

Up-scaling resilience enhancing agricultural innovations for food and nutrition security in semi-arid Kenya

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Innovating for resilient farming systems



McGill

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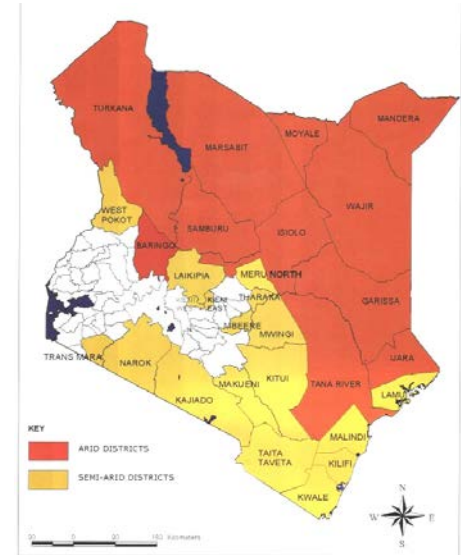
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Photos: IDRC/PANOS, Sven Torfinn

Research Context

- Semi-arid Eastern Kenya, **7.5** million hectares and **20%** of the population
- Characterized by:
 - Low and poorly distributed rainfall (range 400 to 850 mm)
 - Poor fertility and degraded soils
 - Low yields
 - Frequent and severe droughts, crop failure and food insecurity
 - Frequent food aid/famine relief



Challenges Addressed

- Low innovation and adoption rates
- High levels of poverty (approximately 60%)
- Persistent food insecurity
- Environmental degradation
- Poor nutrition status, particularly women and children
- Poor producer-market linkages



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Research Questions

- How to accelerate adoption of technological innovations to improve agricultural productivity and food security?
- How to build resilience in the farming systems through diversification of high value traditional (orphan) crops?
- How to improve utilization of locally available nutritious foods?
- How to enhance market development to create demand for technologies and improve incomes?
- How to influence resilience-enhancing policies?



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Methodological Framework

Participatory Learning and Action Research : Innovation platform bringing together farmers, researchers and other stakeholders to jointly analyse issues, identify constraints and opportunities, seek and develop solutions, and implement and evaluate these solutions, in an iterative learning-action cycle.



Integrated Assessment : Applying a systems-thinking approach to understanding the contextual factors (environmental, organizational, inter-personal, intra-personal) affecting innovation to generate new and integrated insights for research, policy and practice.

Implementing Partners

**Kenya Agricultural
Research Institute**

*Project coordination and
implementation*

McGill University

*Project coordination and
implementation*

**Kenya Medical
Research Institute**

*Research in Nutrition and
Health*

**State Department
of Agriculture**

*Farmer mobilization, up-
scaling and policy support*

Farmer Groups

*Learning partners, sharing
farming experiences, Providers
of land and labour input*

**Freshco Seed
Company**

*Seed production, seed business
development and farmer
training in seed production*

