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of the United Nations

# Improving farmers' access to quality seed potato

Workshop Report

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GCP/RAF/448/EC Strengthening linkages between small actors  
and buyers in the roots and tubers sector in Africa



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Many thanks go to all the participants for their contributions to the workshop.

## EXECUTIVE SUMMARY

The sub-regional workshop on improving farmers' access to quality seed potato was organized as part of the project *Strengthening linkages between small actors and buyers in the roots and tubers sector in Africa*, an EU-funded project being implemented by FAO in seven countries. The workshop brought together actors in the seed potato value chain from Uganda and Rwanda as well as the Democratic Republic of the Congo, Burundi and Kenya. The workshop was organized in response to the lack of access to quality seed potato, which is a major bottleneck in the development of the Irish potato sector in the region. The regular cross border trade in both ware and seed potatoes in East Africa necessitates a regional approach for the development of effective seed potato systems.

The objective of the workshop was to strengthen the capacity of stakeholders engaged in the seed potato system in East Africa, particularly in Rwanda and Uganda, with a view toward improving the potato value chain. Presentations and discussions centered on four main themes: the current situation and policy framework, increasing local commercial seed production, improving quality in the informal seed sector, and the role of research.

The workshop concluded with a field visit to Musanze. This included a visit to a producer of mini-tubers and pre-basic seed, a producer of certified seed, and a group practicing positive selection, as well as the training center of IMBARAGA.

**The current situation and policy framework.** The main outputs were the sensitization of workshop participants to the COMESA and EAC harmonized regulations and standards, discussion on the important role of national platforms in supporting a well-functioning seed potato system, and knowledge exchange about terminology<sup>1</sup> and varieties.

The workshop provided an overview and current status of the harmonized regional standards within COMESA and EAC, which simplify the release of new varieties and facilitate cross-border trade. Most seed regulations have details on cereals and grains but not on seed potato. Each country is recommended to have a seed policy guide and regulations that specifically address the issues of seed potato.

Lack of clarity on import and export requirements, quarantine requirements and variety testing can impede trade. To accompany harmonization, capacity building in pest risk analysis training is recommended in addition to training in seed certification and variety release, phytosanitary and quarantine measures for seed import and export, and phytosanitary documentation. Standardized variety names would solve the problem of farmers or breeders not knowing the particular variety when they want to renew their seed and would provide clarity on what is being imported and exported.

National platforms were identified as useful in improving access to seed potato and developing a more coordinated value chain by promoting synergies and minimizing duplication of efforts. Platforms facilitate the sharing of best practices for quality standards and communication along the seed potato value chain, thereby facilitating a better matching of supply and demand for specific varieties

**Increasing local commercial seed production.** Improving local commercial seed production involves a number of areas including upgrading infrastructure such as screen houses, improving human capacity (technicians), training seed producers and multipliers, and supporting farmer organizations and agricultural institutions to establish collection centers. Market information systems and demand forecasting are needed to synchronize seed production with the market. Developing a seed producer calendar from micro-propagation to seed delivery was recommended to align supply with demand.

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<sup>1</sup> Annex B

Because of the importance of decentralized seed multiplication, more multiplication centers for basic seed need to be established. Along with insufficient pre-basic seed, land is another challenge for commercial seed production. A precise calculation of the amount of land needed for certified seed production at scale is recommended to inform policy decisions.

Business models for commercial seed production include individual multipliers, joint ventures at national level for private seed producers and seed production by farmer associations or cooperatives. Contract farming arrangements between processors and ware potato producers also are important for increasing local commercial seed production, as processors provide the market pull for quality seed and an incentive for investment in the seed potato value chain. Larger buyers with contract farming arrangements may assist in signaling upcoming demand to seed producers. There should be policies in place to encourage financing for seed production and a regulatory framework that supports contract farming.

The workshop agreed that governments and projects could support private seed multipliers by developing business skills through training and practical mentoring, facilitating linkages with financial service providers and developing marketing infrastructure. Developing higher level farmer organizations to be linked to financial services is recommended to improve financial services for the seed potato value chain.

**Improving quality in the informal seed sector.** The formal seed system accounts for less than two percent of the total seed potato demand in the region. The workshop provided knowledge exchange on positive selection techniques and identified Quality Declared Seed (QDS) as a potential strategy for improving access to better quality seed potato. Positive selection is different from commercial seed supply systems in that the focus is on the self-supply of smallholder farmers and involves old technology. The approach can fit in the existing seed system and can reduce the speed of seed degeneration, but it does not guarantee continued good potato harvests. To maintain yield levels, it is necessary to replenish seed from a reliable source.

A QDS system is a quality assurance scheme for seed production that is less demanding than the standard quality control systems. QDS has the potential to bridge the formal and informal systems by catalyzing the development of the formal system while simultaneously upgrading the informal sector to a higher quality semi-formal level. The workshop showed that next steps must take into account the reality that the informal seed system is the predominant system and that shifting to a more formal system will take time and investment. Countries are recommended to develop and recognize a QDS system.

**The role of research.** The workshop underscored the importance of breeding for end-users, and it provided information on end-user needs, notably the nascent potato processing industry that represents a growing market opportunity in the region. A lack of well-suited varieties on the market restricts the potential for processing in the sub-sector. Effective seed demand needs to be determined in terms of varietal requirements by various end-users, the desired quantity and quality, and production targets and timelines.

Currently there are some varieties being tested in the region that have good processing qualities. When released, it will still take about two years before such varieties become available on the market as certified seed. Processing companies with an immediate market to satisfy would like for seed potato – not mini-tubers – to be imported to improve quality quickly, while working with breeders to improve the local varieties in the longer term.

Recommendations for research include testing and introducing varieties that are better suited for processing activities, while continuing to seek ways of reducing the number of years it takes for a potential variety to be tested and listed. Greater investments are needed in national research institutes, inspection and certification bodies and in capacity to produce pre-basic tissue culture plantlets and pre-basic seed to supply private multipliers. Capacity could be increased through larger and more tissue culture laboratories, irrigation facilities for off-season seed production, and increasing the number of skilled staff.

Other priorities include enhancing capacity in disease and pest indexing and screening, and evaluating effective rapid multiplication techniques and affordable germplasm conservation methods. Finally, it is recommended to map seed production zones and to set up a regional platform for researchers involved in seed potato production in order to facilitate the sharing of ideas, resources and experiences.

**Possible follow-up actions.** For Government, a possible next step could include analyzing the potential implications of the respective draft seed policies for the seed potato sector, and whether or not any changes might be necessary to accommodate a transition phase. For research, a next step could be to test and introduce varieties that are better suited for processing activities, while continuing to seek ways of reducing the number of years it takes for a potential variety to be tested and listed. The private sector could develop and lead, with representation from Government, national platforms similar to the National Potato Council of Kenya.



## **ACRONYMS**

ACP	African, Caribbean, and Pacific Group of States
ACTESA	Alliance for Commodity Trade in East and Southern Africa
ART	African Roots and Tubers Project
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
COMESA	Common Market for Eastern and Southern Africa
COMSHIP	COMESA Seed Harmonisation Implementation Plan
CIP	International Potato Center
DFID	UK Department for International Development
EAC	East African Community
EU	European Union
FAO	Food and Agriculture Organization
FECOPORWA	Federation of Irish Potato Farmers
FFS	Farmer Field School
FO	Farmers Organization
GIS	Geographic Information System
IFDC	International Fertilizer Development Center
IMBARAGA	Rwanda Farmers Federation
KEPHIS	Kenya Plant Health Inspectorate Service
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MINAGRI	Ministry of Agriculture and Animal Resources
MoU	Memorandum of Understanding
NAADS	National Agricultural Advisory Services
NARO	National Agricultural Research Organization
NGO	Non-Governmental Organization
OECD	Organization for Economic Co-operation and Development
PPP	Public-Private Partnership
QDS	Quality Declared Seed
R & T	Roots and Tubers
RAB	Rwanda Agriculture Board
RCA	Rwanda Cooperative Agency
SACCO	Savings and Credit Cooperative Organizations
SME	Small and Medium Enterprise
UNSPPA	Ugandan National Seed Potato Producers Association
USAID	United States Agency for International Development
ZARDI	Zonal Agricultural Research and Development Institute

## **1. INTRODUCTION**

### **1.1 Background/context**

The EU through FAO has funded a regional project on “*Strengthening linkages between small actors and buyers in the Roots and Tubers sector in Africa*”. The project aims to improve the livelihoods of small producers engaged in the roots and tubers value chains in seven African countries through the promotion of linkages to domestic and regional markets.

The project’s output areas are as follows:

- 1) National and regional strategies are aligned for improved regional market integration.
- 2) The competitiveness and viability of R&T value chains is strengthened
- 3) Access to information services and finance is improved for smallholders.
- 4) Small producers have access to climatic risk management instruments.

In Rwanda and Uganda the project focuses on the Irish potato sector (“Irish potato” is hereafter referred to as “potato”).

In the project inception workshops in Rwanda and Uganda, one of the major bottlenecks identified in the development of the sector is the lack of access to quality seed potatoes. It emerged that a regional approach for the development of effective seed potato systems is needed because of regular cross border trade in both ware and seed potatoes in East Africa, as well as increased harmonization of trade rules through the EAC and COMESA. In this context, FAO organized this sub-regional workshop on improving farmers’ access to quality seed potato.

#### **Policy Background on seed systems in Uganda and Rwanda**

In Uganda the Government recognizes both the formal and informal seed supply channels in its policies and programmes. The formal sector is fully regulated by the Government and is commercially oriented. This seed source only accounts for 20% of the seeds supplied (all crops). For potato the share is much lower. The Government of Uganda through the National Development Plan (NDP 2010-2015) as well as the Potato Framework Implementation Plan (FIP) considers potato as a priority crop and identifies provision of agricultural inputs such as seed as one of the focus areas that will lead to accelerated agricultural development. Additionally, through its draft potato policy, Uganda aims to promote and facilitate stable and competitive trade in this sub-sector.

The seed sector in Rwanda has been mandated by the National Seed Service in 2001, the Seed Law in 2003 and the National Seed Policy in 2007. The production of certified seed potato is very limited (2% of total seed planted) with low involvement of the private sector. The informal seed system has always managed to bridge the gap. The new draft seed law aims for an active participation of the private sector in seed production. Potato is one of the six priority crops (maize, wheat, rice, potato, beans and cassava) which were carefully chosen by the Government of Rwanda Crop Intensification Program (CIP) for the purpose of improving food security and income generation.

Well-known challenges that impact the seed potato value chain in both countries include limited availability of quality seed potato, high seed price, and insufficient knowledge or access to complementary inputs such as fertilizer and pesticide to obtain the highest return on the quality seed potato. Inadequate awareness of good seed management and storage practices as well as poor marketing systems have prevented the sector’s full potential growth in national and intra-regional trade<sup>2</sup>.

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<sup>2</sup> CIP. (2011). Roadmap for Investment in the Seed Potato Value Chain in Eastern Africa  
[http://cipotato.org/wp-content/uploads/2014/05/CIP\\_Roadmap-Final.pdf](http://cipotato.org/wp-content/uploads/2014/05/CIP_Roadmap-Final.pdf)

Under on-going reforms with market and trade liberalization, both Rwanda and Uganda have improved the environment for increased private sector participation in the overall seed sector. For instance, Uganda's draft potato policy explicitly recognizes two models for the delivery of technology-production packages: 1) Organized farmer group model and (2) Private company-led out-grower scheme model.

