



Exploratory study on Rwanda's Seed Sector: Options for Dutch support

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Keywords: Rwanda, Seed Sector, Seed Policy

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Executive summary

The exploratory study of Rwanda's seed sector has been commissioned by the Embassy of the Kingdom of the Netherlands in Kigali (EKN-KIG), in support of its Food Security portfolio. The objectives of the study have been to: analyze the institutional landscape of Rwanda's seed sector in terms of its capacities, governance and coordination; and advice EKN-KIG on policy issues, and potential activities to support Rwanda's seed sector.

Based on the field study and stakeholders interviewed during the two-week mission the following observations and recommendations were made:

- The new institutional set-up is well designed and can accommodate an ISSD approach; the operationalization of the new institutional set-up may encounter challenges;
- The marketing system is currently the biggest bottleneck in the seed chain; a gradual transition towards a market based system seems crucial;
- The informal seed system is recognized for its function and value and the current support that seems to be effective could be further scaled out;
- The intermediary seed system is important for self-pollinating and vegetatively propagated crops and can be further strengthened through an internal quality assurance system;
- The formal seed system may benefit from a more liberal system of seed marketing and shorter variety release procedures;
- Foundation seed production should be produced based on demand and a cost-recovery basis;

The Netherlands government is already preparing the following support activities to the Rwandan seed sector:

- A seed potato support project assists Rwanda in availing more and better potato varieties, and enhancing their seed multiplication and marketing. In addition, the study recommends supporting the regulatory environment, especially concerning variety release, national performance trials and the seed certification services.
- Support is provided for the development of Rwanda's system of Plant Breeders Rights. The activity contributes to ensuring sufficient protection for breeders to invest in Rwanda's private seed sector. Eventually the support may lead to Rwanda's membership of UPOV.

Other activities that could be supported by EKN-KIG are:

- The Government of Rwanda and EKN-KIG can collaborate within the ISSD Africa Program on developing key seed sector insights and lessons learned to the AUC. Given the fact that Rwanda is ahead of other African countries in preparing its second CAADP compact, Rwanda could lead in the thematic area of: How CAADP and the AUC's ASBP initiatives can contribute practically to a vibrant and pluralistic seed sector.
- Through central funding EKN-KIG can support the Government of Rwanda in designing alternative pathways for the seed marketing system. To this end a strategic study and national platform meeting (under the leadership of the Seed Council) can develop a road map for market-based seed distribution.
- Given the strong background of the Netherlands in the seed sector at home and in Africa through the various ISSD programmes, the Embassy could in time (2015 and beyond) consider supporting the Rwanda seed sector through a full-fledged comprehensive ISSD programme. Such a programme could focus on supporting activities in both the informal and formal seed sectors, strengthening the policy and regulatory environment as well as promoting trade and investment.

1 Introduction

This exploratory study of Rwanda's seed sector has been commissioned by the Embassy of the Kingdom of the Netherlands in Kigali (EKN-KIG), in support of its Food Security portfolio. The study is aligned with the activities of the Agricultural Counselor in the field of Plant Breeders Rights and the Potato Varieties and Quality Assurance Project as well as with the Great Lakes regional strategy on Food Security.

Support to the seed sector has been prioritized by the Netherlands government in the light of the Topsector policy. Horticulture and Planting Material (Tuinbouw & Uitgangsmateriaal) have been selected as one of the nine Topsectors which allows companies additional financing for innovative R&D initiatives both in the Netherlands and abroad. The Topsector strategy has also been well integrated in the Netherlands Development Cooperation policy of: 'A world to gain: A new agenda for aid, trade and investment' (Ministerie van Buitenlandse Zaken, 2012).

The objectives of the study have been to:

- Analyze the institutional landscape of Rwanda's seed sector in terms of its capacities, governance and coordination;
- Advise EKN-KIG and possibly the Rwandan government on policy issues, based on the lessons learned from other Netherlands supported integrated seed sector development (ISSD) projects in Africa;
- Provide recommendations to EKN-KIG in line with the national and regional MASP priorities for future project activities in the seed sector.

Currently the Belgian Technical Cooperation is operating a large seed sector and extension development project and any recommendations for new activities provided in this study will need to be complementary to the activities of this project.

2 Methodology

The study has been carried out by reviewing the major documents written on Rwanda's seed sector as well as a two-week mission visiting the major stakeholders, ranging from government to private sector, and from research to farmers organizations. The following organizations have been interviewed:

- The Ministry of Agriculture and Animal Resources: Policy and Planning Directorate General; Crop Production Directorate General; and Agriculture and Livestock Inspection and Certification Directorate General
- Rwanda Agriculture Board: Headquarters in Kigali, and the zonal offices in Musanze (Potato Tissue Culture Laboratory and Aeroponics Facilities) and Rubona (the National Genebank of Rwanda (NGBR) and the National Seed Testing Laboratory located in Rubirizi.
- Rwanda Development Board and the Seed Processing Unit in the Free Trade Zone which is managed by the Postharvest, Handling and Storage Taskforce (PHHS)..
- Higher Institute of Agriculture and Environment (ISAE), the Faculty of Agriculture of University of Rwanda in Butare and the International Centre for Tropical Agriculture (CIAT) in Kigali.
- Conseil Consultatif des Femmes (COCOF), Imbaraga Rwanda Farmers Association.
- Hinga Volcanoes Seed Company operating in Musanze district (Northern province) and SeedCo (Kigali Office).
- The International Centre for Soil Fertility and Agricultural Development (IFDC) and the Belgian Technical Cooperation (BTC).
- Rwanda Development Board (RDB)

The study was carried out by Joep van den Broek: Seed and Horticulture Expert / Agribusiness Development, Associate Consultant CDI, Wageningen UR, and Jean Marie Byakweli: Rwanda Seed Policy Expert / Consultant.

