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FEED THE FUTURE ENABLING ENVIRONMENT FOR FOOD SECURITY PROJECT

SEEDCLIR: DEMOCRATIC REPUBLIC OF THE CONGO

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CONTENTS

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ACRONYM LIST

ACTESA	Alliance for Commodity Trade in Eastern and Southern Africa
AGRA	Alliance for a Green Revolution in Africa
AGRIPEL	Ministry of Agriculture, Fisheries, and Livestock
ARIPO	African Regional Intellectual Property Organization
ASPKA	Association of Seed Producers of Katanga (Association des Producteurs de Semences du Katanga)
BCNV	Bureau Catalogue National des Variétés
BTC	Belgian Technical Cooperation
CGIAR	Consortium of International Agricultural Research Centers
CIAT	International Center for Tropical Agriculture
CIMMYT	International Maize and Wheat Improvement Center
CIP	International Potato Center
COMESA	Common Market for Eastern and Southern Africa
COMESA STHR	Common Market for Eastern and Southern Africa Seed Trade Harmonization Regulations
CONASEM	National Seed Council (Conseil National Semencier)
COPROSEM	Provincial Seed Council (Conseil Provincial Semencier)
CRM	Maize Research Center (Centre de Recherche du Maïs)
CTAC	Technical Commission for Admission to the Catalog
DPPV	Direction de Production et de Protection des Végétaux
DPV	Direction de la Protection des Végétaux
DRC	Democratic Republic of the Congo
DUS	Distinctiveness, Uniformity, and Stability
FAO	Food and Agriculture Organization of the United Nations
GDRC	Government of the Democratic Republic of the Congo
GIBADER	Groupe Inter Bailleur de l'Agriculture et Développement Rural
HSR	Harmonized Seed Regulations
ICRC	International Committee for the Red Cross
IITA	International Institute of Tropical Agriculture
IFPRI	International Food Policy Research Institute
ILA	Innovation du Lac Albert
INERA	National Institute for Agricultural Research and Studies
IPAPEL	Inspection Provinciale de l'Agriculture, Pêche et Élevage
IPPC	International Plant Protection Convention
IRRI	International Rice Research Institute

ISTA	International Seed Testing Association
NGO	nongovernmental organization
NPPO	national plant protection organization
OAPI	Organisation Africaine de la Propriété Intellectuelle
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
OCC	Office Congolais de Contrôle
OECD	Organisation for Economic Cooperation and Development
OPV	open-pollinated variety
PATPS	National Seed Service (SENASEM) Manual of Procedures (Procedures Administratives et Techniques des Prestations des Services du SENASEM)
PVP	Plant Variety Protection
QDS	Quality Declared Seed
SADC	Southern African Development Community
SADC HSR	Southern African Development Community Harmonized Seed Regulations
SeedCLIR	Seed Commercial, Legal, and Institutional Reform
SENASEM	National Seed Service (Service National des Semences)
SQAV	Service de la Quarantaine Animale et Végétale
SSSA	Seed System Security Assessment
STEP	World Bank Democratic Republic of the Congo Eastern Region Stabilization and Peace-Building Project
UNAGRICO	Union Nationale des Agriculteurs Congolais
UPOV	International Union for the Protection of New Varieties of Plants
USAID	United States Agency for International Development
USAID/DRC	United States Agency for International Development Mission to the Democratic Republic of the Congo
VCU	Value for Cultivation and Use

EXECUTIVE SUMMARY

To develop a dynamic seed system that facilitates farmer access to affordable, high-quality seed, nations must establish an enabling environment for private sector investment supported by strong public research and regulatory institutions. In the eastern region of the Democratic Republic of the Congo (DRC), political upheaval and chronic insecurity have hampered government and donor efforts to transform the seed sector, and a clear, long-term strategy for seed sector development has yet to emerge at the national level. Without a comprehensive legal framework and sustained budgetary support for the development of key seed institutions, access to seed in eastern DRC is guided by short-term development projects, whose overlapping priorities and cyclical support generate a reactionary response from seed sector actors and undermine the establishment of strong institutions and a stable seed market.

This Seed Commercial, Legal, and Institutional Reform (SeedCLIR) study evaluates the enabling environment for the seed sector in six target provinces of eastern DRC to identify the key players, seed system dynamics, and factors that inhibit smallholder farmer access to quality seed. From July 7-26, 2019, the Feed the Future Enabling Environment for Food Security (EEFS) consultant team conducted interviews with more than 70 public and private seed sector stakeholders in Kinshasa and across the six target provinces in eastern DRC, including seed producers, agro-dealers, importers, agricultural research institutions, national- and provincial-level regulatory officials, and a wide range of NGOs and donor organizations implementing seed projects in the eastern DRC region.

The analysis revealed five key themes that characterize the enabling environment for seed across the six provinces.

National and Provincial Seed Policy

The absence of a national seed law and implementing regulations creates uncertainty and unpredictability in the application of seed regulatory procedures. This legal vacuum directly affects the authority of the national seed inspectorate, the National Seed Service (Service National des Semences [SENASEM]), which lacks the necessary powers and resources to properly regulate the seed sector. The resulting informality of the seed sector is one of the primary underlying causes of many of the challenges experienced in the DRC seed sector, such as the presence of fake seed, unfair competition, and the chaos and corruption endemic in emergency seed supply. With only limited coordination among seed sector stakeholders at the national and provincial levels, stakeholders have been unable to mount a concerted lobbying effort that can generate the political will for reform.

National Seed Authority

Implementation of the legal framework for seed will require an effective national seed authority. At present, SENASEM lacks the management systems, staff training, facilities, and equipment to carry out its mandate. In particular, SENASEM does not have the resources to conduct the types of seed testing necessary to establish clear varietal descriptions nor to store reference samples, both of which are prerequisites to official variety registration, seed certification, and plant breeders' rights. A long-term capacity building plan must be established, including coordinated donor support over multiple project cycles and a long-term commitment from the government to provide the necessary budgetary resources to ensure these gains are sustainable.

Seed Quality

Seed quality is a product of actions taken over generations of seed multiplication. With traditional seed saving practices, farmers make these decisions themselves through on-farm seed selection each season. In the commercial seed system, seed quality must be upheld by the seed producer and safeguarded by seed regulatory institutions to ensure that the ultimate label on a seed package truthfully identifies the seed contained inside. This process begins with varietal maintenance, through which a variety's essential

characteristics and identity are maintained over time, typically by the breeder, and continues through field inspections and laboratory testing on the generations of seed, from the breeder seed to the commercial seed that reaches a farmer's hands. For seed imports, importing countries seek documentation verifying that similar quality certification was conducted in the exporting country and submit seed imports to quarantine inspection at the border.

In eastern DRC, none of these essential systems for ensuring seed quality function as needed. The national agricultural research institute, the national plant protection service that regulates seed imports, and SENASEM all lack the financial, technical, and human resources to properly ensure seed quality, and yet seed continues to be certified each year to serve the primarily donor-driven seed market. There is a substantial need for long-term capacity building within key institutions and for facilitating the delegation of quality control, as is appropriate, to the private sector.

Donor Coordination and Knowledge-Sharing

Given the long history of poverty, instability, and violence in eastern DRC, donors play a large role in the seed sector. The seed market is driven by frequent tenders for the purchase of emergency relief seed, and much of the seed produced in eastern DRC stems from development-oriented donor projects and NGOs that support seed contract growers. The presence of donor funding and the weak regulation of seed quality has resulted in a seed market flooded with seed speculators and poor-quality products masquerading as certified seed. In this environment, seed companies producing high-quality seed for sale to farmers have struggled to establish a long-term presence. Greater donor coordination, knowledge-sharing, and a commitment to establishing private sector-sensitive approaches to achieving the humanitarian and development objectives in the region is urgently needed to ensure donor approaches support, rather than undermine, private sector investment in the seed sector.

Domestic and Cross-Border Seed Trade

Despite the daunting range of challenges faced by private sector seed producers, there remains untapped seed market potential, both domestically and for export. Donors can facilitate the development of a sustainable, high-quality commercial seed sector through specific investments to improve the competitiveness of local seed producers in domestic and regional seed markets. To lay the foundation for seed export, local varieties should be registered in regional seed variety catalogs. Domestically, capacity building for local seed companies is needed to enable them to access desirable, locally adapted varieties; assess farmer demand; and employ seed production techniques that ensure seed quality. Together, these investments will ensure that local seed producers can seize existing domestic and export opportunities for increased seed trade while building the foundation for future seed sector growth both in eastern DRC and abroad.

A ROAD MAP FOR SEED SECTOR DEVELOPMENT

The evolution of the enabling environment for seed is a nonlinear process that allows for a certain degree of flexibility in terms of the sequencing of reforms. Some actions, however, such as affirming the legal authority of SENASEM or the enactment of a seed law, are fundamental to the effectiveness of any other reform and must take precedence. Similarly, the establishment of an effective process for variety registration and release is a prerequisite to future investments in plant breeders' rights and regional export opportunities.

The present report provides recommendations under each of the five thematic areas for short-, medium-, and long-term investments to improve the enabling environment for seed across the six provinces of eastern DRC and at the national level. The resulting road map sets forth a sequencing of those reforms in three phases.

- **Phase 1 (Years 1-2)** focuses on laying the groundwork for private sector development through enactment of the seed law, clarification of the legal authority of SENASEM, development of SENASEM's management and information systems, and improved donor coordination.
- **Phase 2 (Years 3-7)** targets the expansion of the legal framework to incorporate clear regulations and a national seed strategy, significant institutional capacity building within SENASEM and the National Institute for Agricultural Research and Studies, and the development of a high-quality, demand-driven seed market system.
- **Phase 3 (Years 8-15)** develops greater sophistication and regional integration through the adoption of plant breeders' rights legislation, the accreditation of private sector providers for certain regulatory functions, and the promotion of seed exports.

For a complete sequencing of recommendations over a 15-year time horizon, please see Annex 1: Road Map for Seed Sector Development.

1. INTRODUCTION

A dynamic seed system that facilitates farmer access to affordable, high-quality seed is essential for achieving targets for poverty reduction, food security, and climate change adaptation in rural areas around the globe. Generating a dynamic seed system requires an enabling environment for the development of a robust commercially driven seed sector supported by strong public research and regulatory institutions. All too often, governments and donors get trapped in a cycle of short-term support for the seed sector in response to extreme poverty or insecurity that fails to engender or even undermines long-term development of a sustainable commercial market for seed.

The history of the seed system in the eastern region of the Democratic Republic of the Congo (DRC) reflects exactly this type of ebb and flow of government and donor investment. Since 1987, multiple strategic initiatives and donor projects have attempted to transform the sector, only to be interrupted by political upheaval and insecurity. Through the decades, the development strategy has repeatedly changed, and investment dollars have shifted from one region or type of actor to the next. A clear, sustainable, long-term strategy for seed sector development has yet to emerge, and the Government of the Democratic Republic of the Congo (GDRC) has not enacted a seed law or provided the necessary sustained budgetary support for the development of key seed institutions.

Without a comprehensive legal framework and strategy from the government, seed activities in eastern DRC are guided by short-term development projects whose overlapping priorities and cyclical support generate a reactionary response from seed sector actors and undermine the establishment of strong institutions and a stable seed market. The regulatory vacuum in the seed sector also creates opportunities for unqualified and unscrupulous seed producers to enter the market. As a result, professional seed companies cannot compete, and the poor quality of seed in the market further weakens farmer demand for improved seed, creating a vicious cycle of underinvestment in seed production and distribution.

1.1 ABOUT THIS ASSESSMENT

The United States Agency for International Development Mission to the Democratic Republic of the Congo (USAID/DRC) seeks to link smallholder farmers with market systems to improve livelihoods and enable transformation beyond subsistence agriculture. USAID/DRC requested that the Feed the Future Enabling Environment for Food Security (EEFS) project conduct this study in recognition of the weak status of the seed sector in eastern DRC and the repeated challenges related to farmer access to quality seed, which serves as a critical input into farmer production systems. The objective of the study was for EEFS to provide USAID/DRC with a clear understanding of the factors impeding smallholder farmer access to quality seed and to deliver recommendations for strengthening the commercial seed sector.

Figure 1. Target Provinces and Crops for the SeedCLIR DRC Assessment

Provinces	Crops
Haut-Katanga Lualaba Tanganyika South Kivu North Kivu Ituri	*Grains*: maize, rice *Pulses*: soybean, bean, cowpea *Tubers*: Irish potato, sweet potato *Horticulture*: tomato, onion, cabbage

The current study was designed to identify barriers to development of the seed sector in six target provinces of eastern DRC through the use of the Seed Commercial, Legal, and Institutional Reform

(SeedCLIR) tool, an analytical framework designed to provide a landscape analysis of key players within the seed sector and to diagnose issues in the enabling environment for seed. A summary of the target provinces and seed crops can be found in Figure 1.

From July 7-26, 2019, the EEFS consultant team, consisting of two international and two national seed experts, conducted interviews with more than 70 public and private seed sector stakeholders in Kinshasa and across the six target provinces in eastern DRC. The team consulted seed producers, agro-dealers, importers, agricultural research institutions, national- and provincial-level government officials responsible for regulating seed, and a wide range of nongovernmental organizations (NGOs) and donor organizations implementing seed projects in eastern DRC region. A full list of the stakeholders consulted for this assessment can be found in Annex IV.