## **Regional developments**

The COMESA Seed Trade Harmonisation Regulations were endorsed by the COMESA Council of Ministers in February 2014. Subsequently, ACTESA developed the COMESA Seed Harmonisation Implementation Plan (COMSHIP) to ensure that national seed laws and regulations are aligned to the COMESA Seed Trade Harmonisation Regulations and to support COMESA Member States' production of locally adapted seed.

In addition, with adoption of regional standards for roots and tubers in the East African Community (EAC), there is the expectation that these standards will expand the use of potato products in high value industrial products such as chips, crisps starch, confectionery, animal feeds, etc. Progressing further into higher and integrated regional value chains will also promote trade in potato products between countries that comply with the harmonized standards.

### **1.2 Objectives, activities and expected results**

The overall objective of the regional workshop was to strengthen the capacity of stakeholders engaged in the potato seed system in East Africa, particularly in Rwanda and Uganda, with a view toward improving the overall potato value chain. Specific objectives include the following:

- Review the current situation in the region with regard to the seed potato industry (production, quality, and value chain) and the policy and regulatory framework affecting development of the seed sector;
- Bring together all actors in the seed potato value chain to improve public-private sector dialogue and exchange experiences on the constraints and best practices in the development of the potato seed sector and increased private sector involvement;
- Improve dialogue on the national potato seed policies to include strategies for promoting local seed production and carry out further analysis of the seed systems related legislations which could impact seed trade in the region.

### **Expected results:**

- Stakeholders sensitized on trade policies related to seed systems and potato sub-sector;
- Lessons shared on an enabling environment and models for private sector involvement in quality seed production and distribution and best practices have been identified.
- Policy guidance for governments and proposed activities for FAO and partners in support of the seed sector's development.

### **1.3 Participants**

The workshop brought together important actors in the seed potato value chain from Uganda and Rwanda as well as the Democratic Republic of the Congo, Burundi and Kenya. Participants included senior managers from Government institutions, development partners, research institutes, NGOs, the private sector including processing companies, and farmer organizations. See annex for the complete participant list.

## 2. OPENING SESSION

FAO Representative of Rwanda Attaher Maiga; the Representative of the EU to Rwanda Johan Cauwenbergh; Telesphore Ndabameny, head of the Crop Production & Food Security Department RAB; and Cora Dankers, Project Coordinator of the African Roots and Tubers project opened the workshop.

The FAO Representative welcomed participants and gave context on the workshop as well as the African Roots and Tubers project. The European Union representative highlighted the fact that the project is financed by the EU through the ACP Secretariat. He also remarked that regulation standardization can work to increase market opportunities and that there is still work to be done on extension services and the opening of the EAC market. Telesphore Ndabamenye framed the workshop as an opportunity for Rwandans to see how synergies in the sub-region can be strengthened. He also focused on how the workshop is an opportunity for sharing ideas from various countries, and he drew attention to the importance of supporting the private sector through an enabling and effective policy environment.

Cora Dankers set the scene for the workshop with a speech about what it takes to improve farmers' access to quality seed. She highlighted that there are important barriers to be addressed if the full potential of potato in the region is to be realized. One major bottleneck in potato production and profitability is limited farmer access to quality seed and therefore the widespread use of poor quality seed potato by farmers.

In the opening remarks, five points were identified as important for satisfying effective demand for seed potato by farmers.

1. Knowledge of effective demand throughout the seed potato chain.
2. Research and development that produces the good quality seed that responds to end-user demand and performs in the particular agro-ecological environments.
3. Efficient seed multipliers who are able to produce the seed potatoes in the most cost-effective way.
4. Seed traders and enabling support services.
5. An enabling policy environment including the organization of quality control and certification and the provision of extension services.

Following the opening remarks, participants engaged in an activity where each wrote down his or her role in the seed potato value chain and placed it on a diagram representing the value chain. The diagram included the entire seed potato value chain from breeding and varietal release to multiplication and certification all the way to end users. In displaying the entire seed potato value chain, participants were invited to reflect on their own activities in the context of an interdependent chain. The exercise demonstrated that a number of participants are involved in more than just one area of the seed potato value chain. Though finance and credit were not represented on the value chain diagram, the exercise did draw attention to the importance of financial services along the seed potato value chain.



### **3. CURRENT SITUATION & POLICY FRAMEWORK**

#### **3.1 Summary of presentations**

##### **The Status of the COMESA Seed Trade Programme**

*Evans Sikinyi, MINAGRI*

There is a lack of appropriate varieties and a great need for availability of quality seed. Harmonization of seed trade regulations in the region aims to address these challenges by promoting the movement of seed. Global seed trade has increased considerably, but Africa for the most part has not contributed to it. However, there are opportunities with population growth and urbanization contributing to increased demand for food. Quality seed is key in meeting this demand. In the COMESA Member States, 23% of the overall seed market (all crops) is supplied by quality seed. The rest is supplied by the informal seed system where the majority of seed consists of landraces and local varieties. Recycled seed is contributing to low yields. Therefore, there is a need to move from an informal to a formal system.

In 2008, the Common COMESA Ministers of Agriculture directed the Secretariat to expedite the harmonisation of seed trade regulations to facilitate regional seed trade. Consultations then were held with both the public and private seed stakeholders. Twelve crops of key importance were identified, one being potato. The draft COMESA Seed Trade Harmonization Regulations were approved by the Ministers of Agriculture in 2013 and endorsed by the Council of Ministers in February, 2014. The COMESA Seed Trade Harmonized Regulations covered seed certification, variety testing and release, and phytosanitary / quarantine measures for seed import and export.

The Alliance for Commodity Trade in East and Southern Africa (ACTESA) then developed the COMESA Seed Harmonization Implementation Plan (COMSHIP), validated by COMESA Member States in 2014 in Addis Ababa, Ethiopia. The mission of COMSHIP (COMESA Seed Harmonization Implementation Plan) is for harmonized regulations to be adopted, leading to an opening of the market for greater private sector participation. COMSHIP has launched in 13 COMESA Member States including DR Congo, Ethiopia, Rwanda, Kenya, and Uganda. National Seed Review Teams have been launched in most countries. Rwanda, Kenya, Uganda and Zimbabwe finalized harmonized draft regulations.

In terms of awareness creation, regulations and brochures exist in three languages (English, French and Arabic). Translation into national languages is planned. The COMESA Variety Catalogue is now operational and online. Seed companies who want to export to COMESA countries are now requested to have their varieties on the COMESA Variety Catalogue available on [www.comesa.int](http://www.comesa.int). The breeder does an online application for the COMESA seed office that evaluates the application and shares it with national authorities. National authorities may test it, and if approved, it is added to the national list. To make the COMESA list, it must be on the list in at least two countries (two seasons for first country and one for the second).

One of the results of the COMESA seed trade harmonization regulations will be that varieties released in at least two COMESA countries can also be sold in other COMESA countries. This will make it easier for seed companies to operate on a regional level. However, the regional trade of seed potato entails important plant health issues. For this reason, some countries in the EAC are reluctant to allow import by the private sector of seed potato from outside the region.

One weakness is with customs officials who need to be better trained. Capacity in pest risk analysis is needed as well. ACTESA has a training programme in place using the DFID funding to be conducted with USAID support. Training will target seed certification and variety release, phytosanitary and quarantine measures for seed import and export, and phytosanitary documentation.

## **Harmonized East African standards for potato and cassava.**

*Stella Apolot – Coordinator Regional and International Standardization, Uganda National Bureau of Standards*

The EAC has 25 standards for root and tuber crops, with 14 standards for cassava and cassava products and 7 standards for potato and potato products. The standard for seed potato – East African Standard 753 – is based on international standards. There are standards for crisps, handling and managing of ware potatoes, and frozen chips.

To develop and adopt standards is one thing, but to implement them is another thing. In 2013, there was a pilot project to raise awareness and enhance implementation of the 25 standards. The pilot project took place in Rwanda and Kenya for potato; Uganda and Tanzania piloted cassava. Project activities included awareness raising on the requirements of the standards, analysis of the value chains for cassava and potato in EAC, the development of quality assurance manuals for regulators, training on quality assurance tools and techniques, building networks of value chain champions, and assessing the level of compliance to the standards.

Beyond the pilot, it was proposed that the ART project takes into consideration some of the achievements from this pilot project, especially the trainings that are based on the manuals – as well as training on the implementation of the harmonized standards.

### **Country Perspectives:**

#### **Seed Potato Policy Environment in Uganda**

*Alex Lwakuba, Assistant Commissioner, MAAIF and Siraj Nyende, Agricultural Inspector National Seed Certification Services, MAAIF*

Thirty-three districts in Uganda are growing potato, and production is 480,000 tonnes per year. UNSPPA, the umbrella organization for seed potato growers, produces most of the country's certified seed, but its production is still only 6%. Tissue culture plantlets are produced by NARO – KAZARDI. A priority for the government is the production and distribution of seed potato varieties that meet end users' needs. The demand exists, but there is insufficient supply. Most farmers are using farm saved seed.

Framework policies that impact the potato sector include the Agricultural Sector Strategic Plan, the draft seed policy and the National Agriculture Policy (NAP). Relevant regulations and legislation includes the Plant Protection and Health Act of 2015, the Plant Variety Protection Act of 2014, the Seeds and Plant Regulations of 2011 and the Seeds and Plant Act of 2006.

The Government currently is harmonizing seed regulations with input from stakeholders, taking into account EAC regional standards and COMESA seed trade harmonization regulations. Harmonization has taken place in field inspection; lab testing protocols; variety testing, release, and registration; and phytosanitary regulations. The regulations will be sent to Cabinet for approval after being adopted by the top policy management of MAAIF.

Recent policy and institutional developments include the new Development Strategy and Investment Plan (DSIP), which takes into account the potato value chain. Some of the government interventions so far have been supporting infrastructure development and research, constructing screen houses and equipping farmer groups to be able to produce mini-tubers from plantlets. Driven by the Plant Protection Act of 2014, plant breeders have brought materials for testing and possible release.

Through IFDC initiatives, seven screen houses have been built so far. The NAADS-OWC (Operation Wealth Creation) program has a demand of about 900 tonnes of seed potato to distribute to selected farmers in potato growing districts. The Government through NAADS has supported the private sector by importing 85 tonnes of a promising potato variety with superior processing qualities for evaluation. It is currently being grown for testing under open quarantine.

Challenges for improving access to quality seed potato in Uganda include pests and disease along with lack of clean seed, high cost of inputs, land shortage, declining soil fertility, inadequate enforcement of policy and standards, and lack of collective marketing. There is also the issue of institutional capacity. With overwhelming demand for seed, there have been quality lapses in inspection.

### **Seed Potato Policy Environment in Rwanda**

*Telesphore Ndabamenya – Head of crop production and food security at RAB*

In Rwanda, potato is the second major food crop in terms of production value after banana and the second most important source of calorie intake after cassava. The highland areas account for 75% of land under potato production and 93% of production. Overall production has increased to around two million tonnes due to increased land under production. The land consolidation program is a contributing factor. The PSTA III (Strategic Plan for the Transformation of Agriculture) involves developing production and quality of seeds while ensuring that demand is being met through effective distribution and capacity building.

The key pillars for potato strategy involve strengthening the research program on potato, multiplication of quality seed potato, organization of the seed potato market, appropriate advisory services to seed potato producers, and developing post-harvest and value addition activities. Innovative elements of this strategy include promoting transparent linkages among seed value chain actors, financial service/business development support for seed multipliers, and strengthening research - most importantly genotype development and controlling diseases.

