



RESEARCH  
PROGRAM ON  
Roots, Tubers  
and Bananas

# Framing policy options for seed market development for low-middle-income countries

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Participatory Plant Breeding and Resilient Seed System Development: Options for Stakeholder Engagement and Benefit Sharing

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# Terms and terminology

**Seed system:** A generic phrase that describes any system in which propagation materials for crops, trees, forages, livestock, and fish are produced, conserved, exchanged, and used.

**Seed system policy:** The set of laws, regulations, guidelines, programs, schemes, conventions, and investment choices that together shape the acquisition, production, conservation, and use of propagation materials for crops, forages, trees, livestock, and fish

**National seed policy:** A statement of principles that guide government action and explain the roles of relevant stakeholders in the coordination, structure, functioning and development of the seed sector. It also serves as the overall framework for regulatory instruments, such as the seed laws and related regulations.



# Why framing matters....

- “Those who defines the problem also define the solution...”
- How we frame the topic determines how we identify the problem, understand different perspectives on the problem, and negotiate towards solutions
  - Direction (objectives), distribution (equity), diversity (defining values)
- Multiple framings exist around seed systems development
  - Biological/technological framing
  - Economics/market framing
  - Political economy/policy process framing

# Why look at VPCs

- Not by maize alone.... VPCs important for food security and local supply chains
- Under represented in the study of seed systems
- Genetic complexity (> grains)
- Distinct reproductive crop biology – vegetative propagation
- Accumulation of seed (and soil) borne diseases
- Bulky and perishable



Banana, cassava, potato and sweetpotato Credit: RTB





# A standard biological/technological framing

VPC seed systems development is often framed as a question of biology

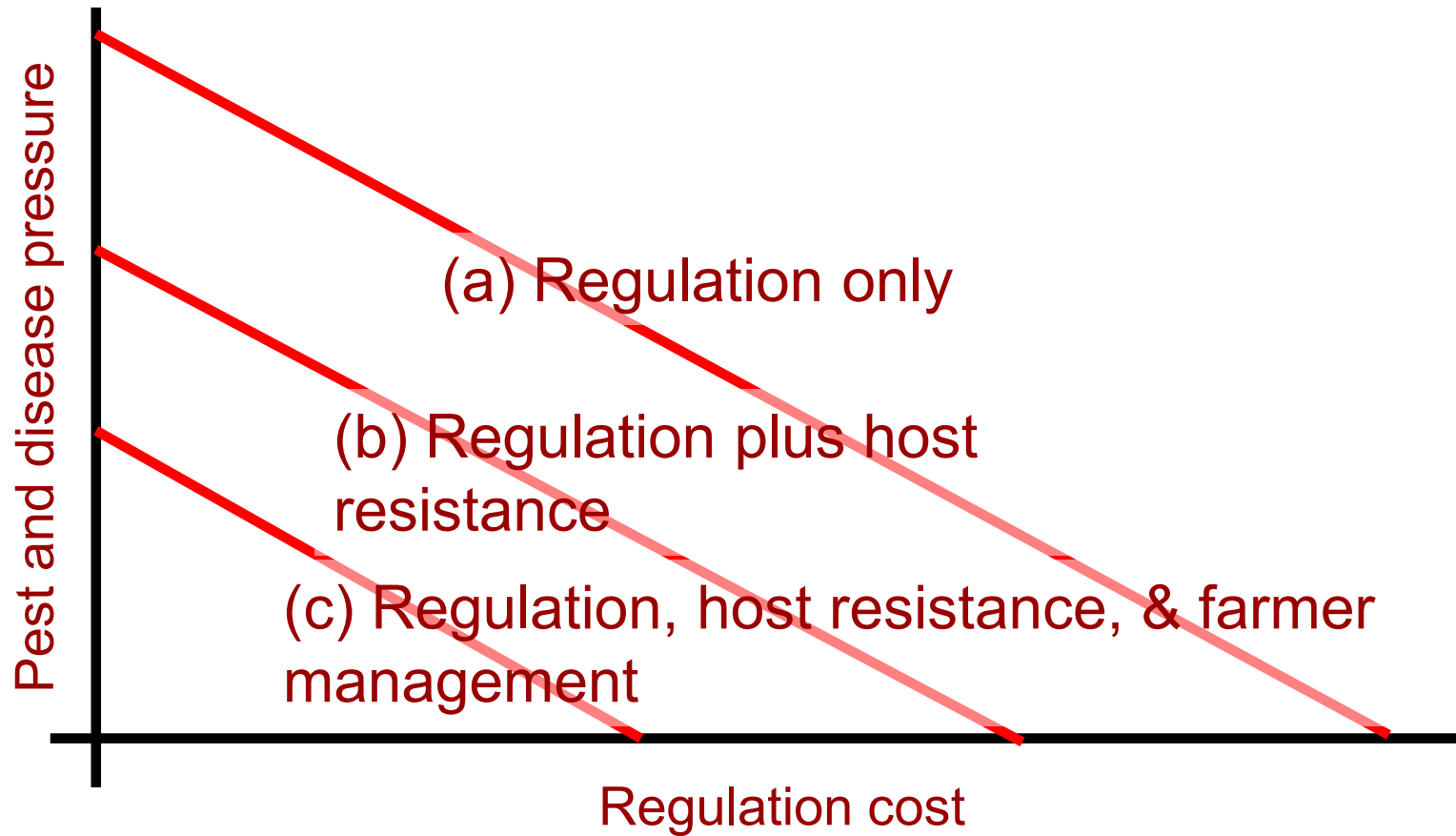
*“How do we optimize seed production systems to deliver the highest possible quality of propagation material to farmers?”*