Box 1. EEFS Consultant Team

Haut-Katanga, Lualaba, and Tanganyika provinces:

- Roger Shongo Diowo, national consultant
- Juan Trives Pire, international consultant

South Kivu, North Kivu, and Ituri provinces:

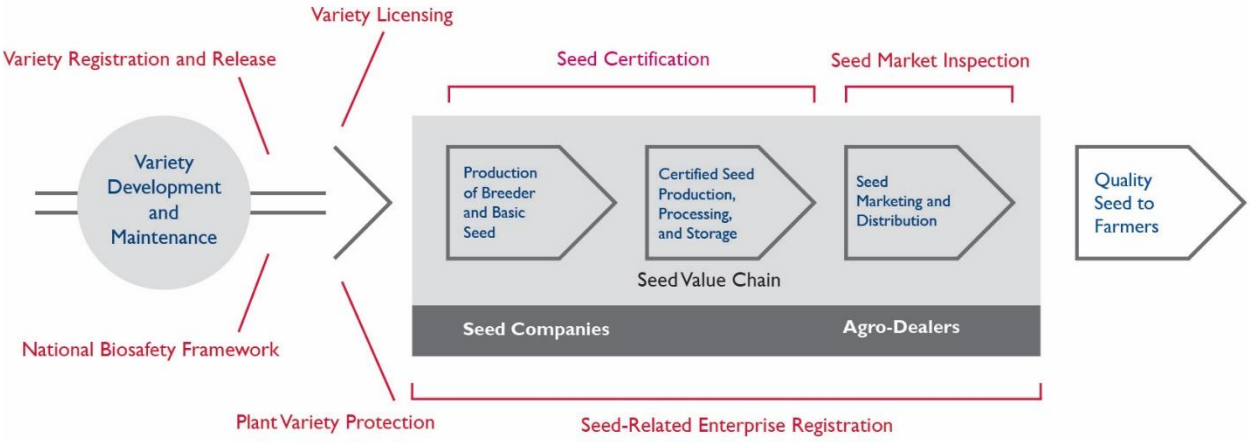
- Espoir Bisimwa Basengere, national consultant
- Stephen Walsh, international consultant

1.2 THE ENABLING ENVIRONMENT FOR SEED

For the purposes of this assessment, the term "enabling environment" is defined broadly to include the formal rules (i.e., policies, laws, regulations, standards), government institutions, informal norms (i.e., political economy, patronage networks, farmer preferences), and roles of the donor community and government in shaping the incentives and disincentives for private investment in the seed industry.

The EEFS consultant team recognizes that an effective legal, regulatory, and institutional framework that governs the seed sector is a necessary but not sufficient criterion for economic growth. This is particularly true in a context such as the DRC, where, as shown in this report, the seed sector lacks guiding legislation and institutions capable of implementing the law.

Figure 2. The Enabling Environment for Seed



Source: Fintrac Inc.

Figure 2 above illustrates the key touchpoints of the commercial seed sector with various regulatory procedures and institutions present in a strong seed regulatory system. Most of these functions are ineffective or nonexistent in the DRC. Accordingly, the EEFS consultant team endeavored to also take

into account the broader political, social, and macroeconomic dynamics that influence the behavior of key actors in the seed system and constrain the production, distribution, trade, and uptake of improved seeds.

1.3 THE SEEDCLIR METHODOLOGY

The SeedCLIR methodology follows a detailed checklist of legal, regulatory, and institutional aspects of seed policy to determine the relative maturity of different areas of the legal and institutional framework for seed. To truly facilitate the development of a robust private industry for seed, all aspects of the enabling environment must ultimately function together in tandem, from seed certification to plant variety protection. Nonetheless, reform is a long-term, complex, and nonlinear process, requiring a constantly evolving stream of taking stock, facilitating dialogue, and building the capability of the public and private sectors to bring about meaningful legal and behavioral change.

Accordingly, SeedCLIR employs a maturity model approach to the assessment of the legal framework and implementing institutions for the regulation of the seed industry in the subject country. This maturity matrix identifies standard stages in the evolution of a country's seed system in which the expansion of private sector participation in the seed system is tied to a gradual maturing of the legal framework and public sector institutions that regulate seed. The maturity matrix can help to identify underperforming areas and target reforms where they are most needed.[1]

The detailed technical analysis of the legal framework and seed implementing institutions in the DRC can be found in Annexes II and III; this information will be useful for any organization wishing to engage in in-depth legal and institutional reforms within the seed sector. The main body of this report explores the broader enabling environment, i.e., the political, social, and macroeconomic dynamics that exist in the absence of a strong formal seed system and their impact on farmer access to seed. The report and its recommendations are intended to generate dialogue and inform investment strategies to build a stronger enabling environment for seed in eastern DRC.

2. THE ENABLING ENVIRONMENT FOR SEED IN EASTERN DRC

2.1 SEED POLICYMAKING

The enabling environment for seed in the DRC is characterized by an almost nonexistent legal framework to govern the sector. The DRC is a member of both the Common Market for Eastern and Southern Africa (COMESA) and the Southern African Development Community (SADC), and the government has taken steps over the years to draft a domestic legal framework aligned with the harmonized seed trade regulations established by these organizations.[2] These commitments, however, remain only theoretical, as the government has yet to enact a national seed law. The lack of political commitment to the sector is further evidenced by poor financial support to SENASEM, the seed inspectorate under the Ministry of Agriculture, Fisheries, and Livestock (AGRIPEL), and to the National Institute for Agricultural Research and Studies (INERA) to carry out their mandates. True progress will require sustained political will to finalize the legal framework and allocate sufficient budgetary resources for implementation.

A draft seed law, initially written more than 10 years ago and since revised to align with the provisions of the COMESA and SADC harmonized seed trade regulations, was submitted to Parliament last year and is

[1] A more detailed explanation of the SeedCLIR methodology and maturity model is available from the Feed the Future Enabling Environment for Food Security project on request.

[2] These regional agreements are known as the COMESA Seed Trade Harmonization Regulations (COMESA STHR) and SADC Harmonized Seed Regulations (SADC HSR).

awaiting deliberation. Discussion of the draft was initially delayed due to parliamentarians confusing the draft seed law with the Agricultural Code. The Union Nationale des Agriculteurs Congolais (UNAGRICO), a Congolese farmers' union, intervened to argue to Parliament that the Agricultural Code is not a suitable replacement for the seed law. Delays in taking up the law in Parliament may also stem from political issues: in the past election, the opposition advocated for the seed law, and now the bill must gain the support of the new President.

In the absence of a seed law, the seed sector in the DRC is governed by the Technical Regulations for the Production, Control, and Certification of Seeds of the Major Food and Vegetable Crops of 1997, which are now in their third revision and have been harmonized with SADC seed procedures for all areas except seed import and export.[3] SENASEM also developed a manual of procedures, the National Seed Service Manual of Procedures (Procedures Administratives et Techniques des Prestations des Services du SENASEM [PATPS]), for variety registration; seed certification; and the accreditation of laboratories, samplers, analysts, and seed inspectors, which were adapted from SADC seed center models with the support of the World Bank.[4] However, SENASEM lacks the organizational capacity and financial and technical resources to apply the procedures at this time.

All of the legal texts pertaining to the DRC seed sector, including the current revision of the seed regulations, are in draft form or only provisionally applied. Although these texts are reasonably well aligned with the DRC's regional commitments and good practice in seed regulation, there is room for improved internal coherence among them as well as a reduction in the excessive procedural burdens the texts create for the private sector.[5] The existing texts also contain gaps, most notably the lack of a law on plant variety protection to ensure plant breeders' rights and lack of a national framework for biosafety.

SENASEM, which carries out the functions of a national seed authority but remains a department of AGRIPEL, has not been officially granted the role of a national seed authority in any of the draft laws and regulations.[6] Most regulatory functions are nonexistent, ineffective, or accomplished through unmandated informal arrangements between institutions. For example, in the absence of a formal variety release committee, there is no body licensed to review variety registration applications and update the national variety catalog.[7] To prevent a total breakdown in the variety registration process, cooperation is necessary between SENASEM, INERA, and universities for the registration of varieties.

The lack of a clear legal framework for the seed sector and sustained budgetary support for seed institutions has caused unpredictability and inconsistency in the application of seed standards, resulting in an anemic private seed sector and poor quality seed for farmers. Seed system stakeholders consistently reference the lack of approved legislation governing the seed sector as a significant impediment to the development of a commercial seed sector, but coordinated advocacy and public-private dialogue on seed sector issues have yet to be established. The draft seed law provides for the establishment of a National Seed Council (Conseil National Semencier [CONASEM]) in which national seed policies and strategies would be debated. In the meantime, with the support of international cooperation projects, some Provincial Seed Councils (Conseil Provincial Semencier [COPROSEM]) have been established. While some provincial councils now provide input on seed sector policies and strategies at the provincial level, major

[3] Règlement Technique Général de la Production, du Contrôle et de la Certification des Semences des Principales Cultures Vivrières et Maraîchères (1997). The current revised draft is known as the Troisième Révision du Règlement Technique Général de la Production, du Contrôle et de la Certification des Semences des Principales Cultures Vivrières et Maraîchères.

[4] These procedures cover three volumes, which are collectively referred to as PATPS. See Annex II for more information.

[5] Annex II provides an in-depth analysis of the draft legal framework for seed in the DRC.

[6] The designated authority responsible for agricultural and seed markets under current and draft law remains AGRIPEL, at the national level, and the Inspection Provinciale de l'Agriculture, Pêche et Élevage (IPAPEL), at the provincial level.

[7] The Technical Commission for Admission to the Catalog (Commission Technique d'Admission au Catalogue des Variétés [CTAC]), whose composition and functions are defined in the draft seed law, remains theoretical.

issues concerning the regulatory and institutional frameworks cannot be resolved without a coordinated national approach, which cannot be defined in the absence of the National Seed Council.

At the national level, UNAGRICO plays an active role in advocating for commercial seed regulation. UNAGRICO participates in regional seed discussions through the Alliance for Commodity Trade in Eastern and Southern Africa (ACTESA) under COMESA, assisted in harmonizing the current draft seed law with SADC texts, and is actively lobbying to pass the seed law in Parliament.

2.2 CROSS-BORDER SEED TRADE IN EASTERN DRC

Cross-border trade in seed through both informal and formal channels plays a central role in the supply of improved seed in eastern DRC. Import levels may reach close to 100 percent for vegetable seeds and around 80 percent for maize seed. There are no exceptional burdens on seed imports, apart from occasional requests for informal payments by border officials to accelerate procedures. In the absence of a legal framework for seed, seed imports are issued general plant import permits, which do not require the applicants to meet specific seed standards nor to confirm that the variety is listed in national or regional seed variety catalogs.[8] In the absence of a clear legal mandate for imported seed quality control, no sampling or testing is conducted at the border; verification of seed imports includes only a review of paperwork. When consulted, the chief institutions responsible for regulating seed imports — the Direction de la Protection des Végéteaux (DPV) and the Service de la Quarantaine Animale et Végétale (SQAV) — were not aware of the COMESA and SADC agreements concerning regional quarantine pest lists for seed, nor do they currently have the capacity to conduct pest inspections or quarantine shipments.

Importantly, on September 9, 2019, the U.S. Government, in partnership with the Government of the Republic of Zambia and Seed Co Zambia Limited, commissioned the first export of hybrid seed from Zambia to the DRC. This historic development was nearly 14 years in progress, since three proposals concerning harmonization of seed regulations in SADC were developed by the SADC Secretariat through the Food, Agriculture and Natural Resources (FANR) Directorate and presented to a meeting of SADC Permanent Secretaries of Agriculture in Maputo, Mozambique, December 7-8, 2005; requiring full implementation of the SADC Harmonized Seed Regulatory Systems (HSRS).

Formal seed exports from the DRC remain difficult to perform. Varieties are not registered in the regional variety catalogs, and the DRC does not participate in Organisation for Economic Co-operation and Development (OECD) seed schemes. The DRC also does not have a laboratory capable of issuing international seed testing certificates accredited by the International Seed Testing Association (ISTA). There is neither plant health inspection nor analytical capacity to support issuing the required phytosanitary certificates.

In addition, very little informal seed export was reported in the six eastern DRC provinces visited for this assessment. No seed exports occur in the northern provinces (Ituri, the Kivus, and Tanganyika), where the domestic needs and ready humanitarian market consume local production and draw steady seed flows into the DRC. In the southern provinces bordering Zambia (Haut-Katanga and Lualaba), a small amount of informal seed exports were reported.

