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3. Formal And Informal Seed Delivery Systems, Challenges Related To Seed Production And Potential Practical Solutions
Seed Production Planning

Dr. Lawrence M’Ragwa
KALRO SEED UNIT

SEMIS Seed Production Course, University of Nairobi
Lecture 1 on 10-8-15 at 12-1 pm
Introduction

• Any seed production plan, unit product costing and total financial/costing plan MUST be tied to detailed market and sale forecast plan in the business plan

• List the products- crop, variety/hybrid, seed class, the company want to deal with

• List products and locate market and gauge the size or volume

• Prepare production plans for the products per sale forecasts

• Prepare Unit cost for each product including all variable, fixed and depreciation costs

• Prepare product cost plan for the agreed business period
Planning Seed Production

Objectives
• To be able to plan seed production using principles of seed production
• To learn how to work in a team and develop leadership skills

Some Questions and answers related to production plans
• Ask and answers some questions before preparing Seed Production Plan, building, purchasing machinery, equipments and employing human resources:-
  • When do I start to grow/produce seed?
  • What crop and variety has market and do I have adequate market research?
  • What is the size/volume of the market and profit?
  • How much money is needed and do I have finances?
  • Is breeder having startup seed,
  • Where and when do I plant?

• Now, company ‘AK’ prepares production plan for available seed class upto marketable certified seed generation
• Plan includes nucleus (stage 1, and 2), stage 3 (breeder), prebasic, basic (foundation) and certified classes of seed
• Production plans are prepared from forecast sale plan
After answering production questions, some steps to follow:

From market and Sale forecast plan which includes at least 30% carry over stock (this depends with company storage capacity, cash-flow)

• Prepare production plan for each class chosen, ensuring the seed quantity is tied to the quantity required by the Market and sale plans

• Plan for effective demand as inaccurate targeting lead to over or under production, loss of income…. 
  • Seed requirement (kg)=crop area (ha) x planting seed rate (kg/ha)

• Area required (ha)= Seed production planned (t)/ seed yield (t/ha)

• Seed effective demand (total seed purchased) =seed sold or required x percent bought seed previous season/s
Production Plans cont’d

• Example:-
• Process of preparing rice var. Nerica 4 three year production plan, October 2015 to September 2018 as in ‘AK’ market and sale forecast plans

• Market plan indicate ‘AK’ will require 25, 50 and 75 MT, to sell in year 2016, 2017, 2018, respectively with carryover stock of 30% each year.

• Calculating quantity of Nerica 4 certified seed required for “AK” to sell to her 50% market share out of 1000 ha required in the Country in first year 2016

Facts about rice var. Nerica 4
• 1. Seed rate 50kg/ha
• 2. Rice var. Nerica yield is 3.5MT/ha
• 3. Projected Country requirement in 2016 for Nerica 4 is 1000ha
• 4. Market will require an increase by 25Mt each year upto 2018
• 4. certified seed requirement 1000ha x 50kg/ha= 50MT

• Market share of Company ‘AK’ is 50%
• Certified seed will be sold to plant 500ha in 2016
• Find out prebasic seed available from Breeder to buy and plant basic seed in October 2015
Example of simple seed plan
Crop rice var. Nerica
Yield 3.5t/ha
Seed rate 25kg/ha

- Certified Nerica 4 seed required for planting 500ha
- 500ha x 50kg = 25MT

Area of certified seed crop required to produce 25MT certified seed
- 25MT/3.5MT per ha = 7.2ha
- Basic seed AK require to plant 7.2ha to produce 25MT certified seed
- 7.2ha x 50kg per ha = 360kg basic seed class

