

Formal and informal seed delivery systems, challenges related to seed production and potential practical solutions.

By

Lawrence R. M'Ragwa PhD

Kenya Agricultural & Livestock Research Organization

Seed Unit

P.O. Box 57811-00200

NAIROBI- KENYA.

Venue

University of Nairobi- College of Agriculture and
Veterinary Sciences

Introduction

- What is seed?
 - Entity by which a living thing reproduces itself.
 - Seed may be from un- improved or improved plant type/variety.
- Seed can be produced through formal or in-formal system.

2. Formal Seed Sectors

- **Formal seed production system is referred to as conventional**
- **In Seed Law, seed is produced through known generations.**
- This generations may be named classes:
 - for example in Kenya: these classes are named: Nucleus (not in certification system of many nations)**
- Certification classes/generations in Seed Law CAP 326 include (1) Breeder, (2) Pre-basic, (3) Basic and (4) Certified.
- In USA, the classes are: nucleus also not in Seed Law while the law allows for:-
 - (1) Breeder, (2) Foundation, (3) Registered (4) Certified.
- Quality Control: Maintenance, Inspections, Tests, Storage and transport.

What classes or generations are in your state seed law?

Status of formal seed sector in Kenya

- In Kenya, about 10% of the seed is from formal seed sector and out this, hybrid maize seed takes 80%. This indicates that majority of farmers do not use certified seed and there is room for promotion, extension and seed business. Kenya has over 100 seed companies but due to profit consideration most are producing hybrids and/or vegetable seeds.

What is the amount of formal seed is produced in your country?

- Seed Companies in most states operate under formal seed sector and the seed produced is certified by a National Regulatory Authority (NRA).
- In Kenya, the NRA is Kenya Plant Health Inspectorate Services (KEPHIS).
- Certification is a process including field inspection, transportation, lab testing and other processes until labeling.

Write down the name of NRA in your country ?

Formal Seed producers

- These include companies and/or contracted farmers. They may be large or small scale.
- ***Production of Quality Seed by large scale farmers:*** These have more than 50 to 4,000 acres of seed crops. Most deal with hybrids, are well funded and have few challenges during crop cycle.
- ***Production of Quality Seed by small scale farmers. : owning about 0.5 to 49 acres***
- This is mostly for open pollinated varieties (OPVs) which large commercial companies do not deal with because of low returns to investment. Most of the 20% of seed in formal sector is produced by these farmers.

Objectives of working with small scale farmers are:

1. To train many farmers on how to produce high quality seed for their own use and also for sale to their neighbors or produce seed: EG. {KALRO Seed Unit (KSU) work with about 2500 such farmers per season). Last season KSU produced 900Mt of ASAL OPVs and 200Mt wheat seed}.
2. To promote and extend the use of improved varieties among various communities where seed is under production, leading to increased adoption and subsequent uptake and seed production by private seed companies.
2. To promote use of quality seed by producers, their neighbors after observing the performance of improved varieties and certified seed.
3. To identify those who can grow quality seed and introduce them to commercial seed producers.
4. To identify farmers who can be persuaded to be transformed and register seed companies. *(KSU has so far assisted two farmers to register their companies)*
 - **e.g. Dryland Seed, Community Micro-Enterprise for Hope Africa Meru.**
5. To improve house-hood incomes of the farmers by increased earnings from their seed farms.

Features of the small scale farmers seed production system

1. Breeders produce seed up to basic seed class
2. Basic seed is contracted to selected and willing farmers who in case of KSU are grouped in Seed Industry Development Units (SIDUs). Operate between 25 to 30 SIDUs per season.
3. Farmers are grouped together in a locality and are encouraged to plant same variety to provide acceptable field isolation.
4. Seed merchants, extension and ultimately KEPHIS provide quality control throughout the crop cycle.
5. Seed production is mono cropped and off- types are rouged under qualified Officers.
6. Seed is dried by the farmers, treated (dressed) with actellic (insecticide) and collected by Breeder/ Company at between 13-15% of moisture content for conditioning
7. Farmers are trained on how to clean, treat and package
8. The balance of the seed left with farmers is for their own use and/or sale to their neighbors.
9. Basic seed of OPV in KARI is produced by over 2,500 small scale farmers grouped under SIDU and is sold to many seed projects. This season for opv we aim at 470MT.