Kinigi is a popular variety and has been emphasized by research, multipliers and marketing. The agronomic strategy involves new potato varieties for various agroecological zones, addressing soil fertility and crop management issues, and looking at the impact of various rotation schemes. More emphasis is needed on rotation schemes to reduce diseases.

In terms of policies on seed systems, the current seed law under development includes protection of varieties and breeder rights. Improving the formal system involves upgrading infrastructure such as screen houses, bringing in private seed producers, increasing human capacity (technicians), and increasing funds, while the informal is more on positive selection. There are ambitious plans to boost the percentage of certified seed by 2017 with the roadmap aiming for 25% certified. Public funds play a role, but stakeholder analysis shows that the private sector is needed to reach that target.

### **Seed trade and plant health issues**

*Alfayo Ombuya – Kenya Plant Health Inspectorate Service KEPHIS*

An ideal seed trade system provides farmers with quality seed in a timely manner while preventing the spread of pests and diseases. The potato tuber is a pathway for transmission of pests and diseases across member states. Some pests/diseases do not uniformly occur across countries in the region. The growth of the potato seed system in the region will depend on how existing and emerging plant health challenges are addressed. Issues of trade involve both the informal and formal sectors. In Kenya, the formal sector involves seed companies registered and certified by KEPHIS. In the informal sector, parent seed cannot be traced from known sources and involves farm-saved seed, farmer-to-farmer exchange and local markets.

Poor productivity in the potato sector is caused by low supply of quality seed, pests and diseases, seasonality due to dependency on rain and limited storage. There are seed trade barriers as regulations governing seed certification and standards vary by country. Member countries have put in place various phytosanitary measures to mitigate risks of pest entry. Variety testing and release procedures are of long duration and lack specific criteria for release. Lack of clarity on import/export requirements, quarantine requirements and variety testing can impede trade. Overcoming these barriers to trade is facilitated by harmonization. Member countries should accede to international bodies setting international standards, rules and regulations such as the OECD's Seed Scheme for field inspection of seed.

The case of Kenya importing seed potato was shared. In Kenya, availability of certified seed potato is still a challenge. Seed potato importation is subject to quarantine and must fulfill national performance trial requirements.

### **3.2 Summary of discussions**

Barriers to trade in seed potato impact farmers' access to seed that can increase productivity and incomes. The facilitator brought up the following themes for discussion:

- Awareness of farmers of the harmonized standards and actions to make sure these standards are known.
- How to ensure these seeds distributed and supplied are of quality.
- The issue of cross-border trade and how to ensure seed traded is disease-free.

#### **Harmonization**

The purpose of harmonization is to facilitate movement of seeds. Once standardized, then seed that comes from one country can be trusted in another. In COMESA, COMSHIP is the implementation plan for harmonization. There had been prior attempts of harmonization, but they did not move forward because national governments did not buy into the system. All this was taken into account with COMESA; instructions came from the Ministers so there is country buy-in. First comes having institutions to regulate this, then capacity building of actors along the value chain. There are plans to do M&E to see how each country has progressed in implementation.

Policy and regulations are there to address the main challenge of the lack of seed. There is work being done on harmonization of standards and indicators to monitor implementation in each country. It was brought up that most standards exist at the regional level but getting them institutionalized is a big task; it is important to involve national regulatory and standards institutions. Countries are not at the same level. A question was raised on what strategy is being put in place within the COMESA mandate to have all countries at the same level. Given the occurring cross-border trade, it is important that countries be at similar levels. The seed regulation in Kenya has details on cereals and grains but not on seed potato. This is also the case in other countries. More care and emphasis are needed with seed potato, as it is vulnerable.

Plans in place for the implementation of harmonization were shared. In each member country, experts are to evaluate the status of the law at national level and to identify where assistance is needed – for example in its regulatory service. Each country has specific needs and is receiving funding from USAID or DFID. There is an effort to get more partners on board as well. At country level, specific needs will be supported, and seed trader associations will be involved. COMESA regulations should be implemented within 7 years.

Stella Apolot of the Uganda National Standards Board reiterated that the East African treaty provides for cooperation in areas of standards. The standards had to be adopted in six months, and now all partner states have adopted these standards. Standards support laws and policies; now they must be implemented and enforced. She asked the group if there is anyone in the room using the standard for seed potato.

#### **Movement of pests and diseases**

There are challenges with both the formal and informal systems. Quality declared seed<sup>3</sup> is 2% and certified seed 2-3%, so the bulk of the rest constitutes the informal seed system. Controlling disease in the informal systems is very important. Seventy percent of farms in Uganda have bacterial wilt due to farmer-to-farmer exchange of seed, underscoring the need to support the informal system as well.

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<sup>3</sup> More information on QDS can be found on page 14.

The issue of importation was discussed. Kenya has allowed in new varieties from Europe for example, which then go through open quarantine. Ninety percent of farmers in Europe buy certified seed each season. If these imported varieties from Europe are used, there could be problems that arise when they are multiplied in the informal system. After importing varieties coming from Europe, what are next steps for multiplication while minimizing disease risk? It is important to ensure good systems are in place when importing varieties. A participant pointed out that there are good varieties being imported from Europe. Uganda is in touch with companies from the Netherlands that can supply good varieties. One variety is being introduced and is in the second season of testing for eventual addition to the national varieties list. It is still in open quarantine. Uganda has a phytosanitary lab based at Kawanda Research Station. There are inspectors, import/export licenses and customs controls units in place.

Drawing from the KEPHIS example, the institution has had to take samples to the UK and the Netherlands for testing. The point was made that the region needs the capacity to test new diseases so that there is not reliance on the companies or exporting countries that are supplying the very same variety they are testing. National inspection services such as KEPHIS should be strengthened to do this testing so that trade is done as equals.

In addition, the point was made that with land fragmentation, disease spread is an issue. An idea was shared on the possibility of acquiring land and leasing it out to increase production of certified seed. In Uganda, PPPs are being used to fill the gap. The Ministry has drafted an MoU with the prison institution that has a great deal of land for production and multiplication of seed potato.

### **Shifting to formal**

Regarding the shift to certified seed in Rwanda, the point was made that the goal of 25% of seed demand being met by certified seed is still a low percentage, even if it is much higher than current supply. It is important to be careful about the rest; most of ware potato will continue to be produced from non-certified seed. As it will take many years for the formal sector to be able to deliver enough certified seed to cover 100% of total seed demand, there was a discussion about an intermediate stage with an improved informal seed sector.

It is important to note that the COMESA seed trade harmonization regulations apply only to trade between countries. Countries are free to adopt regulations that allow the sale of non-certified seed potato within their borders.

An important calculation was made regarding the amount of land that would be needed to meet the goals for shifting to formal. If numbers are put to the goal, Rwanda would need 250,000 ha of land (rough estimate) to produce certified seed. This would put tremendous pressure on land and would require massive investments in the quality control system. Putting actual figures to the percentage goals for certified seed could be a useful outcome of the workshop.

In addition, communication is needed along the seed value chain. While existing demand for certified seed is often not met, certified seed producers sometimes cannot sell their seed as it is of the wrong variety or available at the wrong time. Ware growers should tell multipliers one season ahead how much and what variety they want in order to know the effective demand for each variety.

### **Breeding**

A participant shared his view that the discussion has been on seed without much mention of breeding. The newest material in the region is twenty years old. There are almost no breeding programs, in practice countries only test the new varieties provided by CIP to evaluate if they are well adapted to their agro-ecological conditions and for eventual inclusion in their national variety list and further multiplication. There is a shortage of clean quality seed adapted to the region. It is important to think about starting with quality material and appropriate varieties for the various agro-ecological zones and look at breeding at the local

level. The idea of depending on importation is acceptable in the short term, but in the long term, local breeding is essential.

However, a complete breeding programme takes twenty years, and current testing programmes of new varieties from CIP and other countries takes 5-8 years. Therefore, many participants felt that the priority now should be to increase capacity for cleaning of existing varieties and rapid evaluation and multiplication techniques for new varieties from abroad.

## **4. INCREASING LOCAL COMMERCIAL SEED PRODUCTION**

### **4.1 Summary of panel discussion**

*Facilitator: Patricia Nsiime - FAO*

#### **Wachira Kaguongo - Potato Council of Kenya**

The National Potato Council of Kenya (NPCK) is a public private partnership organization working with seed potato and other input providers, farmers, processors, traders, and organizations like CIP, KALRO and KEPHIS. Of the board members, 45% comes from the public sector and 55% from the private sector. The Potato Council works on the entire value chain, providing a forum for information sharing, networking and articulation of issues. It also works to influence policy that supports seed potato production. In 2013, NPCK worked with organizations from five EAC countries (Kenya, Uganda, Tanzania, Burundi and Rwanda) in enhancing adoption of harmonized East and Central African seed standards and procedures. NPCK also works with stakeholders in developing and distributing potato variety catalogues (Editions 2013 and 2015) for informing farmers how many varieties have been released. These catalogues can be found on NPCK's website. They also have an SMS-based platform through which farmers can find out where to get seed potato of different varieties.

#### **John Bahana – Kisoro Potato Processing Industries, Uganda**

John Bahana sits on the national steering committee for potato and NARO's Governing Council. As Kisoro District is in a corner of three countries, there is seasonal migration of farmers to grow potato in DRC. The FAO Great Lakes Project dealt with this. The role the company plays in the seed system is providing the market pull. The company is aware of the product wanted in the end market, so it talks to farmers about growing that variety – thereby transmitting information up and down the value chain. Next month the company will be processing fries. Ms. Beatrice Ayingabire of the Kisoro District Potato Cooperative Union added that the cooperative is planning to buy from farmers and supply the Kisoro factory. They plan to divide farmers in two groups, some producing seed potato and others ware.

#### **Telesphore Mbonabake – private seed producer, Rubavu, Rwanda**

There are plans to create a national seed company, a joint venture between the certified seed potato producers, to better balance supply and demand across the country. There are two main constraints in seed potato production: the fact that it takes eight months before it can be sold compared to four months for ware and the long rotation involved in seed production (three-year rotation). This is too much time with limited land. Another constraint is access to credit. Local banks have no interest in seed production, and interest rates are very high. The cost of production and necessary investment for seed potato is high as well; 2500 kg/ha of seed is needed while for maize it is 30 kg/ha.

#### **Justus Masanyu – Muko expanded seed potato producers association**

The association is located in southwestern Uganda in a highly productive area. Production support, storage, and collective marketing are the main areas of support they provide. It began as farmers saw potential in doing business with other farmers in the association. In the FAO Great Lakes project, 153 were trained through a Farmer Field School (FFS) approach, and 21 became seed producers. The district government made an MOU with the association and bought 2.7 tonnes. Local seed demand is 632 tonnes. Challenges faced include getting basic seed and exportation, because they grow a local variety that is not yet recognized and thus cannot be certified.

**Facilitator: which policies are helpful for your company/organization and which ones could be improved?**

Wachira Kaguongo of the National Potato Council of Kenya spoke of the importance of harmonized standards, as it simplifies the release of new varieties and cross-border trade. New seed companies are looking at the region, and harmonized standards make it more attractive due to an expanded market that makes investment worthwhile. It is necessary to look at varieties popular with farmers; if certain varieties are marketed but not certified, it is important to have a strategy of absorbing them into the official system to allow certification which will help reduce spread of disease and pests and increase smallholder farmer productivity.

