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AGRILINKS




Strengthening Early Generation Seed Systems in Africa and Beyond

Speakers: Walter de Boef, Bill & Melinda Gates Foundation
Mark Nelson, Context Network
Latha Nagarajan, International Fertilizer Development Center
Rob Bertram, USAID Bureau for Food Security

Moderator: Julie MacCartee, USAID Bureau for Food Security

Date: December 14, 2016

Walter de Boef

Walter de Boef is a Senior Program Officer with the Bill & Melinda Gates Foundation's Agricultural Development Program. When joining the Foundation in 2013, Walter's responsibility was to foster advances to increase smallholder farmers' use of quality seed of improved varieties in particular for food crops. Key in his work was to take a pluralistic approach to strengthen seed systems while addressing major bottlenecks such as early generation seed supply, counterfeiting and quality assurance. He has a broad expertise in Africa, Asia and Latin America facilitating and playing a catalytic role in multi-stakeholder and participatory approaches in agrobiodiversity, seed sector development and promoting resilience, on which he published several books. He holds an MSc in Plant Breeding and a PhD in Communication & Innovation Studies from Wageningen University.

Mark Nelson

One of 12 principals at the Context Network and managing director of Context Global Development, Mark is deeply committed to the advancement of agriculture, making it more productive, efficient and sustainable around the globe. Raised on his family's farming operation and having spent his lifetime working in agriculture, Mark's work with Context spans more than 15 years of leading strategy and management consulting engagements for industry-leading agriculture, biotechnology and food companies, as well as top governmental and non-governmental agencies and institutions. His longstanding work with multinational seed, chemical and food companies demonstrates his understanding of private-sector clients' unique opportunities and challenges. Recently, he has significantly shaped Context's international agricultural development practice through grant-making strategies, program design and monitoring/evaluation engagements with prominent organizations. Across both private and public sectors, Mark has proven leadership in steering large-scale client engagements in diverse geographies consistently and produces on-time, in-budget results.

Latha Nagarajan

Latha Nagarajan is a senior economist at the International Fertilizer Development Center (IFDC) based in Washington, DC. Latha works primarily on issues related to agricultural input markets, technology adoption and impact assessment. Latha has extensive field experience studying seed systems and markets in South Asia and Africa. She is part of the Rutgers Policy Impact Consortium with a research focus on seed policy. Previously Latha worked at Rutgers and IFPRI, and earned her Ph.D. in applied economics at the University of Minnesota.

Rob Bertram

Rob Bertram is the Chief Scientist at the USAID Bureau for Food Security where he serves as a key adviser on a range of technical and program issues to advance global food security and nutrition. In this role, he leads USAID's evidence-based efforts to advance research, technology and implementation in support of the U.S. Government's global hunger and food security initiative, Feed the Future. Bertram's academic background in plant breeding and genetics includes degrees from University of California, Davis, the University of Minnesota and the University of Maryland.

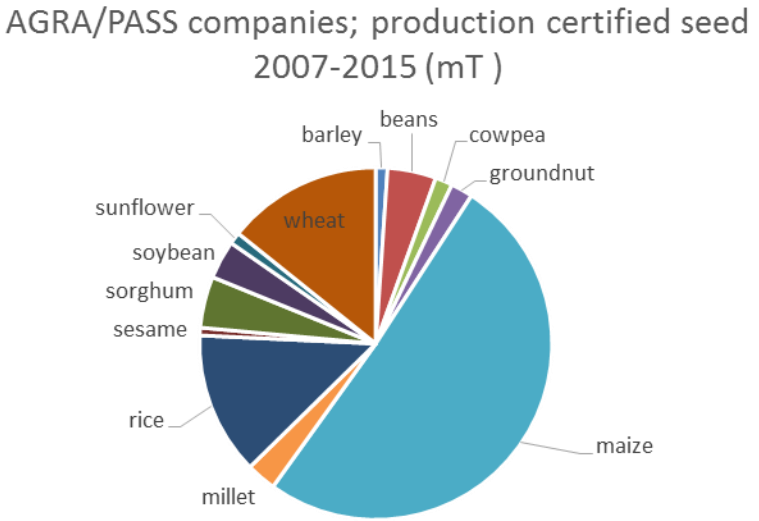
STRENGTHENING EARLY GENERATION SEED SYSTEMS IN AFRICA AND BEYOND - *INTRODUCTION*

Seminar, USAID, Washington DC
December 14, 2016

Walter de Boef
Senior Program Officer
Agricultural Development, Bill & Melinda Gates Foundation

STATE OF THE SEED SECTOR IN AFRICA

- Enhanced capacity in the production and marketing of quality seed of improved varieties through commercial channels
- Increasing numbers of domestic varietal releases in many countries over the past decade



- Realization that these advances are not sufficient for smallholders' benefiting in terms of productivity and production from increased potential of quality seed of new, improved varieties