Informal Seed Sector

1. Informal seed production systems: This represent about 90% of seed planted in Kenya. This system is also called non-conventional and/or traditional – It involves individual small scale farmers or groups of farmers or community based producing seed for their own use.
(Business opportunity for merchants)-Status of others?
2. This system involves production of seed mostly of OPVs, vegetatively propagated material like cassava, sweet potato and seedlings. (Farmer managed)
3. It involves systems that may train small farmers in methods for producing quality seed for their own use and/or for sale to their neighbors but not certified by NRA. The two common methods are traditional and non-conventional.

Traditional Systems

1. Farmer selects his/her own seed. Landraces, other local cultivars;
2. Stores near fire place or on the roof beams/wood/trees or granary to dry
3. Farmers thresh their seed but sometimes they do not control quality because they do not have a know how
4. This is a challenge because seed may be cracked and if maize seed, they include seed with low vigor from the cob tip or late maturity from the cob bottom.
5. This drying may cause the seed to lose vigor and germination thus fails to express its full yield potential.

Non conventional system.

- Basic seed of improved open pollinated varieties is bought by NGOs, seed projects and planted by individual/group or community based seed projects for their own use or sale to neighbors. (Community based)
- Technical advisory services by qualified personnel who provide quality control throughout the entire crop cycle. In Kenya, KEPHIS assist farmers to produce quality seed by providing this service they call 'observations' KSU used this from 1999 to 2002.
- Ministry of Agriculture wants to follow similar in seed potato production.
- No certification is done by NRA.

Challenges and practical solutions

1. Maintaining varieties: especially by seed companies with no breeders is a problem.
2. Limited qualified staff in most seed companies, seed projects.
Solution: Breeding institution should make arrangements to assist.
3. Lack of Isolation distances in some countries like Kenya.
Solution: Time isolations in irrigated farms, contract large scale irrigation farms, cluster farmers in same area to grow same crop.
4. Limited seed quality control in small seed companies and seed projects, because they have no trained staff and/or seed producers are not trained in improved seed production.
Solution: Breeding institution and extension should to assist in training and to monitor. They should by hire the services of retired NRA Officers.
5. Lack of Equipments/machinery because they are expensive
6. No acceptable storage structures.
Solution: Hire equipment/storage as per requirement

Challenges and practical solutions (CONT')

7. Marketing and sales is none existence because of extra cost
8. Demand of OPV – low – or non- existent in formal seed sector after good harvest. Farmers plant their own SEED.
Solution: *Breeding institution and extension should write project proposals to promote their products, assist in training and to monitor. They should hire the services of retired, Research, NRA, ext Officers.*
9. Transforming some farmers and/or farmers group, register as formal seed co. is not easy because of related expenses of the required facilities
10. For example from 1999 to 2017 – KALRO/KEPHIS transformed 3 contract farmers out of 1200 farmers to register their own seed companies. Current KSU is helping two interested grps.

Solution: *Breeding institution and extension should keep encouraging seed project participants to see light and look at what they are doing as a business.*

Challenges and practical solutions (CONT')

- National seed policies are not formulated in most countries or not implemented like in Kenya
- Regional /Pan-African Seed policies need to be developed and harmonized.
- Seed laws need to be prepared and where available like in Kenya be amended to include current issues and also confirm to harmonize seed policies to assist seed trade.
- Many Government Officers do not have time for seed issues especially policies except when there is drought or food crisis 'maize crisis in East Africa
- Seed Industry must engage Governments about seed issues in time of plenty and scarcity/ shortages.
- In fact, Agric development to some Government Officers is like a tap: - open today, close it when there is plenty. Open and close as necessary.

Solution: *Breeding institutions and seed industry stake holders should keep encouraging Government Officers to look at seed industry as a business that will help stabilize the country. They should be more aggressive especially when the country is facing food crisis. The Officials may realize the importance of seed at this period.*

How do your countries keep the tap open to sustain seed production.



Late Mr Kithaka House before growing seed. His wife is producing seed from 2012



Late Mr. Jonathan Kithaka house after selling seed to KSU (Tunyai-Tharaka

His wife is now the owner. She has educated her son upto University.

Seed Enterprises Management Institute

University of Nairobi

Appendix 2. Pictorial presentation of various seed activities



Peter W. primary beneficiary,



M. Kimwere Secondary beneficiary



Mr. and Mrs Ngatas' house before they started growing seed



Mr. and Mrs Ngatas' house after being paid for their seed

Chairman of Parliament AG Committee and former PS Flagging off OPV SEED to ASAI Districts



Asanteni sana

Safari Njema

Seed Enterprises Management Institute

University of Nairobi