- Optimize production
  - Source superior genetics
  - Optimize reproductive biology: choose the right propagation system
  - Invest in specialised techniques and equipment
  - Centralize/decentralize seed production units
  - Manage time and seasonality of production
  - Minimize costs of production (multiplication rates)
- Optimize quality assurance
  - Comply with isolation distance requirements
  - Manage soil, pest, and diseases carefully
  - Farmer management practices e.g. positive & negative selection
- Optimize distribution
  - Bulkiness and perishability → Identify storage and transportation solutions



Sweetpotato planting material: bulky, perishable, and expensive to transport long distances, Lake Zone, Tanzania. Credit: M.McEwan

# Policy and regulation are only part of the story



# An economics framing of seed systems development

- An economics framing of seed systems development emphasizes the process of allocating scarce societal resources to the production, distribution, and use of seeds and traits
- Scarce resources
  - Money: farmer income, seed producer revenues
  - Common property: Ex and in situ genetic resources, information
  - Scientific capital: Breeders' time and effort
- Allocation mechanisms
  - Markets – spot markets, input supply contracts, forward contracts, etc.
  - Barter – fencepost/brownbag exchanges between farmers
  - Collective action – community seed banks, cooperatives, etc.
  - Transfers – Government-financed seed distributions, emergency relief
  - State – Government ownership of the means of (seed) production

# The market as an allocative mechanism

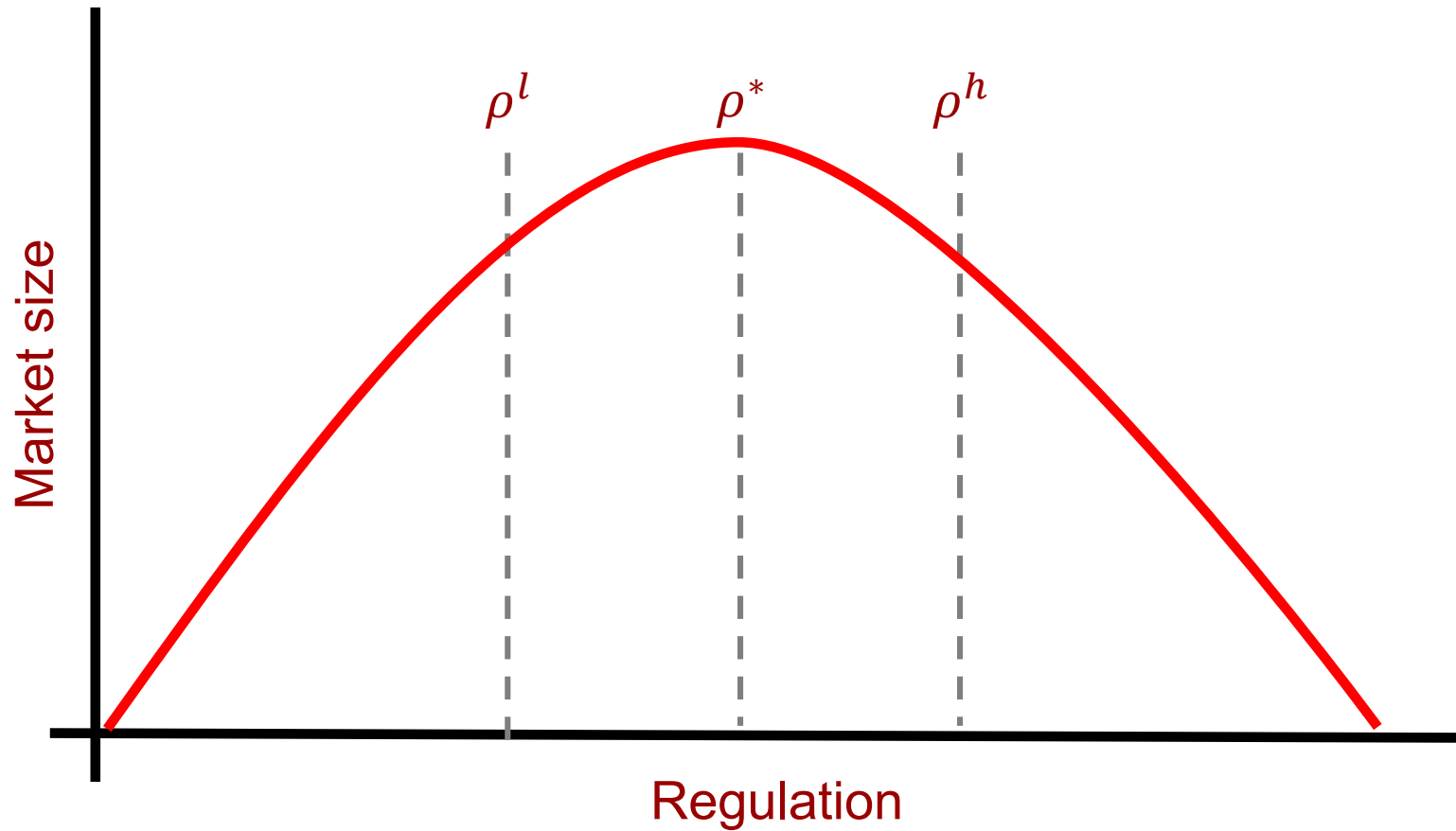
- Markets: The first-best (“efficient”) way of allocating resources *if and only if* the markets are perfectly competitive
- But rarely are seed markets perfectly competitive
  - **Information asymmetries:** Farmers cannot easily observe the traits embodied in a seed or the quality of that seed at the time of purchase
  - **Weak regulation:** Weak regulation allows for the entry of low-quality producers and rent seekers who exploit markets for short-term gains
  - **Risk and uncertainty:** Variable and unknown probabilities discourage farmers from participating in markets for seeds and traits
  - **Insufficient demand:** For various reasons, expected returns to new traits and seeds may not be sufficient to encourage uptake, resulting in thin markets
  - **Government distortions:** Input subsidy schemes and emergency seed relief regularly disrupt seed market development by distorting incentives
  - **Monopolistic competition:** Breeders’ rights and plant variety protection afford seed companies with temporary monopoly power, forcing competitors to compete on attributes other than genetics