SEED SECTOR CHALLENGES

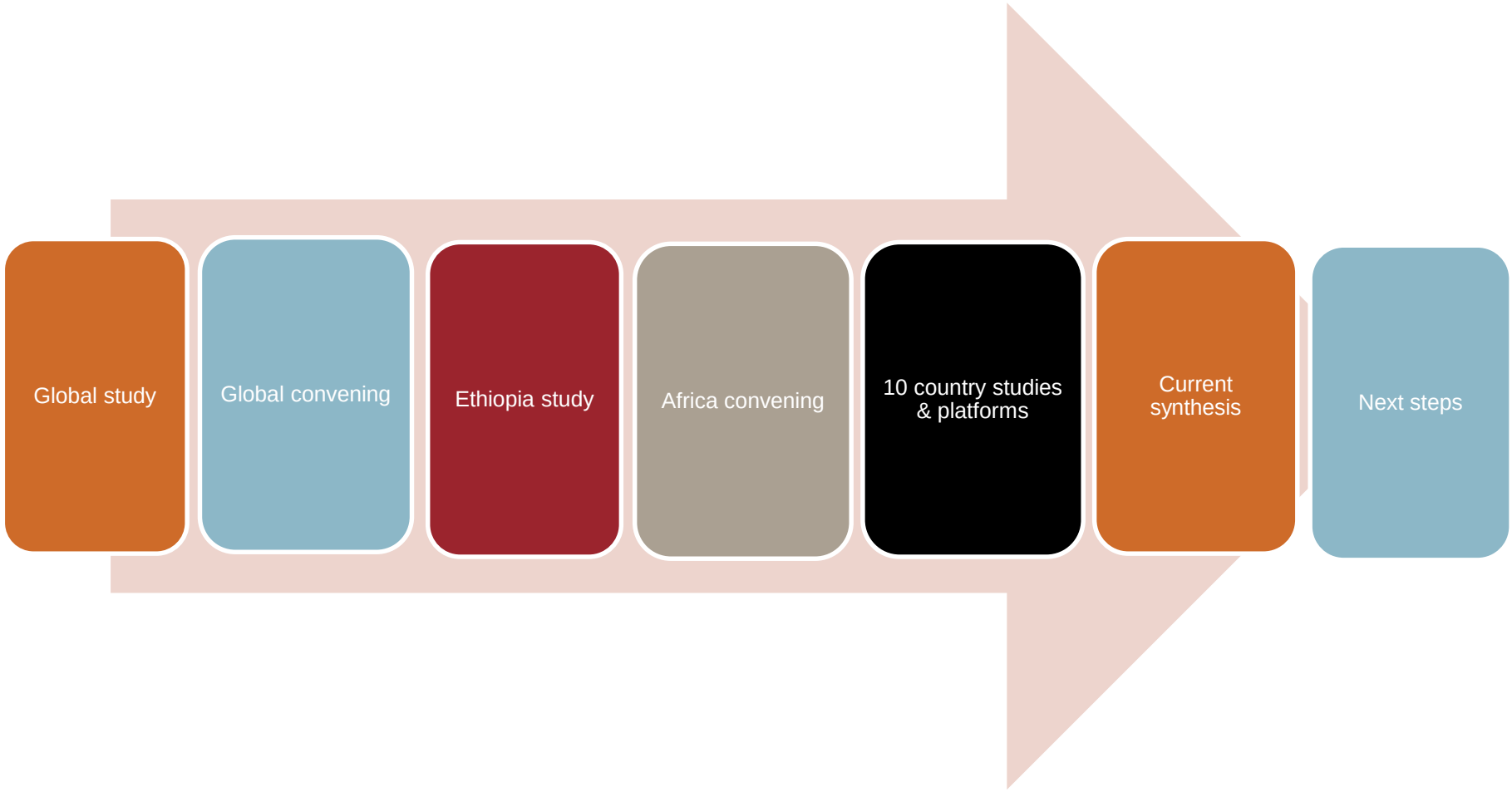
SEED SECTOR CHALLENGES

- Many meetings – Call out list of priorities
- Limited progress – just prioritizing but no action
- AgDev partnership between USAID and Bill & Melinda Gates Foundation
- Early generation seed supply – the first and major challenge

SYSTEMIC CHANGE: EARLY GENERATION SEED

- Build evidence base
- Reduce direct interventions
- Seek systemic solutions that will scale in a sustainable manner
- Work through country pathways
- Assume a catalytic role and engage in complex institutional and systemic change processes
- Take a pluralistic approach considering both
  - Relevance of formal and informal seed systems
  - Responsibilities by private and public sector stakeholders

STEPS IN TAKING SYSTEMIC APPROACH



NATIONAL EGS STUDIES COMMON METHODOLOGY

Countries:

1. Burkina Faso
2. Ghana
3. Ethiopia
4. Kenya
5. Malawi
6. Mozambique
7. Nigeria
8. Rwanda
9. Tanzania
10. Uganda
11. Zambia

Crops:

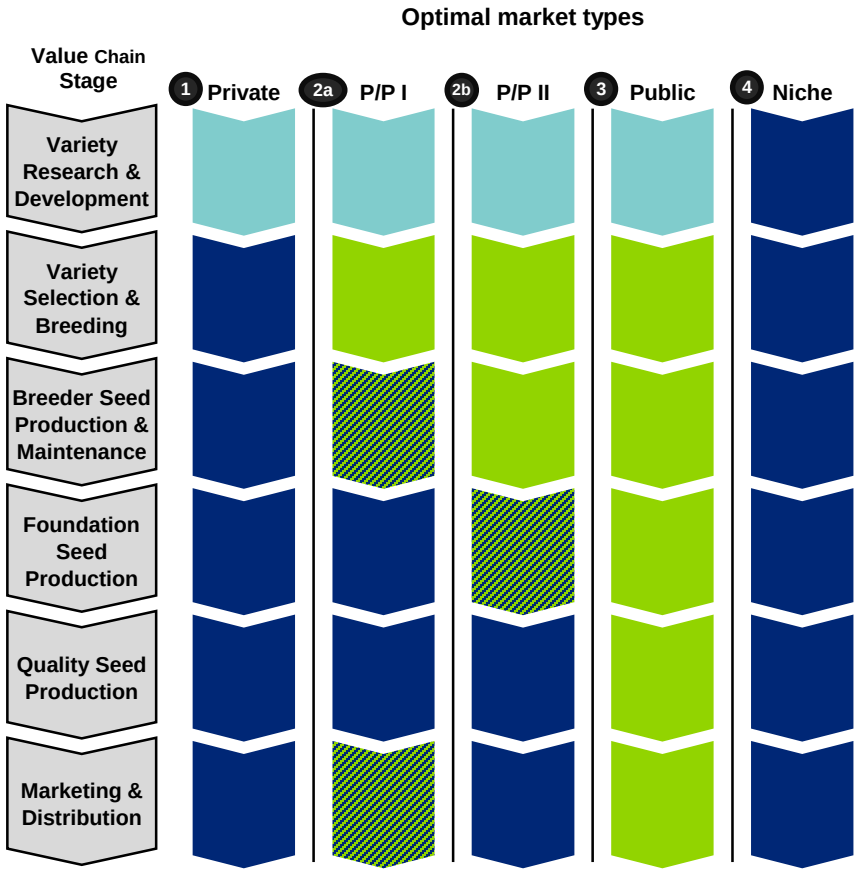
- maize (9)
- other cereals (13)
  - rice (7)
  - sorghum (3)
  - barley (1)
  - finger millet (1)
  - teff (1)
  - wheat (1)
- legumes (19)
  - common bean (7)
  - soybean (4)
  - cowpea (3)
  - groundnut (3)
  - chickpea (1)
- root and tuber crops (6)
  - cassava (2)
  - Irish potato (2)
  - yam (2)
- sesame (2)

