



# Environmental Change and Maize Innovation in Kenya: Exploring pathways in and out of maize

Policy implications  
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## Maize study as window

We used maize as a 'window' through which to analyse the dynamics of environmental, social and technical change in 'innovation systems' in Kenya

Phase 1: Characterising and analysing responses to dynamic changes in different agroecological settings

Phase 2: Multicriteria mapping of 'pathways in and out of maize'

- Traced 'innovation pathways' in maize and other crops, and the responses of various actors to rapid environmental, social and technical change
- How these assumptions frame research and policy agendas and steer solutions and resources in particular directions

## Why maize in Kenya

•Concerns about the effects of climate change present an *opportunity* to open up the debate about alternatives, both within maize-based agriculture and out of maize to other crops or livelihood options

•‘Why maize?’ → ‘Lock in’ to the dominant maize pathway; revealing alternative pathways

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•‘Resilience’ and scale?

- ‘High potential’ – hybrids/intensification and commercialisation/aggregate production and national food security
- ‘Low potential’ – OPVs/ diversification/ context responsiveness

•‘Parallel universes’? – innovation systems and upward linkages from farmers to breeders and donors

## Methods and study sites

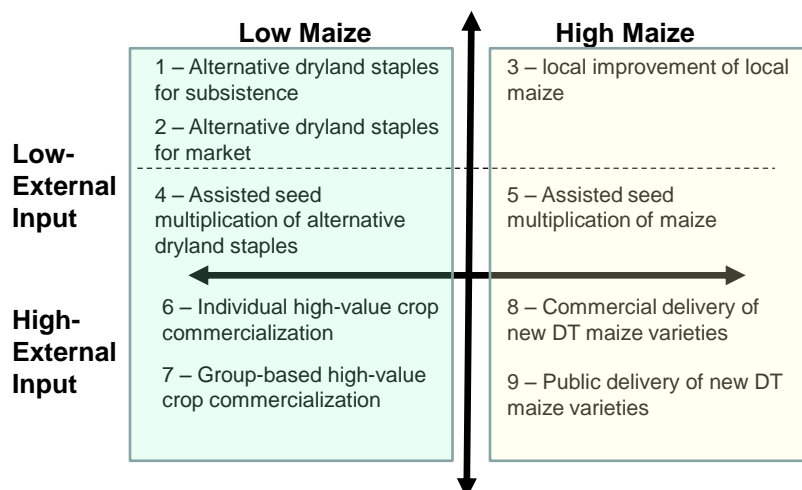
1. **Exploring ‘resilience’, ‘innovation’ and ‘pathways’** and testing concepts in relation to maize in Kenya
2. **Interviews with key actors** engaged in work on maize R&D, adaptation to climate change, food security, etc.
3. **Field and panel data comparative studies** – 3 sites Sakai, Lugari and Nakuru (*low, (medium), high potential*)
  - Sakai, Mbooni East District: ‘low potential’ zone; seed selector interviews; feedback meeting.
  - Mmbasu, Likuyani Division, Lugari District, Western Province – ‘high potential’ zone; feedback meeting.
  - Why Sakai? Increased frequency and intensity of droughts in Eastern Kenya
4. **Mapping ‘pathways in and out of maize’** (based on field and panel studies and key informant interviews)
5. **Analysing pathways and what facilitates/inhibits access to them based on stakeholder criteria** (using Multicriteria Mapping)
6. **Integration, analysis, policy engagement and dialogue**

## Exploring Pathways in and out of Maize

- Fieldwork findings were distilled into a set of **9 core pathways in drought-prone farming regions (e.g. Sakai)**:
  - Reliance on internal/external inputs** → including local vs. certified seed (OPVs, hybrids, etc.) and their sources (informal vs. formal channels)
  - Reliance on maize as key crop**
  - Diversification out of maize** → other key crops ('orphan' dryland staple crops, horticulture)
  - Range of pathways** – analysing pathways in and out of maize;
  - Critical examination of **alternative visions of the future and institutional arrangements**