# Regulation can address market imperfections

- **Quality assurance regulations:** Quality assurance guidelines, regulations, procedures aim to reduce information asymmetries between seller and farmer, thus encouraging the entry of bone fide, high-quality producers and discourage the entry of low-quality producers Consider costs, time, and effort spent on regulatory compliance
- **Breeders' rights:** IPRs that allow innovators to recoup their investments in R&D by granting temporary rights over a share of the gains from innovation
- **Farmers' rights:** IPRs that allow farmers to recoup their stewardship and investment in varietal selection and biodiversity conservation by providing a formal benefit-sharing mechanism of monetary and/or non-monetary value
- **Anti-trust regulation:** Regulations that aim to reduce non-competitive practices by industry actors and reduce entry barrier to the market for seeds and traits

# Regulation may improve the market, but only up to a point





## Other mechanisms to address market imperfections

**Financial mediation:** Credit, insurance, and other financial services and products reduce the costs and risks to farmer participation in markets for seeds and traits

**Demand creation:** Promotion, popularization, and extension programs that create effective demand for seeds and traits when farmers' willingness to pay is low, information is unavailable, or behaviors and preferences constrain demand

**Market interventions:** Input subsidy schemes and emergency seed relief that “distort” market incentives to encourage the uptake of seeds and traits when willingness to pay is less than marginal cost of seed production