Integrated seed sector development

The study has been guided by the concept of Integrated Seed Sector Development (ISSD). ISSD recognizes that within each country different agricultural systems operate each with its own specific needs with regard to seed systems (Louwaars et al 2012). ISSD takes into account the different functions seed plays, including household food security, private sector development, agrobiodiversity management and agricultural entrepreneurship. ISSD takes into account the value of informal, intermediary and formal seed systems in providing farmers access to seed, and this approach calls for diversified incentives and regulations for strengthening the different systems in their functioning.

ISSD assessments have been carried out in eight countries in the context of the ISSD Africa work: Burundi, Ethiopia, Ghana, Mali, Malawi, Mozambique, Uganda, Zambia (Borman et al, 2013). The assessments have led to a number of initiatives operationalizing the ISSD concept into concrete projects and activities; in particular ISSD projects are now being prepared or implemented in: Burundi, Ethiopia, Ghana, Mozambique, Tanzania and Uganda.

Reflection and verification workshop

At the end of the two-week mission, first observations and recommendations of the study were discussed in a half-day workshop in Kigali, in which all major stakeholders, including representatives of the above mentioned organizations, participated. Based on the literature, interviews and the final workshop a characterization of seed systems in Rwanda has been made. The report concludes with a number of recommendations for strengthening the institutional set-up of the seed sector and potential areas for Dutch support.

Rwanda's new seed law and EKN-KIG's seed potato project

During the mission the draft Seed Law was being finalized. The mission supported MINAGRI in further strengthening the draft Law and providing experience from other African countries on specific contentious issues. In addition, the mission supported the fine-tuning of the Potato Proposal ('Potato Varieties and Quality Assurance Project') of the Embassy. Some recommendations were provided to broaden the scope of the project, including focus on the seed potato marketing system and strengthening private sector involvement.

3 Policy context

After the genocide of 1994 Rwanda has chosen a path of fast-track economic and social development through a strong government led development process. Exemplary for the ambition is Rwanda's Vision 2020 (MINECOFIN, 2000) that aims at reaching (lower) middle income status by 2020. The most important objectives of the Vision 2020 with respect to agricultural development are:

- To promote agricultural intensification and achieve yield growth rates of 4,5 % to 5% per year; and
- To focus on the production of high value crops; replacing subsistence farming by a fully monetized, commercial agricultural sector.

With respect to agriculture the Vision 2020 has been further worked out in the Agricultural Policy of 2004. The policy guides the vision's intensification objectives through the increased use of inputs (selected seeds, organic and mineral fertilisers, pesticides) and improved agricultural practices. To this end an increase in the production of quality seeds is targeted, focusing on private-sector led distribution (MINAGRI, 2004). The policy further adopts an approach that focuses on the development and dissemination of technological packages. These technological packages include inputs as seeds, fertilisers (mineral and organic) as well as pesticides, accompanied by sufficient information on the appropriate agricultural practices.

The operationalization of the policy objectives has been extensively detailed in the Strategic Plan for the Transformation of Agriculture (SPAT I: 2005-2008, SPAT II, 2009-2012 and SPAT III 20013-2018). For the context of this study, seeds issues have been dealt with through the Crop Intensification Program (CIP) and the Belgian-funded Support Programme to SPAT II and SPAT III.

The Crops Intensification Program focuses on six priority crops: maize, rice, Irish potato, wheat, cassava and legumes (soybean, common bean and pea). Through the program the government supports the production and distribution of certified and quality declared seed as well as the utilization of chemical fertilizers. So far, the program has achieved impressive results in terms of fertilizer uptake (66 kg/ha in 2009-2010) and the adoption of quality seed and seedlings, especially for maize, wheat and cassava (IFDC, 2010). Yields have increased sharply and between 2000 and 2010 quadrupled for maize and more than doubled for wheat. For the priority crops the government (RAB) provides the foundation seed to seed multiplication groups and after harvesting the certified seed is bought against a premium. Apart from seed potatoes and imported hybrid maize seed, this is by far the most important distribution channel for certified seed. Within the CIP program seeds are provided free or through an in kind reimbursement system to farmers. Cost recovery so far has been limited.

In the new Strategic Plan (SPAT-3) the growth targets maintain ambitious with an envisaged 8,5% agricultural growth rate for the 2013-2017 period (MINAGRI, 2013b). The strategy is characterized by a number of notions emphasizing broad sector transformation:

- From guaranteeing food availability to generating food security through economic growth;
- From farmers as passive recipients to farmers as active market players with new skills;
- From government as a direct provider to government as a facilitator of the private sector; and
- From supplying mostly the domestic market to exporting to the region.

So, an important role is foreseen for the private sector with the government playing a more supporting role as well as ensuring that the enabling environment and regulatory environment are conducive to investments.

With respect to the seed sector a number of directions are given:

- The subsidy on seeds will be continued and expanded to all crops. A so-called smart card system will be introduced replacing the voucher system;

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- The Government of Rwanda distinguishes between certified, quality declared and farmer saved seed. Certified seed will increasingly be channelled through the Rwanda Seed Enterprise buying, processing and selling the seed through a network of private agro-dealers. To facilitate quality declared seed a system of internal quality assurance within farmers organizations is envisaged.
 - The Government of Rwanda will facilitate the imports of seed, clarifying the regulations for quarantine, release and dissemination. Seed imports should be allowed while building local capacity for producing hybrids within the country.

The above vision, policy and strategic plan has in turn been supported through the BTC/RAB project. In the project an 'Innovative Approach' has been taken up, focussing on five core elements (RAB/BTC, 2012):

- Production and sales of Quality Declared Seed (QDS), building a bridge between farm saved and certified seed;
- Improved business and market orientation of seed multipliers and other private seed stakeholders;
- The development of an internal quality assurance system supported by RAB in parallel to the external quality assurance system by MINAGRI (Certification and Inspection);
- The Rwanda Seed Enterprise capacitated to establish high operational standards including timely delivery of certified seed;
- The development of clear crop specific roadmaps describing the seed chain towards certified and quality declared seeds.

