

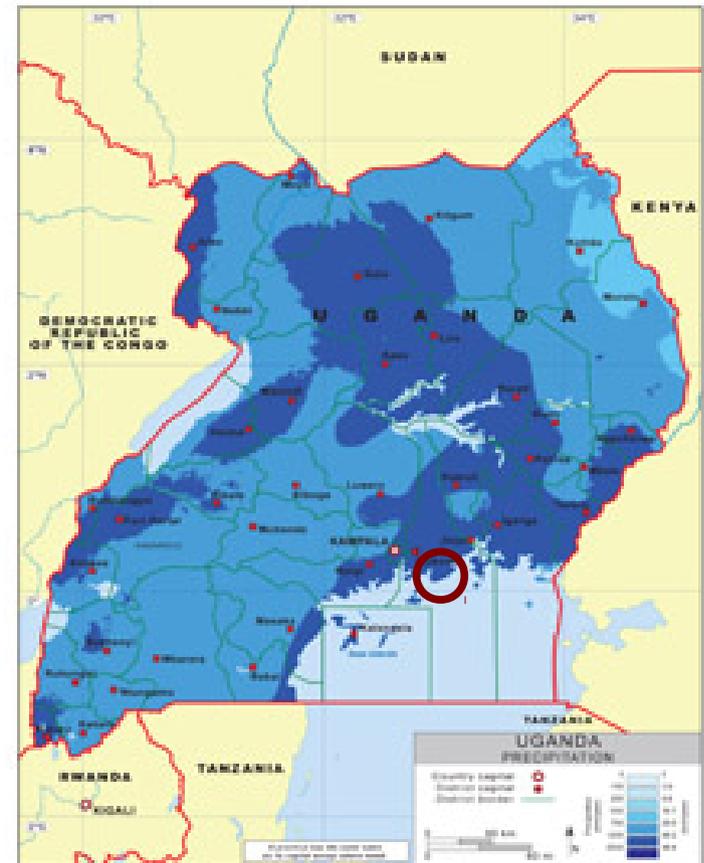
Increasing Capacity of Smallholder Farmers to Produce and Market Indigenous Leafy Green Vegetables in Uganda

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Dept of LAWR, UC Davis



Project Area

- Central Uganda
 - Elevation: 1000-1200 masl
 - Annual precipitation: 1300-1500mm
- Buikwe and Mukono Districts (4 subcounties)
 - Few commercial vegetable producers
 - Near cities, but poor road network
 - Farming system: Banana / Coffee
 - Maize and beans also common cash crops



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Setting the scene

- New and local/regional markets are promising for small farmers to earn living
- Farmers have limited access to market information and are susceptible to bad business deals
- Difficulty to negotiate contracts: small amounts of produce, inconsistent quality, and unreliable transportation
- Extension usually focused on crop production, not on markets
- Market chain approaches bring actors together to create mutually beneficial activities, stimulate joint innovation among market chain actors around shared ideas and demand-oriented interactions
- Market knowledge feeds back into effective production decisions

Linking participatory extension approaches to improve transition from production decisions to marketing success