Country studies supported:

- SSTP/AGRA (ET, GH, MA, MO, TZ)
- AfricaLead (KE, NG, RW, ZA)
- WAAPP/CORAF (BF)
- ISSD Uganda (UG)
- ATA (ET)

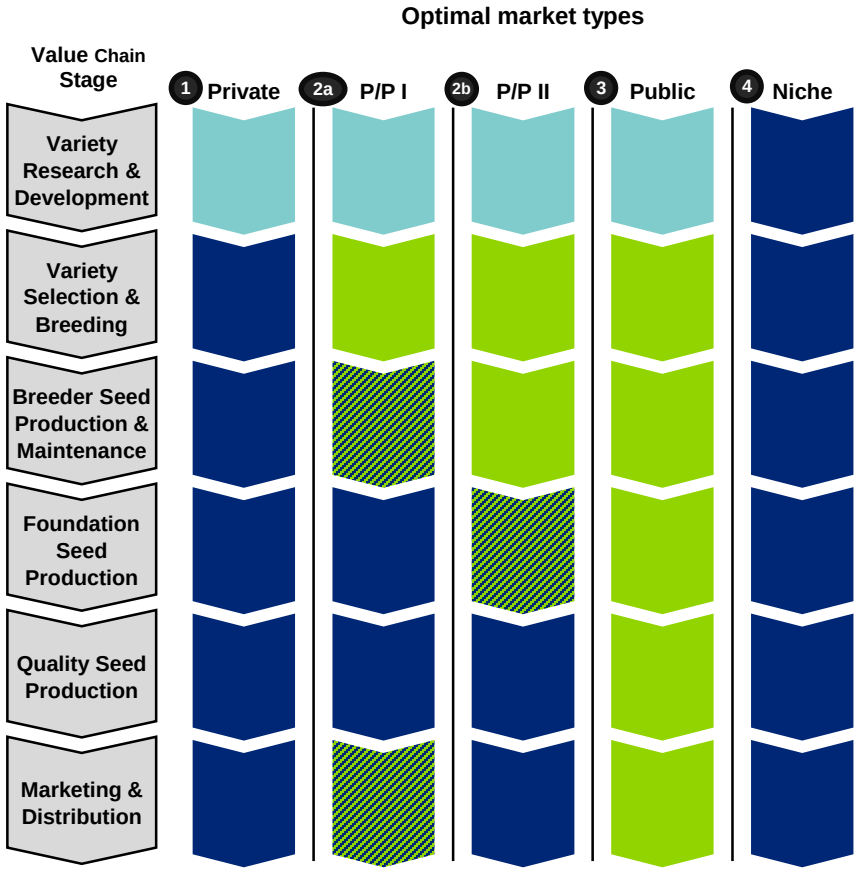
DEFINE CROP SPECIFIC OPTIMAL MARKET TYPES

- Profitability -- not all seed value chain segments are profitable for all crops
- Identify optimal market types
- Nuanced distribution of responsibilities among public and private sector stakeholders