In time it is foreseen that farmer saved seed and quality declared seed will gradually phase out in favour of the adoption of certified seed. An important change in roles is also envisaged for the Directorate of Inspection and Certification taking over key quality control tasks from RAB. Lastly, the project aims at improving the marketing system into the direction of competitive agrodealers, gradually introducing "a system of a fair payment for seeds and services" (RAB/BTC, 2012).

4 Rwanda's seed systems

As described in many of the above highlighted documents and evidenced by the mission's interviews and field visits, Rwanda's seed sector is rather diverse. Four seed systems can be distinguished:

- The farmer based seed, informal system
- The mixed public-private intermediary system focussing on quality declared seed
- The government supported, formal system focussing on certified seed
- The private sector driven, formal system focussing on certified seed

Each of these systems has its own characteristics and is operating in parallel. The following figure highlights these characteristics¹:

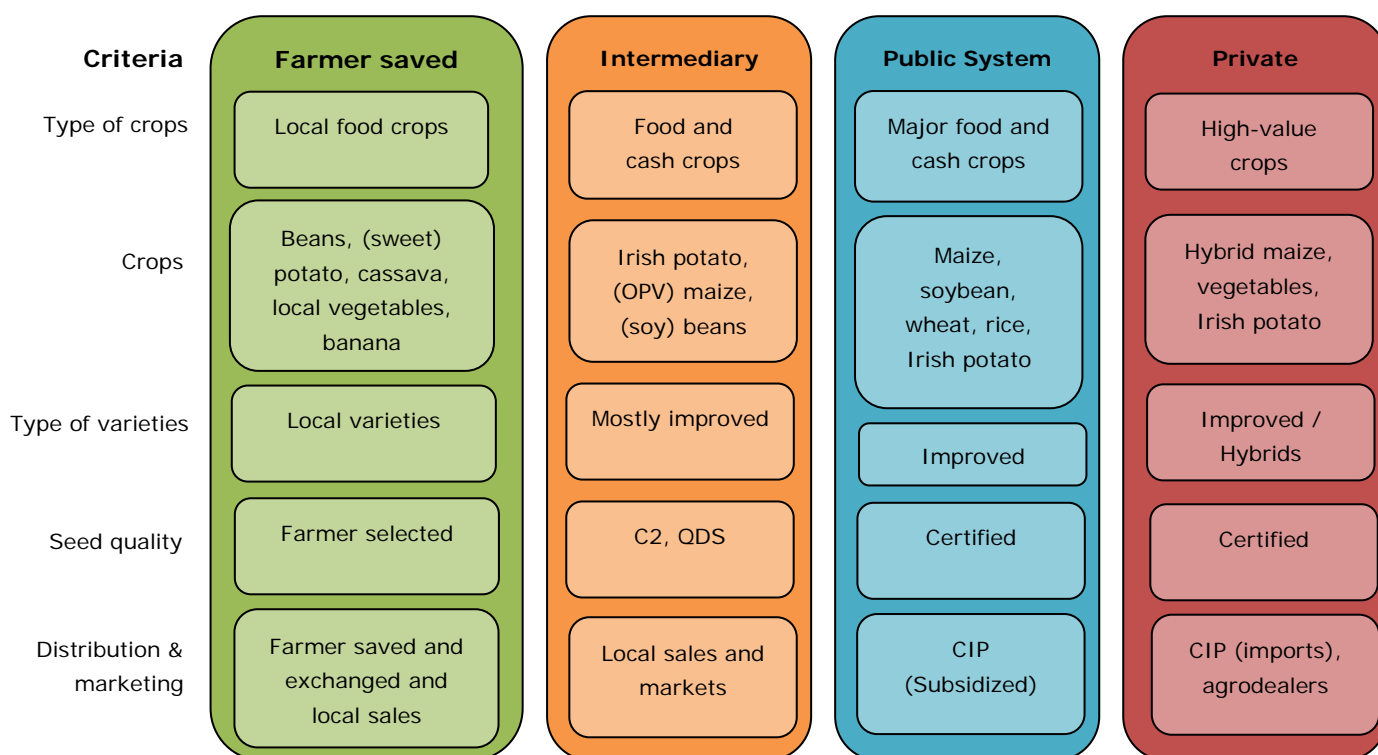


Figure 1: Rwanda's seed sector characterization

With respect to the farmer saved system much work is undertaken to improve the quality of seed saved and exchanged by farmers through positive selection and improved storage conditions and strengthened exchange networks (e.g. through participatory variety selection or seed fairs) by RAB and the BTC project. This system seems especially working well for the roots and tubers (cassava, sweet potato, beans and local vegetables). Most seed is locally produced and selected and exchanged between farmers but can also be source through local sales. Within the RAB/BTC project, the farmer field school concept has been applied to enhance learning within groups of farmers, not only on seeds and varieties but also on good agronomic practices. Like in many countries in Africa and Asia the informal system is by far the biggest seed source for farmers. The following table underlines this observation (Tripp, 2001):

¹ The list of crops involved for each type of seed system is not complete; we only highlight the most salient crops for each system.

Crop and location	Seed Source				
	Farm-saved	Other farmer	Grain market	Formal source	Other
Cowpea, Ghana	76	8	14	2	-
Cowpea, Zambia	71	27	3	-	-
Beans, Rwanda *	63	10	32	1	4
Beans, Zambia	57	34	9	-	-
Maize, Ghana	78	12	-	3	6

Table 1: Farmers' seed sources (%) (Tripp, 2001)

Within the intermediary system important progress is observed in Irish potato, both for QDS and C2 production. Though the QDS system has not yet been fully operationalized (in terms of regulations and guidelines), it provides a fertile ground for Rwanda's important food security crops (beans, potato, small cereals). Most successful seed producers seem the relative larger individual farmers (>1 ha.) and smaller farmer groups (<10 farmers); larger production cooperatives tend to struggle in organizing and managing their operations efficiently. In addition, for the lengthy seed potato chain seed producers' access to credit becomes an issue (to bridge the period between planting and selling) and often seed potatoes are being sold as ware potato. The Imbarraga Farmers Cooperative estimates this takes place for two-thirds of its QDS seed potatoes.