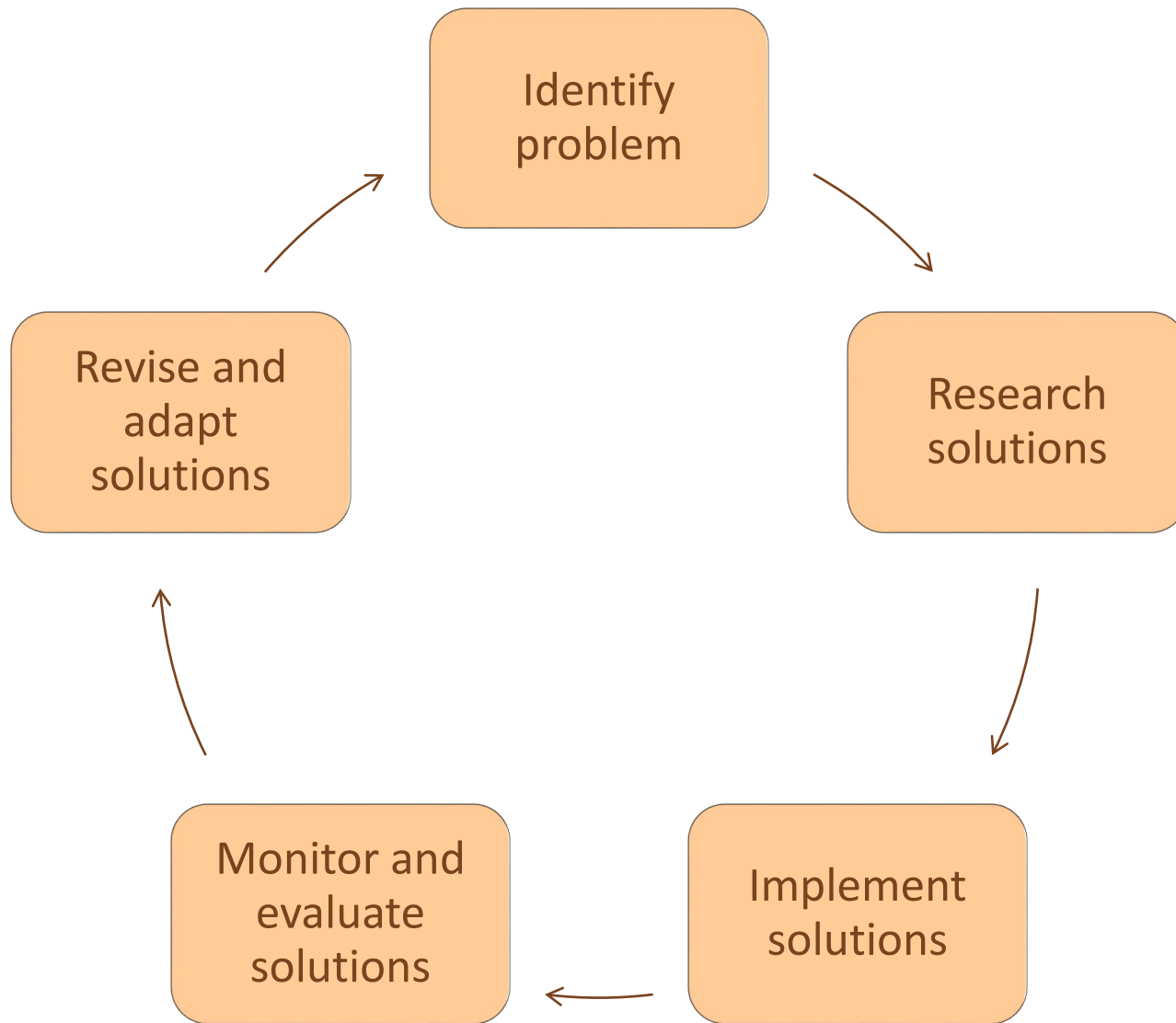


## The policy problem

Public policies for seed system development seeks to strike a balance between multiple approaches, objectives, and outcomes across diverse contexts

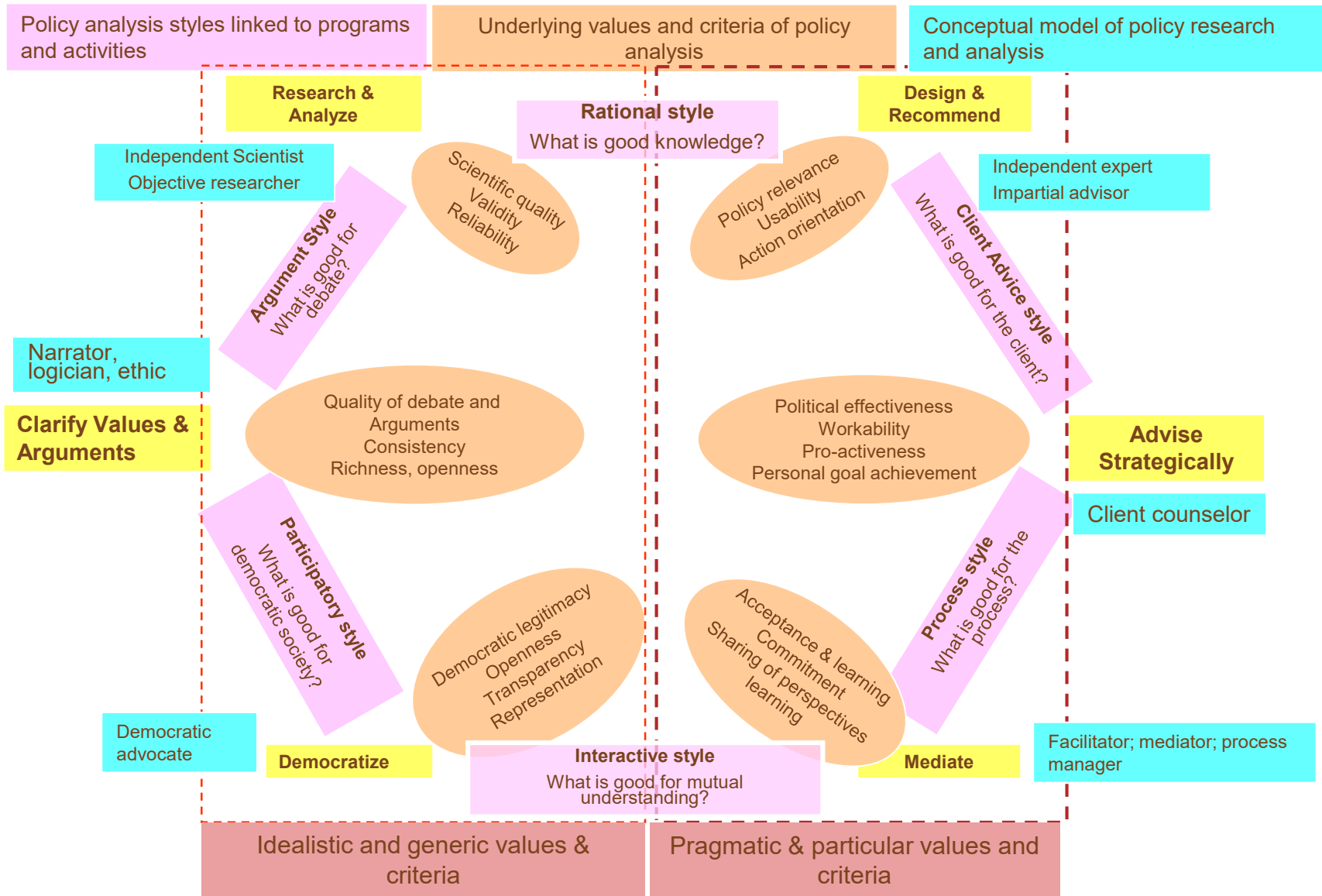
- Past experiences highlight the challenge in
  - Identifying appropriate roles for public, private, and civil society sectors
  - Advancing market liberalization vs. market deregulation
  - Integrating formal and informal seed system integration
  - Promoting improved varieties vs. conserving biodiversity
- Seed system policy must ultimately address
  - Vast diversity inherent in seed systems
  - Governance and management systems
  - Regulation and conservation
  - Property rights, access, and benefit sharing
  - Capacities of seed system actors
  - Sustained financing and investment
  - Context, context, context