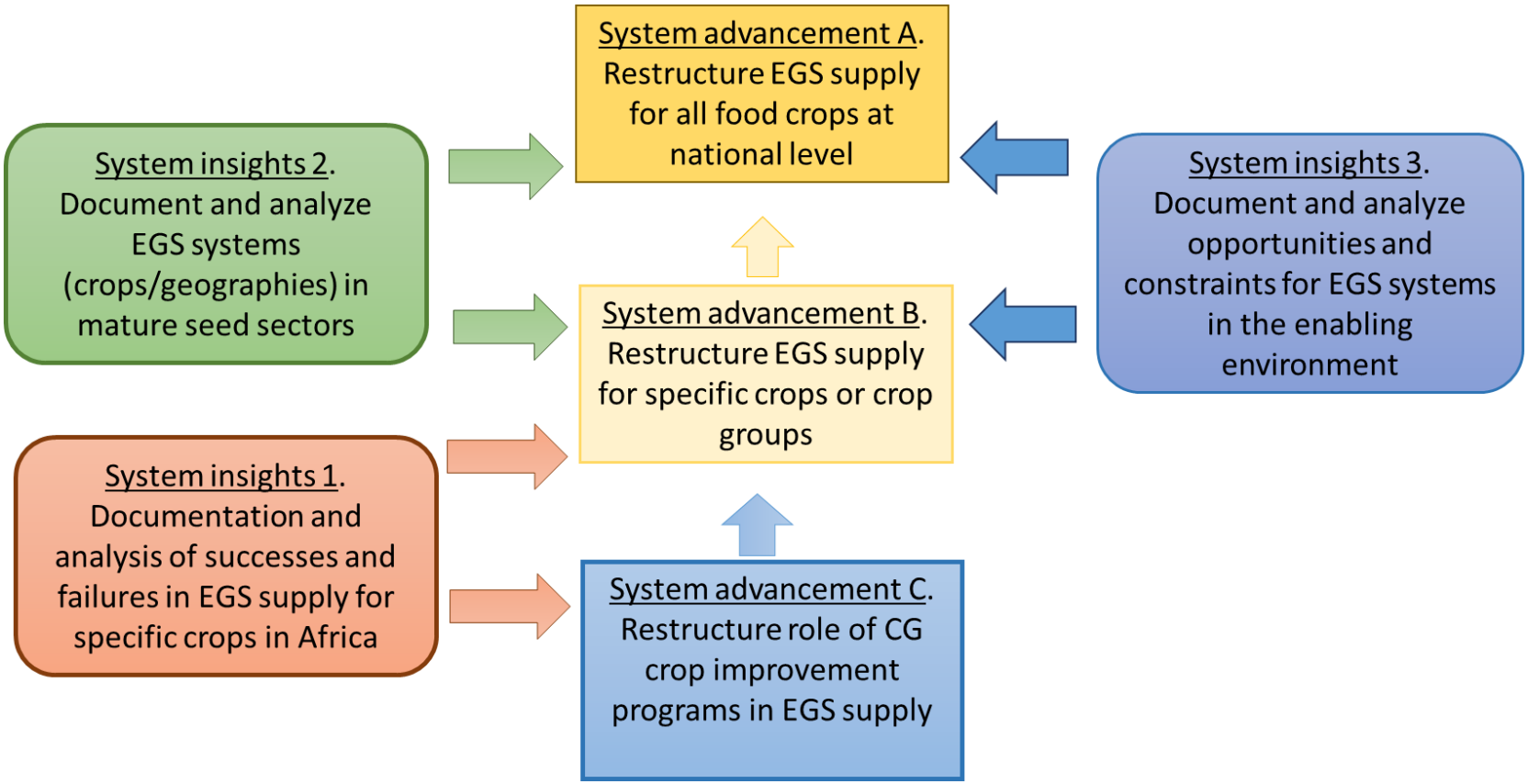


INSIGHTS FOR ADVANCEMENT OF EGS SYSTEMS

- Evidence for systemic change
  - Economic analysis
  - Seed systems
- Restructuring EGS systems: country and crop-types
- Public-private partnerships
- Public expenditure
- Specific role of CGIAR
- Our focus: catalytic processes
- EGS is a major, but only one of the key challenges
- Learn how to deal with other challenges in the seed sector



PROPOSED FUTURE STEPS



THANK YOU

Strengthening Early Generation Seed Systems (EGS) in Africa and Beyond

Synthesis of Rwanda, Zambia, Kenya & Nigeria Country Studies

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On behalf of:

Africa Lead

Scaling up for food security in Africa

DAI

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THROUGHOUT 2016, AFRICALEAD/CONTEXT LED SEVERAL EGS STUDIES IN PARTNERSHIP WITH COUNTRY CONSULTANT NATIONALS

DELIVERABLES	TIME
Pilot In-Country (Rwanda & Zambia) EGS Studies	Jan
Write Curriculum & Train Consultants	Feb
Conduct In-Country (Kenya & Nigeria) EGS Studies	May
Synthesize Four EGS Studies	Jul
Technical Review of Ten EGS Studies	Sep
Develop EGS Investment Plan Guide	Oct

TEAM

Seed Experts:
Mark Walton, Dave Westphal

Country Consultant Nationals:
Evans Sikinyi (Rwanda & Kenya), Watson Mwale (Zambia) , Catherine Mungoma (Zambia), James Karanja (Kenya), Clement Urinzwenimana (Rwanda), Sahel Capital – Ndidi Nwuneli (Nigeria)

Context:
Mark Nelson, Rob Lowenthal, Lloyd Le Page, Seth Taylor, Dan Creagh, Jason Nickerson

DAI:
David Tardif-Douglin, Chuck Johnson

EGS METHODOLOGY – OUR EXPERIENCE IN THE NIGERIA STUDY

Nigeria EGS Study Timeline

- *Three Regional Stakeholder Kick-Off Meetings*
- *250 Field Visits and Interviews with Private and Public Sector Stakeholders*
- *Stakeholder Feedback Meeting*