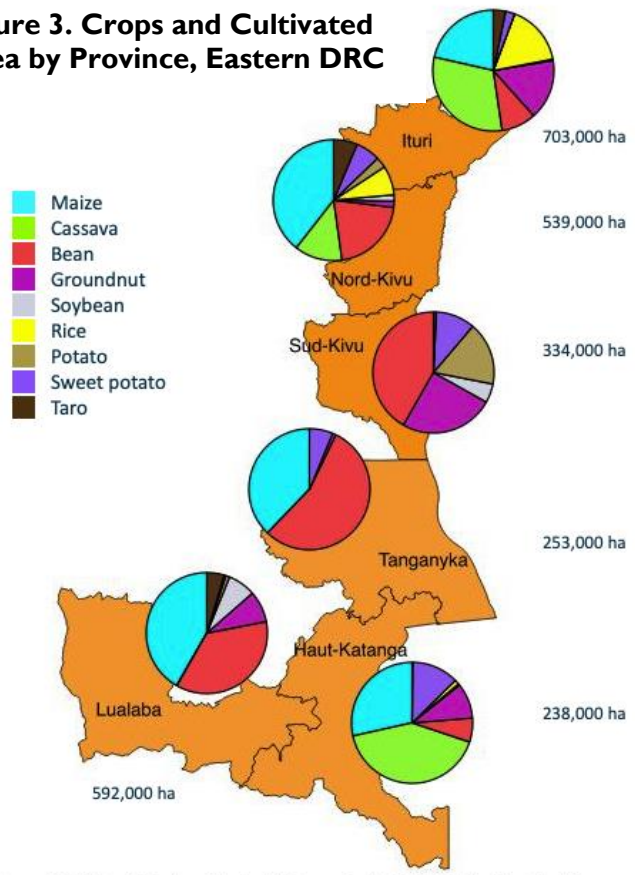
Nonetheless, there is an apparent market for Congolese seed in neighboring countries. For example, Zambian farmers have been reported to visit weekly markets in Congolese villages near the border in Haut-Katanga in search of certified seed of Congolese Babungo maize and even D6 Kenya bean seed. The ability of Congolese seed companies to engage in formal export of Congolese varieties is restricted, as they have not yet been registered in the COMESA and SADC variety catalogs.

[8] When the draft texts are adopted, some of the varieties currently imported will not be admissible within the DRC, as they are not listed in the catalogs of the DRC, SADC, or COMESA.

2.3 OVERVIEW OF SEED SYSTEM DYNAMICS IN EASTERN DRC

The prevalence of the main crops cultivated in each of the six provinces covered by this assessment is shown in Figure 3. The six provinces can be roughly divided into two southern provinces (Haut-Katanga and Lualaba), where a nascent commercial seed sector seeks to gain traction, and the four northern provinces (Tanganyika, South Kivu, North Kivu, and Ituri), where emergency seed relief programs dominate the seed market and have limited the commercial viability of high-quality seed production models.

Figure 3. Crops and Cultivated Area by Province, Eastern DRC



Source: DRC Ministry of Agriculture. Évaluation de la Campagne. Agricole 2017-2028 et Bilan Alimentaire du Pays.

In Haut-Katanga and Lualaba provinces, commercial agricultural production is dominated by maize cultivation, which nonetheless fails to meet consumer demand. Food and seed imports flow in from Zambia, Zimbabwe, and South Africa. In Haut-Katanga, local seed companies were recently resuscitated with the support of donor projects, and all seed sales are made directly to farmers. However, farmers continue to prefer imported hybrid maize varieties over the composite varieties produced locally. For other crops, seed production is fairly well organized, but seed companies produce only one variety per crop, and overall seed production for other crops is estimated to be a small fraction of the production volume of maize seed. All horticultural seed is currently imported. The size of the market and the relative technical simplicity of seed production for publicly available vegetable open-pollinated varieties (OPVs) suggests an unexploited commercial opportunity for local seed producers in vegetable seed.

The agricultural sector in the region is underdeveloped and many farmers still practice subsistence agriculture, further reducing demand for the nascent private seed sector. To achieve food security, the region will need more cultivated land, industrial centers, commercial training for farmers, and better road networks to connect farmers to markets

The provinces were created when the former province of Katanga was split into four smaller provinces in 2015, and the subsequent transfer of skills, responsibility, and resources to the new provinces is not complete. For example, there is no seed testing laboratory or seed inspectors in Lualaba. The lack of effective governance contributes to a large problem of fake seed in the region, primarily in the form of falsified seed packaging containing grains dyed to resemble treated certified seeds. In addition, INERA and the Centre de Recherche du Mais (Maize Research Center [CRM]) in Haut-Katanga lack the capacity to conduct breeding and varietal maintenance that could provide much needed new varieties for local seed companies.

Members of the Association des Producteurs de Semences du Katanga (Association of Seed Producers of Katanga [APSKA]) assist in the maintenance of their local varieties in collaboration with INERA. Although seed companies have managed to produce better basic seed than the state research institutions, the limited number and type of varieties restrains their competitiveness. Facilitating private sector access to new varieties, such as maize hybrids previously developed by CRM, could increase the competitiveness of local seed companies and create space for further private sector investment in less commercially oriented crops, such as beans.

In the northern provinces of Tanganyika, South Kivu, North Kivu, and Ituri, chronic instability and violence have resulted in a seed market driven by emergency seed relief programs. Massive seed tenders create disincentives for the production of quality seed, as quantity requirements spur seed traders to provide any seed or grain available. Few of the existing private seed producers have a primary business model of selling directly to farmers, and seed producers have struggled to compete in a market that fails to compensate the value of quality seed. By contrast, East African seed companies regularly compete in humanitarian seed tenders, particularly for vegetable seed for which there are no local seed providers.

Table 1. Seed Market Segments in Six Provinces of Eastern DRC

	Haut-Katanga	Lualaba	Tanganyika, South Kivu, North Kivu, and Ituri
Market Segments	100% direct sales to farmers	43% Ministry of Agriculture of Lualaba province 35% direct sales to farmer 16% local mining companies 5% milling company	80-100% relief agencies production/distribution

Source: Prepared by the EEFS consultant team on the basis of official SENASEM and AGRIPEL data and information collected from stakeholders during field research.

Table 2. Type and Sources of Seed for Target Crops in Six Provinces of Eastern DRC

	Haut-Katanga	Lualaba	Tanganyika, South Kivu, North Kivu, and Ituri
Maize	80% imported hybrids from Zambia and South Africa (6-10 different hybrids); only one composite variety is offered by local seed companies. The maize seed market is saturated (60% of potential seed demand); 45% seed production of local companies unsold in 2017-2018.	80% imported hybrids from Zambia and South Africa (6-10 different hybrids), two composite varieties offered by local and Haut-Katanga seed companies. Milling company Mbeko Shamba is also a seed producer that distributes both their own and imported varieties to their associated farmers. Local mining companies deliver mostly imported seed, as well as some from Haut-Katanga seed companies, to nearby farmers.	Under a climate of instability, violence, and internally displaced persons (IDPs), most seed is sourced through humanitarian seed tenders, development projects, and with the support of local NGOs. There are no good statistics available on distributed relief seed and its origin, but East African seed companies regularly answer seed tenders, particularly for vegetable

Table 2. Type and Sources of Seed for Target Crops in Six Provinces of Eastern DRC			
	Haut-Katanga	**Lualaba**	**Tanganyika, South Kivu, North Kivu, and Ituri**
Other Agricultural Crops	Beans, groundnut, rice, and soybean are offered by local companies. Seed sales cover no more than 4% of potential seed demand for beans and rice, 1.5% for groundnuts and 25% for soybean. Only one variety per crop is available on the market.	Bean, groundnut, and soybean seed offered directly to farmers by Haut-Katanga seed companies. Seed of the same bean variety is being produced in 2019 by a local company for the provincial government. No data on seed volumes available.	seed for which there are no local seed providers. Some seed is produced locally through informal seed multiplication, such as through Harvest Plus.
Vegetable Seed	100% imported, broad varietal range available.	100% imported, broad varietal range available.	

Source: Prepared by the EEFS consultant team on the basis of official SENASEM and AGRIPEL data and information collected from stakeholders during field research.

2.4 HAUT-KATANGA PROVINCE

Despite tremendous agricultural potential, local agriculture in the Haut-Katanga province is underdeveloped. The food needs of the province exceed local production capacity in many crops, particularly maize, with local production of 200,000 tons compared to an estimated demand of 700,000 tons. The 500,000-ton deficit is covered by imports from Zambia, South Africa, and Tanzania. Beans are the second-highest food import after maize.

Cassava, the traditional staple and main agricultural crop in Haut-Katanga, covers one third of the total cultivated area according to the latest official data released by AGRIPEL.[9] However, maize has become the preferred staple food in cities, and maize production has been increasingly replacing cassava in rural areas.[10] Maize now accounts for 10 percent of the crop surface area. Other food products grown in the province, in order of total crop surface area following cassava and maize, include groundnut, bean, taro, cowpea, soybean, and rice. Potato production is minimal and exists only near the Zambian border, where there is access to Zambian potato seed. Sweet potato has become popular for meeting nutritional needs (particularly for children), and an orange-fleshed variety introduced from Zambia is multiplied informally by farmers.

Local seed production is small, and local companies struggle to access varieties that will allow them to effectively compete. Official seed crop declarations to SENASEM in Haut-Katanga for the 2018-19 season covered only 102 hectares (enough to sow just 4 percent of the cropping area). Declared seed crops include maize (70 percent of seed crop area), beans (11 percent), soybean (9 percent), and groundnuts (6 percent). The dominance of maize in the seed market is due to the greater yield benefits from the use of improved maize varieties as compared to other crops and due to the fact that improved maize varieties are difficult if not impossible to maintain through farmer seed selection methods. The total seed crop area

[9] The province is self-sufficient in cassava, which is mostly produced for household self-consumption.

[10] *Assessment of the DRC's Agricultural Market Systems: Value Chains in the North & South Kivu and Katanga provinces*, USAID LEO Project, Report #16, (2015).

in Haut-Katanga has decreased by 25 percent during each of the past two years, and maize seed production fell by 50 percent in 2018 alone. The main constraint on growth for local seed companies is the lack of access to hybrid maize varieties.

Besides the reduced number of potential buyers caused by a predominantly subsistence-based agricultural sector, one of the main problems that local seed producers now face is the low number of varieties available locally for multiplication (about one per crop). Meanwhile, a broad set of maize varieties with different characteristics are available from Zambia and South Africa. Locally developed improved varieties that are desirable to farmers do exist but are not accessible to seed producers due to the lack of funding and capacity of domestic breeding institutions to maintain the varieties. Seed markets, as agricultural markets, are therefore dominated by imports, which account for 80 percent of maize seed sales and 100 percent of vegetable seed.

Renewed marketing efforts under the UK Aid-funded ELAN RDC project did not result in the expected sales of maize seed, and 45 percent of the maize seed certified in 2017 could not be sold.[11] In 2019, maize seed production is expected to increase by 20 percent due to the production of bio-fortified maize seed funded by Harvest Plus.

Despite these challenges, the seed market in Haut-Katanga, which was once predominantly institutional, now consists of 100 percent direct sales to farmers, a significant step towards a sustainable private seed sector that has not been achieved by any other province reviewed in this report.

2.4.1 Major Seed System Actors in Haut-Katanga

Haut-Katanga: Breeding and Variety Maintenance

The existing public research institutions in Haut-Katanga conduct little to no breeding and struggle to maintain existing varieties. Much of the responsibility for variety maintenance has been assumed by the private sector out of necessity.

- **INERA Kipopo**. The Haut-Katanga branch of INERA is located in Kipopo in an abandoned fish-farming research facility with no electricity. The only working equipment at the site is the meteorological station, which is powered by a photovoltaic system whose solar panels are covered by a thick layer of dust. The facility is in urgent need of refrigeration units and freezers for medium- and long-term storage of germplasm and breeder seed. Without an allocated budget for operating costs and programs, INERA Kipopo carries out testing of new varieties only with the support of development partners.[12] The station struggles to maintain the maize composite variety Babungo and one variety each for bean, groundnut, and soybean. Maintenance of other varieties has been shifted to APSKA, whose members maintain the varieties they produce commercially. INERA Kipopo stores a collection of 20 local varieties plus 480 exotic varieties of bean. With no installations for seed storage or budget for screening the collection to select the best-performing varieties for local seed production and sale, the institution struggles to keep the collection alive.

[11] The maize seed production project implemented by ELAN RDC in Haut-Katanga was quite successful, leading to an active seed producers association, a successful provincial COPROSEM, the transfer of basic seed production from INERA to private seed establishments, a more professionalized group of seed producers, the introduction of effective marketing techniques, and an increase in seed production. Unfortunately, limited demand for the varieties offered by domestic seed producers resulted in a high percentage of the seed remaining unsold. Demand for this seed was undermined by the very limited extent of commercial agriculture in the region and farmer preference for imported hybrid maize varieties.

[12] With the support of the World Bank PICAGEL project, INERA Kipopo is currently testing a Burundian rice variety, a set of bean varieties from the International Center for Tropical Agriculture (CIAT), and eight varieties of cassava through participatory variety selection with farmers in the five main provincial areas of cassava production.

- **CRM**. CRM was established in 1993 under the office of the presidency as a research center supported by the government and seed institutions of the former Yugoslavia. CRM developed several maize hybrids and composite varieties with breeding materials from the International Institute of Tropical Agriculture (IITA) and the International Maize and Wheat Improvement Center (CIMMYT). Today, despite having technical breeding skill on staff, the center has no budget for running expenses and cannot afford variety registration, maintenance, or basic seed production. Inbred lines of hybrid seeds developed previously are currently maintained by Mbeko Shamba, a seed company in Lualaba province, at a germplasm repository in Belgium, having been sent there for safekeeping during the looting of their facilities in Fungurume. CRM continues to conduct research on ecological and organic techniques and believes that it could easily increase maize average yield from the current 0.7 tons to 3.5 tons per hectare simply by improving seed and organic cultural practices.
- **University of Lubumbashi**. The University of Lubumbashi developed two maize varieties (Unilu and Tambo) that are valued by certain farmers who use high-nitrogen fertilization techniques, as these varieties are shorter in height than Babungo maize and therefore more resistant to lodging.[13] As a result of low demand for basic seed, the university discontinued maintenance and seed production of all classes of seed for both varieties (Unilu last year and Tambo some years ago). Mbeko Shamba continues to maintain and produce Tambo. In the absence of a national reference collection of standard samples, the composite Unilu variety may be lost.