**Cascade
Development**

*Participatory Market
Development*

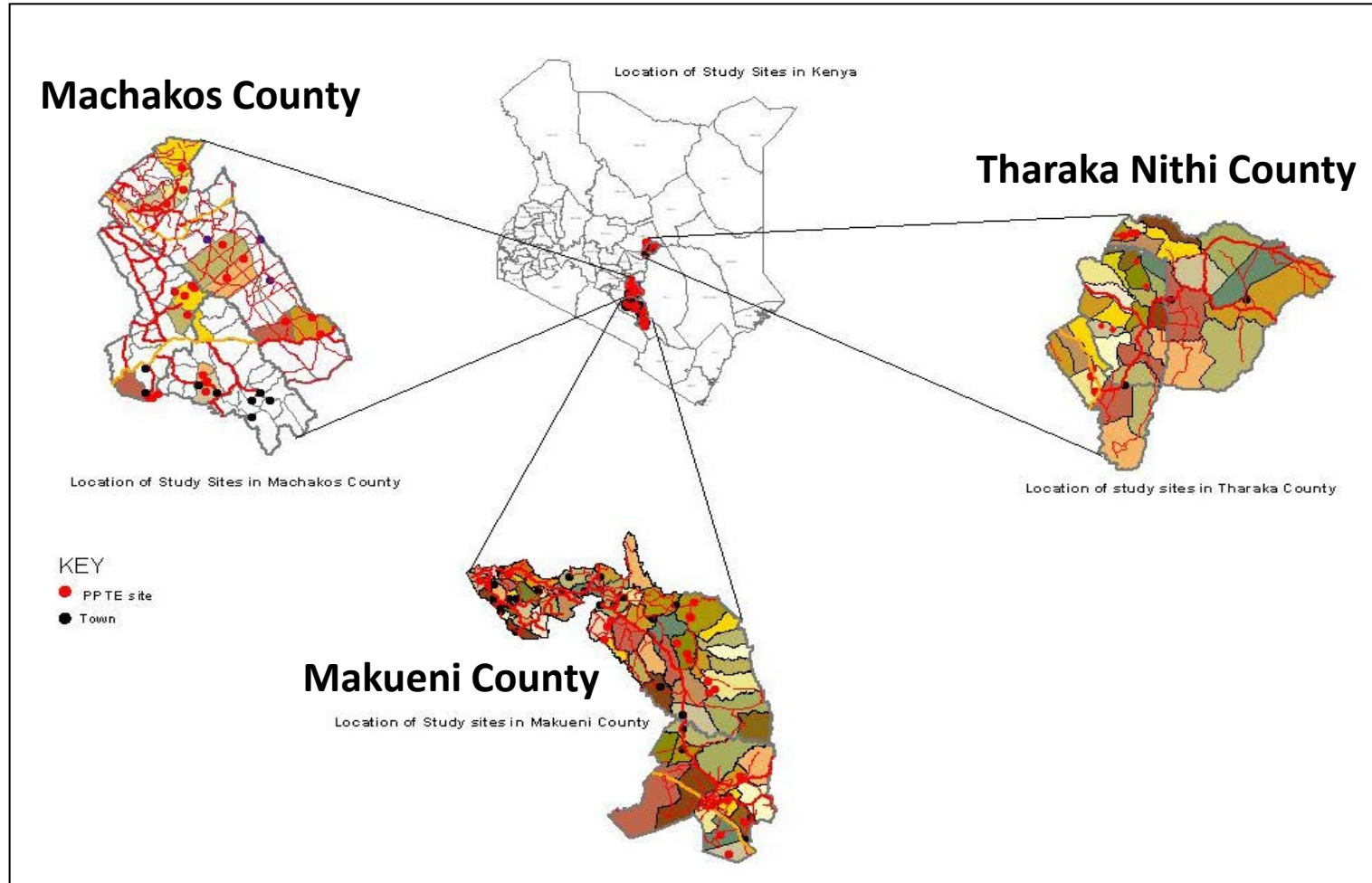
Local Universities

*Contribution to research
through studentships*

**Provincial
Administration**

Community Mobilization

Three Project Sites



Nutrition and Health Baseline Survey

- 23.8% stunting levels in children (6-36 months)
- 14.4% women underweight
- 64.2% women have medium & low dietary diversity
- 86% households with severe food insecurity
- 80% purchase foods on credit (coping mechanism)



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Implementation

- **Scoping** done to characterize study area and inventory available technologies (>70)
- Consolidated into **16** main technologies
- Participatory selection of **8** priority technologies by farmers (**316 M** and **684 W**) in focus group discussions
- Formation of **Primary Participatory Technology Evaluation (PPATEs)** or peer learning sites in each county
- Recipients of knowledge from Primary sites formed **Secondary groups (SPATES)** that practiced the lessons through selected technologies