John Bahana of Kisoro Potato Processing Industries added that his concern is awareness of policies among seed potato value chains. Processors have to interact with the farmer and might not be able to source the desired variety, so then they have to go to the regulator to request the variety.

Telesphore Mbonabake, a private seed producer, made the point that policies often are missing the target as most of the sector is informal. Policies only address two percent since only two percent is formal. It is necessary to formalize the whole system so that policies have positive impact.

**Facilitator: Is cross-border trade a good or a bad thing?**

Wachira Kaguongo of the Potato Council of Kenya stated that country specialization in a certain variety and then exporting that variety is good as long as disease can be controlled. There is need to work together as a region. What comes to Kenya through importation affects everyone in the region. He also brought up the importance of traceability in terms of knowing where a specific seed potato and variety is coming from as well as ensuring that what enters the market as ware is ware and as seed is seed. Having standards on quality declared seed and clarity on what is being imported and exported are important. More harmonized regulations in terms of trade are needed. With seed potato being bulky and therefore expensive to transport and with high perishability compared to grain seed, there is need for more decentralized seed potato production, which will bring down the cost.

John Bahana of Kisoro Potato Processing Industries shared that if policies are synchronized and the same infrastructure, personnel, etc. are utilized - then the goal of a better seed system could be reached much faster and disease spread through cross-border trade can be contained.

Telesphore Mbonabake shared that cross-border trade of seed potato is a good idea but as previously said, there is need for corresponding quality control systems. A participant added that cross border trade is happening regardless; the question is how best to support farmers through their groups and cooperatives so they can produce quality and quantity. The question of where to put the most emphasis was also raised; do we think that cross-border seed trade and solving the problem of seed availability in face of phytosanitary issues are the most important? Or should we prioritize increasing local seed production?

**Facilitator: we hear quality seed is too expensive or farmers aren't interested in paying for it. So why did you get involved?**

Justus Masanyu of Muko expanded seed potato producers association shared that the cooperative can support farmers to analyze cost of production, factoring in increased yield from good quality seed. Using clean seed leads to much better yields and thus ultimately lower cost of production, but sometimes farmers are not aware of these benefits.

Wachira Kaguongo of the Potato Council of Kenya shared a line borrowed from the Potato Council of South Africa that was well received: *seed pays it does not cost*. When high quality seed potato is used, the additional cost is more than compensated by additional yield. In Kenya, there are many companies producing certified seed potato although it is still far from satisfying the demand.

John Bahana of Kisoro Potato Processing Industries added that supporting private initiative is key. The factory in Kisoro is there because there was a belief that it was a worthwhile investment.

#### ***Facilitator: Hearing from other initiatives***

The Belgian Cooperation representative added the perspective that currently, the formal sector has to compete with the informal sector. In Europe, a farmer must plant certified seed, which is not the case in the East African context. Here, it is important to look at how the formal sector can compete with the informal sector. Price, seed quality, varieties available, accessibility – in some areas like quality, the formal sector is ahead, but the informal sector wins on price and accessibility. The focus needs to be on providing added value to farmers. If there is legislation in place to allow release of certain varieties then the formal sector needs to provide. A farmer will not want to pay the added cost if there is no accompanying higher quality. Yes, seed pays but it is also important to look at crop management and whether or not consumers will pay.

Wachira Kaguongo of the Potato Council of Kenya shared his opinion that we need to acknowledge the reality that the informal seed sector is important; then farmers can see for themselves how moving towards formal can improve yields. Brian Isabirye from ASARECA added the question: must we take everything to the formal? Several studies suggest it may not be desirable to go completely to the formal at this moment. We should think about an integrated system, taking into consideration strength of both. The informal is not necessarily bad.

With regard to traceability, CIP shared that it is trying to encourage local research stations to retain the original names of varieties that they get, because these names generally change so much. When farmers want to renew their seed, it is impossible to know which it is, and the same goes for breeders. CIP is trying to improve this situation for sweet potato. Wachira Kaguongo of the Potato Council of Kenya shared that in the region there are public and private varieties, with most of the public varieties coming from CIP. CIP then gives them to research stations in various countries that give them their own name. CIP could then help in standardizing variety names as they help in releasing of the same in different countries, and this would solve the problem.

There was a question addressed to Mr. Bahana of Kisoro Potato Processing Industries on his experiences where the buyer helps in providing inputs to producers. He clarified that the company is not implementing this model yet. However, if the farmer is a registered member of a cooperative/union, they can access low price agro-inputs. As the processor, they are obviously interested in good quality yields. They also have a partnership with a commercial bank to cover farmers' urgent needs, which guarantees that when the farmer brings his yield then the loan is repaid.

#### ***Does the presence of free inputs negatively affect business?***

Wachira Kaguongo of the Potato Council of Kenya confirmed that seed potatoes are often given to poor farmers for free. While humanitarian support should not be restricted, it should come in a designed manner that does not distort markets and is time-bound. The reality on the ground is that when USAID for example distributes seed, the amount of seed relative to total seed demand is so low that it does not negatively affect the local private sector. It is more of an advertisement for high quality seed potato – which is a sentiment that the entire panel shared. In addition, if humanitarian groups buy quality seed locally, it has a positive impact on the seed system.

## **5. IMPROVING QUALITY IN THE INFORMAL SEED SECTOR**

### **5.1 Summary of presentations**

#### **Positive Selection of Potato Seed by Farmer Field School groups in Rwanda**

*Raf Somers from the Belgian Cooperation FFS programme*

In Rwanda, a FFS programme was undertaken on positive selection of seed potato. With FFS, the plant is the teacher, and farmers find solutions to their own problems. In total, 200,000 farmers were reached in 8,000 FFS groups around the country. The informal total seed production by these groups was 17,366 tonnes.

Positive selection involves selecting the best field of the best farmer, removing the imperfect plants in that field, selecting the best plants for harvest and selecting the best potatoes from the harvest, and finally proper storage. Thus, the positive selection methodology practiced in Rwanda is a sequence of positive, negative and positive selection.

The programme was started to help group members, and then it was commercialized. The programme is still being helped along with support from RAB. A challenge would be if the new seed law does not allow the commercialization of informal seed. That would mean that these groups would no longer be allowed to sell their seed potatoes and there would be a sudden shortage in the market forcing farmers to use their own inferior potatoes as seed potato. The opportunity is there for the sub-sector to upgrade to QDS, but this will not happen on its own. Internal quality control systems are needed along with high amounts of certified seed to produce QDS.

#### **Positive selection and storage by farmers**

*Mr Solomon Basaza, District Agricultural Officers MAAIF*

A healthy plant is vigorous, has dark green leaves, well-shaped tubers, and does not show virus and bacterial wilt symptoms or any other disease or insect pest. Positive selection is the selection of the best plants for seed production. Negative selection is the removal of bad plants from the field. In Uganda, bacterial wilt is rampant and therefore negative selection is often not possible.

Positive selection must be done during the flowering stage when wilt can present itself and the healthy plants are pegged. The health of the plants are checked again two weeks after pegging, and pegs are removed if plants are no longer healthy. Then the pegged plants are harvested one by one, and the egg-sized tubers are stored as seed.

Positive selection is different from commercial seed supply systems, and it involves old technology. Both the FAO Great Lakes project and the IFDC project promoted this, so farmers are currently doing positive selection. The focus is on the self-supply of smallholder farmers. The approach can fit in the existing seed system. Positive selection can reduce the speed of seed degeneration but does not guarantee continued good potato harvests. To maintain the highest yields, it is necessary to replenish seed from a reliable source. The main limitation is latent infections stemming from the presence of even small amounts of disease in the tuber and the soil.

The dream would be for commercial seed suppliers to produce enough quality seed, but it is not the reality for now. It was the opinion of Mr Basaza that there will need to be a law to flush out inferior seed suppliers, as farmers tend to go for the cheaper, inferior seed; competition alone will not rectify the situation.

Some aspects of storage of potatoes were also addressed. Storage in crates enables batch handling of potatoes (variety, quality classes for both seed and ware-grades). For seed potato, storage should be done in diffused light stores while for ware potatoes in a cool dark room. Skin setting is essential to reduce post-harvest losses. Skin setting takes place before harvesting while curing, and wound healing takes place after harvesting before storage. Tubers harvested with weak skin are not fit for storage, not even after curing. Curing and wound healing should be done within two weeks.

## Quality Declared Seed: bridge between formal and informal systems

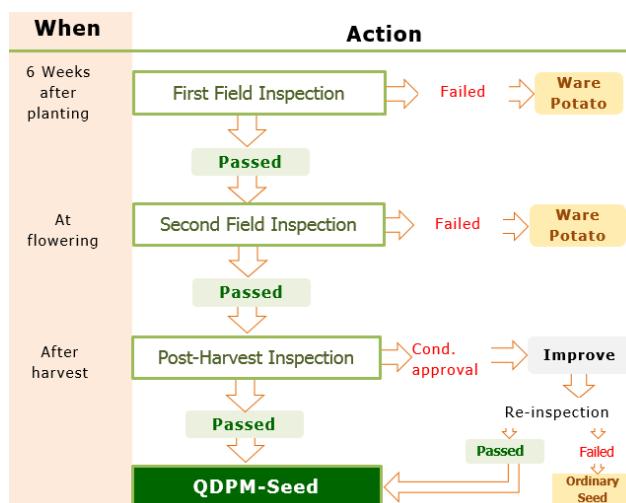
Mr Elly Atieno, CIP Kenya — from concept to institutionalization - an experience from Ethiopia

The Quality Declared Seed (QDS) system retains both the confidence inspiring quality assurance attributes of the formal seed system and the flexibility of the informal seed system to adapt to local circumstances. In Ethiopia, it is estimated that nearly 99% of seed is produced by the informal sector; there is essentially no functional formal seed system. Poor seed quality is a limiting factor for productivity. QDS, developed initially in 1993 and revised in 2006, was conceived as an intermediate step towards a formal certification scheme and was not developed to replace a seed certification programme. QDS production and multiplication is done by trained farmers who regularly replenish their seed stock with quality seeds and planting materials of crop varieties that are registered for production through a QDS system. It involves a decentralized seed multiplication scheme. The related production guidelines for vegetatively propagated crops, known as Quality Declared Planting Materials (QDPM), were developed by FAO and CIP in 2010.

The piloting of the concept in Ethiopia involved intensive awareness creation and training, preparation of the guidelines (manual for potato and sweet potato) in the local language, and labeling of the QDPM seed for traceability and enhanced credibility. The phone number and location of the producer were on the label thereby enabling the buyers to contact them. The pilot ran for two years in eight districts of the country and involved local research and extension bodies, 14 seed producer cooperatives, and 135 fields

### QDS System

A QDS system is a quality assurance scheme for seed production that is less demanding than the standard quality control systems. It is aimed at facilitating farmers' access to quality seeds in situations where resources are limited, especially in developing countries. It offers an alternative to statutory stringent regulatory protocols and is particularly suitable for those crops, areas and farming systems for which the standard seed quality control protocols are difficult to implement or make relatively little impact. Following the success of the QDS, initially developed in 1993 and revised in 2006 but which caters to botanical seeds, the QDPM process was developed in 2010 to guide the production of clean, disease-free planting material of vegetatively reproduced crops. Quality declared systems are different from a formal scheme that results in certified seeds in that QDS protocols allow for less rigorous and low cost inspection regimes. They take into consideration national and local conditions to ensure they are appropriate for target users. It differs from informal seed delivery systems in that QDS (and QDPM) originate from seed on an established list of varieties (including landraces), are produced by registered seed producers and involve quality control and inspections (see figure below). It is an intermediate step towards a formal certification scheme. A QDS system is implemented primarily by seed producers at the community level or field extension officers. Farmer groups can do the multiplication and provide quality control.