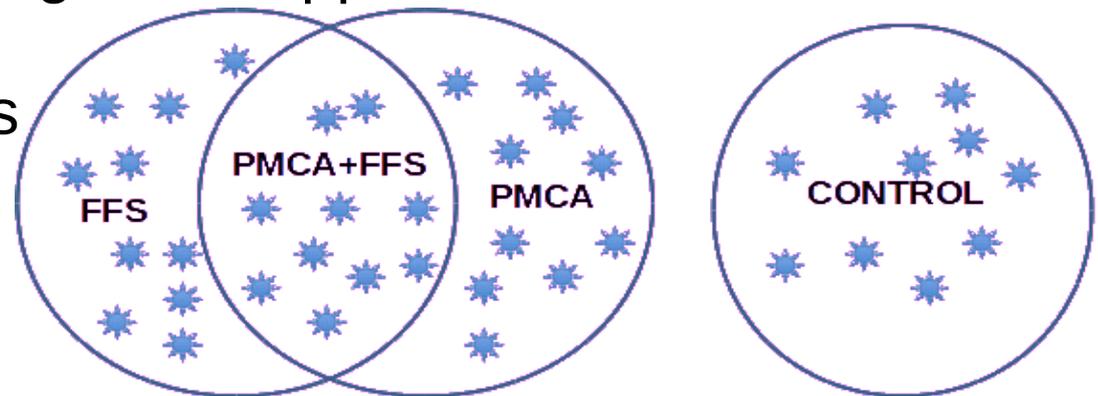


Farmer Field Schools (FFS) – Concern that improved production practices don't result in uptake without corresponding market access

Participatory Market Chain Assessment (PMCA)– Concern that market chain approaches exclude small holders who have not yet commercialized production

Goal: To find ways that integrating these approaches stimulates

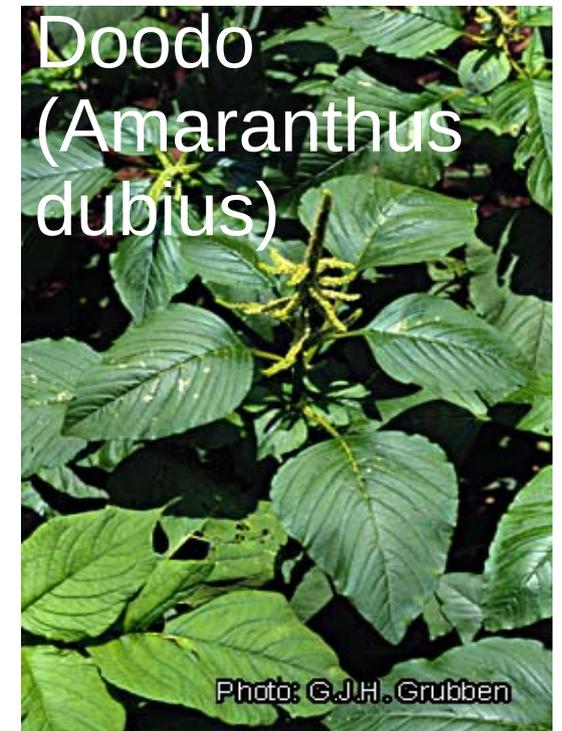
- a) Markets to integrate smallholders as new entrants
- b) Smallholders to begin producing new crops as an enterprise



Four major themes have emerged

- 1) Strengthening participatory extension approaches that link knowledge of markets with production decisions
- 2) Building knowledge base for soil fertility management of indigenous vegetables
- 3) Building capacity via participatory learning and research, and evolving “students into teachers”
- 4) Sparking entrepreneurship: creating small businesses and new partnerships around indigenous vegetables





Multiple partners



- Farmers 400 in 40 farmer groups
- Facilitators 5 (out of total of 10 trained)
- UC Davis (Kate Scow, Johan Six, Mark van Horn, Heidi Ballard, Stephen Boucher; students: Abraham Salomon, MS Sean Kearney, PhD Lauren Pincus)
- National Ag Research Org (NARO) in Uganda (Beatrice Akello, Peter Lusembo, Molly Allen, Losira Nasirumbi, Damalie Magala, Winfred Nakyagaba)
- National Agriculture Advisory Services, Dennis Yiga
- Makerere University, Kampala (Prossy Isubikalu, Peter Ebanyat, MS students: William Sessemate, Nassib)
- Uganda Christian University, Mukono (Michael Masanza, 8 interns)
- The Rural Agency for Sustainable Development in Nkokonjeru (Sam Mwebe, Ignitius Bwoogi, Edith Nagenda)
- World Food Logistics Organization (Lisa Kitinoja w/Diane Barrett)

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Adoption via Participatory Extension (FFS)

Fertility Amendments:

Participatory research trials, market representatives for each group, modification of local amendments

- ~75% of FFS participants using some kind of fertility amendment on their own vegetable plots after FFS
- Increase of almost 30% in proportion of participants using some fertility amendment
- 4 times increase in plot size (~48 m² at baseline to ~200 m² after FFS)