Basic seed Plan
Basic class is produced from prebasic seed
- Seed required to plant 7.2ha to produce 25MT certified seed
- 7.2ha x 50kg per ha = 360kg or 0.360MT
- Area of basic seed crop required by AK to produce 360kg basic seed
- 0.36MT/3.5MT per ha = 0.1ha or 1,000 m²
- Prebasic seed AK require to plant 0.1ha to produce 0.360MT Basic seed
- 0.1ha x 50kg per ha = 5kg pre-basic seed class
Example 1b: Actual Field scenario: Rice var. Nerica 4 Field Seed Production plan for self/open pollinated crop

(F) Seed Production Planning Season 6:- Plant in March 2016: Certified Seed
- Certified Nerica 4 seed required for planting 500ha in October 2016
- 500hax 50kg = 25MT
- Add carry over stock of 30% x 25MT=7.5 MT
- Therefore total certified seed to be produced is 25+7.5=32.5 MT
- Area of certified seed crop required by AK to produce 32.5 MT certified seed
  - 32.5MT/3.5MT per ha= 9.3ha
- ‘Basic seed AK require to plant 9.3ha to produce 32.5MT certified seed
- 9.3hax50kg per ha= 465kg

(E) Season 5:- Plant in October 2015: Basic Seed Plan
Basic class is produced from prebasic seed
- Seed required by AK to plant 9.3ha to produce 32.5MT certified seed crop
- 9.3hax50kg per ha= 465kg
- Add carryover for one year 50% of 465kg =232.5kg
- AK will produce 465+232.5=697.5kg basic seed from pre-basic seed crop planted in March 2015
- Area of basic seed crop required by AK to produce 697.5kg basic seed
- 0.6975MT/3.5MT per ha= 0.2ha or 2,000 m2
Production cont’d

(D) Season 4: March 2015: Pre-basic seed Plan
Prebasic class is produced from Breeder seed
- Prebasic seed to be bought by AK from Breeder to plant 0.2ha of basic seed crop
  - 0.2ha x 50kg per ha = 10kg
- Add carryover: 2000% of 10kg = 200kg
- Breeder will produce 10 + 200 = 210kg pre-basic seed from breeder seed planted in stage 3 in October 2014
- Area of prebasic seed crop required by Breeder to produce 110kg prebasic seed
  - 210kg / 3500kg per ha = 0.06m² or 600 m²

(C) Season 3: Planted October 2014: Stage 3 (breeder seed)
- Breeder seed is planted from approved single plots depends with requirements
- Harvest and store at least 367.5kg in cold room and sell the rest of the seed
- Breeder seed required to plant 0.735 prebasic seed crop
  - 0.738ha x 50kg per ha = 36.75kg
  - Add carryover of 1000% of 36.75kg = 367.5kg
  - Breeder to produce 36.75 + 367.5 = 404.25kg breeder seed from stage 2
  - Area of breeder seed required for stage 2
    - 0.40425t / 3.5t per ha = 0.1155ha or 1155 m²
Production cont’d

(B) Season 2: March 2014: Nucleus seed: stage 2 (single plots)
• 0.40425t/3.5t per ha = 0.1155ha or 1,155 m²  single plots are planted
• Approved single plots are bulked to plant stage 3 (breeder seed)
• National regulatory Authority together with Breeder approved single plots conforming to DUS. The seed from the approved plots is bulked to plant stage 3

(A) Season one: October 2013: Stage 1… called Nucleus seed (Panicle to row)
• Breeder will plant many selected panicle/ear or pod to rows to generate seed for single plots
• National regulatory Authority together with Breeder approved rows conforming to DUS. The remnant seed from the approved rows are promoted to stage 2

After the variety passes DUS and other pre-release tests (March 2013):-  Breeder plants Zero Bulk Plot
• Breeder plants bulk plot from which panicles/rows/pods are selected from plants conforming to DUS
• These are threshed separately.
• Remanant seed is kept and the rest is planted in stage 1 Block.
Exercises on Seed Production Planning

• Exercise 1a: create spread sheet seed-plan (5 minutes)
• Example 1b: from Table 1 (15 minutes)

• Rice var. Nerica 4. (self pollinated variety) seed production plan:
  Calculate carryover amount and area you will require to produce salable rice var. Nerica 4 certified in season 7 of 50Mt and 8 of 75 mt with the carry over of 30% (Table 1).

