



# Research and Seed Policies Impacting Bean, Maize, and Cassava Seed Systems in Uganda

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## Summary

Agriculture in Uganda is predominantly crop based with common bean (*Phaseolus vulgaris* L.), maize (*Zea mays* L.), and cassava (*Manihot esculenta* Crantz), as the major staple crops. This study evaluated the current seed industry research and seed policies and their effect on the evolution of bean, cassava and maize seed systems in Uganda. It further examined current capacities in crop improvement, seed production, and marketing by the private sector, public certification, and quality assurance systems. Formalizing the seed industry is challenged by inadequate supplies of breeders and foundation seed, limited seed conditioning capacity, limited seed business skills, and unethical practices. Overcoming these constraints requires macro-economic interventions such as greater investment in training and research, improved infrastructure, better mechanisms for policy implementation, formalized seed markets, and intensified extension services.

## Assessment of Maize, Bean, Cassava Seed Systems

### Farmer Saved Seed System

The majority of smallholder farmers in Uganda obtain seed from informal channels including farm saved seed, seed exchange among farmers, and purchases from local markets. These channels can contribute over 85% of the germplasm supply, depending on the crop. Favored varieties depend on cultural norms as well as farmer knowledge/experience in their particular environment. Maize, beans, and cassava are dominant crops in the informal seed systems, reflecting their easily managed modes of propagation. Self-pollinating beans can be saved with minimal loss of genetic purity. Vegetatively propagated cassava also maintains genetic uniformity under farmer's propagation. Open pollinated varieties of maize do not require strict isolation to maintain their genetic identity. Production of these crops for domestic use are not subject to seed certification or routine inspection.

### Community based seed system

This is intermediary between the informal farmer seed saved system and formal seed system. In this case, farmer groups cooperate to produce seed of improved varieties, particularly beans, released by the National Agricultural Research Organization (NARO) breeding units. Seed produced in this system are considered 'quality seed', which is generally of greater market value. Service provision is one key aspect that distinguishes this system from the farmer saved seed system. Service providers such as NGOs and NAADS extension service play key roles in linking producer groups to markets.

### Formal seed system

The formal seed system in Uganda is composed of local and international private seed companies. Local seed companies access new varieties from NARO and some have exclusive marketing of hybrid maize seeds. The certification agency is involved in a limited number of crops such as maize. Although cassava and beans varieties are under compulsory certification, they generally are not certified. Local seed companies often lack capital and seed business skills. Service providers are mostly agricultural dealers who distribute seed directly to farmers or through village agents. The whole seed industry lacked sufficient seed data on which to base planning and budgeting for seed production.

## Assessment of Regulatory Frameworks

Key issues regarding Agricultural Seed Policy:

**Inadequate capacity for effective seed certification and inspection services.** The certification system in Uganda is based on the strict European system where farmers operate at higher levels of understanding and management. Farmers in Uganda cannot afford to pay for certification services coupled with lack of knowledge of their rights.

**Lack of breeders' rights and protection of indigenous knowledge.** The PVP legislation addressed by policy makers despite numerous attempts by seed actors and MAAIF to have the bill passed by parliament. Similarly, lack of protection of farmers' rights has left them neglected by seed suppliers which has eroded indigenous knowledge useful in variety selection.

**Lack of policy to regulate, guide, and monitor genetically modified seeds.** Currently there is work on maize for water use efficiency (WEMA) but this material has been in confined trials since 2010. This challenge has also been raised by the cassava program where there is already research on transgenic cassava varieties aimed at curtailing viral epidemics in conventionally bred varieties.

**Failure to adhere to international seed testing standards.** Seed produced in Uganda cannot be accepted in international trade. This limitation stopped Monsanto from producing seed in Uganda because they were flying in inspectors from Kenya where the national seed laboratory is accredited to ISTA. As of April 2016, Uganda had not ratified its membership to the Union for Protection of Plant Varieties (UPOV). This would require implementing a Plant Variety Protection law, which is lacking.

## Conclusions

To improve maize, beans, and cassava 'seed' systems in Uganda, public and private concerns need to address:

- Lack of promoting sectoral agricultural policy
- Limited government budget allocation < 6% of GDP.
- Poor attention to climate change and environmental degradation
- Predominance of informal seed systems
- Limited agronomic skills and small scale of farms
- Limited use of agricultural inputs
- Low level of private sector investment

## Recommendations From Surveys and Interviews

Provide incentives such as grants, training, and plant variety protection legislation for broad stakeholder participation in research, particularly through public-private partnerships.