The lion's share of certified seed in the government supported formal system is mobilized through the Crop Intensification Program (CIP). Currently, it is RAB that takes the responsibility for the early generation (breeders' and foundation) seed production, while most of certified seed multiplication is undertaken by individual farmers and farmer groups. Currently around 5,000 ha. of land is used by officially registered seed producers (RAB data). These include more than 350 individual producers, more than 100 cooperatives and eight private seed producers (including e.g. CIAT and CIMMYT). The most important crops for certified seed are: maize (more than 7,000 tons, mainly OPV), potato (around 3,000 tons) and beans (climbing bean and soybean: almost 1,000 tons). In addition, it is estimated that around 2,000 tons of hybrid maize seed are being imported yearly. Currently RAB has eight inspectors and this seems adequate for the amount of fields to be inspected. Also the seed testing laboratory in Kigali has sufficient capacity to do the necessary seed tests although it needs some fine tuning especially in seed health testing.

Local Commercial Seed produced (Certified & QDS) produced (MT) 2006-2013								
	2006	2007	2008	2009	2010	2011	2012	2013
Maize	231	458	337	509	1.391	5.794	5.760	7.123
Wheat	22	72	61	79	33	136	372	32
Rice	11	197	101	206	200	206	70	18
Beans	46	80	89	108	121	1.244	869	133
Soybean	0	16	37	19	121	136	359	664
I. Potato	196	1.965	1.403	905	1.531	2.062	2.809	2.925

Table 2: Local commercial seed (Certified and QDS) produced (in mtons) 2006-2013 (MoFA)

A relative small though emerging system involves the private seed producers. Recently, SeedCo established its regional office in Rwanda while also other (hybrid maize and potato) companies are eyeing investments in Rwanda, most notably hybrid seed companies and a number of seed potato companies. Private sector stakeholders indicate that the current government controlled marketing and distribution system (including its subsidies) are significantly holding back the take-off of the private seed sector. A second often heard obstacle is the rather dormant seed agrodealer network, that presently mostly focuses on fertilizers and plant protection, and has little knowledge and interest in seeds. So far only hybrid vegetable seeds easily find their way to the farmers given their superior characteristics and relative low weight and cost (seed to yield ratio).

An interesting case is the Imbarraga Cooperative Union, that works on seed potato production in three different systems: positive selection (farmer saved seed), quality declared seed and certified seed. Farmers that are member of the Imbarraga Farmers Cooperative produced:

- 800 tons through positive selection with 48 farmers groups and 1050 farmers;
- 610 tons of quality declared seed; and
- 90 tons of certified seed (2013 data, pers. comm.).

This example shows the importance of the informal and intermediary systems. Especially for seed potato, with its high relative seed weight and low multiplication factor, these latter systems will remain important for a long time. Imbaraga further indicated it would be very interested to develop a system of *internal quality assurance*, taking up the certification (either of QDS or certified) itself and being accredited by MINAGRI Inspection and Certification Directorate. A similar view was expressed by SeedCo for their, relatively large-scale irrigated, production locations.

5 Institutional setting

The study dedicated quite a substantial time to the analysis of the seed regulatory environment and institutional set-up. An important reason for this was the revision of the Seed Law and the related changes in the institutional set-up with respect to quality control, plant variety protection and the system of foundation seed production (MinAgri, 2013).

The past systems

Rwanda started producing Certified Seeds in 1961 through the Rwanda Agricultural Research Institute (ISAR²). At the time, activities related to seed production, breeding and germplasm conservation were merged under the same umbrella department in ISAR. In 1972, the Government of Rwanda created the “Services des Semences Sélectionnées (SSS)”- which was incorporated into the Directorate of Extension in the Ministry of Agriculture and Livestock Development. From that moment onwards, ISAR’s main responsibilities were to develop new varieties, to conserve germplasm and to produce pre-basic seeds while SSS was responsible for basic and commercial seed production.

Basic and commercial certified seeds production was mainly a government-led activity carried out through agricultural developments projects scattered countrywide. In 1981, the National Seed Testing Laboratory was created in Kigali to provide inspection and quality assurance services to seed producers. Seed rules and regulations were not much developed and until 1994 widespread use of improved seed was limited to a few farmers. Certified seed production has been mainly financed by the Belgian Government until today.

In a post-genocide response to rehabilitate the agricultural sector, the Belgian Government financed the project “Appui au Secteur Semencier du Rwanda” (ASSR-1998-2002) whose main goal was to regenerate initial stock of certified seeds for maize, Irish potato, beans, soybeans and sorghum. In 2000, the Government of Rwanda created the National Seed Production Service (Service National Semencier-SNS) which was responsible for basic and commercial seed production while pre-basic seed production was maintained under ISAR mandate. In 2003, SNS issued the National Seed Law aimed at regulating all seed-related business.

In 2005, the SNS was dismantled while a new Seed Unit was created and incorporated into the newly created Rwanda Agricultural Development Board (RADA). Meanwhile, the AFSR³ project was implemented through the new Seed Unit. A new Seed Policy was drafted and Genetic Resources activities were mainstreamed culminating in the construction of the first National Genebank of Rwanda (NBGR). Seed rules and regulations were mainstreamed, seed inspection and certification operations were expanded countrywide while the private seed producers got support from the Government and AFSR. In addition, a national seed association umbrella organization, the Cadre de Concertation des Acteurs de la Filière Semencière – CCAFSR- was created with financial support from AFSR. However, there was no institutional separation between seed production and seed certification activities implying that the Seed Unit was judge and jury at the same time.