• What basic seed quantity is required to produce calculate certifies seed

• What amount of prebasic seed would be purchased from the Breeder in order to produce basic seed with a carry over of 30%.

• Exercise 2 from table 2 (10 minutes)
• Seed maize single cross hybrid production plan
  (Give hand out of the CIMMYT Seedplan and demonstrate how to calculate Breeder’s, seed)
• Take home exercises, prepare plan for Nerica 3
• Using Excel sheets do exercises from Dr. John MacRobert Seed plans 5.1 and 5.2.
THANK YOU
Asante
Seed Production Unit Cost Preparation and Cost Planning

Dr. Lawrence. M’Ragwa
KALRO SEED UNIT
Presentation on Seed Production, Unit cost preparations and Cost Planning
SEMIS Seed Production Course, University of Nairobi
Lecture 2 on 10-8-15 at 2-3 pm
Introduction

- Any seed production plan, unit product costing and total financial/costing plan MUST be tied to detailed market and sale forecast plan in the business plan

- List the products- crop, variety/hybrid, seed class, the company want to deal with

- List products and locate market and gauge the size or volume

- Prepare production plans for the products per sale forecasts

- Prepare Unit cost for each product including all variable, fixed and depreciation costs

- Prepare product cost plan for the agreed business period
Product Unit Cost Preparations

• Cost items
• Fixed cost is one off or when required
• Working costs, overhead plus depreciation
• These are reviewed annually or as per need

• Prepare pricing which include working cost + depreciation + profit markup
• Prepare cash-flow plan
• Sale plan including income
• Indicate gross and net profit of each product

• Models of calculating growers prices
• Production Cost model
• KALRO Seed Unit (KSU)
• Go to excel tables of maize hybrid and Rice

Other methods (models) of preparing Growers’ prices (by Dr. McRoberts)
• Market price
• Gross Income
• Equivalent Gross Margin
### Production Cost Model (Cost plus model)

In this model, the costs of production are calculated and a percentage profit margin is calculated and added to give the price. (Show summary of detailed variable costs for some KALRO Seed Unit Products) Excel cost of production Tables.

#### Production Cost Model (Cost plus model) by Dr. MacRobert

Note using figures from Table below: Gross margin (GM) \(\%\) = \((\text{Income} - \text{TVC})/\text{Income}\) x 100

Or: \(\text{Income} = \text{TVC}/(1 - \text{GM}\%)\)

Expected average yield from seed crop = 3.6 t/ha

Therefore, the grower price = $\ldots$/t

What will be the return per dollar invested for this scenario? 

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<th>Unit/ha</th>
<th>Cost/unit</th>
<th>Cost ($/ha)</th>
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<tr>
<td>Basic Seed</td>
<td>25 kg/ha</td>
<td>$5/kg</td>
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<tr>
<td>Labour</td>
<td>27 LD/ha</td>
<td>$3/LD</td>
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<tr>
<td>Fertiliser - Basal</td>
<td>500 kg/ha</td>
<td>$600/t</td>
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<td>Fertiliser – Top Dressing</td>
<td>500 kg/ha</td>
<td>$600/t</td>
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<td>Herbicide</td>
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<tr>
<td>Pesticides</td>
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<td>$6/kg</td>
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<td>Tractor &amp; machinery</td>
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<td>Transport</td>
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**Total Variable Costs (TVC)**

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<th>Unit/ha</th>
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<th>Cost ($/ha)</th>
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**Expected gross margin**

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<th>Cost/unit</th>
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**Total Expected income**

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# Total Unit Production Cost for certified generation seed maize