Informal Inspection Scheme for Potato

In February 2014, the QDS (and QDPM) concept was officially recognized in the updated Ethiopian Seed Proclamation No 782/2013, but standards and guidelines still needed to be developed by the Ministry of

Agriculture. In May 2015, the standards were ratified and named Quality Declared Seed to take into account other crops. Positive feedback has been received from the Ministry, and currently Government of Ethiopia partners are taking over the management of the system.

Lessons learned include the importance of quality control to prevent further spread of disease, decentralized seed production, a champion to drive the process, labeling for traceability and to maintain credibility with buyers, and peer accountability among members of cooperatives. Going forward, there will be national and regional training workshops as well as continuous capacity building for local inspectors, seed producers, and information systems. The linkage between early generation seed producers and seed cooperatives will be strengthened, and seed directories will be developed.

## 5.2 Summary of plenary discussions

There was discussion on whether or not it is reasonable for strict laws to move the sector to the formal system. There are questions on how this shift would be regulated without some mechanism to incentivize farmers to move to the formal. Moving to the formal with the given targets in Rwanda requires large amounts of land. If there were to be a law prohibiting the sale of non-certified seed, it could not happen overnight as there would not be enough certified seed available. In response, Mr Sikinyi clarified that the proposed seed law is for all crops. He advocated to keep the prohibition of the sale of non-certified seed but with the understanding that the government would issue temporary exceptions for certain crops or temporary recognition of quality declared seed. However, others were of the opinion that if you already foresee that this will be necessary, why not make a provision for such exceptions within the law itself?

Going completely to certified seed for smallholders is not possible because they are too small and too many. But in Rwanda a hybrid system with QDS would be feasible. In such a hybrid system the formal sector could supply certified seed to larger commercial farmers and to QDS producers who multiply good seed<sup>4</sup>. However, at this point, if all positive selection groups were to evolve into QDS groups, the formal system could not meet the demand of QDS producers for certified seed. Thus, in Rwanda, such a hybrid system would simultaneously increase the effective demand for certified seed and move the informal sector to a higher quality semi-formal level.

However, the situation is different in other countries. For example in Kenya, QDS is not recognized, but the share of certified seed in total seed sales is already higher. Different countries need to see how dominant the informal system is and plan accordingly. A question was raised on how QDS fits into COMESA and EAC standards. COMESA standards are for regional trade but not national trade. As in Ethiopia, other countries can have a QDS system that is recognized for domestic sales. It was agreed that the example from Ethiopia gives a roadmap for finding a connection between informal and the formal.

Other recommendations coming out of the discussion included the issue of synchronizing seed production with the market. As stated earlier, ware growers should tell multipliers one season ahead what their demands are. A seed producer calendar from micro propagation to seed delivery would be helpful in aligning supply with demand. A national potato council as in Kenya could be helpful to improve the communication.

Regarding capacity building, it could be useful to establish a potato academy focusing on the entire value chain.

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<sup>4</sup> The QDS regulation would need to include a provision that QDS producers have to replenish their seed stock with certified seed at regular intervals

## 6. THE ROLE OF RESEARCH

### 6.1 Summary of presentations

#### Beyond yield: breeding for end-users priorities

Mr Ngerero, Director Seed Production Unit, RAB

The job of potato breeding and selection in a country is to develop new potato cultivars with desired traits, to collaborate with relevant value chain actors to assess the characteristics of advanced selections from the country program, and to provide a basic seed source of selections to growers for commercial testing. It is important for variety end users to identify desirable traits and to be in dialogue with the breeder.

A clarification between *variety development* and *variety identification* was made, with variety identification being shorter. Variety development is the breeding of a new variety out of existing varieties, through many stages. Rwanda practices variety identification as it seeks varieties suitable for the country. The breeders take germplasms and test them, which is only part of the complete development phase. This approach is done in many African countries as they do not develop their own varieties.

Methods of plant breeding include selective breeding (artificial selection), cross breeding, out crossing, and gene-transfer techniques. Variety development in the cross-breeding method involves a five-step process, ending with market development to determine consumer acceptance in the market for intended use. The entire process can take 14 cropping seasons or more.

Rwanda has moved from the classic identification method to a fast identification method with release in five to six cropping seasons. This involves the introduction of 100 mini-tubers per variety in the first season, exhibition trials in seasons two and three, national yield trials in four locations in season four, and finally national performance/validation yield trials in season five followed by release.

Currently, the research institution does the variety release. Under the proposed system of the draft seed law, the application will be made by the (commercial) breeder for variety release. In the case of a successful DUS (Distinctness, Uniformity and Stability) test, an overall improvement in performance or 'value for cultivation or use' (VCU) must be shown and subsequently proposed to the Minister for publication in the official gazette. Then the seed sample is submitted to the national laboratory and the gene bank followed by production of early seed generation (breeder and pre-basic) using tissue culture labs and screen houses.

#### Mr Thijs Boer, Holland Fair Foods

Thijs Boer, co-founder of Holland Fairfoods, shared his insight on research that takes into account end user needs, in his case for processing potatoes into crisps. The company started at the beginning of 2015.

He underscored the potential for processing in the sub-sector. The main challenge is the availability of varieties with good processing qualities. Characteristics such as small size are important, but other traits such as dry matter content are essential as well. In Europe, three kilograms potatoes are needed for one kg of chips, whereas in his company, they use six kg for one kg of crisps. It could be possible to get from 6.5 to 5 kilograms through other improvements but not beyond that due to the lower dry matter content of current varieties.

The developing processing industry faces challenges because of a lack of well-suited varieties on the market. He suggested that the best step would be to import seed potato, not mini-tubers, from Europe to improve quality – while working with breeders to improve the local varieties. It is the duty of research to provide what the market demands.

## **Providing foundation (pre-basic) seed to private sector seed multipliers**

*Dr. Alex Barekye, Director of Research Kachwekano ZARDI, NARO*

Potato can give quick returns; in four months the crop can be harvested. There are various opportunities in this industry, including nascent processing companies. With this shift in preference, new varieties are needed.

There are a number of challenges in the seed potato system. Seed availability is at five percent of demand, and there are high transport costs and a need for decentralized production of pre-basic seed. The use of storage facilities such as diffused light stores is low, so post-harvest challenges need to be addressed as well. NARO needs to identify more private sector actors or farmer organizations to become multipliers.

NARO has tissue culture plants in labs at Kachwekano, and they have facilities to produce basic seed such as the aeroponic facility of KAZARDI – though costs are high. They have 300 acres devoted to seed production in an area with limited insect activity. They are working through other partners and IFDC to enhance production of clean seed. Some of the processes could be done by private seed producers such as producing mini-tubers from plantlets, but it is necessary to work with farmer groups to ensure high quality materials are not wasted. There are private tissue culture companies such as Biocrops Ltd with whom they are collaborating. In 2014, NARO supplied a modest 36 tonnes of pre-basic seed to farmer groups such as UNSPPA. These groups are allocated seed based not on what they need but based on what is available; there is not enough to meet the demand.

Challenges include inadequate resources to support production of pre-basic seed, limited private sector involvement, the need to better synchronize seed availability with the planting season, disease, and the long period of time needed (three years). Lessons learned include the importance of expanding infrastructure, initiating more partnerships with development partners and the private sector, and strengthening farmer associations involved in seed production.

### **6.2 Summary of plenary discussions**

There was discussion on the lack of processing varieties and tradeoffs between varieties. In response to the demand, it is possible to develop suitable varieties according to that need, but it cannot have all good traits. A variety may be high yielding but less resistant to pathogens, or the processors may like a variety for its processing qualities but which gives low yields. The question was raised about what incentives are in place for farmers to supply a variety such as this one? Mr. Ngerero of RAB shared Rwanda has a variety good for crisps, and its high price is an incentive to produce it. He acknowledged that there are fewer incentives to produce the low yielding Sangema, but it does have high dry matter content. Thijs Boer added that Holland Fairfoods pays a high price for Kinigi compared to the market price. There is another variety that has higher dry matter content, but yield is so low that the cost would be too high, even with improved conversion rates.

Questions were raised on testing genetic compatibility of various varieties, on where in-vitro plantlets are coming from, and on how many cultivars are there already released. One of the challenges of breeding is the time it takes to get the variety. If there is a potential variety, can we reduce the number of years to get it tested and listed? Another challenge that was discussed is the timing for the market. Often seed is not ready in time, in which case irrigation is a potential solution so that seed can be produced off-season.

Through similar meetings with stakeholders, steps have been taken to harmonize efforts such as the Integrated Seed Sector Development (ISSD) approach. An integrated seed sector development (ISSD) programme builds upon the strengths of both the formal (public and private) and informal (farmers and community-based) seed systems and seeks to consolidate them<sup>5</sup>. How do we make sure synergies are there?

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<sup>5</sup> <http://www.issdseed.org/>

The Director of KAZARDI made the point that the system is there, and now it is time for the private sector to come and partner with them on this. For the sake of effective management, harmonization of the programs is useful for sharing information.

On the point of breeders listening to the market, KFC in Kenya cannot get potatoes from Kenya and instead have to import them from Egypt. For the farmer to be able to invest, alignment with the output market is needed. The market should drive varieties, so that farmers can supply what is needed. There is demand for various varieties. The market is there, and researchers need to satisfy it. Strengthening private public partnership is important as both the public and private sectors have a role to play in building a vibrant sector.

## **7. GROUP WORK**

### **7.1. Summary of Group Discussions**

#### **Group 1 - support to seed potato multipliers**

The group structured their recommendations in response to six challenges including insufficient pre-basic seed, capital, business skills, land for seed multiplication and marketing infrastructure, as well as poor quality of seed potato in the informal sector.

The challenge of insufficient pre-basic seed is one faced throughout the region. In addition to the lack of pre-basic seed, farmers often lack the technical knowhow to engage in the seed value chain as multipliers. To overcome these challenges, the group discussed identifying and building the capacity of seed producers to produce basic and certified seed. Echoing earlier discussions on the importance of decentralized seed multiplication, the group focused on establishing more multiplication centers for pre-basic seed.

The production of seed potato from tissue culture plantlets to certified seed requires large amounts of land, which is a challenge in the region. The group suggested that government and private landowners be encouraged to lease out land to multipliers. This would create an environment where farmers may be more inclined to engage in seed multiplication.

Financial services for the seed potato value chain are needed. Farmers lack access to adequate capital that is needed to engage in the production of pre-basic seed and in multiplication. Loans do not accommodate the significant amount of time required for all the multiplication cycles, meaning that much needed capital is out of reach. The group discussed the development of higher level farmer organizations as a possible solution. These larger groups could then be linked to financial services.

Engaging in the seed potato value chain requires a certain level of business skills that individual farmers and farmer groups may not have acquired yet. A large piece of capacity building for seed producers should focus on developing business skills through training and practical mentoring.

Those enterprising seed multipliers who are already established have done so in a challenging environment. Market information is often not available. Seed multipliers do not always let the producers of pre-basic seed know how much they require ahead of time. This is due to market uncertainties which are a limiting factor at each step of the seed value chain. To overcome these challenges, the group suggested to support farmer organizations and agricultural institutions to establish market infrastructures such as collection centers and market information systems. This would improve communication, efficiency and trust throughout the chain.