In 2009, all agricultural development agencies created in 2005⁴ (RADA, ISAR and RARDA) were merged to create the Rwanda Agricultural Board (RAB). The RADA Seed Unit was again dismantled and dissolved into RAB’s new structures creating confusion among seed stakeholders as to who is responsible for what (breeding, seed production and germplasm conservation). Certified seed production decreased, the private seed producers were not enough supported as before obliging the Government to rely heavily on seed imports from Kenya, Uganda and Tanzania (hybrid maize, wheat) in order to meet CIP seed needs. Meanwhile a newly Belgian-funded seed and extension project, the “Support to SPAT II project” was initiated.

² ISAR = this French acronym stands for “Institut des Sciences Agronomiques du Rwanda”.

³ AFSR = Appui la Filière Semencière du Rwanda was another Belgian funded seed project (2005-2009).

⁴ Only two extensions authorities, RADA and RARDA (Rwanda Animal Development Authority) were created while ISAR was maintained as a Research Organisation.

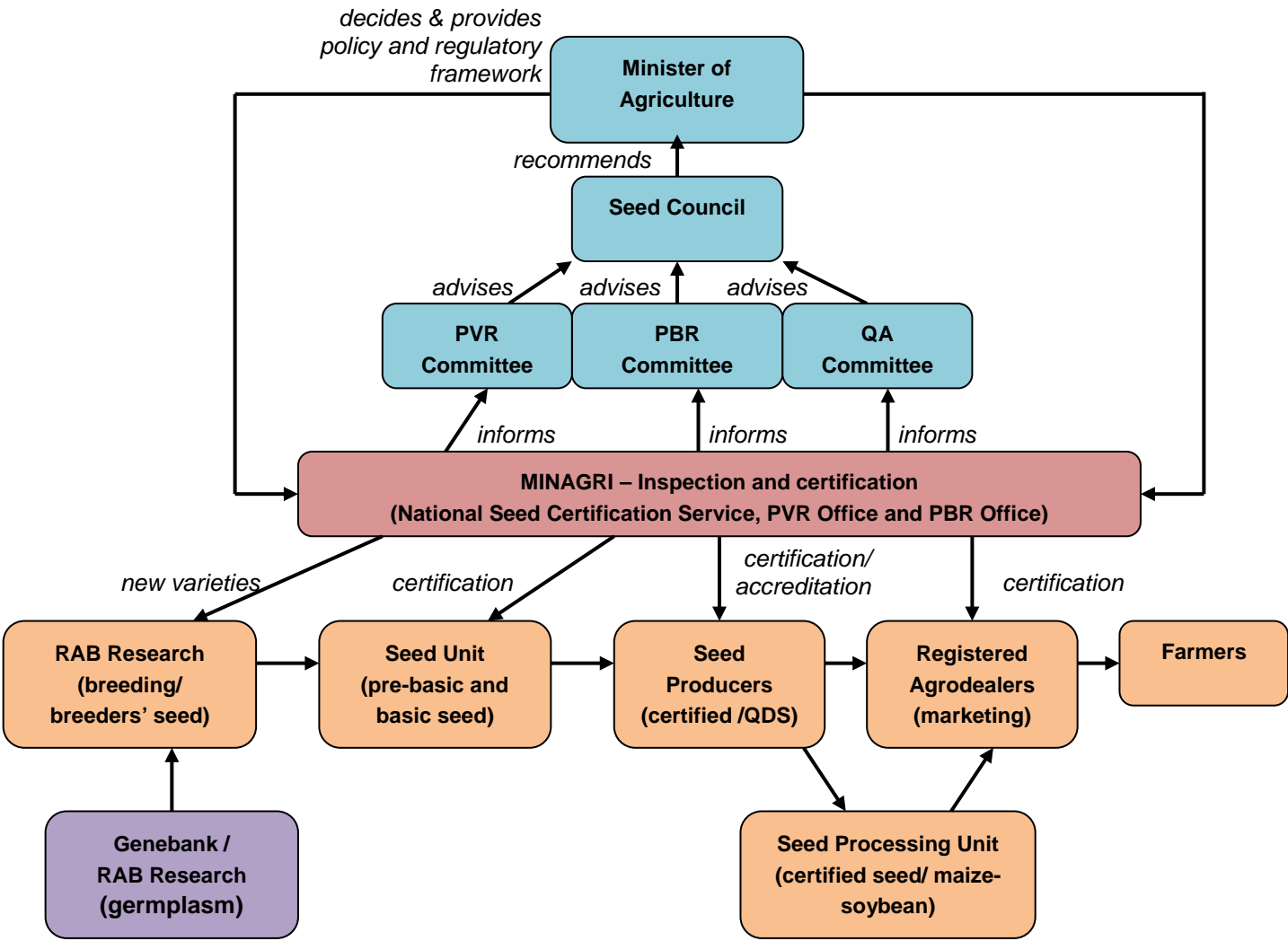
In summary, the last few years the formal seed system has been dominated by the activities of the Rwanda Agricultural Board (RAB). RAB brought together the support functions of research and extension (e.g. varietal development and popularization of new varieties), while also being responsible for some regulatory tasks of seed inspection and certification as well as the variety release. In addition, RAB has been the main actor responsible for early generation seed production, contracting outgrowers for seed multiplication and organizing the seed distribution to recipient farmers. In the formal seed system only seed multiplication was left to other organizations than RAB. Though the system has contributed significantly to the performance of the Crop Intensification Program, the system has been criticized for ‘wearing too many hats’ (being player and referee at the same time), especially when it comes to the regulatory areas of: quality control and variety release.