Utilize farmer knowledge during selections of new hybrids and varieties introductions during on-farm trials.

Strengthen the seed certification system to expand awareness of improved varieties among farmers and promote seed trade to farmers in Uganda and the East Africa region.

Review certification requirements for variety release and provide incentives that allow field testing data already collected and farmers' choice as the most important criteria for variety release.

Conduct regular market research to determine demand for breeder seed from public research institutions; establish seed data bank within each seed certification unit.

Utilize the NGO network to promote marketing of improved varieties, already with farmers. Seed promotion through on farm demonstrations and farmer testimonies as the most effective means of communication with farmers.

Establish regular research and seed policy cycles to create consensus among stakeholders and avoid delays in passing agricultural legislation. This also would require strengthening implementation mechanisms in the Ministry of Agriculture.

Participatory research was singled out as one important aspect that enables direct interaction of researchers with farmers through on-farm, farmer-managed evaluation of experimental varieties.

A pluralistic National Agricultural Research System that enables both public and private sector research to work together, jointly carrying out research as well as sharing in government funding is critical for building capacity in the private sector.

## Methods

The study covers the following in regard to provision of seed and planting materials of maize, beans, and cassava;

- Seed systems assessment and clarifying roles of actors, interests, challenges and opportunities
- Seed related programs promoting use of improved seeds
- Existing research and seed related policies and legal frameworks in Uganda and their implementation
- Seed and biotechnology programs and future trends of biotechnology development in Uganda

Existing research and seed policy frameworks were reviewed and documented. Similarly, existing seed systems in Uganda were assessed. An historical approach traced changes in the way policies have been framed, paying particular attention to the shifts in narratives to current trends in policy direction. Most of the information synthesis was from available literature, analysis of publications and reports, and public internet sources. The relationship between industry players, their networks, and associated interests were assessed to elucidate how contemporary policies are initiated, came into play, and who was involved.

Interviews were conducted to 'map' the current situation for maize, beans, and cassava seed systems in Uganda. This involved interacting and consulting with key players engaged with these commodities such as government policymakers and implementers, public/private researchers and academicians, commercial sector seed suppliers and traders, NGOs, associations, and farmers operating in different parts of the country. Their answers and recommendations were consolidated where appropriate and abbreviated for purposes of this presentation. A complete version of this study is available upon request ([westgate@iastate.edu](mailto:westgate@iastate.edu))



[www.esaff.org](http://www.esaff.org)

<http://tcktktk.org/2013/01/bean-market-photo41090/>



<http://www.sunrise.ug/wp-content/uploads/2015/11/New-Cassava.jpg>

## Actor/Stakeholder Survey

Self-administered questionnaire taken by representatives of seed companies, seed trade associations, NGOs, and a regional research policy organization (ASARECA). Values are percentage of respondents concurring with the response or recommendation.

Issue		Responses	Recommendation
	%		
Research and Seed Policies on seed value chains of maize, beans and cassava.	100	Existing research policy crucial in shaping the seed industry.	Increased networks between international, public, and private partnerships as well as active farmer participation in variety selections.
	100	A good seed policy was necessary to boost improved seed supply.	Review of the government seed policy.
	90	A Certification Body was essential to supervise the 'young' seed industry.	Strengthen role of certification on the ground.
	90	Acknowledged barriers to regional and international seed trade.	Review of existing government seed policies and regulatory frameworks.
Accessibility to new varieties for maize, beans and cassava	100	Supported strengthening local capacities for crop improvement.	Provide incentives such as Plant Variety Protection legislation.
	70	Indicated too few varieties being released.	Participatory breeding with farmers to enhance knowledge and awareness.
	70	indicated too few varieties were available from outside Uganda.	Provide incentives in the trade legislation to attract international investments
Availability of improved maize and bean seed, and improved cassava cultivars in Uganda	80	Acknowledged the shortage of breeder seed	Prior seed planning in consultation with the source so that production can be arranged ahead of time.
	70	Confirmed a seed shortage for several crops	Expand seed production through informal seed systems
Accessibility of improved seed for maize and beans including cassava stems to farmers.	100	Respondents thought hybrids were more profitable	50% recommended more concentration on marketing hybrids.
	80	alluded to new variety introduction as expensive	70% recommended seeking sponsorship for their promotion.
	100	Poor distribution network as impacting use of seed throughout the country	90% recommended establishing a link between rural seed village schemes and formal seed companies