# The conventional policy change cycle





# The more realistic view of policy change



Source: Mayer, I.S., van Daalen, C.E. and Bots, P.W.G. (2004), Perspectives on policy analyses: a framework for understanding and design. *International Journal of Technology, Policy and Management* 4(2): 169–191; Graphic courtesy of H. Elliott.

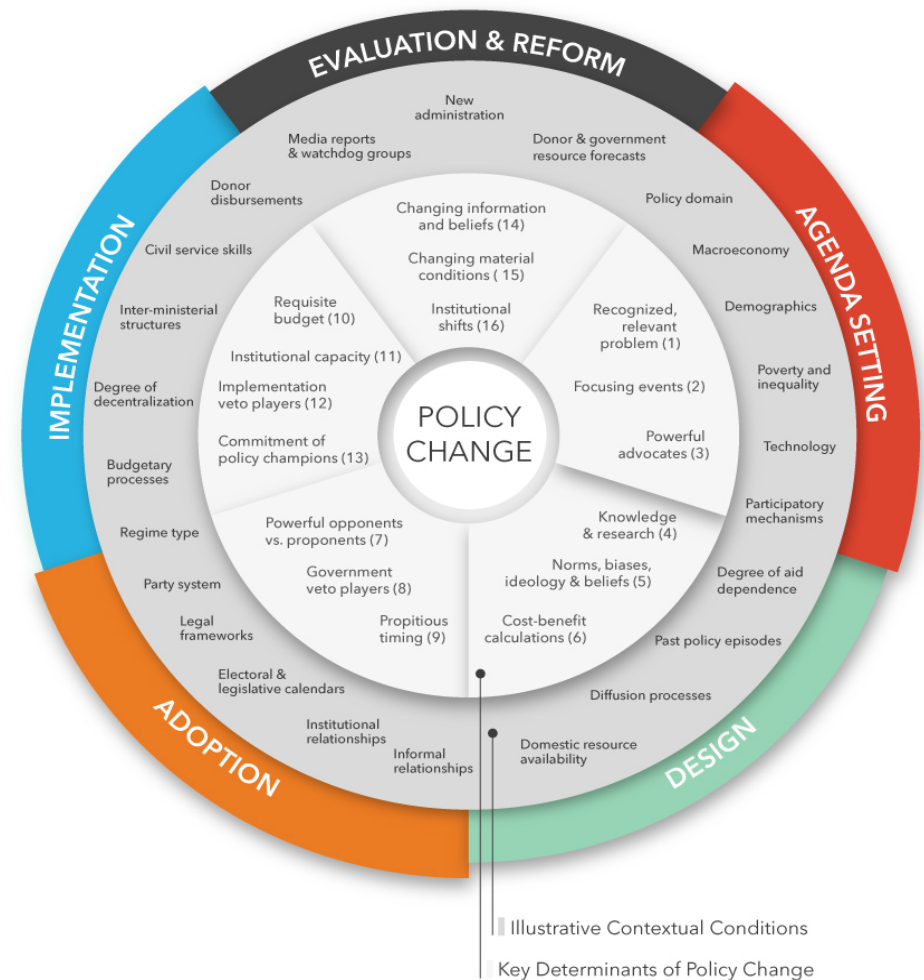


## *A political economy framing*

- Analysis of the actors, interests, and incentives that influence the design and implementation of seed policy
- Related to political agronomy, political ecology, and other disciplines
- Key variables for consideration
  - **Actors:** Public, private, civil society, scientific, bureaucratic, etc.
  - **Incentives:** economic development, biodiversity conservation, food security, profit maximization, market power,
  - **Resources:** Degree of power and influence
  - **Institutions:** informal, formal; collaboration, competition; collective, individualistic
  - **Context:** Crop, production system, extent of commercialization