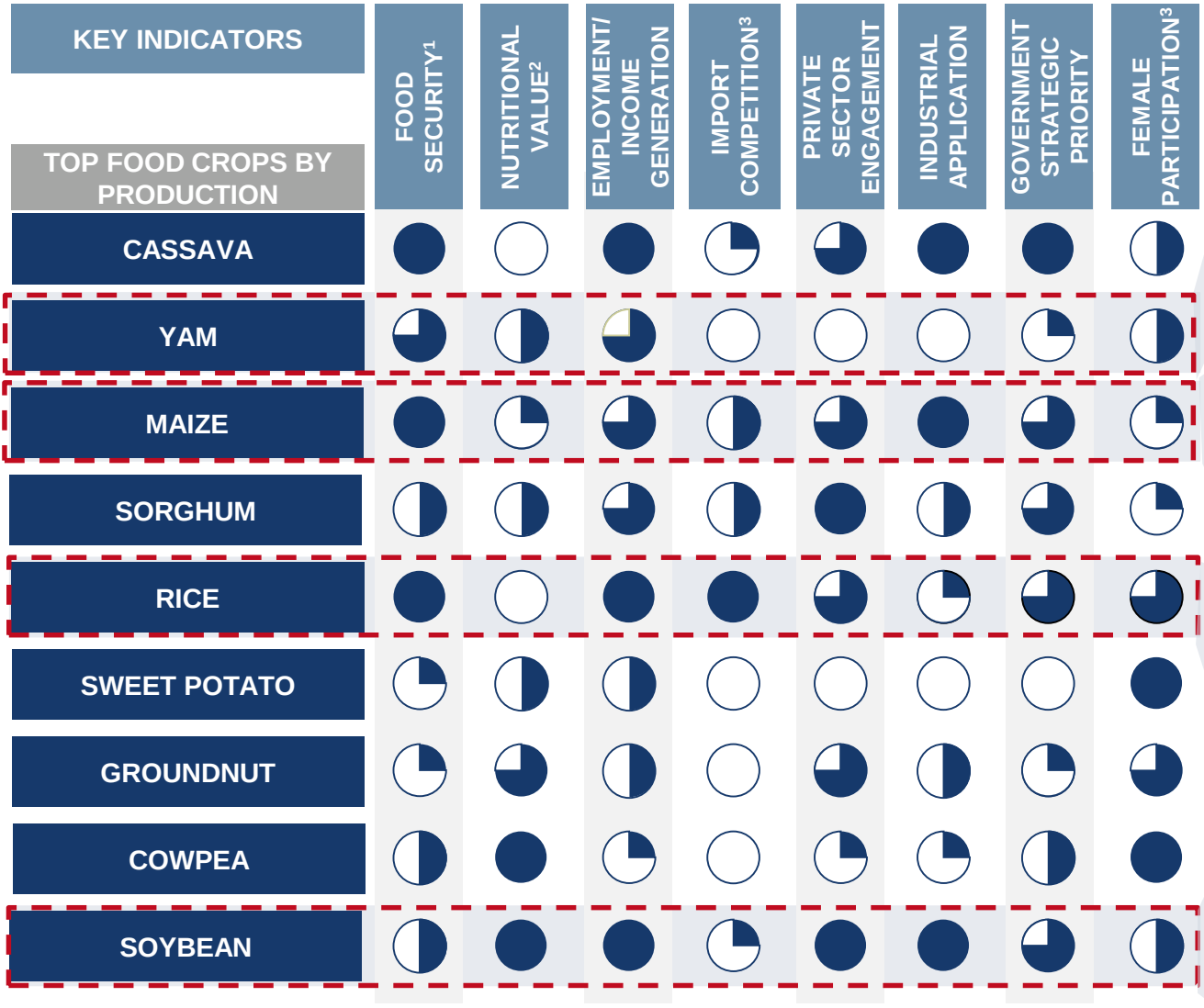
Steps of Analysis

A CURRENT SITUATION
1. Dominant Seed Systems
2. Prioritized Crops
3. Current EGS Systems

B ECONOMIC ANALYSIS
4. Potential EGS Demand
5. Cost of EGS Production
6. EGS Demand Matched with Revenue/Cost

C DEFINE EGSS OPERATIONAL STRATEGIES
7. Optimal Market Archetype
8. Key Challenges
9. Public-Private Partnership Mechanisms & Solutions
10. Recommendations

RICE, YAM, MAIZE AND SOYBEAN SELECTED FOR THE EGS SYSTEM STUDY IN NIGERIA



YAM
- Key food security and smallholder farmer crop
- Under-developed EGS system a critical factor limiting yields

MAIZE
- Strong and growing demand from feed and food processors
- National yields among the lowest in the region; low adoption of hybrids a key reason

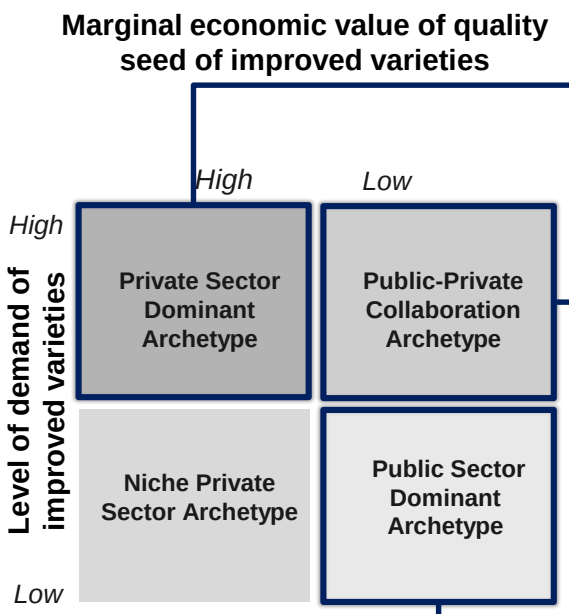
RICE
- Nigeria the 2nd largest global importer of rice
- Insufficient EGS a major cause of low yields and poor quality production that doesn't meet market needs

SOYBEAN
- Government priority to double production to meet growing feed and industrial demand
- Lack of adoption of improved rust resistant varieties constraining yield

Source: FAOSTAT (2014); Scholarly Journals of Agricultural Science (2013); Nigeria Agricultural Sector Risk Assessment, World Bank (2015)

Low ○ ◔ ◑ ◕ ● High

DIVERSE CROP ARCHETYPES INFORM SPECIFIC RECOMMENDATIONS



Recommendations

Rice: Private sector dominant archetype

- Establish a private processor-oriented rice seed system
- Remove legal and policy barriers to stimulate local production

Hybrid Maize and Soybean: Private-public archetype

- Develop an EGS-PPP focused on ramping up foundation seed supply, enhancing profitable EGS production capabilities, developing a cost-effective quality assurance system, and increasing farmer demand for improved, high-quality seed
- **Hybrid Maize**: Accelerate the production and distribution of hybrids suited to the Humid Rain Forest agro-ecology
- **Soybean**: Increase the capability of NCRI substations; increase farmer and agro-dealer knowledge about the benefits of improved varieties

Yam: Public sector dominant archetype

- Establish a strong National Yam Value Chain Association
- Support the demonstration and distribution of improved seed yam

Cross Crop

- Establish a National Seed Fund
- Support the improvement of the quality assurance system
- Implement clear and strong IP policies
- Suppress counterfeit seeds through the quick enactment of the New Seed Law

RATIONALE FOR PPPs IS COMMON ACROSS ALMOST ALL EGS SEED SYSTEMS PROFILED

Rationale

Structural and demand issues identified that impact quantity, quality, and use of early generation and certified seed can be addressed and resolved, but only if ***adequate financial and human resources*** are brought into play.