Adoption via Participatory Extension (FFS)

Marketing

Comparing FFS graduates at baseline vs end of FFS:

- ~60% of FFS participants now selling vegetables from their individual plots
- ~70% of participants that sell greens are women
- >5 times increase in income per plot

More than 87% of sales venues within rural areas (trading centers, rural towns, village stalls, etc)



Participants' View – What positive changes occurred

1) Developing community seed systems:

Most FFS groups developed local supply systems in response to poor availability and quality

2) Improved Diets and Household Health

-About 1/3 of participants report improved diet/health as one of the most important changes caused by participating -

3) Improved household income & consumption

- Participants reported a major change caused by participating is better access to income for both daily needs (soap, sugar, medication, etc) (~40%) and school fees (~12%)

4) Friendship

-The most commonly reported positive change



Nutritional Impacts: Protein

Adopting even very small Nakati production can have a significant effect on improving protein nutrition of children.

1. Average increase in plot size of about 150 m².
2. Assuming about ½ is sold, this equals about 150 kgs per season for the household
3. Nakati contains 4+% protein in the leafy portion*
4. An under-10 year old child requires ~20 grams of protein per day**
5. 500 grams (a small bundle of greens) per day satisfies 100% of the child's daily protein requirement

* Vegetables. Volume 2 of Plant Resources of Tropical Africa. Editor: Gerardus J. H. Grubbe; Publisher PROTA, 2004 ISBN 9057821478, 9789057821479 (P 472)

** CDC, <http://www.cdc.gov/nutrition/everyone/basics/protein.html>

Per 100g Fresh Leaves:

Calcium - 523mg	Iron - 6mg	Niacin - 1.8 mg	Ascorbic Acid - 67 mg
Phosphorous - 94 mg	Thiamin - 23 mg	B-Carotene - 6.4 mg	Riboflavin - 44 mg

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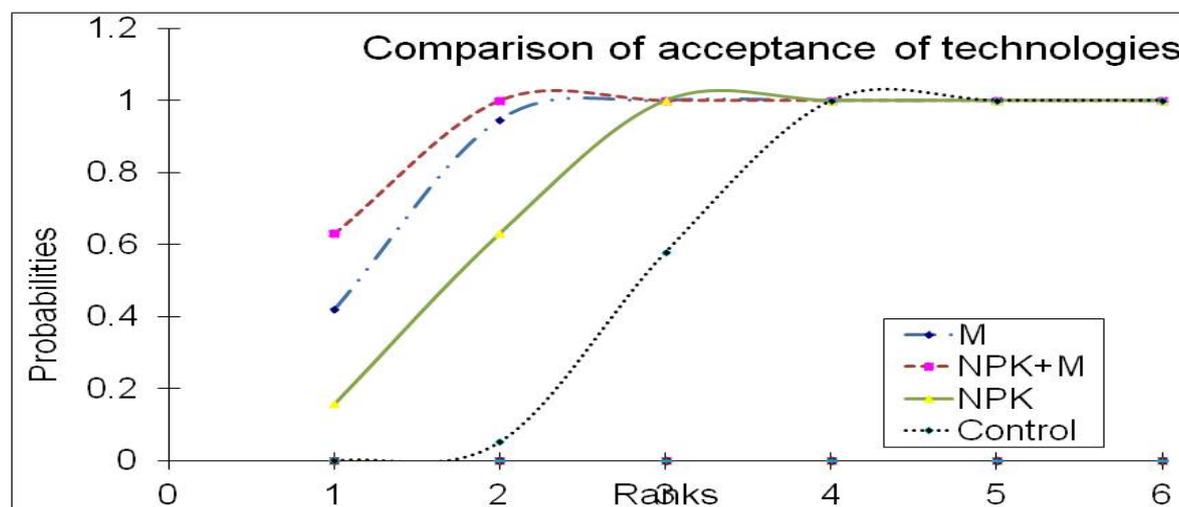
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- 1) Sparking entrepreneurship: small businesses around indigenous vegetables (mobile irrigation others?)