Haut-Katanga: Seed Production and Distribution

Local seed companies are engaged in all aspects of seed production, processing, storage, and sale. As with variety maintenance, basic seed production, which was previously the role of INERA, has been delegated to the private sector. Certified seed production occurs under the inspection of SENASEM.

Haut-Katanga: Basic Seed Production

- **APSKA.** After consultations within COPROSEM, as of the last growing season, APSKA has assumed responsibility for the production of basic seed of maize,[14] bean, groundnut, soybean, and rice varieties. Production is supervised in principle by INERA Kipopo, which also provides the pre-basic seed. APSKA coordinates the production of basic seed among association members and in turn provides basic seed to members for further multiplication.
- **Harvest Plus.** Harvest Plus, a joint venture between CIAT and the International Food Policy Research Institute (IFPRI), is introducing high alpha-carotene varieties of maize and high iron varieties of beans in Haut-Katanga.[15] These varieties are selected for their nutritional value rather than their potential for boosting commercial agriculture.

Box 2. Partial List of Seed Producers in Haut-Katanga (2018-2019)

Seed Companies:
- Mimosa
- Maydive
- Bon Berger
- NYOTA
- FERKAL
- Safari International
- Source
- Maison Sinai
- ITAK Katanga

NGOs:
- AFME

[13] "Lodging is the displacement of stem and roots of plants from their proper and vertical placement either due to the higher [nitrogen] application, higher wind speed, excessive soil moisture, soil density, storm damage, sowing date or over plant population." See Lodging: Significance and preventive measures for increasing crop production, International Journal of Chemical Studies 2018; 6(1): 700-705, available at https://www.researchgate.net/publication/322617914_Lodging_Significance_and_preventive_measures_for_increasing_crop_production.

[14] Mimosa, a seed company member of APSKA, has taken over the production of Babungo maize basic seed.

[15] Harvest Plus is part of the Consortium of International Agricultural Research Centers (CGIAR) Research Program on Agriculture for Nutrition and Health (A4NH) and receives funding from the Government of the United Kingdom (UK Aid), the Gates Foundation, USAID, the European Commission, and CGIAR donors. See https://www.harvestplus.org/.

Harvest Plus produces seed of these varieties through its own informal seed production programs, some in cooperation with INERA Kipopo.[16]

Haut-Katanga: Certified Seed Production

Following discussions at COPROSEM, 2017-2018 was the last season featuring certified seed production by public breeding bodies such as INERA, CRM, or the University of Lubumbashi. Last season (2018-2019), all declared seed crops came from private seed companies.[17] Production of certified seed in Haut-Katanga is limited to maize, beans, groundnuts, soybean, and rice.

- **Local seed producers**. Sixty percent of seed companies active in Haut-Katanga are run by women, who also account for a significant number of contract growers.[18] The Association de Producteurs de Semences du Katanga (Association of Seed Producers of Katanga [APSKA]) is made up of small- to medium-sized seed producing enterprises with areas planted per year varying between 5-25 hectares. Of the initial 20 members, only 10 are still active today due to a host of issues such as unpaid invoices from provincial and national government, competition from subsidized seeds from Zambia, low access to affordable credit, and dilapidated road and communication infrastructure.

  Processing of seed is done manually. The only seed conditioning chain[19] in Haut-Katanga was given to INERA Kipopo by a project of the Belgian Technical Cooperation (BTC). With no electricity supply at INERA Kipopo station, the electric powered chain is starting to rust inside its original packaging. APSKA is now trying to gain access to the chain for its own basic seed production. Private seed companies have their own premises for seed conditioning, chemical treatment, packaging, storing, and labelling. INERA Kipopo station also has a large storage space that is currently underused.

  APSKA recognizes that marketing techniques, together with the availability of better and more diverse varieties, are significant challenges faced by the private seed sector in Haut-Katanga. Their members' natural market reaches into Lualaba province following the main mining road axis from Lubumbashi to Kolwezi through Likasi. Along this axis, there is an increasing presence of APSKA member sale points. Recently some members began introducing demonstration fields along the main road network servicing the mining industry with the support of the ELAN RDC project. Points of sale were also set up, and stalls were established in weekly village markets. Seed companies distribute their seed in Haut-Katanga and Lualaba provinces and made attempts to explore Tanganyika markets until security problems forced them to abandon the efforts.

- **Imported seed**. Hybrid maize imports come mostly from Pannar (a South African seed company) and SeedCo (a Zambian seed company). Both companies, as well as Zambian seed company Zamseed, formerly ran offices out of Lubumbashi. The Pannar and Zamseed offices finally closed two years ago due to the limited local market. Seedco is registered as a seed producer in the DRC and has varieties under registration testing. The company has also expanded their network of demonstration trials farther inland with the support of the ELAN RDC project. Nevertheless,

[16] Seed production by Harvest Plus is informal in the sense that the program does not employ strict protocols for quality and consistency of seed over multiple generations, nor does the program follow formal SENASEM procedures for seed crop declaration and certification.

[17] According to SENASEM, however, INERA is still producing R1 of the Sam4Vita maize variety for Harvest Plus.

[18] Local seed production was previously supported by the World Bank Programme Multisectoriel d'Urgence de Rehabilitation et de Reconstruction (PMURR) project and a project of the Belgian Technical Cooperation (BTC). For the past three years, local seed production has been supported by the UK Aid-funded ELAN RDC project (2015-2018), which facilitated the functioning of APSKA and COPROSEM and advocated for private companies' access to pre-basic and basic seed.

[19] A seed conditioning chain is a set of seed processing machines that clean, sort, treat (such as with fungicide or insecticide), and package seed. The raw harvest of the seed crop is put into the line of machines, and the final output is packaged and labeled seed.

the company stated that it would not produce seed in the DRC as long as there is no national seed law. According to local sources, the company is considering leaving the DRC because of low seed demand.

- **Agro-dealers**. As in the rest of the DRC, there is no seed-specific registration required for seed dealers, nor any inspection of seed sale points in Haut-Katanga. Agro-dealers play an important role in the importing and distribution of maize and vegetable seed as well as the distribution of locally produced seed.

Haut-Katanga: Seed Regulatory Institutions

- **SENASEM.** The SENASEM branch in Lubumbashi is comprised of an office and laboratory building provided by the BTC. The branch has five permanent employees plus four temporary staff who are paid only on the basis of inspections undertaken. Inspection fees, such as for testing Distinctiveness, Uniformity, and Stability (DUS) and Value for Cultivation and Use (VCU) (standard seed tests), are not fixed in advance but rather agreed on with the seed grower/company. This structure creates an incentive for favorable inspection findings. Inspectors do not follow a valid sampling procedure during field inspection and do not have access to accurate descriptions of the varieties they inspect. There are no control plots of basic seed as stipulated by the draft seed regulations, nor are reference samples available. Varietal purity, the main component of seed quality, is not properly evaluated.
- **NPPO (DPV and SQAV)**. The functions of a national plant protection organization (NPPO) are filled by DPV and SQAV, two services under AGRIPEL.[20] The NPPO is responsible for issuing plant import permits for seed imports. In the last year, the NPPO has issued plant import permits for seeds of maize, groundnuts, soybean, and bean (no statistics on volumes are available). The NPPO does not require the variety to be in the DRC, COMESA, or SADC variety catalogs in order to grant a plant import permit. At the border, seed imports are evaluated on the basis of paperwork alone. NPPO staff check for the presence of compulsory plant import permits and international phytosanitary certificates. The import process is perceived differently depending on the individual importer. Seed imports are eligible for an exemption from import taxes, which should be applied automatically at the border but is inconsistently applied and frequently subject to informal payments.
- **Inspection Provinciale de l'Agriculture, Pêche et Élevage (IPAPEL).** The Haut-Katanga branches of SENASEM, DPV, and SQAV operate under IPAPEL, which is the provincial-level office of AGRIPEL.
- **COPROSEM.** The recently created provincial seed council now plays a central role in coordinating the seed sector. COPROSEM holds monthly meetings with the support of the ELAN RDC project. The council held elections for the managing board last year, in which APSKA was elected to the vice presidency, and SENASEM holds the secretariat. The provincial inspector (the head of IPAPEL) is the elected president of COPROSEM. The current concerns highlighted by COPROSEM include low sales in the seed sector, recovering CRM hybrid lines for commercial seed production in competition with imported hybrids, and fighting fake seed in the market.

[20] As described further in Annex III, two institutions, DPV and SQAV, today fulfill most of the functions of a NPPO in the DRC. DPV is a service under AGRIPEL responsible for managing the agricultural production and plant protection units and providing certificates for the import, export, and internal movement of seed and planting material between provinces. SQAV, nominally the quarantine service, lacks basic equipment and legal frameworks (e.g., a national pest list) with which to carry out its function. In practice, the EEFS consultant team could not distinguish between the roles of SQAV and DPV at various border postings. Accordingly, for purposes of this report, these institutions are referred to collectively as the NPPO.

2.5 LUALABA PROVINCE

Provincial statistics on agriculture and seed for Lualaba are notably scarce, but the main crop by cultivated area is maize (65 percent of the cultivated area), followed by groundnuts, taro, sorghum, bean, and soybean. Seed supply is dominated by imports of maize and vegetable seed from Zambia and South Africa, with a broad range of varieties supplied from SeedCo, Pannar, and Zamseed. Local supply of seed of other crops comes from Haut-Katanga seed companies (some of which use contract growers in Lualaba) and two province-based seed producers — Mbeko Shamba and SAGRICEM — that produce for their own farmers or the provincial government. As in the case of Haut-Katanga, production is limited to one variety per crop, and the poor varietal diversity reduces the resilience and sustainability of local cropping systems.

2.5.1 Major Seed System Actors in Lualaba

Lualaba: Breeding and Variety Maintenance

- **Mbeko Shamba**. With no local branch of INERA or university-based breeding programs in Lualaba, the only seed breeding and variety maintenance occurring in the province is conducted by the private company Mbeko Shamba. The company receives financial and technical support from Belgium and has one plant breeder on staff with wide experience in inbred line maintenance and hybrid seed production. The company is currently maintaining the composite maize variety Tambo (bred by the University of Lubumbashi, which discontinued its maintenance)[21] and testing South African maize hybrids for prospective production in the DRC (the latter in collaboration with agro-dealer Katanga Mboleo from Lubumbashi, who is the main importer of Pannar maize hybrids). The company also maintains parental lines of hybrid maize varieties previously produced by CRM in a germplasm bank in Belgium. Mbeko Shamba plans to produce basic potato seed through a joint venture with a Belgian company next season.

Lualaba: Seed Production and Distribution

There are two local seed companies in Lualaba, both of which formerly discontinued their commercial seed activities and no longer sell directly to farmers. SAGRICIM discontinued its seed activities many years ago and is only working now at the request, three years ago, of the provincial government, which serves as its only client. Mbeko Shamba stopped commercial seed production due to problems with the fraudulent use of its brand. The company now only produces seed for its own use and for affiliated farmers. Both companies maintain their own varieties, produce their own basic seed, and have their own seed conditioning equipment and storage facilities.

- **SAGRICIM.** This seed company runs the only surviving seed farm from the original World Bank program for seed farm privatization from 1989-1992. All of the trained staff from this era, including the seed farm manager, still work for the company. Located in Lubudi, the farm survived two lootings, and its seed processing equipment is still functional. SAGRICIM restarted seed producing activities in 2016 following the election of the new provincial government and its request for maize and bean seed to support agricultural development activities under the new provincial development strategy. Although production was interrupted in 2017-2018 for political reasons, the 2018-2019 season has seen new orders for seed resulting in 60 hectares of Babungo maize seed production and 5 hectares of D6 Kenya bean seed. The provincial government delivered the seed to farmers for free in 2017 but intends to employ a credit scheme starting in 2019. SAGRICIM has made no effort to date to develop its own market and relies on irregular demand and support from the provincial government.
- **Mbeko Shamba.** Mbeko Shamba initiated its activities in 1982 as a maize seed company. Some years ago, the company stopped marketing seed due to the legal vacuum, which caused unfair

[21] See section on Haut-Katanga for more information on the University of Lubumbashi.

competition and widespread falsification of their brand packaging. In an attempt to diversify, the company gradually extended its activity to grain, vegetable, and fruit production, partly destined for sale to the mining sector. Today its main activity is the production and commercialization of maize flour using contract growers, to whom the company distributes imported South African hybrid maize seeds and seeds of the composite maize variety Tambo that they produce themselves. The company inherited a seed conditioning chain from a World Bank project that since suffered looting. The different elements of the conditioning chain have been restored, but the machinery remains unassembled.