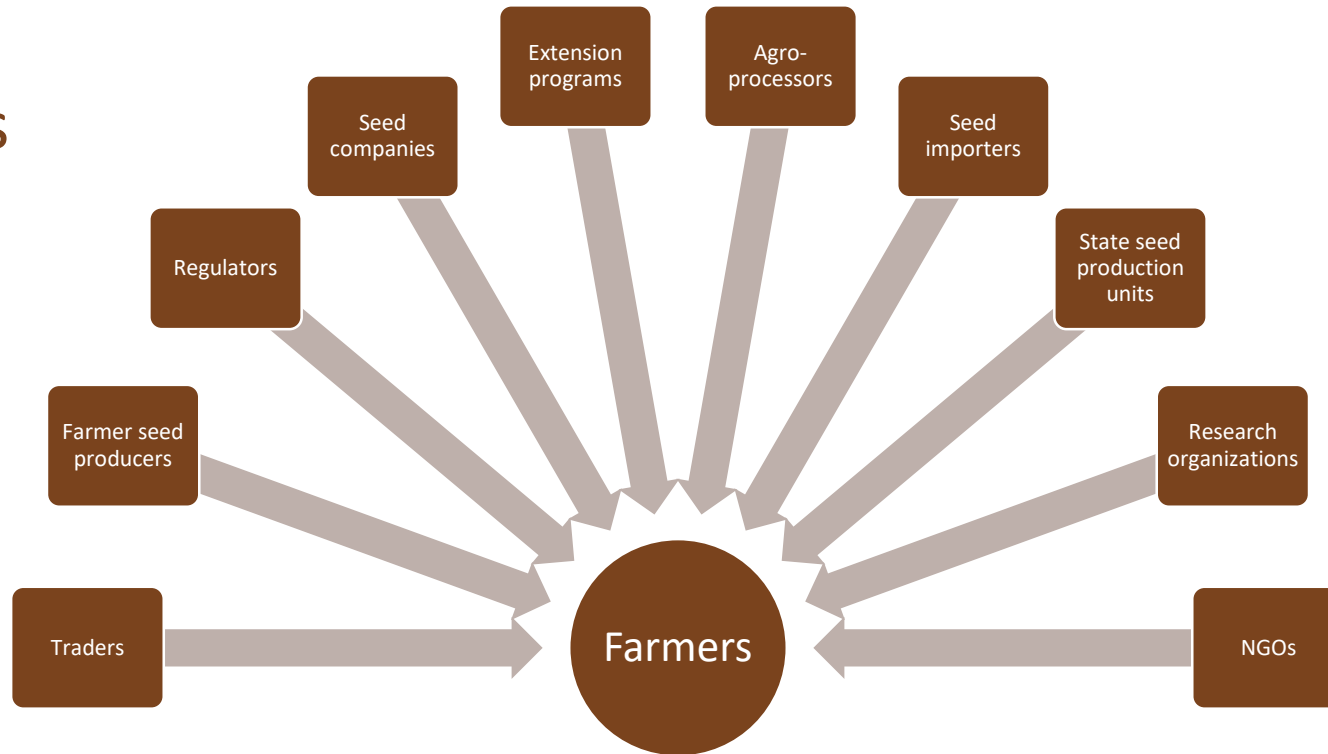
# Policy process analysis

- A political economy framing focuses on policy processes
- A range of analytical tools can be used to
  - Analyze how ideas, interests, and institutions interact
  - Identify drivers of policy change
  - Recognize potential entry points into the policy change process



# Political economy of seed

## Actors



## Institutions

- Quality assurance systems for VPC seed
- IPR regimes to ensure breeders' rights
- Trust relations between farmers and known seed producers
- Collective action via community seed enterprises
- Etc.

# Seed potato in Kenya

- Only 4-5% of seed potato used in Kenya is *certified*
- 94-95% flows through the informal sector
  - With often unknown source or health status
  - Yield gap 8-10 t/ha compared to potential of > 40 t/ha
- Seed potato itself is difficult to produce
  - Low multiplication rate; bulky; requires specific storage conditions (dormancy)
  - Subject to accumulation of seed & soil borne diseases
  - Seed potato and small ware potato indistinguishable
  - Seed and ware potato production systems overlap
- Crop & seed characteristics matter for
  - Seed production models
  - Appropriate quality assurance system



Potato at flowering stage, Meru County, Kenya. Credit: M.McEwan



# How do current seed frameworks work for VPCs in Kenya?

## Research questions

- Does the current seed regulatory framework in Kenya and its implementation meet the need for increased availability and access to quality seed
  - For whom and with what consequences?