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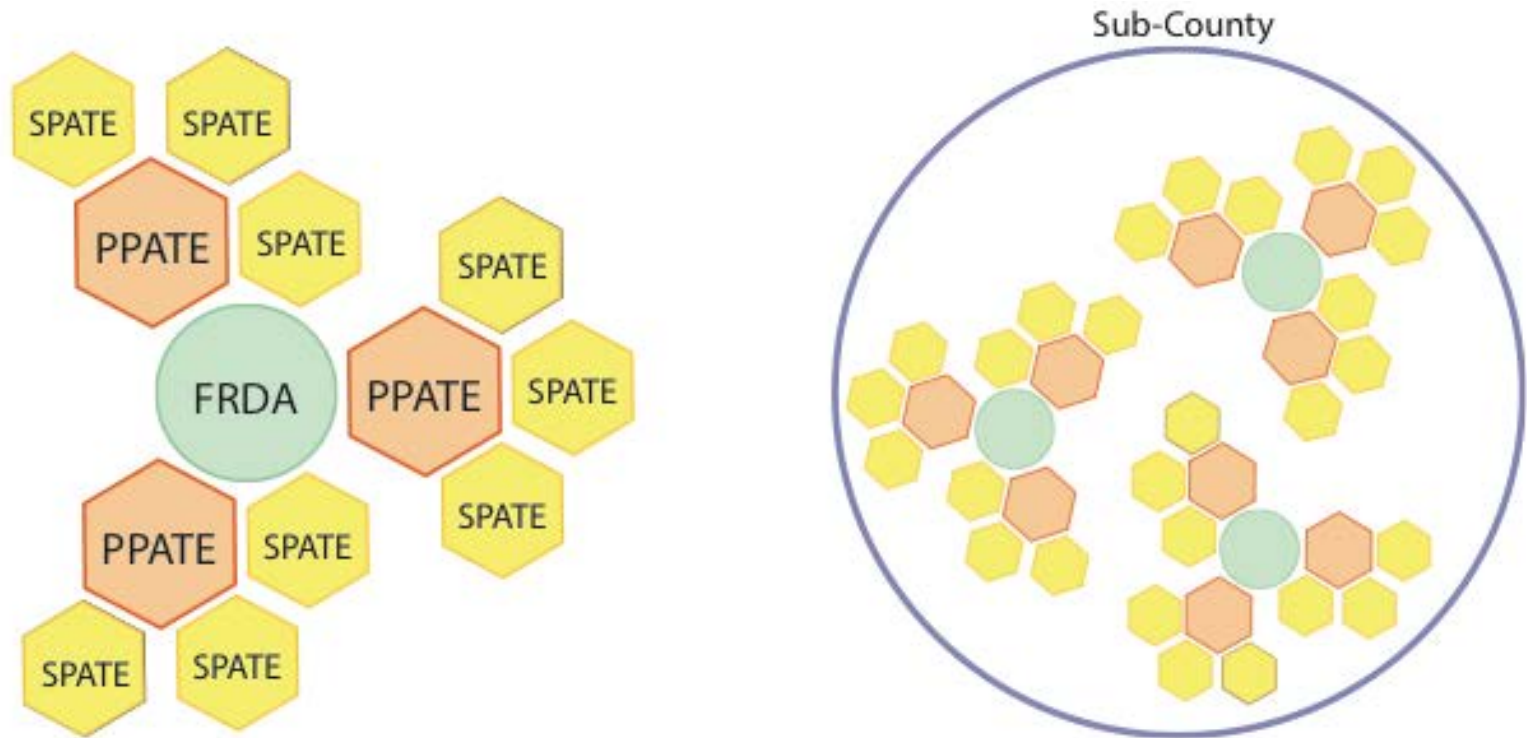
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Implementation (2)



Initial Technologies



Natural Pasture Improvement



Grain Amaranth



Cassava



Napier Grass



Pigeon Peas



Green Grams



Drought tolerant and early maturing maize



Dolichos Lablab



Cowpeas



Beans



Sweet potato



Gadam Sorghum



Millet



Indigenous Chicken

Participatory Assessment & Selection of Technologies



Makueni FFD, February 2014

Assessment criteria:

- Potential to contribute to resilience of the farming systems
- Contribution to income diversification and stabilization to household food and nutrition security
- Contribution to equity at household as well as at community level

Participatory Assessment & Selection of Technologies (2)

Mwala County - Kavumbu FRDA

Mwala County - Kavumbu FRDA				
October 2011			August 2013	
Rank	Technology	Scores	Technology	Scores
1	Sweet potato	8.49	Indigenous Chicken	9.06
2	Cowpeas	8.30	Fodder & forages	8.94
3	Beans	8.25	Green grams	8.94
4	Maize	7.96	African leafy vegetables	8.94
5	Indigenous Chicken	7.86	Sweet potato	8.63
6	Sorghum	7.64	Beans	8.38
7	Green grams	7.63	Cowpeas	8.38
8	Cassava	7.52	Natural pasture improvement	8.00



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Results

- Peer learning and extension through **54** Primary farmer groups (753 F and 498 M) and **216** Secondary groups (6,000 farmers)
- **121** Farmer Nutrition Champions trained to sensitize community on good nutrition and consumption of local high value crops
- **3** farmer groups trained by FRESHCO on production of high quality assorted seeds worth Ksh 4,121,730 (CAD 51,521)
- **18** Market opportunity farmer groups (MOGs) formed and trained to facilitate collective produce marketing



Crop technology evaluations and field activities



**Evaluation activities with
PPATEs**



**SPATEs harvesting green grams on
farm**

Up-scaling, field days, farmer exchange visits



Tomorrow's farmers



Farmer exchange visit



Results (2)

- Increased awareness and allocation of land area for high value legume crops (**20 – 67%**)
 - green grams, cowpeas, pigeon peas, and dolichos
- **Increased usage** of manure/fertilizer combinations and water harvesting practices
- Improved produce prices by **more than 50%** when collectively sold
- **11 MSc and 5 PhD** students trained



Comparison of improved technologies vs. farmers' practice



Agronomic Practices



Farmers' Traditional Practices

Results (3)

Scaling up of technologies using the PPATE-SPATE model

- *Increases the socioeconomic impact of technologies to larger scales of coverage to benefit more people and to foster policy and programme development:*
 - The process is geared towards ensuring that more (poor) farmers benefit from access to and effective use of agricultural technologies
 - It is a process that expands, replicates, adapts to sustain and reach a greater number of people
 - It is part of a broader process of innovation and learning
 - The process is not linear but an iterative and interactive cycle



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Results (4)

Dissemination of research results through field days



Makueni FFD, February 2014

Year	No.	Attendance		
		Men	Women	Total
2012	13	1334	1229	2576
2013	4	441	790	1235
2014	7	610	1244	1854
Total	24	2385	3263	5665

Results (5)

Capacity building for Trainers-of-Trainers

Type of Training	Gender/Number Trained		
	Men	Women	Total
Nutrition champions	41	80	121
Indigenous chicken service providers	24	37	61
Agro-forestry	6	4	10
Post-harvest handling	50	72	132

Success stories... many!

Francis Mutua:

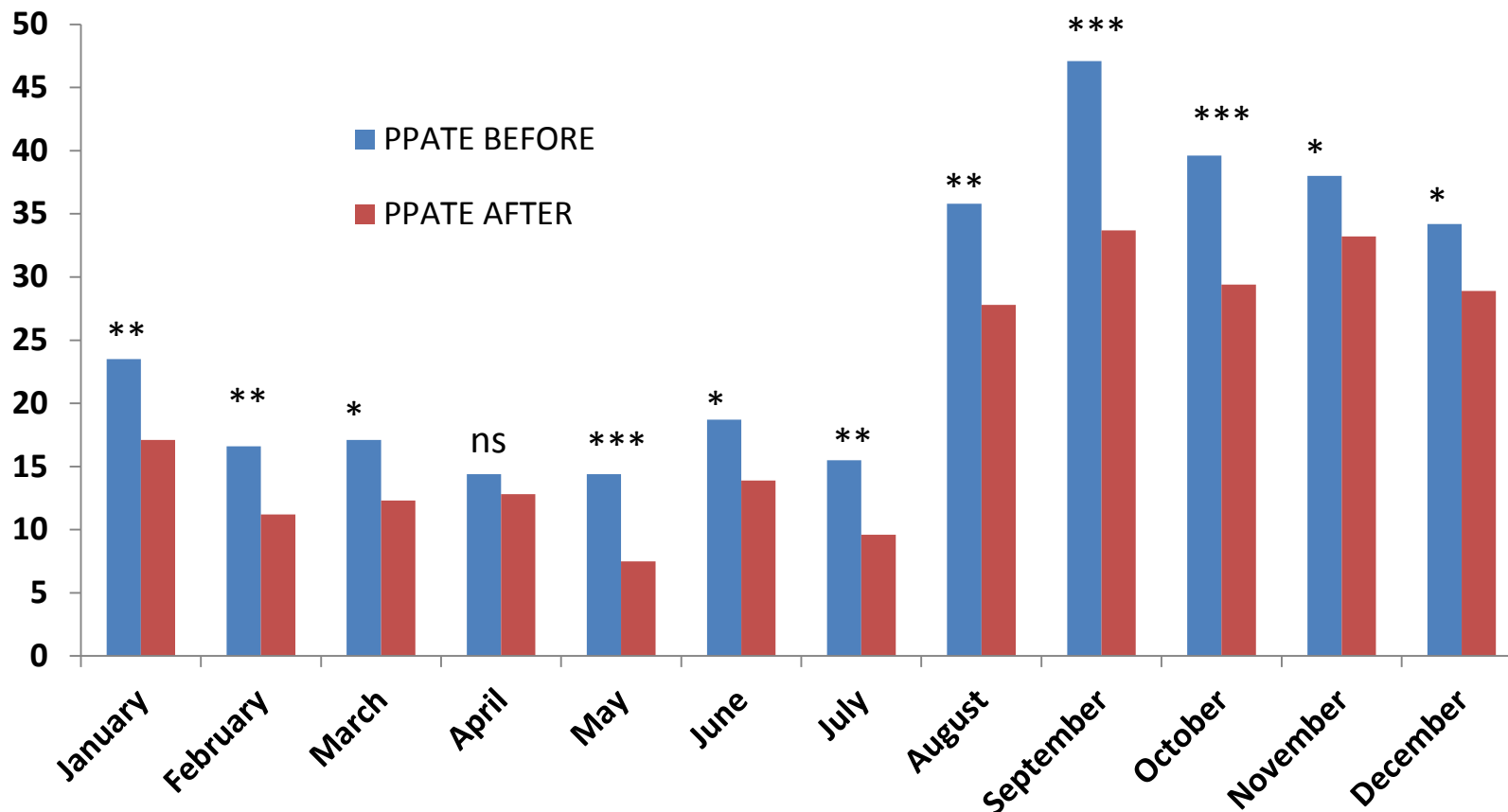
“My neighbours are my constant visitors at my farm and have been emulating the use of improved technologies and I am happy for they appreciate what I do”



Francis used to harvest **30-50 kg/acre** of green grams
and currently **450 kg/acre**

And, what about food security...?

Percentage of households with insufficient food in given months
(2011 and 2013/2014)



*** P < 0.01, ** P < 0.05, * P < 0.10 [McNemar's test (one-tailed test)]

Key Messages

- Among the different methods of knowledge transfer, ‘learning by doing’ is appropriate for farmers to learn and internalize
- Access to input and output markets are key drivers to adoption of technologies in semi-arid farming systems
- Continuous sensitization of farmers on potential opportunities empowers them to make informed choices



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Key Messages (2)

- Increased trust and communication facilitates the information flows required for system innovation
- Food security and resilience are complex challenges and decentralized approaches are essential
- Need for enhanced partnerships across institutions and better contextualized enabling policies for long term success
- How to sustain and scale up success using existing resources?



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Thank you