- **Haut-Katanga companies.** In recent years, Mimosa, a seed company based in Lubumbashi, has been enlarging its distribution channels by establishing demonstration fields and sales points along the axis road between Lubumbashi and Kolwezi with the support of the ELAN RDC project. The company has 15 hectares of seed crops under contract growers in Lualaba province, including 5 hectares of basic seed of the Babungo maize variety produced under the supervision of INERA Kipopo.
- **Mining companies.** Under the Mining for Agriculture initiative, mining companies are obliged by the provincial government to support 500 hectares of maize crop each agricultural season.[22] Imported maize hybrids, which can yield 10 times more than local varieties if used with adequate fertilizer, make up most of the seed distributed by mining companies. The mining companies represent about 16 percent of the seed purchases in the province.
- **Agro-dealers.** Agro-dealers offer seed at street stalls and shops in the major cities and along the main road. As in Haut-Katanga, there is no seed-specific registration of seed dealers, nor any inspection of seed sale points. Eighty percent of maize seed sales by agro-dealers are of imported maize hybrids. Agro-dealers import Pannar hybrid maize seed directly from South Africa, SeedCo maize hybrids via the company's branch in Lubumbashi, and a broad spectrum of vegetable seeds. They also distribute seeds of composite maize, bean, groundnut, and soybean varieties from Haut-Katanga seed companies.

Lualaba: Seed Regulatory Institutions

Due to the very recent separation of Lualaba from the former Katanga province, decentralization is not complete, and seed regulatory institutions are virtually non-existent in the province.[23] Neither SENASEM nor INERA has an office present in the province. Nonetheless, the new provincial government intends to establish a COPROSEM by upcoming decree, and the government would like to move from their current system of free seed delivery to farmers to a credit system to promote private seed sector development.

- **SENASEM.** SENASEM is not yet operational in Lualaba province. A provincial coordinator has been nominated but there are no offices, seed testing laboratory, nor inspectors in the province. In the absence of a provincial-level branch of SENASEM, the two local seed companies, which originally registered with SENASEM Lubumbashi, are not declaring seed crops, nor are their crops inspected and certified by SENASEM Lubumbashi. Lualaba contract growers working for Haut-Katanga seed companies continue to be inspected by SENASEM Lubumbashi.

[22] The Mining for Agriculture initiative derives from a decree by the governor of the former Katanga province, which requires mining companies to invest in agricultural production up to 500 hectares per year as a means of subsidizing local agriculture. Mining companies provide input credit to farmers (good seeds, fertilizer,) along with a technological package (technical sowing at the right time), the cost of which is recovered in kind when the crop is harvested and used for consumption of the mining workers. Surplus production is purchased from farmers at a remunerative price. In Lualaba, five of six mining companies participate in this initiative: TFM, MMG, BAZANO, BOSSMINING, RUASHI MINING.

[23] Lualaba province, like Haut-Katanga and Tanganyika, is one of four new provinces created in 2015 resulting from the division of the former province of Katanga in accordance with the provisions of the 2006 Constitution.

- **NPPO (DPV and SQAV).** The institutions for plant protection present at the borders with Zambia (at Sakabinda and Mutshasa) and Angola (at Solwezi and Dilolo) include DPV and SQAV. As in Haut-Katanga, no seed-specific procedures are applied at customs beyond a review of the required paperwork, although there may be delays in granting the import tax exemption, and final clearing of a shipment may require informal payments. Although firm statistics could not be obtained, stakeholders estimated that most imported seed crosses the border in Lubumbashi and is transported via the axis road. Vegetable seed, which is much lighter and easier to transport, may enter the province through Lualaba border crossings.
- **IPAPEL.** IPAPEL Lualaba, in which the local branches of DPV and SQAV are located, is currently putting in place additional public services for agriculture in close cooperation with the provincial government. It intends to set up a local branch of SENASEM as soon as the means become available.

2.6 TANGANYIKA PROVINCE

Unlike Haut-Katanga and Lualaba, Tanganyika suffers from a worsening security situation due to a tribal war between the Pygmies and Bantoues that has caused a loss of lives and property as well as the displacement of more 500,000 of the province's 2.7 million residents. For security reasons, humanitarian agencies and NGOs find it difficult to extend their activities further than 30 kilometers from the capital of the province (Kalemie). The conflict is a major obstacle to commercial agricultural and seed market development in the province.

According to AGRIPEL statistics, the most important crops in the province are beans (52 percent of the cropping area), followed by maize (40 percent), sweet potato, and groundnut. IPAPEL Tanganyika also reports the production of cassava, groundnut, beans, and manioc, and small amounts of rice, sweet potato, cowpea, plantain, potato, garlic, onion, sugar cane, and palm oil.

The seed sector in Tanganyika is completely dominated by short-term relief and humanitarian assistance. Any potential seed sector development is made difficult by the influence of humanitarian seed tenders. Almost 100 percent of seed purchases are sponsored by humanitarian or development organizations and distributed as emergency seed. There is virtually no local production of improved seed, and improved seeds do not exist in the local market.

Attempts to ensure seed quality in the tender documents by requiring the seed to be certified have only made the situation worse. In the absence of trained seed inspectors and seed testing laboratories, seed quality cannot be checked or guaranteed before being distributed by humanitarian organizations. Consequently, more and more commercial grain is entering the tenders under the guise of certified seed. Most humanitarian agencies and NGOs acknowledge their awareness of the fraudulent practices common in humanitarian seed tenders and the deteriorating quality of the seed distributed to farmers. Yet tenders for certified seed continue to be issued even when it is clear there is no quality seed available.

2.6.1 Major Seed System Actors in Tanganyika Province

Tanganyika: Breeding and Variety Maintenance

- **INERA Emiligombe.** In May 2018, an INERA research center was established at Emiligombe farm in Tanganyika. This center and its 17 research staff were formally recognized by the Kinshasa-based director of INERA in June 2019. The station possesses a small office and storage facilities provided by USAID. With funding from the World Bank PICAGEL project, INERA Emiligombe is currently conducting participatory variety selection testing with farmers on a Burundian rice variety and cassava varieties from IITA. In the future, the staff would like to cross local varieties with imported germplasm carrying desired characteristics to create new, better performing

varieties adapted to Tanganyika. This level of breeding will require a plant breeding and research laboratory and seed conditioning facilities.

Tanganyika: Seed Production and Distribution

As there is no branch of SENASEM operational in Tanganyika, there is no certified seed produced in the region. Additionally, there is virtually no local production of improved seed (even of a lesser quality), with the exception of a few donor projects that support village-level seed production.

- **Village-level seed production.** In cooperation with Harvest Plus and the newly recovered INERA Emiligombe research center, the USAID Food for the Hungry project works with 300 farmers to facilitate informal seed multiplication of Harvest Plus biofortified maize and bean varieties using basic seed produced by INERA Emiligombe. With project support, INERA Emiligombe is producing 1.5 hectares of basic maize seed this year and plans to extend production next year to include Harvest Plus bean varieties and the maize composite variety Katanga. The World Bank and the Food and Agriculture Organization of the United Nations (FAO) have similar projects in the province aimed at increasing the production of improved seed through less formal channels.

In the absence of commercial seed production within Tanganyika province, basic seed for humanitarian seed tenders are reportedly filled by seed companies in Haut-Katanga (primarily Mimosa) and the INERA office in South Kivu.

Tanganyika: Seed Regulatory Institutions

As in the case of Lualaba, provincial administration in Tanganyika is still in the process of being set up. The provincial government is aware of the need to regulate relief seed but has not yet considered the installation of a COPROSEM.

- **SENASEM.** There is no formally recognized branch of SENASEM in Tanganyika. In the absence of a functional seed certification agency, there can be no seed certification in the province. A SENASEM coordinator, inspectors, and analysts were designated by the provincial government in 2018, but these individuals are still waiting to be confirmed by SENASEM in Kinshasa. The 20-person staff lack salaries, an operating budget, office space, and equipment, and there are no seed testing facilities in the province. The main activity of the provisional SENASEM office last year was identifying the fields of potential seed growers in the province. Staff identified 82 hectares of grain crops of maize variety ZM627, 17 hectares of Babungo maize, 44 hectares of rice (Nerica 4), 34 hectares of groundnut (JL4, GI7 and MGV 4), and 10 hectares of bean (D6 Kenya) in the territories they visited. The issuance of seed crop declarations and seed certificates for these fields could lead to seed of unknown genetic origin being offered as certified seed for seed tenders. The practice of enabling grain to be identified as seed occurs widely in the region, and there is an urgent need to better regulate humanitarian seed tenders to ensure the integrity of what is labelled as certified seed.
- **NPPO (DPV and SQAV).** Although IPAPEL Tanganyika did not report any seed imports occurring through the port in Kalemie, DPV and SQAV staff are likely present as at other border crossings.
- **IPAPEL.** As in other provinces, IPAPEL acts as the official government institution in charge of regulating seed production and trade in the province and is setting up agricultural public services in the province in close cooperation with the provincial government.

2.7 SOUTH KIVU PROVINCE

South Kivu enjoys significant cross-border trade with Rwanda and Burundi, but the province has struggled with insecurity since 1994. The most important crops supported by seed activities in the province include cassava, beans, maize, vegetable seed, Irish potato, and sweet potato. Early generation potato, maize, and vegetable seed is sourced from South Kivu-based INERA Mulungu research center, IITA, Rwanda, and Burundi. Erratic weather in the region creates a need to identify seed varieties adapted to different ecologies and rainfall patterns.

The seed market in South Kivu is dominated by large multi-year development programs. Stakeholders estimated that registered seed producers (comprising one registered seed company and a vast network of contract growers linked to local NGOs) derive 80 percent or more of their sales from purchases for aid projects, either directly or through sales to seed traders seeking to fill seed tenders regularly posted by international NGO projects and United Nations agencies.

There is an emerging degree of coordination among seed sector stakeholders through COPROSEM, which is co-chaired by IPAPEL and the director of the one seed company in South Kivu province.

2.7.1 Major Seed System Actors in South Kivu Province

South Kivu: Breeding and Variety Maintenance

- **INERA Mulungu.** The INERA research center at Mulungu is located 25 kilometers from Bukavu. There are 343 staff at the research center, of which 42 are researchers, including two legume breeders and one cereal breeder. The center has excellent working relationships with the CGIAR centers, regional universities, and local NGOs and seed producer organizations. These relationships have enabled the center to conduct substantial varietal testing and, in some cases, registration and release of varieties in the DRC variety catalog across a range of crops, typically using germplasm imported from other countries or CGIAR centers. Most of these activities were supported by development projects, such as a recent project funded by the Alliance for a Green Revolution in Africa (AGRA) that linked the newly released varieties to seed companies for production and sale.[24] INERA Mulungu self-financed the development of one sweet potato variety using participatory variety selection to incorporate feedback from local farmers into the evaluation of the variety.[25]

  INERA Mulungu continues to maintain and produce pre-basic seed of some of the varieties it developed, with a particular focus on beans, for which it maintains a subset of the 24 climbing bean varieties developed that have been identified as being locally adapted and farmer preferred.[26] However, the institution's capacity for variety maintenance and pre-basic seed production of potato and maize varieties was destroyed along with its tissue culture laboratory in 1994.[27]

- **Universities.** The University of Bukavu has worked with the International Rice Research Institute (IRRI) to introduce and maintain rice varieties adapted to the high-altitude areas in the Kivu region.

[24] The AGRA project was aimed at identifying public hybrids that are appropriate for the DRC, training and supporting early generation seed production, registering seed companies that are interested to license hybrids, and supporting these companies through capacity building for seed production and seed marketing.

[25] Additional information regarding these partnerships can be found in Annex VI.

[26] A full list of bean varieties maintained at INERA Mulungu can be found in Annex VI.

[27] There is now no functioning TC laboratory in the DRC for in-vitro clean seed production at the start of the potato seed production cycle. Irish potato and sweet potato require clean starter material to produce early generation seed, and there is no capacity to "renew" potato planting material, which, due to the preponderance of viruses, degenerates. This characteristic of potato seed creates a commercial opportunity for cleaner seed production as less viral load is directly linked to higher yields.

The University Evangelical of Africa is working with Harvest Plus to conduct multi-location trials of their biofortified maize and bean varieties.

South Kivu: Seed Production and Distribution

South Kivu: Basic Seed Production

- **Maize.** The basic seed used by registered maize seed producers in South Kivu comes from several sources. For Sam4Vita, basic seed is sourced through Harvest Plus. For Ecavel 1, basic seed comes from ISABU, the Burundian National Research Program. Basic seed of the ZM series was previously produced by INERA Mulungu under an AGRA-supported program that has subsequently closed due to what was reported by several stakeholders as financial malfeasance at INERA Kinshasa.
- **Other crops.** Basic seed of crops other than maize is produced by Harvest Plus (for particular biofortified varieties of bean), CEDERU (sweet potato cuttings), and certain seed producers. Basic seed of potato is produced in North Kivu with local NGO partners such as FOPACO, Syndicat pour le Développement Intégré des Populations (SYDIP), and AJCDE. Some basic seed is imported by NGOs, such as ASOP (potato and bean) and SARACEF (potato from North Kivu).

South Kivu: Certified Seed Production

- **INERA Mulungu.** INERA Mulungu periodically supports seed production of maize, beans, Irish potato, and soybean in North and South Kivu in collaboration with international organizations, including the FAO, International Committee for the Red Cross (ICRC), and South Kivu-based NGOs such as World Vision and Mercy Corps, and a standard set of local partners using different project financing arrangements.[28] INERA has also produced maize seed under contract for Harvest Plus.
- **Local seed producers.** Aside from the seed produced by INERA, improved seed in South Kivu is produced by 46 producer organizations, nearly all linked to aid projects, including one official seed company and numerous NGOs, cooperatives, and large landowners who produce seed with contract growers. The seed fields of these organizations are registered and inspected by SENASEM, but the groups themselves are largely not registered.