Summary of EGS-PPP stakeholder roles by crop

		Common Bean, Groundnut	Potato	Hybrid Maize, Soybean
Seed Production	**Breeder Seed**	• NARIs • CGIARs	• NARIs • CGIARs • International Seed Companies	• NARIs • CGIARs
	Basic Seed	• Seed Production Units of NARIs • Local Seed Companies	• Seed Production Units of NARIs • Local and International Seed Companies	
	Commercial Seed	• Local Seed Companies • Farmer Groups • Cooperatives • Traders, MFIs, Credit Associations		• Local and International Seed Companies contracting Outgrowers
	Marketing & Distribution	• Commercial seed producers plus agro-dealers and NGOs		
Non-seed production stakeholders		• **Public**: Ministry of Agriculture, Extension, Quality Assurance • **Private**: Agro-Processors, Supermarkets, Traders, MFIs, Rural Credit Providers, Associations • **Civil Society**: NGOs, programs, media		

CROP-SPECIFIC EGS SYSTEM UPGRADING OPPORTUNITIES CENTER ON IMPROVING EGS PROFITABILITY

	DIFFERENTIAL YIELD PERFORMANCE	LEVEL OF ABIOTIC/BIOTIC PRESSURE	SEED PRODUCTION COST	SEED PRODUCTION YIELD	TRANSPORT-ABILITY	QUALITY ASSURANCE COSTS	PRICE PREMIUM PAID FOR QUALITY TRAITS	FREQUENCY OF SEED REPLACEMENT
HYBIRD MAIZE	High	Low-Medium	High	High	High	High	Low-Medium	High
RICE	Low-Medium	Medium-High	Medium-Low	Low-Medium	High	Low-Medium	Medium-High	Low-Medium
POTATO	Low-Medium	High	Medium-High	Low-Medium	Medium-Low	Low-Medium	Medium-High	Medium-High
SOYBEAN	Low-Medium	High	Low-Medium	Low-Medium	Medium-High	Low-Medium	Low-Medium	Low-Medium
COMMON BEAN	Medium-Low	Medium-High	Low-Medium	Medium-Low	Low-Medium	Medium-Low	Medium-Low	Medium-Low
GROUNDNUT	Medium-Low	Medium-High	Low-Medium	Medium-Low	Low-Medium	Medium-Low	Medium-Low	Medium-Low
YAM	Medium-Low	High	Medium-High	Medium-Low	Medium-Low	Low-Medium	Medium-Low	Medium-High

High ● ◕ ◑ ◔ ○ Low

Source: Directional estimates from Context interviews

POLICY RECOMMENDATIONS: CROSS COUNTRY

Legal and Regulatory	Resource Allocation	Market Development
Implement clear and strong IP policies that enable licensing agreements and support appropriate royalty sharing.	Increase funding for breeding and seed production activities, as well as royalty collection systems at NARIs and universities to levels that ensure they can deliver on their mandates.	Build a seed forecasting demand system to provide real-time information on the specific varieties and quantities needed to meet market demands.
Operationalize quality declared system.	Increase funding of national and local extension to increase number of trained personnel and demonstration trial coverage.	Develop agricultural credit and working capital products for capital intensive EGS and commercial seed producers.
Reform breeder incentives to align with market impact rather than number of releases.	Hire and train quality assurance lab and field personnel for inspection and sampling.	Develop agricultural products for smallholder farmers to invest in high quality inputs.
Implement contract enforcement mechanisms between seed companies and outgrowers.	Increase storage capacity for seed which will allow seed producers the opportunity to store inventory from successful harvests and increase sales flexibility.	Promote the use of small seed packs tailored to smallholder farmer needs.
Establish a grades and standards system for marketing of production.		Increase farmer and seed producer educational and training programs in the use of agronomic and business best practices.
		Develop a communications strategy to educate farmers on the benefits of improved varieties using radio, television, documentary films, farmer days, market days, and national champions.

THANK YOU

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USAID FROM THE AMERICAN PEOPLE

AfricaLead Scaling up for food security in Africa

Synthesis of EGS Country Studies: Ghana, Malawi, Mozambique and Tanzania

Latha Nagarajan
IFDC

Carl Pray
Rutgers University

Richard Jones
AGRA-SSTP

Seminar on Strengthening Early Generation Seed (EGS) Systems in Africa and Beyond
Washington, DC
December, 14th 2016

Background

- Study by USAID-funded Scaling Seeds and Technologies Partnership (SSTP) implemented by AGRA
  - April to November 2016

- Data collection and analysis by two national consultants in each country with expertise in plant breeding, seed technology and business management

- Technical support provided by Rutgers University FTF Consortium

Tanzania – Methodology

STEP 1. Initial stakeholder consultations for crop selection

- **Private firms, public sector including universities, national & international research centers, key government agencies on agriculture, seeds and quality control**

STEP 2. Interviews to gather information on (based on Context Network Methodology)

- **Existing EGS structure/actors**
- **Demand estimation (existing vs. potential)**
- **Cost components of all EGS stages in seed chain**
- **Legal/market/policy constraints/opportunities**

STEP 3. Analysis and reporting

- **Matching up demand with revenues**
- **Selection of optimal crop-market archetypes**
- **Discuss the opportunities**