#### **Group 2 - Research**

The driving question for this group was the kind of research that needs to be undertaken in order to increase access to good quality seed. The first step is to determine market needs. Effective seed demand needs to be determined in terms of varietal requirements by various end-users, the desired quantity and quality, and production targets and timelines.

There was discussion around enhancing the physical and human capacity to produce pre-basic seed. This involves enhancing the human and physical capacity to produce plantlets and mini-tubers, such as through tissue culture laboratory, irrigation facilities, and increasing the number of skilled staff. Other priorities include enhancing skills in disease and pest indexing and screening, evaluating effective rapid multiplication techniques, and affordable germplasm conservation methods.

Finally, there was discussion around strengthening linkages with stakeholders through training seed growers on the production of good quality seed through positive and negative selection, good agricultural practices, seed inspection protocols, etc. This recommendation involves mapping seed production zones and setting up

a regional platform for researchers involved in seed potato production in order to share ideas, resources, and experiences.

### **Group 3 - Policy support for farmers' increased access to quality seed**

As discussed in previous sessions, there is need for seamless trade and movement of seed potato between countries. At the same time, there is risk of spreading diseases and pests from one country to another, along with the risk of introducing new diseases to the region from Europe and other continents. Though moving towards 100% certified seed has advantages, high prices and low supply of certified seed are a barrier, and affordable seed potato is paramount. There are institutions in place to support a healthy seed system but they lack equipment and resources. At the same time, financial institutions are not eager to deal with the sector.

The policy group broke the solutions down into three areas. The first is a recommendation that each country have a seed policy guide and regulations that address the issues of seed potato. In addition, there was agreement that countries should develop, recognize and support a QDS system. Policy, regulations, and standards should mirror the harmonized regional standards. To avoid the spread of disease, quarantine measures on imported planting material should be strengthened along with laws for controlling potato diseases.

The second solution would be institutional capacity building. This includes building the capacity of subsector institutions and increasing budgetary support. They drew from the experience of KEPHIS in Kenya to say that each country should have a strong regulatory body to control the quality of seed potato.

The third area was to increase access to finance. In all countries, very little seed potato financing possibilities exist, so there should be policies in place to encourage financing of the sub-sector. Developing a regulatory framework for supporting contract farming was discussed, as was working with financial institutions on financial services suitable for the sub-sector (low interest rates and a grace period on repayments given the duration of the seed potato value chain). Contract farming helps to increase access to finance. It involves credit that is often in-kind (in the form of inputs), as is the repayment (in the form of produce). This arrangement makes small-scale loan transactions possible for farmers.

### **Group 4 – French-speaking group covering all discussion areas**

Under the theme of policy, the group highlighted the fact that agro-ecological zones extend beyond borders into neighbouring countries and therefore norms and standards should be harmonized among the countries in the sub-region. They advocated for more cross-border trade along with lessening import and export taxes, and a recognition of a harmonized QDS in the sub-region.

To increase information exchange within the value chain to facilitate better matching of supply and demand of seed potato, they also suggested to establish national and regional platforms that engage the private sector.

On the subject of research, the group discussed the introduction of new varieties according to market requirements, promoting participatory research, and conducting GIS-based mapping analyzing the soil and phytosanitary issues.

On the development of the seed value chain and on the informal seed sector, the group discussed the need for a comprehensive strategic plan (national and regional) for the development of the sector. This would involve establishing structures for the planning, management, and marketing of seeds – in addition to improving storage and packaging of seeds, the harmonization of prices by seed category and quality, and capacity building of farmer groups in positive seed selection to improve the quality of seed potato in the informal sector.

## **7.2 Discussion on group work and closing plenary discussion**

The need for investing in research into new varieties and the limited capacity of inspectors were discussed. These issues are related to the investment issue, as it is important to invest in these areas. Participants discussed the issue of getting the correct varieties for specific purposes such as processing. Regarding investment in infrastructure, a participant made the point that USAID is providing funding on upper part of the chain, but little done on early generation seed multiplication facilities. The question is how to get effective investment in this area, and what kind of models are needed. We can use varieties from outside, but high quality varieties coming from the region are needed as well, but there is under investment in this area. Developing local breeding programs is the long-term solution for quality seed. Moreover, the participants recommended that a catalogue be developed of the varieties for the whole sub-region with the specifics of the varieties and where they grow.

Private initiative in producing seed must be supported. The market for potato products is there and is growing because of the tourist market and a growing middle class. This trend though must be invested in so that demand can be met.

When discussing cross-border trade dynamics, it is important to be thinking more in terms of agroecological regions instead of country boundaries. Phytosanitary control is needed to have quality.

Isaac Nzabarinda of the Federation of potato Cooperatives FECOPORWA shared his experience. He is a seed multiplier and has screen houses. They have just started committee of seed multipliers from across the region including DRC, Rwanda, and Uganda. He would like to learn from the similar committee in Uganda to know how it is structured. The mentioned committee is a creation of an IFDC project in potato producing districts. This committee consists of agriculture-focused government departments, farmer representatives, and a chair who is political head of district. They are interested in evolving into a national potato council as in Kenya. It was suggested that Rwanda be an observer. Eventually all the national committees could together develop into an East African potato council.

## 8. FIELD TRIP

The workshop concluded with a field visit to Musanze. This included a visit to a producer of mini-tubers and field grown pre-basic class seed, a producer of certified category seed, and a group practicing positive selection as well as the training center of IMBARAGA.

Isaac Nzabarinda, President of the Federation of potato Cooperatives (FECOPORWA), shared about his work in producing mini-tubers and pre-basic class seed. He receives tissue culture plantlets from RAB and produces mini-tubers and finally certified seed. Before, farmers were only saving seed. The idea for the screen house seen on the field trip came from a meeting with RAB. He also received training from Agriterra for the business plan. Research into Use (RIU) provided advice on the screen house and supported 50% of the cost to build it. Normally, he gets around 65,000 mini-tubers from the screen house.



Mr Mbonabake and he are not the only multipliers with such facilities. Now there are 23 screen houses in Rwanda and one with a hydroponic system. The plan for the future is to make a national company. This way,

they could more easily be in contact with buyers and produce the seed together from tissue culture plantlets all the way to certified seed. The idea is for the company to exist at the regional level as well, sourcing to farmers in other countries as well.



Going from mini-tubers to basic seed can take two years, and banks won't give a loan that lasts that long. His additional challenges include having enough land for rotation. It takes 10 hectares to produce 300 tonnes of basic seed, so the limiting factor is certainly land. Sometimes multipliers will sell this basic seed as certified seed or even as ware instead of seed. Multipliers often do not plan ahead, making it difficult to satisfy the demand. The amount of time needed to get return is at least eight months, which is why some take it to the market as ware. Often, seed multipliers are not willing to use the seed he produces because it is more expensive. In addition, the only source of tissue culture plantlets is RAB, so there is not much choice in the market.



The group of participants then moved to the storage facility where the basic and certified seed is kept. If buyers do not come, he plants it himself. If there were multiple buyers of mini-tubers and basic seed, he could sell only the mini-tubers and basic seed, but he has to repay the loan so sometimes is forced to sell as certified seed or ware potato.



The group also visited a field of a farmer producing certified seed. (right)

Workshop participants then visited a group of farmers who were practicing positive selection. They had formed a group to get quality seed because before they were getting low yields. They were trained on positive selection. Before, they got 15 tonnes from 3 tonnes of seed, but now it is up to 25 tonnes. They have a seed store, and they emphasized the importance of proper storage. They have advanced to negative selection and will eventually get certified seed as well. They can't buy certified seed at the moment because they don't have enough land individually (farmers with less than 5 ha cannot buy certified seed) – so they are coming together in order to have enough land. They also face the challenge that it is difficult to get a loan from the SACCO.

Finally, workshop participants then visited IMBARAGA. Farmers have been trained on seed potato production through FFS, and they produce every category of seed. There is a training center for all crops, and they train in all aspects and have equipment for farmers. Participants got a sense of the entire seed potato value chain through a display that IMBARAGA had organized to show their activities along the chain.

## **9. LESSONS, CONCLUSIONS AND RECOMMENDATIONS**

The workshop discussed and yielded interesting insights into possible pathways and actions in the areas of policy, the role of and support to the private sector, and of research.

### **9.1 Main findings and conclusions**

#### **Current situation & policy framework**

Harmonization of standards simplifies the release of new varieties and facilitates cross-border trade. By creating a regional seed market, it will be more attractive for investment by new seed companies. National policies, regulations, and standards should mirror the harmonized regional standards. COMESA regulations should be implemented within seven years. One of the results of the COMESA seed trade harmonization regulations will be that varieties released in two COMESA countries can also be sold in other COMESA countries. In the EAC context, developing and adopting standards is one thing, but implementation is the major challenge.

The policy and institutional environment differs per country. In each member country, experts are to evaluate the status of the law at national level and to identify where assistance is needed. Most seed regulations have details on cereals and grains but not on seed potato. Each country is recommended to have a seed policy guide and regulations that address the issues of seed potato specifically.

There is risk of spreading diseases and pests from one country to another, along with the risk of introducing new diseases to the region from Europe and other continents. Member countries have put in place various phytosanitary measures to mitigate risks of pest entry, but the capacity to enforce these measures should be strengthened. To accompany harmonization, capacity in pest risk analysis training is needed in addition to training in seed certification and variety release, phytosanitary and quarantine measures for seed import and export, and phytosanitary documentation. Specifically, the region needs the capacity to test new diseases so that they do not need to rely on the companies or exporting countries that are supplying the very same variety they are testing. National inspection services such as KEPHIS should be strengthened to do this testing.

There are institutions in place to support a healthy seed system, but they lack equipment and resources. Lack of clarity on import/export requirements, quarantine requirements and variety testing can impede trade. One weakness is with customs officials who need to be better trained. Phytosanitary documentation such as labels would be helpful for customs staff, but they also need to be trained to ensure that what enters the market as ware is ware and as seed is seed.

Traceability of varieties is important to the seed potato value chain in order to have clarity on what is being imported and exported. When CIP provides new varieties to national research stations they often give them their own name. When released, farmers may change the name again. Then, when farmers or breeders want to renew their seed it is difficult to know which variety it is. Standardized variety names would solve the problem, and CIP is encouraging national research stations to retain the original names.

Countries are recommended to develop, recognize and support a QDS system. There are two approaches to dealing with non-certified seed in the national draft seed policies. The first is to keep the prohibition of the sale of non-certified seed in national draft seed policies with temporary exceptions to be issued for certain crops or temporary recognition of quality declared seed. The second is to have provision for such exceptions within the law itself. Countries are free to adopt regulations that allow the sale of non-certified seed potato within their borders as COMESA seed trade harmonization regulations apply only to trade between countries. As in Ethiopia, countries can have a QDS system that is recognized for domestic sales.

There should be policies in place to encourage financing of the sub-sector and a regulatory framework that supports contract farming. Contract farming can ensure processors have a ready supply of quality potatoes

while guaranteeing access to finance and a market for farmers. Contract farming can provide access to both technical and marketing assistance. To overcome the challenge of limited land, there may be the possibility of acquiring land and leasing it out to increase production of certified seed. In Uganda, PPPs are being used to fill the gap. The Ministry has drafted an MoU with the prison institution that has a great deal of land for production and multiplication of seed potato.

### **Increasing local commercial seed production**

Throughout the workshop, examples of several business models for commercial seed production were provided, including private individual multipliers, a joint venture at national level for private seed producers and seed production by farmer associations or cooperatives.