MS thesis research at Makerere U
(William Sekamete w/ 2 undergrads):
 Determining fertilizer response curves
 for indigenous vegetable “Nakati”
 -Biomass yield response to
 combinations of organic/ inorganic
 fertilizers
 - Use efficiencies and profitability of
 applied
 nutrients
 -On-Farm trials for farmers’ preferred
 organic amendments



farmers’ preference to fertilizers



PhD Research at UC Davis—
Lauren Pincus

- Quantifying yield constraints of Nakati
- Understanding interactions between soil properties and soil amendments on yields & agronomic efficiency
- Assessing adoption of ISFM from participatory research



Collaborative research between
UC Davis and Makerere University

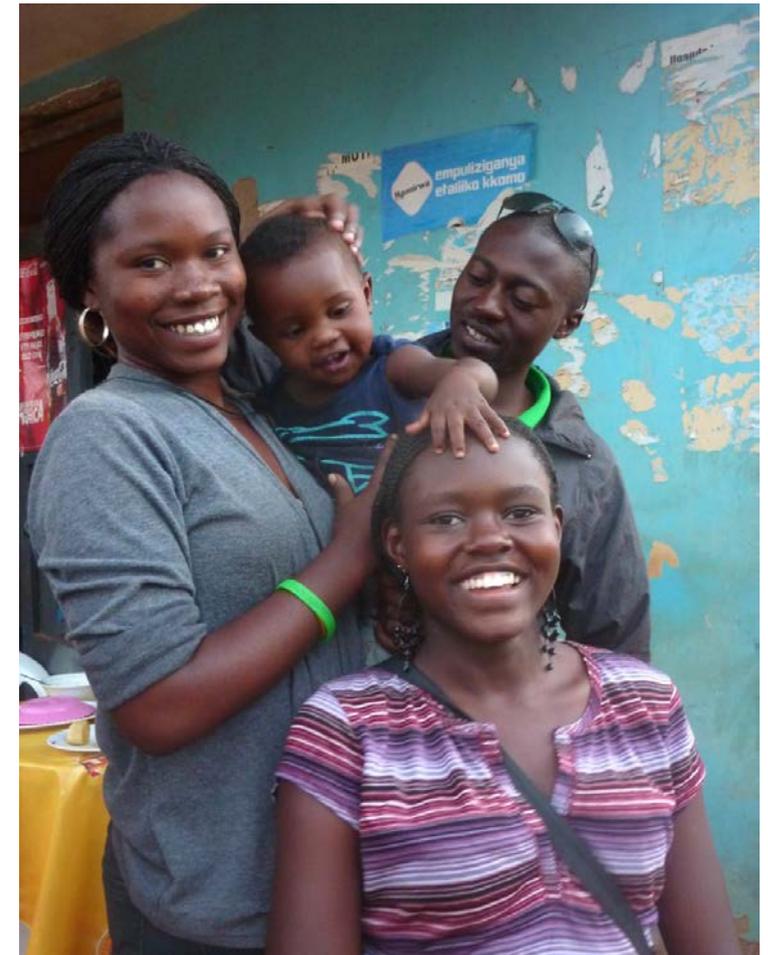
- Effect of charcoal / ash / burning on growth of Nakati
- Chemical characterization of charcoal and comparison to industrial biochar



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- 3) Building capacity via participatory learning and research, and evolving “students into teachers”**
- 4) Sparking entrepreneurship: creating small businesses around indigenous vegetables (mobile irrigation, seeds, others?)