  The improved seed produced through these schemes is most often gathered and distributed or sold by the project or organization as emergency seed. For example, Harvest Plus collects and sells all of the seed produced by its contract growers as opposed to the contract growers operating in some form of competition with one another to sell to NGOs. In early 2019, the FAO procured 100 tons of seed produced in South Kivu from Harvest Plus for Ituri province. Some projects employ a more development-oriented approach in which some of the seed produced is sold directly to farmers using marketing strategies such as demonstration plots. For example, under a joint project by the World Food Programme and FAO (Purchase for Progress [P4P]), seed is marketed through 25-30 community-owned seed boutiques and demonstrations through farmer field schools.[29]

  There are only a few private sector seed producers who operate independently of aid projects. These enterprises typically sell at least a portion of their seed directly to farmers.

- **Agri-Force**. The only registered seed company in South Kivu, Agri-Force began as an NGO and transitioned to a seed company with the support of AGRA in 2017. Sixty percent of Agri-Force seed is produced by three seed producer organizations and 40 percent by 15-20 individual seed

[28] See Annex VI for additional detail on INERA Mulungu seed production volumes and partners.
[29] Table 25 in Annex VI provides a more thorough description of the various projects engaged in certified seed production in South Kivu.

producers. Agri-Force estimated that 60 percent of the seed they produce is maize; 15 percent soybean; 15 percent bean; 5 percent rice; and 5 percent other crops, such as sweet potato and Irish potato. Agri-Force sells its seed through a network of 23 agro-dealers. The company estimated that 50 percent of the seed they produced goes to humanitarian organizations, 20 percent is held by producer organizations, 20 percent by smallholder farmers, and 10 percent is purchased by large concession owners.

- **APAFED.** APAFED is a large landowner in Uvira territory, Rusizi Plain, producing seed of maize, groundnut, and cassava on a 20-hectare parcel. The director has been in the seed business since 2002. APAFED's main clients are the ICRC, ZOA International, Adventist Development and Relief Agency (ADRA), and Caritas, but the director noted that individual seed purchases from farmers and farmer organizations account for up to 20 percent of all seed sold.
- **FONIMIS**. FONIMIS is another large landowner in Uvira Territory, Rusizi Plain producing maize, cassava, and bean seed on a 20-hectare parcel through 67 seed producers that lease the land. FONIMIS's main clients for seed sales are individual farmers and NGOs.
- **Importers**. The primary seed imports in South Kivu are hybrid maize and vegetable seed. Mercy Corps plans to promote access to imported vegetable seed through their farmer field schools and seed producers. Other projects and NGOs are also importing early generation seed, such as mini-tubers from Rwanda.

South Kivu: Seed Regulatory Institutions

- **SENASEM**. SENASEM is extremely well established in South Kivu and regularly engages in inspecting seed fields, vetting seed that is sold in seed fairs, reviewing seed tenders before they are posted, and inspecting seed procured for tenders. The South Kivu branch of SENASEM has a total of 31 staff, including 22 seed inspectors. The laboratory at Bukavu only has the capacity to conduct tests for physical purity, germination, and moisture content; there is no laboratory with the capacity to test for common plant diseases for different crops. SENASEM conducts approximately 300 physical tests annually and has a published fee structure for laboratory tests and field visits. For field crops such as beans, maize, and soybean the fee per sample is $41 USD. Field inspections start at $50 USD per day, with lodging and transport covered by the requesting party.
- **NPPO (DPV and SQAV)**. There are 21 border posts in South Kivu, 18 of which are functioning, and a total of 90 NPPO staff (roughly five per post).[30] The NPPO staff review importation documents for seed entering into the country. Each seed import requires a phytosanitary certificate from the NPPO of the exporting country, a certificate of origin from the exporter, and an import permit issued by the NPPO. NPPO staff noted that the importation paperwork is routinely submitted for INERA and the CGIAR centers, such as IITA and CIAT, but is much more rarely completed by commercial seed importers bringing in vegetable seed or hybrid maize to South Kivu or by projects importing early generation seed such as mini-tubers from Rwanda.
- **COPROSEM**. The provincial-based seed council was established in South Kivu in November 2018 and is co-chaired by IPAPEL and the managing director of Agri-Force. The desire for coordination arose from the recognition of the large number of seed producers in the province and the lack of a governing and regulatory structure among them. Three strategic issues identified by COPROSEM South Kivu include putting into practice a Quality Declared Seed standard (QDS), making the exemption process for seed importers widely applicable and not dependent on a

[30] It should be noted that this information, which was provided by NPPO staff, contradicts the official data provided by the GDRC to the International Plant Protection Convention (IPPC). See Annex III.

Kinshasa-based approval process, and simplification of the process of registering new varieties in the national variety catalog.

2.8 NORTH KIVU PROVINCE

Bordering Uganda and Rwanda, North Kivu has long been at the epicenter of conflict and displacement, with more than 400,000 people displaced from their homes in eastern parts of the province in 2017 alone. Since mid-2018, the province has suffered from the second worst Ebola outbreak in history, which has killed more than 1,500 people and made the cities of Beni and Butembo difficult to access. In July 2019, the city of Goma recorded its first confirmed Ebola cases.

The most important crops supported by seed activities in the province include cassava, beans, maize, Irish potato, vegetable seed, and sweet potato. Potato is a particularly important crop in the North Kivu highlands and a number of local NGOs specialize in potato seed production. Early generation seed is sourced from Rwanda, Uganda, Burundi, and Kenya for potato, maize, and vegetable seed as well as from INERA Mulungu and INERA contract growers in North Kivu. Early generation seed production and seed regulatory institutions are particularly weak in North Kivu.

The seed market in North Kivu is driven by emergency seed tenders and projects, which are carried out by nearly every NGO with agricultural activities in the province. The most common territories for relief seed include Rutshuru, Masisi, and Nyiragongo. There are only two registered seed companies in North Kivu province, both of which were initially supported by AGRA and focus primarily on hybrid maize.

Seed sector stakeholders in North Kivu are poorly coordinated. COPROSEM as a provincial seed coordination body exists on paper but has not yet begun hosting broad-based seed sector stakeholder consultations. Seed tenders do not pass through any centralized coordinated vetting process at the provincial level.

2.8.1 Major Seed System Actors in North Kivu Province

North Kivu: Breeding and Variety Maintenance

- **INERA North Kivu**. There are currently no INERA seed breeding or maintenance activities in North Kivu. Since 2014, however, INERA has maintained an office in North Kivu (Goma). INERA Mulungu (the INERA research station in South Kivu) provides support to the Goma office given the amount of seed activities in North Kivu that require engagement with INERA for early generation seed. The World Bank's DRC Eastern Region Stabilization and Peace-Building Project (STEP) is funding a new office for INERA in Goma and a vehicle for staff use. INERA will maintain at least two staff in Goma to coordinate activities with INERA Mulungu and other INERA stations.

  With support from AGRA, INERA North Kivu conducted seed trials and produced pre-basic maize seed in North Kivu using materials originating from CIMMYT between 2016-2018. The agency rented land and supported private seed enterprises in basic seed production. Staff carried out two seasons of trials with four replications in three territories, but this activity stopped in 2018.

North Kivu: Seed Production and Distribution

North Kivu: Basic Seed Production

- **INERA North Kivu**. INERA North Kivu provided technical support to a Masisi-based basic potato seed producer, ÇAAP Tujitegemeye, and three potato seed producer partners under the STEP program. INERA North Kivu has also facilitated early generation seed production contracts with seed producers in North Kivu.

North Kivu: Certified Seed Production

- **Local seed producers**. Seed production in North Kivu is characterized by a strong well-established network of local NGOs working with contract growers. Most of this seed is sold to international NGOs or to seed traders competing in seed tenders from international NGOs, donor projects, and United Nations agencies. All of the seed produced and sold by these producers is considered to be certified, yet capacity building among farmer seed producers is considered to be poor, and SENASEM lacks the capacity to truly inspect and certify seed produced in the province. While a few projects, such as the P4P program,[31] facilitate sales directly to farmers or hold seed fairs, most sell into the institutional market for emergency seed, which involves seed tenders followed by direct seed distribution and training for farmers.[32]

  The only registered seed companies in North Kivu are JOB Seed and Plantation Anany, both of whom were partners under an AGRA program which sought to identify and register Congolese seed companies with the capacity and interest to pursue commercial seed opportunities, primarily with hybrid maize.

- **Imports**. The seed tender market leads to massive imports from Kenya, Uganda, and Rwanda, which are poorly regulated. The problem with unregulated seed is particularly acute for vegetable seed where it is common for expired seed to be re-packaged and sold on the market. There is also a huge unregulated market for hybrid maize and potato seed from Rwanda and Uganda, which enters North Kivu with no inspection or verification. Since 2018/2019, Rwanda has virtually closed the border with North Kivu due to the Ebola outbreak, which has had a noticeable impact on seed flows into local markets.

- **Agro-dealers**. There are seven agro-dealers based in Goma. Smaller agro-dealers that sell directly to farmers are selling almost exclusively imported vegetable seed. They have a hard time participating in or winning seed tenders for vegetable seed, because they generally work with small volumes. The large volumes requested in seed tenders require sizable upfront capital that small agro-dealers do not possess. As a result, the vegetable seed tender winners are usually large traders that have sufficient capital but may have very limited understanding of vegetable seed.

North Kivu: Seed Regulatory Institutions

- **SENASEM North Kivu**. SENASEM North Kivu is comprised of 26 staff based out of the provincial coordination office in Goma as well as 11 staff based in Beni, nine in Butembo, and three in Walikale. There are 31 seed inspectors employed by SENASEM North Kivu, of which 15 are based out of the Goma office, six in Butembo, eight in Beni, and two in Walikale.

  There are only two functioning seed laboratories in the province: one in Goma and one in Butembo. As in South Kivu, both are able to conduct tests for physical purity, germination, and moisture content only, and there is no laboratory to test for common plant diseases. Together, the two North Kivu laboratories conducted approximately 100 lab tests in 2019. The volume of seed tested does not seem to align with the volume of seed procured or produced by projects in North Kivu province.

[31] The FAO is working with the World Food Programme on the P4P seed program (2018-2022) in Masisi, Nyiragongo, and Rutshuru Territories through 348 farmer groups of approximately 20 households per group. The project will support community managed transformation centers with a boutique for selling seed, a warehouse, an area for drying seed, and a grinding mill. Demonstrations are planned through farmer field schools and are expected to include only the varieties produced by the farmer groups.

[32] NGOs noted as being heavily involved in emergency seed work in North Kivu include Mercy Corps, World Vision, Agro-Action Allemagne, International Committee for the Red Cross, and Caritas. The Goma-based office of Caritas, for example, has procured via tender and distributed more than 200 metric tons of seed over the past three years: 92 tons of rice, 50 tons of beans, 18 tons of Irish potato, 40 tons of maize, and 600 kilograms of soybean.

SENASEM maintains records of registered seed producers and fields on a season-by-season basis but has no centralized database for seed production in the province. Individual seed fields can be traced through triangulation with the seed producers and projects purchasing the seed, but there is no systematic documentation.

- **NPPO (DPV and SQAV)**. There are 14 border posts in North Kivu and 234 NPPO staff.[33] The volume of officially declared seed imports is very low, despite the large quantities known to arrive from Uganda, Rwanda, and Kenya. Pirated vegetable seed that has expired and been repackaged is a common problem.
- **COPROSEM**. The COPROSEM council for North Kivu is co-chaired by IPAPEL as president and INERA as first secretary. To date, COPROSEM North Kivu has not hosted any multi-stakeholder meetings nor has a set of priorities been identified.

2.9 ITURI PROVINCE

Ituri province enjoys significant cross-border trade with Uganda, but has repeatedly struggled with insecurity associated with mining and inter-ethnic conflict. The most important crops supported by seed activities in the province include cassava, beans, maize, vegetable seed, and sweet potato. Early generation seed is sourced from INERA in Ituri and South Kivu and from Congolese NGOs working in North Kivu and Ituri.

The seed sector in Ituri is dominated by relief and development programs with a focus primarily on Djugu Territory and parts of Mahagi Territory, and to a lesser extent in Mambasa, Aru, and Irumu Territories. The seed market is driven by short-term seed projects and emergency seed distributions sourced through large tenders of 50-100 metric tons, which can be quite lucrative and generate significant competition from seed traders. The seed tenders drive down the price paid to acquire seed and are generally not accessible to small seed actors. Seed fairs, a less disruptive and more market friendly means to address emergency seed needs, have also been carried out in Ituri province, but large tenders are much more common means to respond to emergency seed needs.

There is limited coordination among seed sector actors and a low level of mutual understanding in terms of the scope and scale of seed activities of different seed sector stakeholders operating in Ituri province.

2.9.1 Major Seed System Actors in Ituri Province

Ituri: Breeding and Variety Maintenance

- **INERA Nioka**. The INERA research center at Nioka is located approximately 125 kilometers from Bunia. The station has 12,000 hectares, an enormous size for a research station, which offers tremendous potential for isolated seed production, a prerequisite for producing high-quality early generation seed. There are 249 staff, of which 37 are technicians, three are scientific staff, and one holds a PhD. With very few scientific staff and no breeders, the center cannot carry out research activities related to breeding, and varietal maintenance can be compromised. INERA Nioka hosts a collection of 10 legume varieties and has maintained a collection of 28 varieties of sweet potato that dates back to a PRAPACE regional program that ended in the early 2000s.
- **University of Bunia**. The University of Bunia has worked with Harvest Plus and the FAO on varietal adaption for a sub-set of bio-fortified varieties of vitamin-A-rich maize and iron-rich beans for dissemination to 2,500 households in Djugu and Mahagi Territories.