## Methods

- RTB multi-stakeholder framework used to identify stakeholder types & guide questions
- Key informant interviews; focus group discussions; document analysis
- June-July 2017: Field interviews in Meru and Nakuru Counties
- <https://doi.org/10.7910/DVN/MSIMRE>
- **Gender dimensions:** (Mudege et.al 2018-2019)
  - Review of documents and policies, literature review
  - Sex & Age disaggregated FGDs; individual interviews
  - Workshop processes, video documentation



Seed producer David Maingi showing his plot.  
Credit: M.McEwan

# Findings: seed potato in Kenya

## Context

- Limited number of private seed companies and parastatals in the formal sector
- Women and men are seed producers and users in informal sector
  - food security and income objectives
- Sale of seed which has not been certified (Informal sector) = illegal
- Devolved authority to County Governments, but not for seed quality assurance

## Biological/technical

- Seed and ware potato systems interlinked
- Widespread seed and soil borne disease & pests (bacterial wilt & potato cyst nematode)

# Findings: seed potato in Kenya

## Market/economic

- **Type of varieties** (imported and national) for different markets, & uses
- **Scale of seed production**
  - Small scale: not sufficient production to attract buyers who require large volumes
  - Large scale: use seed potato as rotation crop with other high value crops; sell in large volumes and large sales units
- **Seed production models:** scale, models: (outgrower; individual/group; PPP), seed production technologies
- **Sourcing:** saved seed, neighbours, groups producing “clean seed”, informal markets, seed companies

## Gender

- **Registration:** minimum land size & fees
  - Women and youth: insufficient land size to meet rotation and isolation requirements for certified seed –
- **Inspection:** cost, timeliness, soil/lab testing

# Political economy: seed potato in Kenya

## Actors

- Local, county, national, international, multi-disciplinary; with different perspectives and interests
- Seed producers and seed users
  - Lack of sex disaggregated data on responsibilities, access to resources, constraints and use of benefits
  - Business case for certified seed production - problematic