Improving local commercial seed production involves upgrading infrastructures such as screen houses, increasing human capacity (technicians), training seed producers and multipliers, and supporting farmer organizations and agricultural institutions to establish collection centers and market information systems. Because of the importance of decentralized seed multiplication, more multiplication centers for basic seed need to be established.

Communication along the seed value chain and demand forecasting are needed to synchronize seed production with the market. While existing demand for certified seed is often not met, certified seed producers sometimes cannot sell their seed as it is of the wrong variety or available at the wrong time. Larger buyers with contract farming arrangements may assist in signaling upcoming demand to seed producers.

A seed producer calendar from micro-propagation to seed delivery would be helpful in aligning supply with demand. Platforms made up of private actors along the seed potato value chain are an important tool for value chain coordination and communication. For example, the Potato Council of Kenya disseminates information to farmers on where quality seed can be found through an SMS-based platform. Regarding capacity building, it could be useful to establish a potato academy focusing on the entire value chain.

*Seed pays it does not cost.* When high quality seed is used, the additional cost can be compensated by additional yield. As part of their marketing, suppliers of certified seed should sensitize the ware potato farmers that by using more expensive high quality seed, their cost per kg of ware potato produced will actually go down.

Humanitarian support in the form of input supply does not necessarily disrupt the market for private seed multipliers and can serve as an advertisement to farmers for high quality seed potato. It should not be restricted, but it should be well-designed and time-bound. If humanitarian groups buy quality seed locally, it has a positive impact on the seed system.

Along with insufficient pre-basic seed, land is another challenge for commercial seed production. The amount of land that would be needed if all farmers were to only use certified seed is enormous. A more precise calculation on this amount should be carried out to inform policy decisions on certified seed. In addition, governments and private landowners should be encouraged to lease out land to multipliers. This would create an environment where farmers may be more inclined to engage in seed multiplication.

Financial services for the seed potato value chain are needed. Seed potato multipliers in the region lack access to the adequate capital needed to engage in the production of mini-tubers and multiplication. A possible solution is developing higher level farmer organizations to be linked to financial services. The time needed to go from plantlets via mini-tubers to pre-basic and basic seed is about two years. This is a challenge both for start-up financing and for matching supply to demand. Seed multipliers in Rwanda are already organizing into a joint company to be better able to match supply and demand and to increase access to finance.

## **Improving quality in the informal seed sector**

The formal seed sector accounts for a small percentage of seed potato production in the region. Though moving towards a more formal system is desirable, the informal sector plays and will continue to play an important role. Therefore, strategies and policies must take this reality into account. According to one participant, it was the first workshop that discussed about the formal and informal seed sector in relation to each other.

Quality Declared Seed (QDS) systems have the potential to bridge the formal and informal seed potato systems. The experience of QDS in Ethiopia provides a model in the region. Lessons learned include the importance of quality control to prevent further spread of disease, decentralized seed production, a champion to drive the process, labeling, and peer accountability. A QDS system would include a requirement for QDS producers to regularly replenish their seed stock with certified seed, thereby increasing the effective demand for certified seed. Certified seed producers would need to increase production to meet the demand if all groups currently practicing positive selection were to move to a QDS system and buy certified seed on a regular basis.

In Rwanda, there are ambitious plans to boost the percentage of certified seed by 2017 with the roadmap aiming for 25% certified. Even when this ambitious target is reached, most ware potatoes will continue to be produced from non-certified seed. It will take many years for the formal sector to be able to deliver enough certified seed to cover 100% of total seed demand. An intermediate stage with an improved informal seed sector is recommended.

Rwanda already has many producer groups practicing positive (and negative) selection that could develop into recognized QDS producers. There are already 24 private multipliers producing mini-tubers and pre-basic seed, in addition to multipliers producing certified seed who could replenish the stock of QDS groups. A target of having all seed become either certified or QDS in a time frame of about five years seems realistic.

Kenya is already more advanced in terms of certified seed. Uganda on the other hand produces less certified seed relative to total seed demand. Positive selection is practiced on an individual basis and seems less rigorous than in Rwanda. Therefore, a hybrid system of certified seed plus QDS may take more time in Uganda than in Rwanda. Seventy percent of farms in Uganda have bacterial wilt due to farmer-to-farmer exchange of seed, underscoring the need to support quality improvements in the informal system as well.

## **The Role of Research**

There is a shortage of clean quality seed adapted to the region, and the newest material in the region is twenty years old. The role of research is to provide varieties that respond to the existing demand such as that of processing companies.

There is great potential for processing in the sub-sector, but a major challenge is the lack of well-suited varieties on the market. Characteristics such as small size and nutritional content are important, but other traits such as dry matter content are essential as well. The first step is to determine market needs. Effective seed demand needs to be determined in terms of varietal requirements by various end-users, the desired quantity and quality, and production targets and timelines. Currently there are some varieties being tested in the region that have good processing qualities. When released, it will still take about two years before such varieties become available on the market as certified seed. Processing companies with an immediate market to satisfy would like for seed potato – not mini-tubers – to be imported to improve quality quickly, while working with breeders to improve the local varieties in the longer term.

Most countries need greater physical and human capacity to produce pre-basic tissue culture plantlets and pre-basic seed to supply private multipliers. In Uganda, seed multipliers are allocated pre-basic seed from NARO based not on what they need but based on what is available; there is not enough to meet the demand. Recommendations include larger and more tissue culture laboratories, irrigation facilities for off-season seed

production, and increasing the number of skilled staff. Other priorities include enhancing skills in disease and pest indexing and screening, evaluating effective rapid multiplication techniques, and affordable germplasm conservation methods.

Strategies for reducing the number of years to get a potential variety tested and listed should be undertaken to improve the overall functioning of the seed potato value chain. Rwanda has moved from the classic identification method to a fast identification method with release in five to six cropping seasons.

It is recommended to map seed production zones and set up a regional platform for researchers involved in seed potato production in order to facilitate the sharing of ideas, resources and experiences.

## 9.2 Possible follow-up actions

### For Government

The workshop showed that next steps must take into account the reality that shifting to a more formal system will take time and investment. In this context, a possible next step for governments could include analyzing the potential implications of the respective draft seed policies for the seed potato sector, and whether or not any changes might be necessary to accommodate a transition phase.

### For Research

A next step for research could be to test and introduce varieties that are better suited for processing activities, while continuing to seek ways of reducing the number of years it takes for a potential variety to be tested and listed.

### For the Private Sector

The private sector, along with representation from government, could develop and lead national platforms similar to that of the National Potato Council of Kenya. Such platforms would promote synergies and minimize duplication of efforts, share best practices for quality standards, information management, and communication along the seed potato value chain.

### Possible support of the project to various areas

Workshop participants along with the field visit show the amount of land required in the formal seed system. In order to inform policymakers in the region, it could be useful to undertake a study to have more formal estimates on the amount of land needed if all farmers only used certified seed. The study would address the following issues:

- How much land would be needed for seed production if all seed potato would be certified?
- If the government were to choose an intermediate option to move the informal positive selection groups to a QDS system, how regularly should QDS groups replenish their seed stock with certified seed?
- What institutions should be responsible for oversight of the QDS to ensure the internal quality control of the groups is sufficiently rigorous?
- What would be the amount of certified seed necessary in that case compared to current production volumes of certified seed?

Several issues will need to be addressed such as which of the various strategies for a QDS system could be taken and whether there would be external or internal quality control. In Rwanda, the project could aim to play a more active role in supporting the QDS system, while in Uganda, PASIC (Policy Action for Sustainable Intensification of Crop Systems in Uganda) might be a better vehicle for such activities in order to avoid duplication of efforts. The results of the workshop - and possibly this study - will be presented and validated, and next steps of the development of the QDS systems will be discussed.

In addition, a number of other activities could be undertaken:

- Developing a policy brief on the regional seed potato system.
- A technical paper with inputs from the presentations.
- For the Farmer Field School programme to be implemented, the curriculum will include positive selection techniques with a view to prepare farmer groups for a future QDS system.
- At the already planned national workshop in Rwanda, the results of the regional workshop will be discussed as well as the possible establishment of a national potato platform. The Kenyan National Potato Council could serve as an example.
- The project training programme on business skills for SMEs and for farmer groups will be adapted also for the private seed multipliers and seed producer associations.

## **10. ANNEX**

## **Annex A - speeches and PowerPoint presentations**

<https://www.dropbox.com/sh/z4gmh5fbolzhcrs/AADWLpKWXtuzuWFPWcb401E4a?dl=0>.

## **Annex B - Terminology**

## **Use of seed producer, seed multiplier and farmer**

In the report, *farmer* is used to describe ware potato producers, while *seed producer* and *seed multiplier* are used interchangeably to describe individuals or companies involved in producing and multiplying seed potato.

## **Use of potato seed and seed potato**

Potato seed = true seed, from the flowers, used by breeders in varietal development

Seed potato = tubers used for planting

Ware potato = potato used for consumption or processing

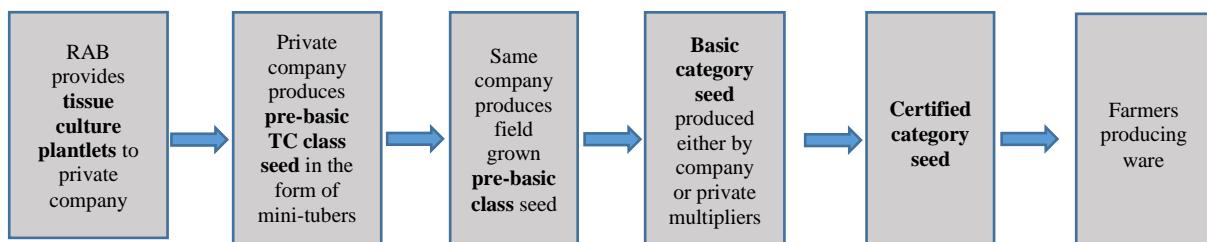
## **Use of Quality Declared Seed (QDS) and Quality Declared Planting Material (QDPM)<sup>6</sup>**

QDS is used when referring to the propagules as botanical seeds while QDPM is used for vegetative propagules such as potato tubers.

## **Classification of Seed Potato**

Class	Description
Pre-basic TC (tissue culture) class seed	Directly derived by micropropagation and may be tissue culture plantlets or tubers of the first generation
Pre-basic class seed (field grown)	Generations of seed multiplied in the field prior to Basic seed
Basic category seed	These are seed potatoes descended directly from Pre-basic or Basic category seed or produced under the special provisions of a national certification scheme and are mainly intended for the production of certified seed potatoes.  Seeds are classified as either Basic I or Basic II, depending on their scores for certain the minimum requirements, with Basic I being of higher quality, i.e. having a lower tolerance threshold.
Certified category seed	These are seed potatoes descended directly from Pre-basic, Basic or Certified category seed and are mainly intended for the production of potatoes other than seed potatoes.  Seeds are classified as either Certified I or Certified II, depending on their scores for certain minimum requirements, with Certified I being of higher quality, i.e. having a lower tolerance threshold.

## **Using the Field Trip to Musanze as an example**



The above classifications for seed potato are the ones used throughout this report. However, there were other terms that were used during workshop discussions, causing confusion as to which segments of the seed potato value chain were being referenced. For clarification, the table below provides the definitions used by the

<sup>6</sup> <http://www.fao.org/3/a-i1195e.pdf>

Organization for Economic Cooperation (OECD) and the Association of Official Seed Certifying Agencies (AOSCA).