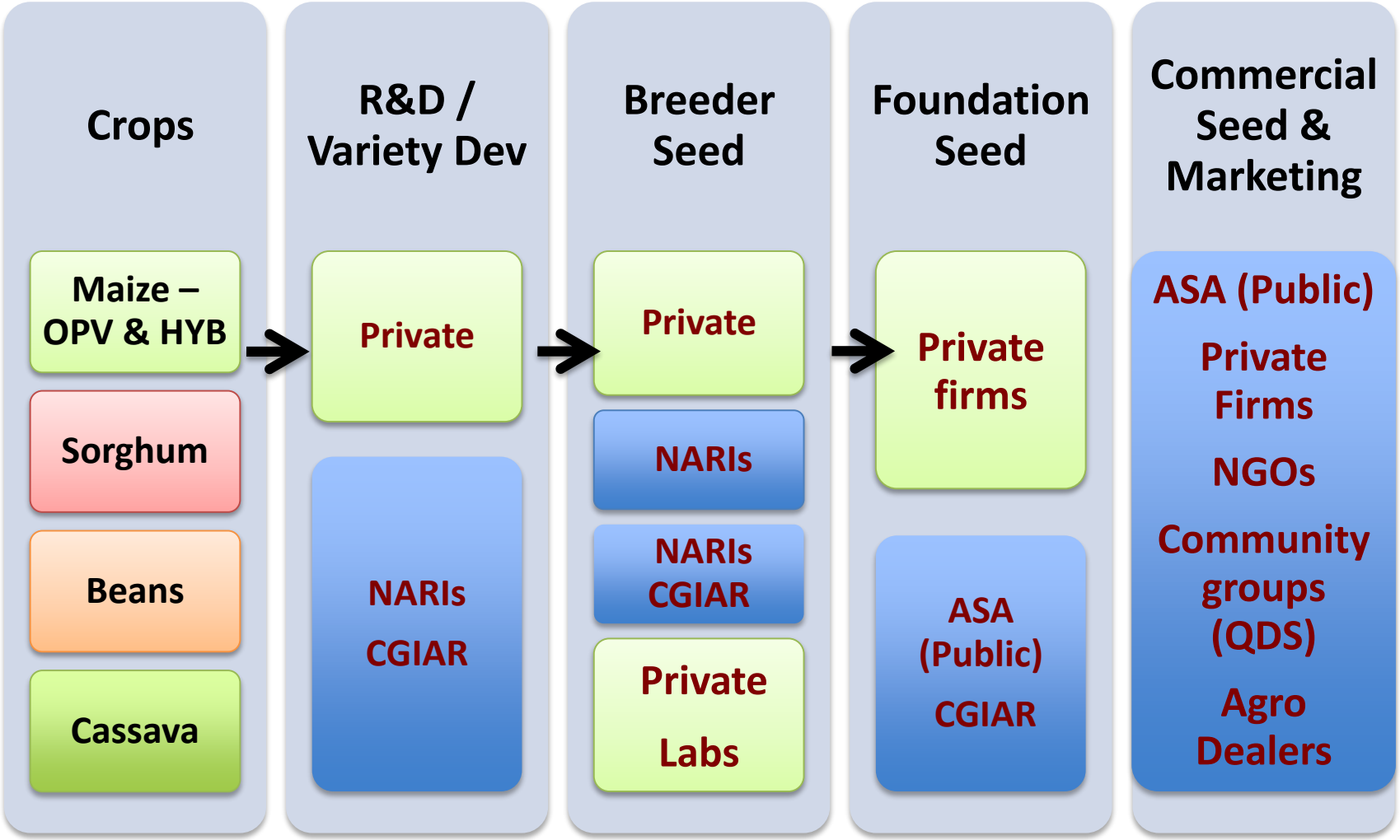
STEP 4. Final validation workshop with stakeholders