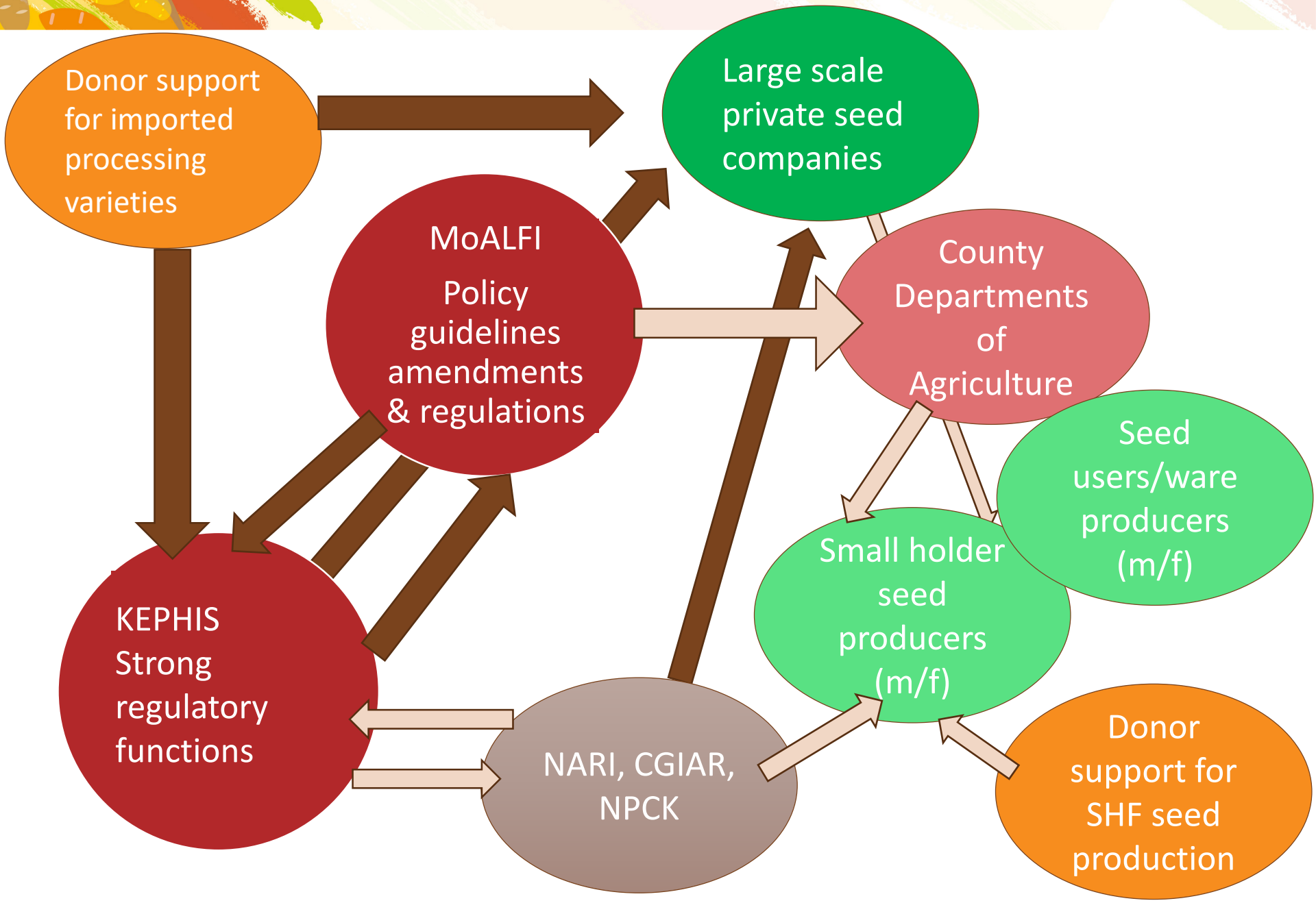
## Narratives

- Food and income security
  - NGOs & CGIAR: alternative “clean seed” production models with support for quality assurance & market linkages from County Department of Agriculture
- Minimize risk of plant diseases
  - Regulatory body: institutional and country reputation - prevent spread of Bacterial Wilt and Potato Cyst Nematode
  - Maintains position that all seed production should be certified



Potato, Kenya.  
Photo credit: Spielman/IFPRI

# Who sits at the table?

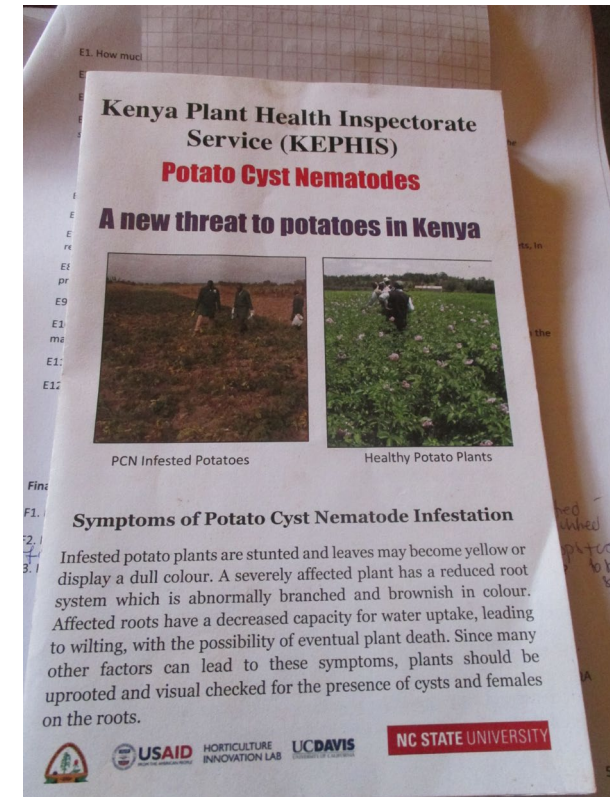




# Implications

Increasing supply and access to quality seed for smallholder farmers

- **Small scale seed production models:** higher inclusion and equity; decentralised access; BUT lower volumes of seed (?) and higher risk of spread of disease
- **Large scale production models:** larger volumes/lower unit production cost = lower selling price; reduced risk of spread of disease; BUT higher costs for distribution channels to reach all types of farmers
- **Farmer seed and ware management practices critical irrespective of policy & regulation**



Disease risk – multi partner strategies for increasing awareness and management practices. Credit: M.McEwan



# Implications

- Informal and formal seed and ware production systems are interlinked
  - ignoring the informal poses a risk to the whole potato system
  - but “formalising the informal” also increases the risk
- What level of quality (“clean seed”/certified) is appropriate to minimise spread of disease?
  - and what are associated costs of risk mitigation
- Process: “Who sits at the table”
  - not the rural, young, women informal seed producers and users
  - seed regulatory frameworks & processes: “gender blind”
- Complex social and technical trade-offs
  - Underlines the importance of multi-stakeholder consultative processes

# Final reflections

- Leveraging interaction between informal and formal seed systems (species, seed value chain & context specific)
  - Maintaining biodiversity, inclusion while improving efficiency, quality, provenance
  - <https://issdseed.org/>
- Seed standards and regulations
  - Exploring options for quality assurance approaches: decentralisation, accredited inspectors, use of ICT platforms [www.seedtracker.org](http://www.seedtracker.org)
  - Kenya: development of separate regulations for VPCs and “standard” seed class for some OPVs and VPCs
  - Seed production technologies: Rooted Apical Cuttings
- Multi-level interactions: harmonisation of seed regulations by regional bodies and international conventions and impact on farmer and community-based seed systems & biodiversity
- Biological/technology, market framing need to be augmented by understanding political economy and policy processes in seed systems development
- Multi-stakeholder consultations and engagement critical to identify and implement appropriate seed regulatory frameworks



# Thank you

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