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<tr>
<th>Name of centre</th>
<th>Muguga/Masongaleni</th>
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<tbody>
<tr>
<td>Particulars of seed</td>
<td>Maize (Hybrid)</td>
<td>Class: CG1</td>
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<td>Site of production</td>
<td>Masongaleni</td>
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<tr>
<td>Area planted (hectares)</td>
<td>1</td>
<td>Total Production (kgs) 3200.00</td>
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<table>
<thead>
<tr>
<th>Item</th>
<th>Items of cost</th>
<th>Unit</th>
<th>Total quantity</th>
<th>Rate per unit (B)</th>
<th>Total cost (A*B)</th>
<th>Cost per kg</th>
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<tr>
<td>No</td>
<td>Detasselling</td>
<td>man-days</td>
<td>26</td>
<td>336</td>
<td>8736</td>
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<td><strong>Sub-total</strong></td>
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<td><strong>2.73</strong></td>
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**KEPHIS INSPECTION COSTS**

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<th>Total quantity</th>
<th>Rate per unit</th>
<th>Total cost</th>
<th>Cost per unit</th>
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<td>6</td>
<td><strong>Resident team leader costs</strong></td>
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<td></td>
<td>transport costs</td>
<td>800</td>
<td>40</td>
<td>32000</td>
<td>10.00</td>
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<td>Per diem costs to Masongaleni</td>
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<td><strong>KSU Advisory services</strong></td>
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<td>Per diem costs to Kiboko</td>
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<td>56000.00</td>
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<td>a)</td>
<td>Pre-basic seed               kgs</td>
<td>20</td>
<td>150</td>
<td>3000</td>
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<td>Gunny bags                    pcs</td>
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## PROCESSING/STORAGE COSTS

### a) Labour costs

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<td>336</td>
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<td>Seed dressing-Murtano</td>
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<td>Packaging</td>
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### c) Seed grading costs

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<td>120</td>
<td>960</td>
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<td>Diesel for transportation</td>
<td>litres</td>
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<td>120</td>
<td>9600</td>
<td>3.00</td>
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### Seed grading costs

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<td>Diesel for cleaner</td>
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### Seed packaging

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<tr>
<td>Surgical gloves</td>
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<td>Mouth Mask</td>
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<td>7</td>
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<td>Milk</td>
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<td>32.5</td>
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### INSPECTION COSTS

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<td><strong>Total processing, storage and farmer payment cost</strong></td>
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<td>Overhead costs (Cross cutting costs)</td>
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<td>Marketing and promotion costs at 0.5% of field costs</td>
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<tr>
<td>Storage costs at 1% of field costs</td>
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</tr>
<tr>
<td>Building maintenance and other renovations at 1.5% of field costs</td>
<td>0.59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment/machinery maintenance at 1.5% of field costs</td>
<td>0.59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff Allowances at 10% of field costs</td>
<td>5.89</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td><strong>9.45</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total field costs + overhead costs

**Summary Field, Processing and Storage Costs**

**TOTAL UNIT OPERATING COST (Field, processing, storage and other costs)**

Gross Surplus @ 37.18% of Total unit operating cost

Retail Selling price of this seed
Go to KSU excel Seed Production planning and Costing Tables on Maize hybrid and Rice 2-3pm on 10-8-15 Do exercises
• Market Price Model
In this model, a margin over the ruling commercial price of the grain is paid to the seed grower.
This system is often used for crops like beans, sorghum, groundnuts.
The ruling price of grain in the market is $0.30/kg
The company decides to pay a 25% premium for certified seed production.
Therefore, the grower price = $________/t

• Gross Income Model
In this model, the farmers expect to earn a certain income per ha from another crop they could grow instead of your seed crop. Thus, they expect the same gross income from the seed crop as any other competitive crop.
The expected price for groundnuts is $0.85/kg, and the farmer can yield 1.7 t/ha of groundnuts.
If he grows your maize OPV seed, he will be expected to yield 3.6 t/ha.
Therefore, the grower price = $________/t