The new system as proposed in the draft Seed Law

In the new organizational structure a number of new institutions (or entities or departments but not really new institutions) are being established; most notably the Rwanda Seed Unit, the Rwanda Seed Processing Unit located in the Free Trade Zone in Nyandungu, the Seed Council, and a number of committees (in particular the Plant Variety Release Committee). The new system is visualized by figure 2 on the next page. Also the Seed Law has been revisited to reflect all those new changes.

In the new system the distinction between production (RAB and seed producers) and the regulatory functions are more clearly separated. Also, a number of services are being centralized (again) to the national level, most notably the inspection and certification service⁵, the foundation seed production and seed processing.

Figure 2: Schematic representation of Rwanda’s newly proposed public formal seed system



⁵ The Seed Inspection and Certification Service will be located inside the Directorate General for Agriculture and Animal Inspection and Certification making it completely independent from the seed production service.

The draft Seed Law provides very clear tasks and responsibilities for each of the institutions. The different colours of the figure present the different mandates of the different organizations. The orange depicts the primary seed production chain, from breeders' seed production, through foundation seed production, QDS and certified seed multiplication to the processing and marketing of the seed to the end consumer, the farmer. The Genebank can provide important germplasm for RAB's breeding activities but as such is not part of the seed chain. Enforcing the Seed Law and regulations (in strawberry red) is the Ministry of Agriculture's Inspection and Certification Directorate. The Directorate is responsible for specific seed services and regulatory enforcement: the seed inspection and certification, plant variety testing and registration, and registering new varieties on DUS characteristics (Office of the Registrar). In terms of the approval of new varieties, the development of new regulations, guidelines and manuals it is the Minister, supported by the Seed Council and its various Committees (in blue) that is responsible.

Other important notions are:

- The status of the Seed Unit will be more disentangled from the overall RAB (though it can still become a semi-autonomous Unit within RAB). The exact status in terms of financing, accountability and chain coordination was not yet clear at the point of writing.
- The new seed law reinforces the role of the Seed Council as the body that provides the coordination, policy and regulatory oversight for the seed sector (being directly accountable to the Minister of Agriculture). Under the Council a number of Committees are being established of which the Plant Variety Release Committee has gone farthest in preparing its operational guidelines (PVR Committee, 2013). Other committees could include one for Plant Breeders Rights and one for Quality Assurance. In the interviews with key informants some concerns were expressed about the composition of representatives in the Seed Council and PVR Committee, not having sufficient knowledge of seed and seed related issues.
- The Seed Law leaves open the possibility for establishing systems of Quality Declared Seed and internal quality assurance. The Seed Quality Control Services (under MINANGRI's Inspection and Certification Directorate) can further develop these regulations and can recommend these through the Seed Council and final Ministerial approval. To this end a specific Quality Assurance Committee could be established.
- The Seed Law further acknowledges the importance of a strong protection for plant breeders. UPOV membership is mentioned, though a strong *suis generis* system has also been proposed striking a balance between strong breeders' and farmers' rights. Currently, no PBR regulation and office are present in Rwanda.

6 Observations and recommendations

Based on the field study and stakeholders interviewed during the two-week mission we make the following observations and recommendations.

The new institutional set-up is well designed and can accommodate an ISSD approach; operationalization may encounter some challenges

Overall, the new institutional structure, as presented in the new Seed Law and other government documents, is well designed with a clear task division between the organizations involved in production and development, and the organizations involved in enforcement and regulatory oversight. Once the new Law is approved all regulatory oversight and enforcement issues can be well addressed and can guide the seed sector adequately. In the context of ISSD the Law provides substantial entry points for the design of regulations that support all seed systems in parallel. For example, the opportunity for creating a system of QDS and internal quality assurance can support both the emergence of a strong intermediary and formal private seed system. With respect to Plant Breeders Rights the current Law tends to lean more strongly towards UPOV membership, potentially obstructing farmers' rights.

However, the main challenge will arise in the implementation of and support for the new Seed Law and operationalization of the new oversight and regulatory bodies. In particular this applies to: the Seed Unit (for foundation seed), the Seed Council and its Committees and the Certification and Inspection Directorate. Supporting the emerging private sector will initially require more public involvement related to the establishment of the appropriate systems for seed quality assurance, PVR and PBR, before the private sector will be willing and able to fully take off. Patience will be required. This accounts both for the intermediary and formal private seed system as well as the seed agrodealer system.

The marketing system is currently the biggest bottleneck in the seed chain; a gradual transition towards a market based system seems crucial

Currently the RAB/CIP model of completely government-led seed chain coordination and distribution is prohibiting the development of a sustainable, market-based system. Especially for hybrids (maize, vegetable seeds) the government could consider opening up to the private sector. The intermediary system with strong seed producer cooperatives could benefit from a freer marketing system as well, in which cooperatives are motivated to sell (a part of) their quality seed themselves (instead of selling back to RAB). This can gradually support the emergence of autonomous, well organized business-oriented local seed businesses, in which RAB more and more takes up the role of supporter and facilitator instead of seed chain manager. It can also stimulate stronger backward and forward linkages between the Seed Unit (for which varieties early generation seed is needed?), the seed multipliers (for which varieties is there a market for quality seed?), and the farmers (demand for quality seed of the right varieties of the right quality that are affordable and available).

The system of seed vouchers is well developed throughout Africa and the world. The main drawbacks of the system appear to be the high (public) cost and the longer term dependence created with farmers (making it an unsustainable system). In India, a seed voucher system has been developed that supports only new varieties for a limited number of years. Also the amount of seed subsidy for the new varieties gradually decreases over the years (to zero in year four). This system ensures creates a market incentive for the private sector to take up quality seed production of farmer demanded seeds and varieties. This system could be taken as a starting point for reforming the subsidized seed marketing system in Rwanda.