## Typology of Pathways



See Briefing Paper 3 for details



## Dominant Pathways

- ***Orphan or Sibling crops***
- ***High value-High risk crops (Horticulture)***
- ***Formal-informal Maize Seed Systems***



### ***Dominant Pathways (1): Orphans or siblings? Alternative dryland staple crops***

- Traditional' crops, new pathways
- Climate change as an opportunity: time to re-think 'orphan crops'
- Focus on markets, not taste preferences
- 'flagship' initiatives/breeding programmes, e.g DTMA and WEMA- understand 'what is happening on the ground?'
- Challenges: market barriers and opportunities
- Addressing markets for *both* maize and non-maize crops-reduce maize dependence



### Sorghum farmers, Sakai

“Kenya’s beer industry is turning to sorghum ... to reduce its longstanding reliance on the more expensive barley. Brewers have started substituting some of their imported raw materials in partnership with local sorghum farmers.”



## *Pathways within maize (2)* Living in parallel words? Bridging informal and formal seed systems

- Informal seed systems: not just a last resort
- Building on the informal? Assisted seed multiplication and storage
- Farmer seed selectors: vital link in the chain
- Bridging formal and informal seed systems- a ‘two pronged approach’
- Existing and new policies and regulations for local seed systems
- Challenges: quality control and continuity of supply



### Seed selector, Sakai

“On seed selectors... the law is silent. But we know they are there. They play an important role in food security” (Regulator, January 2009)

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## ***Pathways out of maize (3)*** **Getting the high value without the high risk? Horticultural crops**

- New crops, traditional constraints (access to water, cost of inputs, post harvest storage/markets)
- Much potential, much uncertainty
- Challenges - reducing the risk:
- Value chain (VC)strengthening and ‘scaling-up’--investment in VC required



## ***Dominant Pathways- Summary of Policy issues and options***

### **Orphan or Sibling crop**

- Support local value chain development
- Biofuel development -dual purpose (sweet sorghum)
- Research, production and distribution of improved seed

### **High value-High risk crops (Horticulture)**

- Access to information on pricing
- Technical expertise for planting
- Incentive structure-on water harvesting-Sand dams

### **Formal-informal Seed Systems**

- Capacity building-interlinking formal and informal system-on production, storage and distribution
- Regulating informal systems-CAP326 – the seeds and plant varieties act
- R&D in preservation and conservation of local varieties



## ***Pathways in and Out of maize: Climate change as an opportunity***

- Climate change presents an *opportunity* to re-think existing policies and practices
- Why do farmers' think their local varieties are better?
- Participatory plant breeding (PPB) 'has not died'-workable PPB methodology?
- Maize in a system: multiple roles, different circumstances
- Beyond 'lock in': maize security ≠ food security
- Importance of markets: key entry point
- Resilience through diversity: opportunities, but many constraints...

# Thank You!

## STEPS Centre links

STEPS Briefing Papers by John Thompson, Sally Brooks, Molly Morgan, Erik Millstone, Hannington Odame, Francis Karin and Andrew Adwera

[1: Environmental Change and Maize Innovation Pathways in Kenya: Seeking Resilience through Diversity \(pdf 100kb\)](#)

[2: The STEPS Pathways Approach \(pdf 70kb\)](#)

[3: MCM Maize Project Method \(150kb\)](#)

[4: Maize Security does not equal Food Security? Breaking the 'Lock in' to the Dominant Maize Pathway \(340kb\)](#)

[5: Orphans or Siblings? Opportunities and Constraints in Alternative Dryland Staple Crops \(pdf 460kb\)](#)

[6: Living in Parallel Worlds? Bridging Formal and Informal Seed Systems \(230kb\)](#)

[7: Getting the Value Without the High Risk? The Rise of Horticulture in Sakai \(336kb\)](#)

STEPS Working Paper 36 by Sally Brooks, John Thompson, Hannington Odame, Betty Kibaara, Serah Nderitu, Francis Karin and Erik Millstone

- [Environmental Change and Maize Innovation in Kenya Exploring Pathways In and Out of Maize \(pdf 817kb\)](#)