• Equivalent Gross Margin Model
In this model, the farmer expects to earn an equivalent gross margin per ha from the seed crop as he/she could from another competing crop.
For example, a farmer calculates the variable cost of production dry beans to be $750/ha, and he/she expects a yield of 1.4 t/ha and a price of $1.20/kg.
Therefore, the expected gross margin is: $________/ha.
Using the case of the seed crop, in example 1 above, calculate the seed grower price so that the gross margin from the seed is equivalent to the gross margin of the dry beans.
Formula: \( Y_{seed} \times P_{seed} - TVC_{seed} = GM_{beans} \)
\( i.e., P_{seed} = (GM_{beans} + TVC_{seed}) / Y_{seed} \)
Therefore, the price to be paid for the seed is: $________/t

Q1: In these examples, as a seed company, which grower price model would you want to use and why?
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________

Q2: In these examples, as a farmer, which grower price model would you want to use and why?
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
Example 2. After unit cost prepare Whole and Retail price List for the Year

<table>
<thead>
<tr>
<th>Crop</th>
<th>Whole sale price (no Transport) Ksh</th>
<th>Retail prices Ksh</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPV Maize</td>
<td>135</td>
<td>170</td>
</tr>
<tr>
<td>Hybrid Maize</td>
<td>160</td>
<td>180</td>
</tr>
<tr>
<td>Sorghum White e.g. Gadam</td>
<td>110</td>
<td>125</td>
</tr>
<tr>
<td>Sorghum (colored)</td>
<td>105</td>
<td>120</td>
</tr>
<tr>
<td>Pearl millet</td>
<td>95</td>
<td>115</td>
</tr>
<tr>
<td>Finger millet</td>
<td>155</td>
<td>160</td>
</tr>
<tr>
<td>Beans</td>
<td>165</td>
<td>170</td>
</tr>
<tr>
<td>Cowpeas</td>
<td>135</td>
<td>150</td>
</tr>
<tr>
<td>Pigeon peas</td>
<td>140</td>
<td>155</td>
</tr>
<tr>
<td>Green grams</td>
<td>165</td>
<td>170</td>
</tr>
<tr>
<td>Dolichos</td>
<td>165</td>
<td>170</td>
</tr>
<tr>
<td>Wheat seed</td>
<td>65</td>
<td>75</td>
</tr>
<tr>
<td>Soya bean</td>
<td>130</td>
<td>150</td>
</tr>
<tr>
<td>Nerica rice</td>
<td>150</td>
<td>155</td>
</tr>
<tr>
<td>Sunflower</td>
<td>110</td>
<td>120</td>
</tr>
<tr>
<td>Mango</td>
<td>95</td>
<td>100</td>
</tr>
<tr>
<td>Citrus</td>
<td>95</td>
<td>100</td>
</tr>
<tr>
<td>Paw-paw</td>
<td>25</td>
<td>30</td>
</tr>
</tbody>
</table>
THANK YOU
Asante
Formal and informal seed delivery systems, challenges related to seed production and potential practical solutions.

By

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Venue

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Introduction

- What is seed?
  - Entity by which a living thing reproduces itself.
  - Seed may be from un-improved or improved plant type/varieties.
- Seed can be produced through formal or informal 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 50 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. (illustrate with KSU farmer list)
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.
   
   Solution: Breeding institution should make arrangements to assist.

2. Limited qualified staff in most seed companies, seed projects.

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 2002 – KARI/KEPHIS transformed two 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 stakeholders 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.
Mr. Jonathan Kithaka House before growing seed

Mr. Jonathan Kithaka house after selling seed to KSU (Tunyai-Tharaka)
Appendix 2. Pictorial presentation of various seed activities

Peter W. primary beneficiary, from 1998 – 2011 (2.500)

M. Kimwere Secondary beneficiary from 2000 – 2011 (approx 7.5 Million)

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

Mr. and Mrs Ngatas’ house after being paid for their seed
Assistant Minister and PS Flagging off OPV SEED to ASAL Districts
Asanteni sana
Safari Njema