[33] It should be noted that this information, which was provided by NPPO staff, contradicts the official data provided by the GDRC to the International Plant Protection Convention (IPPC). See Annex III.

- **Innovation du Lac Albert (ILA)**. ILA, one of two seed companies present in the province, has been testing 80 hybrid Irish potato varieties with the support of its Dutch seed company partner Solynta. Registration for two of the varieties has been initiated and is expected to be complete by 2021.

Ituri: Seed Production and Distribution

Ituri: Basic Seed Production

With the exception of a few varieties of beans and potato, basic seed for seed production in Ituri province has been sourced from outside of the province for at least the last three years. Basic seed of maize varieties has been sourced from INERA Ngandajika research station in Lomami province or from NASECO's seed farms in Uganda, and basic seed of rice comes from INERA Yangambi in Tshopo province.[34] All of the basic seed fields inspected by SENASEM Ituri were either managed by INERA Nioka for beans or by ILA seed company for potato.[35]

Ituri: Certified Seed Production

Seed produced and inspected in Ituri province in 2017 and 2018 covered six crops: beans, maize, rice, soya, cassava, sorghum, and groundnuts. As in South and North Kivu, most seed produced locally is destined for seed tenders or project-funded seed fairs. Four international NGOs and the FAO have carried out emergency seed activities in the past year, including seed vouchers, fairs, and direct seed distribution. Key informant discussions with seed traders in Ituri province revealed that seed tenders for Ituri province exceeded 500 metric tons for 2018.[36]

For a variety of reasons, private seed companies and many seed traders are shut out of seed tenders and seed fairs. Given the dominance of these programs in the market and the free or discounted seed they distribute, the private seed sector is at a disadvantage in trying to establish a commercial presence in the province.

- **Local seed producers**. There are 18 seed producers in Ituri, including INERA Nioka, two seed companies, and more than 10 local NGOs. Among the 18 seed producers in Ituri province, only the two seed companies confirmed that they are formally registered with SENASEM as a seed producer. The groups of seed contract growers managed by local NGOs are not registered, but their seed fields are registered and inspected by SENASEM when intended for sales in the project-supported market, such as FAO seed fairs.
- **INERA Nioka**. INERA Nioka station is an active maize and bean seed producer and a regular participant in NGO seed tenders. The station also produces seed for NGOs and projects, including Caritas Mahagi, Agro-Action Allemagne, Fonds Social, and FAO.
- **NASECO**. NASECO is a Uganda-based seed company whose headquarters, 12-hectare research facility, and basic seed production are all based across Lake Albert in northwestern Uganda. NASECO has been active in DRC since 2015, with sales roughly split evenly between North Kivu, South Kivu, and Ituri provinces. In the DRC, NASECO produces 35 percent of its seed on its own land and 65 percent through approximately 250 contract growers and a group of 100 farmers. In 2018, the company started construction of a 750-metric-ton warehouse 30 minutes south of

[34] Lomami province is part of the prior Kasai-Orientale province in south central DRC. Tshopo is part of the former Orientale province and is located close to Kisangani in northeastern DRC.

[35] RIMA, an NGO producing maize and rice seed through seed producers groups in Ituri, generates some early generation seed for OPV maize varieties, but the NGO makes field-based selections because of the lack of varietal maintenance and is not inspected by SENASEM.

[36] Further information on the major seed tenders for 2018 in Ituri province can be found in Annex VI.

INERA Nioka, but construction has been delayed due to security issues, and the company did not produce seed in the DRC in 2018.

NASECO focuses on hybrid maize production but has also produced and sold limited quantities of climbing bean and wheat seed. The company developed the Bazooka hybrid maize variety at its research facility in Uganda in collaboration with CIMMYT to better serve smallholder farmers. The variety was selected for its ability for its ability to produce in a low-nitrogen environment and deliver a robust yield in different ecologies; suitability up to 1,900 meters; and tolerance to lethal maize necrosis and fall armyworm. None of the NASECO hybrid varieties are listed in the DRC seed catalog.

NASECO is the most important hybrid maize seed company in eastern DRC, and it accounts for at least 75 percent of all hybrid seed sales in eastern DRC. Most of the hybrid maize seed sold by NASECO in the DRC is packaged in 250-gram, 500-gram, and 1-kilogram packets that are sold through a combination of re-sellers (kiosks and approximately 220 agro-dealers) and through direct sales by 30 NASECO agriculture agents strategically employed in North Kivu, South Kivu, and Ituri provinces. NASECO's sales strategy focuses on the expansive use of small demonstration plots, so that farmers can witness the performance of NASECO seed under diverse ecologies. NASECO agriculture agents are paid a basic salary, given a motorcycle after three years of service, and receive commissions based on sales and achieving the target of establishing 200 demonstration fields per agent.

- **ILA**. ILA, a nascent private potato seed company based at INERA Nioka research station, is a joint venture with the Dutch company Solynta that began in 2016 with funding from the Dutch government. As described above, the company is engaged in breeding hybrid Irish potato varieties, but the company recognizes an immediate pressing need from farmers for clean and affordable seed potatoes. To meet this demand, ILA currently produces conventional seed potatoes using certified mini-tubers from mini-tuber producers in other countries and reputable regional labs. ILA registered their first sales in 2017. ILA is also planning to train selected farmers to become potato seed contract growers.

Ituri: Seed Regulatory Institutions

- **SENASEM Ituri**. SENASEM has a total of 17 staff in Ituri province who regularly engage in seed inspection (during production and for seed fairs) and the review of draft seed tender documents. Only six of the staff receive a monthly salary paid by the government; the rest are dependent on per diems and fees associated with carrying out field inspections. Through the World Bank's STEP program, SENASEM Ituri was able to acquire six motorcycles for use by field inspectors. As in other provinces, the laboratory at Bunia is only able to conduct standard seed testing on physical purity, germination, and moisture content and cannot verify seed health. The reported crop types and number of tests conducted by SENASEM Ituri in 2018 do not align with the number of fields of various crop types reported in field inspections. This discrepancy is indicative of the need for more systematic information systems for SENASEM and for stronger integration between field inspections and lab tests.

- **NPPO (DPV and SQAV)**. NPPO staff number around 10 at the provincial headquarters in Bunia, in addition to 132 staff based at 14 border posts throughout the province. NPPO staff provide seed importation authorizations (import permits based on phytosanitary certificates from the seed importing country) as well as phytosanitary certificates for seed exports and for movement of seed from one province to another. At the border, NPPO staff review this paperwork as part of the clearing process for an incoming shipment.

  In the previous 12 months, NPPO staff issued a total of three importation authorizations and five certificates for moving seed from outside of the province and to other provinces. These numbers

are extremely low considering the scale of seed tenders in the province and the extent to which seed is sourced from neighboring countries, particularly Uganda. NPPO staff acknowledged that many seed imports enter Ituri without their knowledge and validation of the required import permit and phytosanitary certificate, and the staff do not know how much seed and other agricultural inputs are actually crossing the border.

While much of this seed may very well be quality early generation seed with valid phytosanitary certificates, the potential for low-quality and fake seed to cross the border is heightened when reputable seed importers are not making official declaration of their seed imports, as it fosters a laissez-faire attitude towards early generation seed imports. That is, if the major importers meeting project tenders with imported seed do not follow the importation paperwork and procedures, it is hard to expect less financially and human resource-endowed seed importers to do so.

NPPO staff indicated that the Agricultural Code has a clause stating that importers can pay the equivalent of approximately $150 (235,850 Congolese francs) for a three-month exemption for any tax of agricultural inputs. In practice, this exemption is not being received, because the process requires filing paperwork in Kinshasa, which is a challenge for companies based in the east and that lack Kinshasa-based representation.

- **COPROSEM**. There is no provincial seed council in Ituri nor other formal mechanism for coordinating seed sector actors at this time.

3. KEY CONSTRAINTS AND RECOMMENDATIONS

The following section highlights key constraints to seed sector development across the six eastern DRC provinces studied and outlines short-, medium-, and long-term recommendations for key investments to improve the availability of quality seed for smallholder farmers.

Overall, public and private seed sector institutions in the DRC lack the capacity to develop, maintain, monitor, and scale up new and improved varieties as well as the financial incentives to do so. Overcoming these challenges will require a commitment from the GDRC to establish and enforce policies that promote and support the development of a strong private sector seed industry.

The constraints and recommendations fall along five broad categories:

1. National and provincial seed policy
2. National seed authority
3. Seed quality
4. Donor coordination and knowledge-sharing
5. Domestic and cross-border seed trade

The recommendations take into account the fact that while the GDRC has acknowledged the need to improve the legal and institutional framework for regulating the seed sector through its accession to the COMESA and SADC harmonized seed agreements, implementation of those agreements, beginning with the enactment of a national seed law, has stalled. The adoption of COMESA/SADC seed regulatory models will be a very long-term process even with firm donor support, and it will not begin to be effectively implemented until there is political will and sustained state budget allocations that allow the key seed regulatory institutions to fulfill their mandates. In the interim, however, there are opportunities for interventions in the broader enabling environment for seed that can improve access to quality improved seed for smallholder farmers.

Similarly, while the underdeveloped agricultural sectors and insecurity endemic in eastern DRC are major problems that undermine farmer demand for improved seed and impede the development of a commercial

seed sector, the recommendations below focus on seed-specific investments. To ensure sustainability, all donor projects promoting increased seed supply of existing or new varieties should first ascertain that there is sufficient market access and demand for the resulting farmer production. In addition, this report does not purport to provide expert guidance on conflict mitigation and risk management techniques, but it should be noted that until the ongoing conflict in the region is resolved, it will remain a continual risk to the sustainability of all investments.

3.1 NATIONAL AND PROVINCIAL SEED POLICY

Lack of a clear legal and regulatory framework for the seed sector. The lack of a national seed law was identified by many stakeholders as one of the major constraints on seed sector development and a primary underlying cause of many of the challenges experienced, such as the presence of fake seed, unfair competition, and the chaos and corruption in emergency seed supply. The lack of a national seed law also directly affects the authority of SENASEM in terms of its legal mandate, which should include, among other things: enforcing a national variety catalog, establishing the genetic identity of varieties offered for sale in the DRC, certifying the quality of seed produced locally, and the suppression of fake seed in the market. Passing the seed law is also a prerequisite for the creation of a national variety release committee that can formally evaluate and register new varieties in the national variety catalog.

Lack of clear legal mandate for SENASEM. In many countries (in the region and around the world), the national seed law designates a specific agency as the national seed authority and imbues that agency with certain powers to inspect and regulate the seed market. In the DRC, even though SENASEM currently fills many of the functions of a national seed authority, that power has been formally delegated to AGRIPEL. Thus, SENASEM cannot set fines nor confiscate fake seed without the approval of AGRIPEL or the IPAPEL coordinator in the local province. This structure undermines the independence of the agency and places undue political influence on its decisions.

Limited national- and provincial-level public-private dialogue on seed sector issues. Coordination at the provincial level is nascent, and COPROSEM has only recently been established in some of the provinces. During stakeholder roundtable discussions with seed sector actors in South Kivu, North Kivu, and Ituri, stakeholders noted that the meeting was the first of its kind involving a diverse group of seed producers. Advocacy must be driven not just by the private seed industry but by farmers as well, and advocacy groups should include farmer organizations to ensure they have a voice in the policy process. The Groupe Inter Bailleur de l'Agriculture et Développement Rural (GIBADER), a donor coordination group consisting of international and bilateral development agencies active in the DRC, could play a role in facilitating coordinated advocacy by these different groups and in supporting the GDRC in the implementation of the seed policies and laws that result.

Inconsistent application of the exemption from import tax on seed. By law, imported seed is eligible for an exemption from import tax. Since 2018, the practice has been for imports of less than $2,000 USD to be exempted when entering the DRC, but stakeholders claimed that the exemption is not being granted on any systematic basis. Without an exemption, importers pay tax if and when they declare that they are importing seed. Some companies suggested the exemption process should be simplified and applied automatically to prevent the continued need for traders to pay small bribes to cross the border.