Capacity Building at All Levels

Farmers:

Farmers training farmers

FFS combines classroom and field learning for “experiential” learning experience for farmers. Gain research skills through group plots

Build business connections in local community

Facilitators trained:

11 ag professionals trained as certified facilitators + 20 farmer leaders

Educational institutions:

2 student internships, 5 special projects and 4 volunteers at UCU

2 Makerere M.S. students, 2 UCD grad students (MS and PhD)

Ugandan and US co-advising of graduate students, links to IITA scientist

Post-Secondary Training: 5 high school grads as project assistants

Research professionals:

Building research and leadership skills among young MUZARDI staff

Guiding grad and undergrad students

Postharvest training for MUZARDI staff member with Kitinoja/Barrett project

Assoc Director of MUZARDI (female) promoted to institute

Private sector

Training of local NGO staff in organizational & leadership skills, budget and accounting



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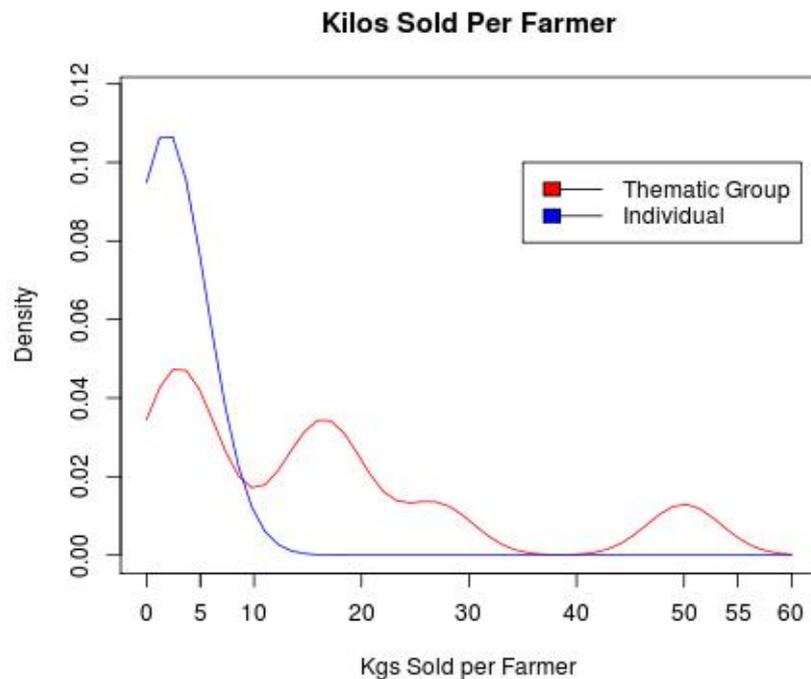
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Sparking entrepreneurship:

1. Seed production and marketing group established, trained, and registered as a CBO – “*Nkokonjeru Seed Packers*”
2. Over 120 kgs of seed sold
3. Working agreement with an international seed company (Kenya Seed Co. / Simlaw Seed Co.) to supply seasonally (up to 500kg)
 - Seed Quality: Uniform tan color, heavy, no spots or lesions, recently harvested (<3-4 months), lack of extraneous materials



Seed Marketing Group



Outcomes - Integrated participatory approaches

NGOs/CBOs adopting leafy greens production & marketing support among their client farmers



