constraints of coffee & bananas
  - ✓ Identifying the existing farmers' coping strategies for the constraints
- Diagnostic surveys were conducted in 6 major coffee growing regions of Uganda - central, Mt. Elgon, Busoga, southwestern, West Nile and mid-northern
- 10 districts selected at random in each region & in each district 10 households sampled randomly
- A questionnaire was administered to the selected households
- 5 coffee & banana plants assessed for pests & diseases in each field

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Key results of your research/project so far:

- The banana-coffee agroforestry systems were characterized in 6 coffee growing regions – coffee varieties, banana cultivars and shade tree systems
  - ✓ Site-specific recommended shade trees
  - ✓ Pure stand coffee or bananas - discouraged

  - ✓ Entry point for promoting coffee and banana production in non-traditional coffee growing regions, particularly (mid-northern Uganda) – ARIBA SACCOS cooperative in Amur district
  - ✓ Promotion of propagation of shade trees – at NaCORI (*Albizia coriaria* and *Cordia africana*) and nursery operators

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Key results of your research/project so far…..:

- Major biotic & abiotic constraints and how farmers manage them identified and documented
  - ✓ Biotic – weeds, pests – black coffee twig borer (BCTB) and leaf defoliators (coffee), diseases – coffee wilt disease (CWD) for Robusta coffee & coffee leaf rust (CLR) for Arabica coffee, black sigatoka & banana bacterial wilt (BBW) for bananas
  - ✓ Abiotic - declining soil fertility & drought
  - ✓ BCTB was observed infesting cocoa in the field for the first time – has management implications
  - ✓ Red blister disease important in Robusta coffee growing regions
  - ✓ Shade trees that are alternate hosts of BCTB – *Albizia chinensis, Maesopsis eminii* and *Markhamia lutea* – management implications

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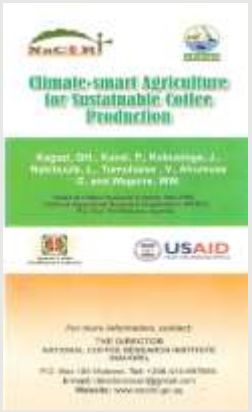
Key results of your research/project so far…..:

- Farmer training materials developed – brochures, posters



- 2 technical advices on shade trees & BCTB management generated
- 4 manuscripts submitted for publication – 1 published, 2 in press and 1 under review
- 2 MSc theses (Judith Kobusinge & Lilian Nakibuule) in Agroecology

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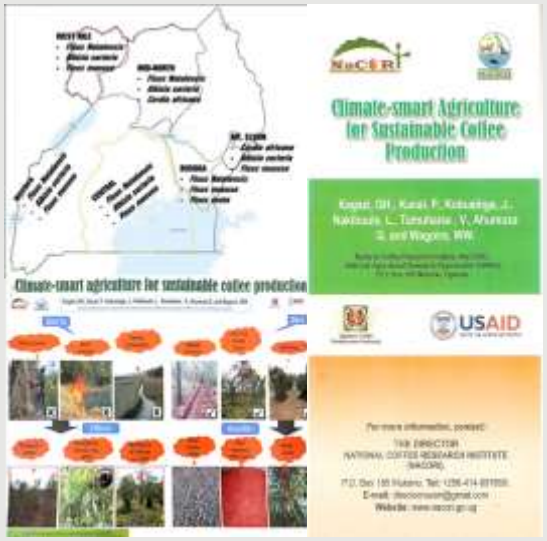
Graph or diagram showing major results of your research/project



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Top next steps for your project:

- Promoting the coffee-banana agroforestry systems in areas where they are limited scale e.g. mid-northern Uganda (PEER-USAID supplement funding secured)
- Determining site-specific appropriate coffee:banana:trees ratios using models (looking for funding)
- Establishing and promoting banana cultivars that can withstand prolonged drought in mid-northern Uganda
- Identifying other good trees for the coffee-banana agroforestry systems in areas with prolonged drought e.g. *Faidherbia albida* and *Acassia* sp.
- Promoting generation of appropriate shade trees and banana seedlings in coffee nurseries – complete package (coffee-banana-trees) for farmers

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Top next steps for your project: …..

- A 4 year - USAID-funded project (US$300,000) - Climate risk assessment in different Robusta shaded systems – one of the PEER graduates (Judith Kobusinge) to do a PhD on this project
- Chicago Zoological Society - Chicago Board of Trade Endangered Species Fund – invited a full proposal to assess the potential of conserving Red stinkwood, *Prunus africana* in agricultural matrix – beyond protected and forest remnants (in coffee-banana agroforestry systems)
- A proposal to the National Geographic Society aimed at determining the effect of termite assemblages and the ecological roles they mediate along a land-use gradient – from 'rustic (forest) coffee through coffee-banana agroforestry to 'pure' coffee

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Top next steps for your project…...:

How data and results from your project will impact stakeholder decisions and the development problem:

- Information has been developed into farmer training materials e.g. brochures, posters, leaflets, maps and video clips and streamlined into main extension services
- Technical advice documents on shade trees and BCTB management generated to inform policy
- Information used as entry point for promoting coffee and bananas in non-traditional growing regions, particularly, mid-northern Uganda
- Management of BCTB is no longer aiming at coffee only but also cocoa and shade trees

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Top next steps for your project…...:

Challenges you have faced in collecting meaningful data:

- Farmers giving wrong data, particularly size of farm and income
- Farmers & researchers not knowing some of the banana and tree species
- Modeling the three plant in the system (coffee, bananas and trees) to optimize spacing for maximum probability
- Some of the recommended shade trees may not have any other economic value e.g. *Ficus* sp.

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PEER CORE TEAM

Scientists

Graduate students

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