The informal system is recognized for its function and value and current support may be further scaled out

Rwanda has a very successful system of extension support for improving the informal seed sector. The examples of support for positive selection in the potato sector and successes from the BTC project – Farmer Field School approach stand out in this respect. Given the variety in (self-pollinating and

vegetatively propagated) crops and varieties in the country, continuing working on positive selection and improved agricultural practices appears as a valuable strategy. The current experience could be further scaled out and serve as an example for the wider East African region. In this line, strong linkages between research, extension and (potentially) the Genebank proves crucial.

The intermediary system is important for self-pollinating and vegetatively propagated crops and may be strengthened through an internal quality assurance system

The intermediary system of individual or farm groups is currently a strong element in Rwanda's seed sector. Though the overall government strategy is geared at formal seed production in the medium term, it seems unlikely this will take place soon, especially not for the self-pollinating and vegetatively propagated crops (pulses, small cereals, roots and tubers). Given the high costs of certified seed production (in terms of production costs, transport, quality control and transaction costs), the intermediary system can be cheaper and more efficient for these crops than the formal seed system.

In this line the study recommends to support the strongest farmers organizations in setting up their own internal quality assurance system (with QDS) combining it with a local marketing system (see earlier). In addition, the intermediary system can be a vehicle for promoting new varieties (released by public research), and can be a partner in on-farm trials and participatory variety selection.

The formal seed sector may benefit from a more liberal system of seed marketing and shorter variety release procedures

The formal seed sector is best supported by a regulatory framework of: sound quality assurance, fast variety release and solid protection of plant breeders rights. In addition, for the private sector, a relatively liberal system of seed marketing and agrodealer network can enhance the overall availability and sales of improved seeds, as indicated already above. Currently the seed distribution system is holding back the further promulgation of seed companies. In addition, the variety release process seems rather opaque and lengthy (four seasons both on-station and on-farm). Clearer and shorter variety release procedures seem commendable in line with other countries in the region; especially where it concerns varieties that have already been successfully tested and released elsewhere.

Foundation seed production should be produced based on demand and a cost-recovery basis

With the establishment of the Seed Unit the public provision of pre-basic and basic seed seems guaranteed. The sheer presence of such a facility has almost become unique in Africa and can be a strong asset for promoting quality seed of food security crops (pulses, small grains and roots and tubers, as well as wheat and OPV maize).

However, the status of the Seed Unit (under RAB) does not appear to be clear in terms of decision-making autonomy, cost recovery and management. The unit could benefit from a gradual shift towards a semi-autonomous enterprise (e.g. in public-private partnership modality), with clear cost recovery objectives and internal financial incentives. In addition, the Seed Unit needs to ensure a demand driven approach linking up well with seed producers and farmers to ensure the basic seed it produces is in demand. To this end, some form of seed chain coordination could be organized under the new Seed Council.

Supporting the genebank in linking conservation and genetic resources use

An impressive infrastructure has been established for the Rwanda Genebank. In time the Genebank could serve as a regional Genebank as well (e.g. for food legumes). However, currently funding for its core operations (basic collection of varieties and maintenance) is lacking. The Genebank could be further supported once a strategic action plan is developed with specific projects (packages) on major Rwandan biodiversity crops that are important for (disease resistance) breeding – e.g. beans and cassava. Genebank could benefit from having direct collaborative linkages with CGIAR's Genebanks including Seed Vault and the Global Crop Diversity Trust Fund which can help secure core funds in addition to government budget. In the long run (for instance 10 years) the Genebank could run as a standalone institution instead of being under tutorship of RAB.

The special case of potatoes: seed chain integration from varietal screening to marketing support

Given the Dutch expertise and private sector interest in Irish potatoes, special attention was paid to the ongoing initiative around EKN-KIGs Potato Proposal. The mission assisted in the discussions with the RAB researchers and the Minister to clarify the potential scope and focus of the project. The initial project proposal very much focuses on research (screening and varietal selection) and public multiplication of varieties. The mission recommended broadening this scope and:

- Develop a specific component on the regulatory environment, strengthening the variety release and quality control system under MINAGRI's Inspection and Certification Directorate. This is in line with the other recommendations provided above in the seed sector exploration.
- Develop an additional component on private sector seed potato multiplication and marketing; supporting a number of larger seed companies and cooperatives in their seed multiplication initiatives towards seed stockists and direct marketers.

Both components would benefit from some external advise and partnerships with e.g. Wageningen UR and NAK Tuinbouw/Agro. In the context of the recommendations given above, figure 3 below presents a framework on how key project activities relate to each other. The project activities brings together RAB, MinAgri, Wageningen UR, NAK and private sector partners, in support of increased yield and income for Rwandan potato farmers.