<b>Definition</b>	<b>OECD</b>	<b>AOSCA</b>	<b>Description</b>
1st generation	Breeder	Breeder	Breeder seed is the initial source of seed and is usually produced by the breeder. It is the source for the production of pre-basic or basic seed.
2nd generation	Pre-basic	Foundation	Pre-basic seed is the progeny of the breeder seed and is usually produced under the supervision of a breeder or his designated agency. This generation is commonly used for crops that have low multiplication ratios and where large quantities of certified seed are required
3rd generation	Basic	Registered	Basic seed is the progeny of breeder or pre-basic seed and is usually produced under the supervision of a breeder or his designated agency and under the control of a seed quality control agency
4th generation	Certified 1	Certified	Certified seed is the progeny of basic seed and is produced on contract with selected seed growers under the supervision of the seed enterprise, public or private. Certified seed can be used to produce further generations of certified seed or can be planted by farmers for grain production
5th generation	Certified 2	-	

## Annex C

### AGENDA OF GCP/RAF/448/EC SEED POTATO WORKSHOP

**Sub-Regional workshop on Irish Potato Seed Systems in East Africa**  
**Umubano Hotel, Kigali**  
**25<sup>th</sup> to 27<sup>th</sup> November, 2015**

**Day 1**

time	Activity	Facilitator/presenter
08:00	Registration of participants	
<b>Opening session</b>		<b>Facilitator: Otto Muhinda, FAO</b>
09:00	Welcome	Mr Attaher Maiga, FAO Representative
09:10	Address by donor representative	Mr Arnaud De Vanssay, EU delegation
09:20	Opening speech	Mr Telesphore Ndabamenye, Head of crop production and food security RAB
09:30	Quick round of introduction of participants and icebreaker exercise	
10:00	Setting the scene: <b>What does it take to improve farmers' access to quality seed?</b>	Ms Cora Dankers, FAO project coordinator
10:15	Photo moment	
10:30	Coffee break	
<b>Theme 1: Current situation &amp; policy framework</b>		<b>Facilitator: Mr Wilberforce Walukano (IITA)</b>
11:00	Introduction to theme and reminder of timekeeping method	Facilitator
11:05	Regional trade in potato seed, COMESA  Seed Trade Harmonization Regulations and EAC regional standards for roots and tubers	Mr Evans Sikinyi, seed specialist, MINAGRI, Rwanda  Ms Stella Apolot, Coordinator Regional and International Standardization, Uganda National Bureau of Standards
11:25	Seed potato policy environment in Uganda	Mr Alex Lwakuba, MAAIF
11:40	Seed potato policy environment in Rwanda	Mr Telesphore Ndabamenye, head of crop production & food security RAB
11:55	Seed trade and plant health issues	Mr Alfayo Ombuya, Kenya Plant Health Inspectorate Service, Kephis
12:10	Discussion	
13:00	Lunch	
<b>Theme 2 Panel discussion: Increasing local commercial seed production</b>		<b>Facilitator: Ms Patricia Nsiime</b>
14:30	Introduction to panel discussion	Facilitator
14:35	Presentation of panellists (5 minutes each)	Panellists:
15:00	Panel discussion on - Farmer willingness/ability to buy quality seed - Involving private sector in subsidized seed - Policies affecting private sector - regional trade	- Mr Justus Masanyu, Muko expanded seed potato producers association (Uganda) - Mr Telesphore Mbonabake (Rwanda) - Mr John Bahana, Kisoro potato processing Ltd - Mr Wachiru Kaguongo, National Potato Council Kenya
16:00	Plenary Discussion	

**Day 2**

time	Activity	Facilitator/presenter
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09:00	Brief recall of day 1	Participant
<b>Theme 3: Improving quality in the informal seed sector</b>		<b>Mr Brian Isabirye, ASARECA</b>
09:05	Introduction to theme	facilitator
09:10	Positive selection and storage by farmers	Mr Solomon Basaza, District Agricultural Officers MAAIF
09:30	Quality declared seeds; bridge between formal and informal sector (about Ethiopia experience)	Ms. Elly Atieno, CIP Kenya
09: 50	Discussion	
10:30	<b>Coffee</b>	
<b>Theme 4: The role of Research</b>		<b>Mr Elly Atieno, CIP</b>
11:00	Beyond yield: breeding for end-users priorities	Mr Ngerero, Director Seed Production Unit, RAB, & Mr Thijs Boer, Holland Fair Foods
11:20	Providing foundation/pre-basic seeds to private sector seed multipliers	Mr Alex Barekye, Director Kazardi, NARO
11:40	Discussion	
12:30	Introduction to group work	<b>Ms Cora Dankers</b>
12:30	lunch	
14:00	Group work: to identify good practices for replication and upscaling Group 1: Policy Group 2: Research and extension Group 3: Seed value chain development Group 4 Francophone: <i>What does it take to improve farmers' access to quality seed?</i>	
15:30	Presentation of group work	<b>Ms Patricia Nsiime</b>
16:10	Plenary discussion to find consensus on lessons learned and best practices	<b>Mr Wachiru Kaguongo</b>
17:00	Introduction to field visit and closing of workshop	<b>Mr Otto Muhinda</b>

### DAY 3

Field visit: to seed multipliers in Musanze

Departure from Umubano hotel at 07:00, return around 18:00

## Annex D

**Sub-Regional workshop on Irish Potato Seed Systems in East Africa**  
**Umubano Hotel, Kigali**  
**From 25rd to 27<sup>th</sup> November, 2015**  
**PARTICIPANTS LIST**

Country	Name Organization	Name participant
<b>International &amp; Regional organizations</b>		
Kenya	East African Farmers Federation (EAFF)	Norbert Tuyishime (Program Officer)
Kenya	International Potato Centre (CIP)	Elly O.Atiemo (Research Associate)
Kenya	Alliance for a Green Revolution in Africa (AGRA) Programme for African Seed Systems(PASS)	Valentine Miheso (Senior Program officer)
Kenya	Grow Africa	Leah Kasera (Regional institutions & Country rep Ethiopia & Kenya)
<b>From Rwanda</b>		
Rwanda	Ministry of Agriculture and Animal Resources (MINAGRI)	Théophile Ndacyayisenga (RAB)
Rwanda	Rwanda Agriculture Board (RAB); Seed Production Unit	Gervais Ngerero (Director of Seed Production Unit)
Rwanda	Rwanda Agriculture Board (RAB)	Daniel Niyikiza (Director of seed Inspection)
Rwanda	Rwanda Agriculture Board (RAB) Crop production & Food Security	Telesphore Ndabamenye
Rwanda	RAB potato programme	<b>Senkesha Ntizo (researcher)</b>
Rwanda	University of Rwanda	Obedi Ishibwela Nyamangyoku (Senior Lecturer)
Rwanda	University of Rwanda	Student (Mr Kagame)
Rwanda	RAB	Higiro Joseph
Rwanda	COMESA / ACTESA COMSHIP	Evans Sikinyi
Rwanda	International Potato Centre (CIP) – Rwanda	Kirimi Sindi, PhD, Country Manager, Rwanda
Rwanda	European Union delegation	Arnaud de Vanssay
Rwanda	European Union delegation	Johan Cauwenbergh
Rwanda	Embassy of the Netherlands	Teddie Muffels
Rwanda	National Farmers' Federation IMBARAGA	Emmanuel Nsabimana (Agronomist)
Rwanda	Federation of Irish potato Cooperatives FECOPORWA	Isaac Nzabarinda (president)
Rwanda	USAID-Private Sector Driven Agricultural Growth (PSDAG)	Patrice Hakizimana (Agriculture advisor)
Rwanda	IFDC: PReFER and Catalyst programme	Laurence Mukamana (National coordinator)
Rwanda	KMTB	Innocent Semanyana (President)
Rwanda	COIMU, seed & ware potato coop, Rubavu	J. de Dieu Munyandekwe
Rwanda	private seed producer	Telesphore Mbonabake, Niyabihu
	Hollanda Fair Foods Ltd	Thijs Boer
Rwanda	Hollanda Fair Foods Ltd	Samson Munana (Sales&Promotion)
Rwanda	RDA:PPK Project	Dismas Habumugisha (Technique Director)

Rwanda	Dutch Embassy	Innocent Watabishi (Agribusiness Policy Officer)
Rwanda	Regional Potato Trading (RPT Ltd)	Emmanuel Ufitingabire (Managing Director)
Rwanda	Belgian Cooperation FFS programme	Raf Somers
Rwanda	NGF Consult Ltd	Henry Karenzi
Rwanda	Ministry of Agriculture and Animal Resources (MINAGRI)	Beatrice Uwumukiza
<b>From Uganda</b>		
Uganda	Ministry of Agriculture, Animal Industry & Fisheries (MAAIF)	Alex Lwakuba (Assistant Commissioner)
Uganda	Kisoro District Local Government	Solomon Basaaza (District Agricultural Officer)
Uganda	Ministry of Agriculture, Animal Industry & Fisheries (MAAIF); National Seed Certification Services	Nyende Siraj
Uganda	Ministry of Agriculture, Animal Industry & Fisheries (MAAIF)	Stephen Katabazi
Uganda	Kabale District Local Government	Christopher Gakibayo Kamengo
Uganda	Uganda National Standards Board (UNBS)	Stella Apolot
Uganda	Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA)	Brian Isabirye
Uganda	International Potato Center (CIP)- Uganda	Sam Namanda
Uganda	Kachwekano/Kabale Zonal Research Institute (KAZARDI)	Alex Barekye (Director of research)
Uganda	Uganda National Farmers Federation (UNFFE)	Mr. Agustine Mwendya, Acting Executive Secretary
Uganda	Uganda Cooperative Alliance	Ivan Asiimwe
Uganda	Muko expanded Seed potato producers Association	Justus Masanyu (Credit & Marketing Advisors)
Uganda	Uganda National Seed Potato Producer Association (UNSPPA)	Tindimubona Stephen
Uganda	Kisoro District Potato Cooperative Union Ltd	Beatrice Ayingabine
Uganda	Kisoro Potato Processing Industries	John Bahana (Director)
Uganda	International Fertilizer Development Centre (IFDC) CATALYST Uganda project	Deo Tibanyendera
Uganda	PASIC (IITA/IFPRI)	Wilberforce Walukano
<b>From other countries</b>		
Kenya	National Potato Council of Kenya (NPCK)	Wachira Kaguongo
Kenya	National Potato research Centre, Kenya Agricultural and Livestock research Centre (KALRO)	Jane Muthoni Mbugua (Senior research officer)
Kenya	KEPHIS	Alfayo Ombuya (Plant Health Inspector)
Congo	PADA (Nord Kivu)	Phenias Magigire Kifigi (Coordinateur de en Province du Nord Kivu)

Burundi	CAPAD	Pierre Claver Nahayo (Agricultural Program)
Burundi	ISABU	Astere Bararyenya (Potato research Leader)
Congo	Potato Program, INERA-Mulungu (Bukavu)	George Bouwe Nasona
Austria	Belgian Technical Cooperation (BTC) – SPAT II	Arne Hede
Rwanda	FAO-Rwanda	Attaher Maiga
Rwanda	FAO-Rwanda	Otto Muhinda
Uganda	FAO-Uganda	Patricia Nsiime
Rome	FAO-project task force	Siobhan Kelly
Rome	FAO-project task force	Cora Dankers
Rome	FAO consultant: rapporteur	Brendan Rice