- **Feedback on proposed plans and building the action plan**

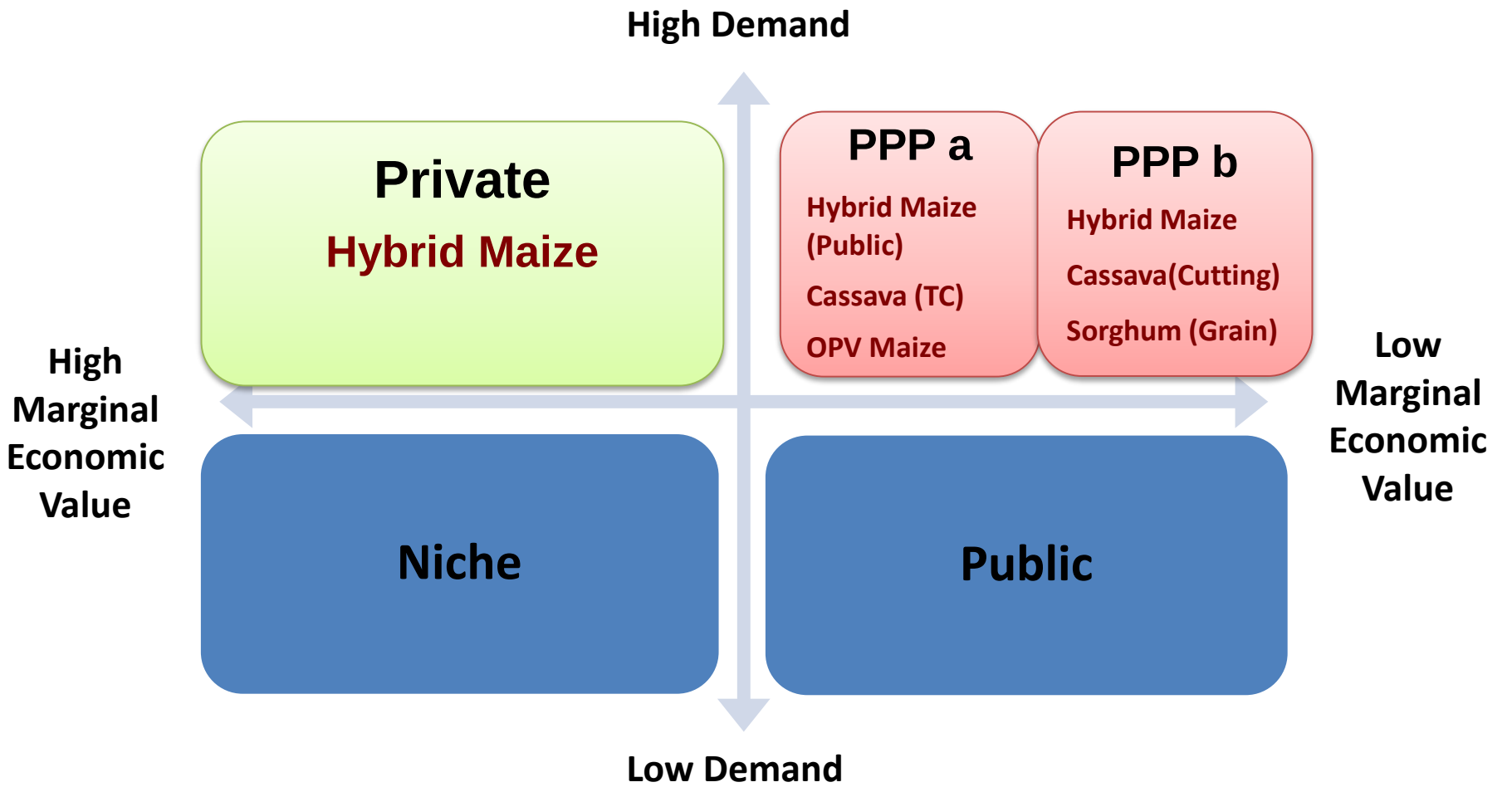
STEP 1: Crop Selection

Crop Type	Crops	Rationale
Cereals	**Maize Hybrids** **Maize OPV**	• Food security and key priority crop for stakeholders (>4.1 million ha) • Low yields: poor MV adoption • Streamline existing EGS systems • High private sector interest
	Sorghum	• Food security crop in dry areas • Growing market demand: breweries
Legumes	**Common Beans**	• Important food and nutrition crop (>1.1 million ha) • Lack of EGS of farmer-preferred varieties
RTBs	**Cassava**	• Food security, government priority - dry areas • High potential for processing • High EGS demand for disease-free cuttings

STEP 2: Information on Current Seed System Actors



Summary of Crop Archetype Assessments



Key Challenges

Policies	Constraints
Regulations & quality assurance	• Active participation in SADC/EAC seed harmonization, but full implementation not in place • Erratic trade policies, e.g. export bans • Licensing of public varieties in place, but excessive delays/cumbersome procedures
Technical & management capabilities	• No enforcement of regulations on fake seeds • Inadequate/unworkable QC procedures/infrastructure facilities
Demand creation & market linkages	• Poor estimation of demand • Irregular government and donor procurement of seed • Weak government breeding programs for crops like beans, cassava and sorghum • Inadequate field trials/seed production testing and promotion of new varieties
Incentives & access to capital	• High interest rates • Limited or no funding support for service providers

EGS Tanzania – Next Steps

1. Validation workshop for stakeholders – September 29
   - Public and private seed companies, government agencies, research, donor agencies, development projects
2. Consensus on crops and optimal market types for improving EGS system in beans, cassava and sorghum
   - Modified the optimal market type – sorghum into niche category - Industrial potential/demand from private sector for white sorghum varieties
   - Suggested to include sesame into niche category – export crop/processing sector
3. Setting up of "seed working group" to finalize action plans for EGS

Optimal Market Type for EGS in TC Cassava: Public-Private Partnership (PPP)

Rationale:

- Demand for “virus – free seedlings”
- Marginal economic value to use (and market demand) for improved TC seedlings in cassava is medium to high

Opportunities for private sector participation in EGS

R&D/Variety Dev.	• NARIs, IARC (Public)
Breeder Seed	• NARIs, IARC (Public) • Private labs for Virus indexing / cleaning
Foundation Seed	• NGOs, community groups (QDS) • Private – Cuttings • Private – Mass micro-propagation labs
Commercial Seed & Marketing	• Private firms • Community groups

Proposed Crops & Market Types in SSTP Countries

Crop Type	Crops	Proposed market types	TZ	Ghana	Malawi	MOZ
Cereals	Maize(Hy)	Private PPP (Public Hy)	★	★	★	★
	Maize (OP)	PPP (public OP)	★	★		★
	Rice	PPP I & II		★	★	★
	Sorghum	Niche, Public	★	★		
Legumes	Common Beans	PPP II	★		★	
	Cowpea	PPP II		★		★
	Groundnut	PPP II		★		★
	Soybean	PPP, Private		★	★	★
RTBs	Cassava	PPP I (TC) PPP II (Normal)	★			★
	Yam	Niche, PPP I		★		

Proposed Actions in SSTP Countries (1/2)

1. **Identify key EGS pilot projects in each of the four SSTP countries where there is an existing unmet demand for EGS**

2. **Develop business plans for proposed interventions**

3. **Select an existing service provider (or) select through a competitive bid to implement**

4. **Provide financial support to service provider for EGS production and marketing**

5. **Technical support to service provider to achieve higher quality standards**

Proposed Actions in SSTP countries (2/2)

6. Ensure quality standards

- Genetic purity of seeds – use molecular characterization

(DNA finger printing, etc.)

- Physical purity (weeds, dirt, etc.)

7. Establish a web-based seed platform to provide:

- Information on released varieties, geographic adaptation, seed suppliers, seed availability and mechanism to complain about poor quality

8. Close collaboration with key government policy-makers

- Inform bottlenecks on access to varieties, extension and policies

9. Learn from the pilot – disseminate results and evaluate for further scale-up

Acknowledgements

1. AGRA - SSTP Team and Consultants

Tanzania:

- Vianey Rweyendela (SSTP), Emmarold Mneney, Oswald Mashindano

Mozambique:

- Anabela Manhica (SSTP), Alda Tomo, Maria Estrela

Malawi:

- Geoffrey Kananji (SSTP) Joseph Dzanja, Henderson Chimoyo

Ghana:

- Boateng Forster (SSTP), Juliana Asante-Dartey, Amos Rutherford

2. Rutgers University FTF Consortium

- Anwar Naseem
- David Gisselquist

LESSONS LEARNED

1. **Funding limitations require governments to make trade-offs to optimize their use of resources to achieve national goals.**
2. **NARIs are generally too under-resourced to successfully achieve their main objective, which is variety development and selection. Foundation seed production is not a core NARI competency and should be limited to specific situations where there is no private sector interest.**
3. **Validating the value of quality seed of improved varieties versus the status quo at the farm level is an important component of a sustainable EGS system.**
4. **Increasing farmer adoption of improved varieties requires a comprehensive approach including demonstration, education, training and credit.**
5. **Producing quality seed requires different, more rigorous management practices and access to resources and facilities than those required for crop production. The corollary is that tailored training programs are also required.**
6. **Integrating rapid multiplication of root and tuber technology and linking it with end users such as processors is improving the marginal economic value of crops and attracting private sector interest.**
7. **Quality assurance systems need to be tailored to crop-specific requirements.**
8. **Crop grades and standards are critical to improving the marginal economic value of crops, but they are non-existent.**

Questions and Answers

JOIN THE DISCUSSION

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