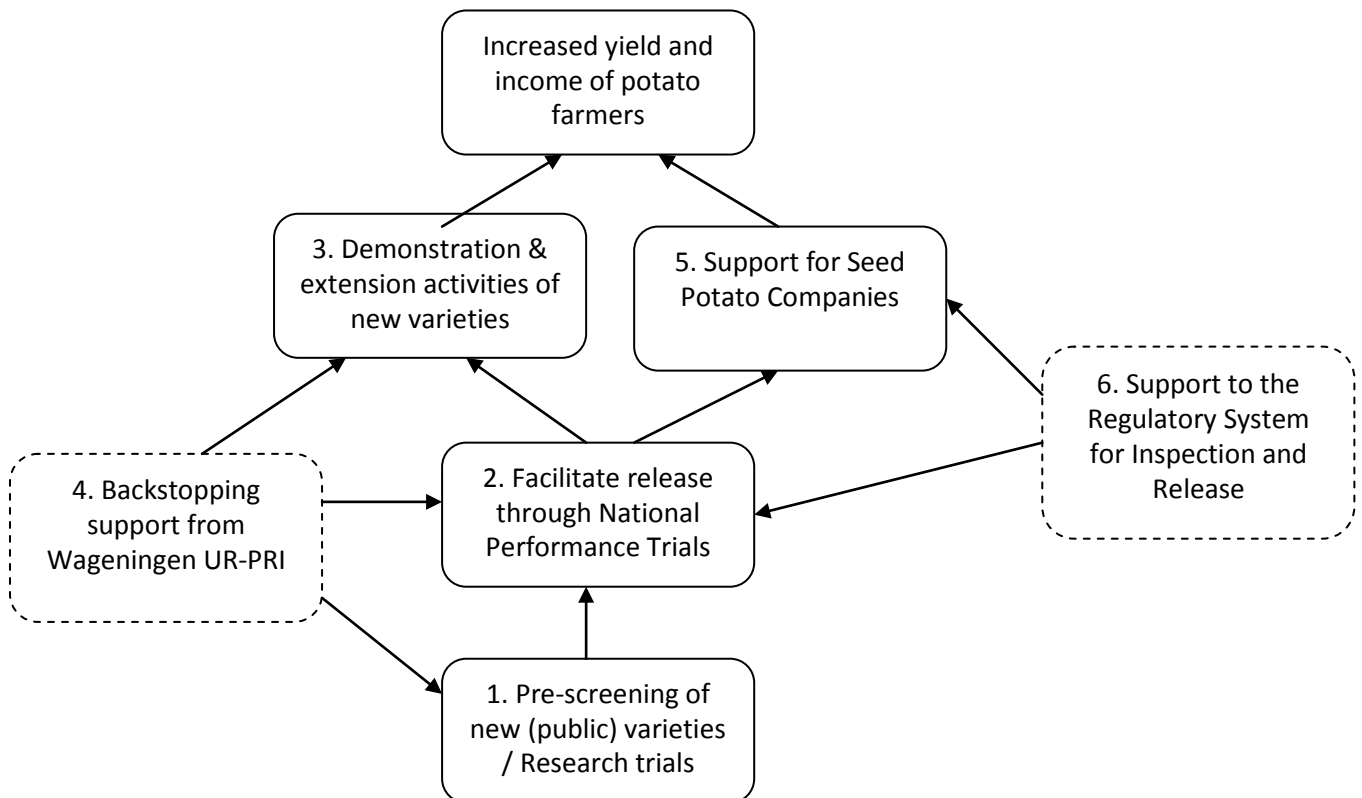


Figure 3: Draft conceptual framework for EKN-KIG Seed potato support project

Working with universities as facilitators of innovation in the seed sector

The mission further investigated the potential role of universities in supporting the seed sector and possibly facilitating a number of outreach project activities. The mission found that Rwanda's Universities (brought together under the University of Rwanda) currently do not have many outreach projects and are rather focused on more fundamental research activities and teaching. At some faculties interest exists to broaden the research approach towards more action and participatory research, though this is still at an infant stage. In terms of seed technology study programs and courses, ISAE seems well advanced and a potential collaborator for more technical project activities.

In addition, universities can be drivers of change in training seed specialists and participating in extension work. The newly created University of Rwanda has plans to set up an MSc programme in Seed Science and Technology under the technical and financial assistance from the Swedish Government and Universities.

7 Potential for Dutch involvement

Ongoing activities

The Netherlands government is already preparing the following support activities to the Rwandan seed sector:

- The earlier mentioned Seed Potato proposal will support Rwanda in availing more and better potato varieties, and enhancing their seed multiplication and marketing. In addition, the project will be able to support some activities in the regulatory environment, especially concerning the variety release procedures and support for a number of national performance trials. Also, some support can be provided to the Seed Certification Services, providing training on potato related quality issues and seed testing (e.g. on pest and disease detection).
- Through the Dutch Ministry of Economic Affairs support is provided for the development of Rwanda's system of Plant Breeders Rights. The support is intended for supporting Rwanda in preparing sufficient protection for breeders to invest in Rwanda's private seed sector (especially for potato, soybean and hybrid maize seed production). Eventually the support may lead to Rwanda's membership of UPOV.

Additional activities

Other activities that could be supported in 2014 are:

- Within the Gates Foundation and Dutch supported ISSD Africa project, there are opportunities to collaborate on a number of thematic pilots within a pan-African setting of learning and collaboration: (1) Common challenges to promoting entrepreneurship in seed value chains; (2) Access to varieties in the public domain; (3) Matching global commitments with national realities; (4) The African Union Commission's (AUC) Comprehensive Africa Agriculture Development Program (CAADP), the African Seed and Biotechnology Program (ASBP) and seed sector development. Given that Rwanda is ahead of other African countries in preparing its second CAADP compact the last theme seems particularly interesting to collaborate on. To this end a partnership with RAB/BTC and the AUC could be established. Through pilot projects in four selected African countries, a thematic team of Dutch and African experts will explore and provide recommendations on the following question: How can CAADP and the ASBP initiatives contribute practically to the development of a vibrant and pluralistic seed sector in African countries?
- Secondly, through central funding EKN-KIG can support the Government of Rwanda in designing alternative pathways for the seed marketing system. To this end some resources have been made available that can contribute to a strategic study and national platform meeting (preferably under the leadership of the Seed Council) in which a road map for market-based seed distribution can be discussed.
- Given the strong background of the Netherlands in the seed sector at home and in Africa through the various ISSD programmes, the Embassy could in time (2015 and beyond) consider supporting the Rwanda seed sector through a full-fledged comprehensive programme. Such a programme could focus on supporting activities in both the informal and formal seed sectors, strengthening the policy and regulatory environment as well as promoting trade and investment. During the visits it was noticed that the Netherlands have a very good reputation and network in Rwanda's agricultural sector, both in the public and private sector. A full-fledged ISSD program could be either accommodated within a Great Lakes regional programme (with strong stand alone activities in Rwanda) or directly through EKN-KIG bilateral resources.

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the potential
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