Katente – Onward Uganda Farmers Association

Buleega Village

Mobile Irrigation Technology

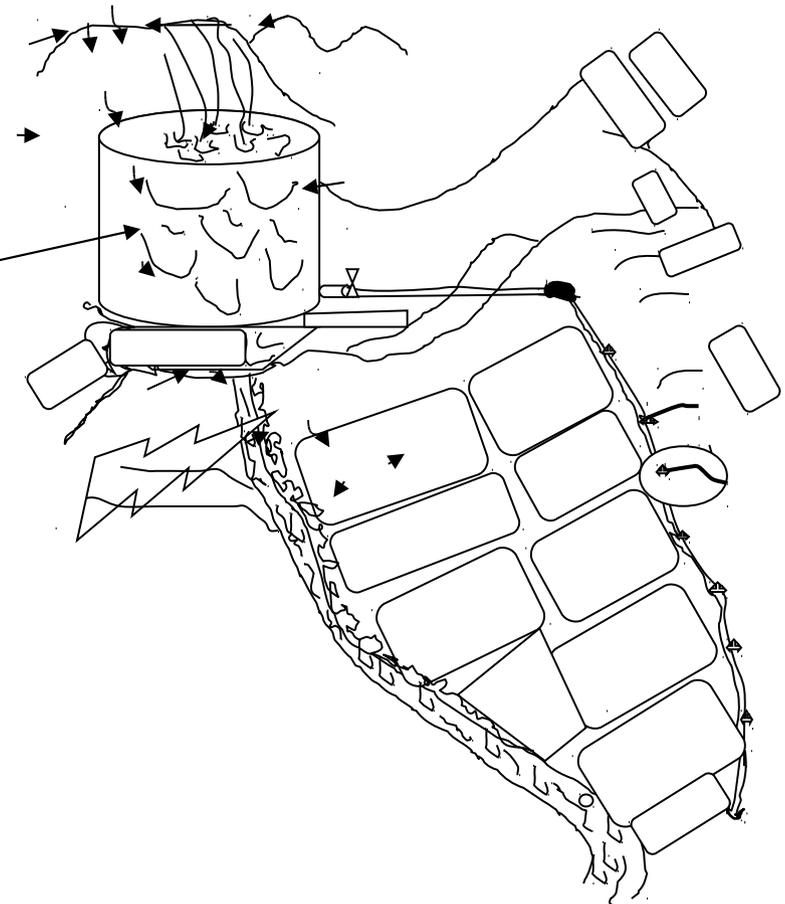
- Worked with local Savings and Credit Cooperative (SACCO) to allow farmers to access irrigation equipment on lease
- Guarantee fund for groups qualified to pilot
- Currently in R&D to improve the system and develop it into commercial business model
- Working with technology development lab at UC Davis to improve system

Private sector company developed from the project's irrigation pilot



NEW LINKAGES TO OTHER INSTITUTIONS

- 2 workshops on irrigation held in partnership with the Zonal Agric R&D Institutes (ZARDIs)
- 9 irrigation schemes developed for representative sites in Uganda
- 2 collaborative research projects developed linking UC Davis and National Agricultural Research Organization (NARO) scientists



Conclusions

Small is Beautiful: Market interventions for non-commercial farmers should be able to target small, local, but regular sales

This may result in some of the biggest gains in women's economic empowerment and uptake of technologies

Non-commercial farmers need special considerations in market development: not a simple matter of sharing information on market standards, information, and spreading contacts

Structural barriers are large for these farmers e.g: land access, domestic opportunity cost, poor supporting markets (transport, labor, inputs)

Horticulture markets may need to establish better standardized rather than tacit links: poor trust and collaborative interest between farmers and traders implies market governance is a key issue here

Seed marketing group success suggests potential for improved market participation if sales are based on standard knowledge

How can unregulated horticulture markets become more standardized?

Conclusions

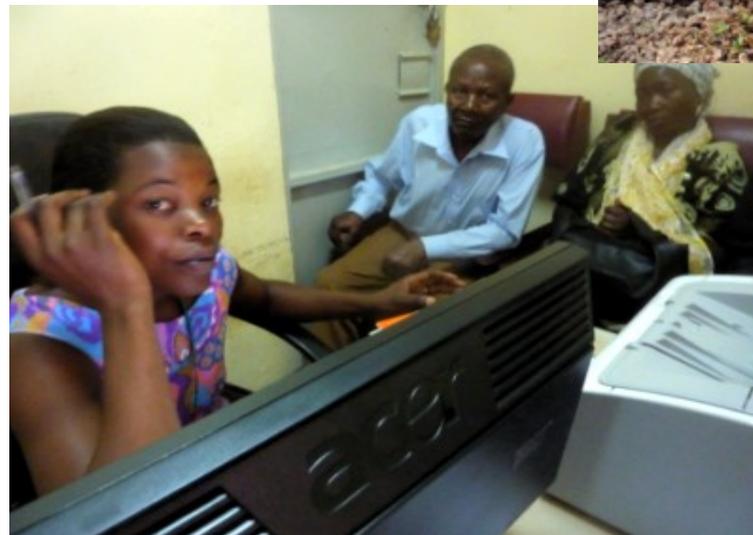
Its all about the people:

Without commitment from a few entrepreneurial participants, there would be far less to show.

Ensure the right people are in the room

Give them the incentive to take risks

Leverage resources through them wisely



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