National and Provincial Seed Policy Recommendations	Geography
Short-Term (1-2 years)	
Work with AGRIPEL, producer associations, the local COPROSEMs, and other interested parties to advocate for the legal changes necessary to grant SENASEM the official legal mandate of seed authority. To avoid confusion or further delays in the effective implementation of the seed law, the language of the law must be changed	National, All Provinces

National and Provincial Seed Policy Recommendations	Geography
to officially designate SENASEM as the national seed authority. Facilitate knowledge-sharing with other regional seed authorities regarding the importance of a semi-autonomous structure that allows SENASEM to better control its own budget and decision-making.	
Work with AGRIPEL, producer associations, the local COPROSEMs, and other interested parties to advocate for passage of the seed law. The draft seed law has failed to gain traction in parliament in part due to a lack of concerted lobbying on behalf of seed sector stakeholders, who have until recently lacked organization and a united voice. GIBADER should assist in consolidating seed coordination through COPROSEMs and effective lobbying from interested parties such as APSKA, UNAGRICO, and the provincial governments to encourage passage of the law. Work with local government and the private sector to establish strong COPROSEM councils, including good representation of farmers and a balance of public and private sector stakeholders.	National, All Provinces
Advocate for consistent application of the import tax exemption for seed. The unpredictable manner in which the import tax exemption for seed is applied creates uncertainty in the private sector and likely contributes to the problem of undeclared seed imports. In national and provincial-level dialogue on seed issues, advocate for the import tax exemption process to be applied consistently and automatically for all seed sector importers in eastern DRC.	National, All Provinces
Medium-Term (3-7 years)	
Support the GDRC in the adoption of a national seed policy and strategy. Once the seed law is approved, work through GIBADER to facilitate an inclusive public-private consultation and drafting process to define a comprehensive national seed policy and fund the required programs, projects, and other actions needed for its implementation.	National, All Provinces
Support a full review of the seed regulatory framework and procedures. Facilitate a much-needed thorough revision of general and crop-specific seed regulations and of the SENASEM PATPS to provide internal coherence and technical and procedural soundness.	National, All Provinces
Long-Term (>7 years)	
Work with AGRIPEL, producer associations, the local COPROSEMs, and other interested parties to advocate for a plant breeders' rights law, including provisions for the licensing of public varieties by INERA breeders. Plant breeders' rights would encourage local and foreign agricultural research entities to develop better crop varieties, conduct maintenance breeding of existing varieties, and produce an adequate amount of high-quality early generation seed. Allowing INERA breeders to benefit from licensing fees generated by the public varieties they develop would motivate them to develop new crop varieties that meet the needs of farmers.	National, All Provinces

3.2 NATIONAL SEED AUTHORITY

SENASEM lacks the technical and financial capacity to properly certify seed. Despite the lack of a seed law, regulations and procedures that would be enacted under it have been provisionally developed in accordance with international and regional standards for seed markets. The provincial branches of SENASEM are far from being able to implement either current seed regulations or SENASEM's

own manual of procedures in any of the six provinces. SENASEM is limited by a lack of laboratory capacity to conduct more than standard seed certification tests (such as germination, physical purity, and moisture content), and there are no seed health testing laboratories in the DRC. In addition, SENASEM seed categories (pre-basic, basic, R1, R2, and QDS) are not sufficiently controlled, and inspectors do not have the capacity to trace fields back to early generation seed. Given the discrepancy between the numbers of seed tests, registered seed fields, and volumes of seed tenders, it appears that only a fraction of the seed being produced and sold in many of the northern provinces is being inspected at all. In Lualaba, which lacks a provincial SENASEM office, no provincial seed certification services take place.

These challenges are compounded by a fee structure for seed certification services, whereby SENASEM inspectors derive nearly all of their pay from delivering punctual certification services, the fees for which are paid by the seed producer whose fields they are inspecting. While entrepreneurial, this system creates incentives for abuse; if the SENASEM inspector does not accept the quality of the seed he inspects, he will not get paid his per diem by the seed company he is visiting. Consideration should be given to a regulatory arrangement whereby private seed inspectors to carry out seed certification inspections, and SENASEM accredits the private seed inspectors. This arrangement will require further research to determine its feasibility and steps necessary to practically implement it in the DRC.

Perhaps one of the biggest challenges to improving seed certification is the lack of a seed information management system and databases as a means to promote effective and efficient seed certification and transparency in the seed sector. Among the provinces visited, each SENASEM office uses a different format for recording seed sector data. SENASEM staff in Kinshasa cannot provide data on the volume of seed produced, number of fields inspected, or other key seed sector performance data in other provinces. SENASEM received training and resources to improve its data systems from Belgium, but the agency has had difficulty systematizing data for traceability. There is also no online resource or official database of testing protocols for the variety catalog.

Traceability of seed generations is universally compulsory under seed production regulations and, along with effective field inspection and seed testing, is a cornerstone in promoting seed quality and protecting the integrity of the system. Certified commercial (R1) seed can only be produced from certified basic seed, which must be traced back to the breeder seed. In the DRC, given the challenges in variety maintenance and access to pre-basic and basic seed, it is virtually impossible to produce certified seed, yet SENASEM continues to certify seed each year. When combined with the profit motive generated by the seed tender market (described below), a high percentage of the seed packaged and sold as "certified" seed in the DRC consists of grain or lower quality seed than what is reflected on the label.

Box 3. SENASEM Basic Operational Needs*

- Offices, training/meeting room, and seed testing laboratory
- Training in DUS testing and field inspection
- Training in laboratory management, ISTA sampling, and seed testing
- Training in seed certification
- Developing and installing internal management system
- Sampling equipment
- Integrated DRC Seed Information Management System

** Exact needs vary by SENASEM branch and should be determined through a thorough assessment of existing capacity in each province.*

National Seed Authority Recommendations	Geography
Short-Term (1-2 years)	
Facilitate knowledge-sharing to improve SENASEM's management system and organizational structure. Facilitate a working group or study tour including staff from SENASEM offices in various provinces and Kinshasa to learn about the organizational	National, All Provinces

National Seed Authority Recommendations	Geography
structure, management, and processes of national seed authorities in other SADC or COMESA countries in the region.	
Develop an integrated seed information management system to manage all SENASEM functions. Fund the development and implementation of an integrated seed information management system across all SENASEM offices nationally. This database should include catalog information, variety description, name of maintainer and seed producer, documentation of registration, seed crop declaration, and information on field inspection, seed sampling, testing, and labelling. Such data can support overall seed sector coordination and facilitate seed import and export within the region.	National, All Provinces
Medium-Term (3-7 years)	
Strengthen SENASEM's capacity in seed testing and, eventually, the accreditation of private laboratories. Support capacity building for the SENASEM Kinshasa laboratory to obtain ISTA accreditation as a national seed reference laboratory, giving it access to tailored training and participation in proficiency testing. Set up a laboratory management system with a designated quality manager (medium-term), facilitate ISTA accreditation as a national seed reference laboratory (long-term), and develop standard procedures for third party accreditation. Once the seed testing capacity of the national seed testing laboratory is proven (through ISTA proficiency testing) and procedures for accrediting laboratories are in place, SENASEM will then be able to properly accredit third-party private seed laboratories in the DRC, with periodic audits of their laboratory management systems and annual ring tests.[37]	National, All Provinces
Build SENASEM's overall capacity to implement the management systems, staff training, facilities, and equipment needed to act as an effective National Seed Authority and accreditation body. A thorough capacity building plan for SENASEM will require adjusting regulations, improving internal management, and financing basic operational needs (as described in Box 3 above). In particular, the fee structure for seed inspections must be amended, so that the salaries of seed inspectors are no longer dependent on direct payments of fees and per diems from the seed producers they inspect. The plan should include a strategy for long-term economic sustainability but may require guaranteeing running costs in the medium term to ensure that investment in training or equipment will not be a wasted effort.	National, All Provinces
Support the establishment of the Technical Commission for Admission to the Catalog and the official release and registration of new varieties in the national variety catalog following proper DUS testing and storing of a reference sample. A new variety cannot be properly registered without DUS testing to determine its genetic composition nor can it be properly maintained without the existence of a reference sample, which is typically stored by the national seed authority. Once SENASEM has developed the capacity to fulfill these requirements, the national variety catalog can be regularly updated.	National, All Provinces
Long-Term (>7 years)	
Strengthen SENASEM's capacity to implement procedures for the accreditation of third-party seed quality control services. Procedures for third-party	National, All Provinces

[37] Accreditation for one private seed testing laboratory has already taken place, despite SENASEM's lack of formal procedures for doing so. CEPROSEM, a seed company on the outskirts of Kinshasa that produces certified vegetable seed, was supported under a former project funded by the European Union and is still operational ten years after the end of project funding.

National Seed Authority Recommendations	Geography
accreditation for field inspectors, analysts, and samplers have already been developed in PATPS Volume 3, but SENASEM lacks the capacity to implement them. Review the current PATPS Volume 3 to ensure the listed procedures are internally consistent and technically sound. Develop an internal standard management system and train SENASEM staff in how to implement accreditation procedures.	

3.3 SEED QUALITY

3.3.1 Variety Development and Maintenance

Poor quality of early generation seed. Besides the concern with genetics and limited diversity, many seed stakeholders throughout the six provinces complained about the quality of early generation seed. The main feature of seed quality is the genetic purity and identity of the variety. These characteristics are established during variety registration, after which the breeder maintains this level of quality through maintenance breeding. Without adequate maintenance or germplasm repositories, improved varieties cease to exist, and the seed cannot be produced.

INERA lacks the funding, facilities, and equipment for variety development, maintenance, and production of breeder seed. In the northern provinces of eastern DRC, there is no traceability on pre-basic and basic seed, which are only produced on an ad hoc, project-demand basis and sometimes sourced from other countries. In the southern provinces of Haut-Katanga and Lualaba, where the commercial importance of maize creates more of a need for quality basic seed, the problem has been solved by seed producers taking over the production of basic seed from INERA.[38]

Seed Quality: Variety Development and Maintenance Recommendations	Geography
Medium-Term (3-7 years)	
Support private variety development and maintenance. Early generation seed production is not licensed to any organization beyond INERA, yet there are many examples of this occurring informally. Advocate for SENASEM (with the agreement of the breeder) to formally register private seed producers as maintainers of specific varieties. Advocate for INERA to formally license other seed producers to produce basic seed under its supervision.	Haut-Katanga, Lualaba
Long-Term (>7 years)	
Support capacity building in breeding and variety maintenance at INERA, particularly for crops with less commercial potential. Provide education and training grants for Congolese researchers and technicians in order to support breeding and varietal maintenance at INERA research stations and CRM, with a focus on varietal maintenance for crops that do not have a strong business case for the private sector, such as cowpea and rice. Basic needs for variety development, breeder seed production, and variety maintenance include office space, plant breeding laboratory building and equipment, solar power equipment, cooling and freezing facilities for short- and medium-term seed storage, and simple seed conditioning equipment for breeder seed. For CRM, basic needs include conditioning and storage equipment for the production of pre-basic seed and necessary materials for the maintenance of existing maize inbred lines. These investments must be accompanied by a long-term increase in budgetary	Haut-Katanga, Tanganyika, South Kivu, Ituri

[38] Breeder seed is the seed produced by the breeder during the variety maintenance process from which pre-basic and basic seed are produced. Breeder seed is not intended for sale, whereas pre-basic and basic refer to regulated classes of seed that may be certified for commercial sale. Pre-basic seed is used to produce basic seed, and basic seed is used to produce certified (R1) seed.

Seed Quality: Variety Development and Maintenance Recommendations	Geography
resources allocated by the GDRC to ensure sustainability. Donors should also support INERA's participation in regional, continental, and international crop improvement networks, such as those run by the CGIAR centers.	

3.3.2. Seed Classes

Overreliance on the use of the R1 class of seed. The inability of SENASEM to provide proper seed certification services leads to poor quality seed being distributed to farmers under the guise of "certified seed." SENASEM's manual of procedures (PATPS) includes standards for only two seed classes: basic and certified.

The category of Quality Declared Seed was created to render seed varieties for which the increase in yield is insufficient to justify the cost of adhering to the highest standards of certification more competitive in the market. QDS seed meets lower standards for varietal purity and germination and does not require official field inspection. It does, however, require registration of the seed producer, declaration of the seed crop, and the ability to trace the origin of the seed back to the breeder seed. Across the six provinces of this review, Ituri was the only province visited where SENASEM inspected seed categorized as QDS. The private sector in Haut-Katanga and Lualaba are producing seed purported to be R1, but which in reality is only QDS. Under the current circumstances, the use of the QDS seed class is important because it is an explicit acknowledgement by the seed inspection agency that the requirements regarding the source of the mother seed for the production of certified classes are not being met.

An additional class of emergency seed is defined in the seed regulations of many countries that is allowed under special circumstances when no seed of other categories is available. The DRC previously recognized a similar category of seed ("Bon a semer"), which was permitted when the origin of the seed could not be traced conclusively, but the seed was deemed of sufficient quality and adapted to the farmers for whom it is intended. Introducing an emergency seed category would allow the use of grain selected from commercial crops — which is happening now on a grand scale without regard to the regulations — as a source of emergency seed, helping to bring transparency to the current practice and to eliminate bad seed from humanitarian networks. Table 3 defines the characteristics of classes of certified, QDS, and emergency seed according to existing SENASEM procedures for certified and QDS seed (which align with OECD standards and FAO standards, respectively) as compared with the proposed class of emergency seed.[39]

Table 3. Seed Category Distinctions

Category of Seed	Classes of Certified Seed (pre-basic, basic, R1, and R2) (OECD standards)	Quality Declared Seed (QDS) (FAO standards)	Emergency Seed (Proposed)
Registration of Producer	Required	Required	Not required
Type of Variety	Registered variety	Registered variety	Registered variety
Source of Mother Seed	Preceding certified class	Any certified class	Any certified class (if possible)
Seed Crop Declaration	Required	Required	Not required

[39] The characteristics and requirements for emergency seed as shown in Table 3 are illustrative. Final standards for the proposed class of emergency seed should be determined through an inclusive consultative process with all seed sector stakeholders.

Table 3. Seed Category Distinctions			
Category of Seed	**Classes of Certified Seed (pre-basic, basic, R1, and R2) (OECD standards)**	**Quality Declared Seed (QDS) (FAO standards)**	**Emergency Seed (Proposed)**
Type of Inspection Required	Official field inspection of seed crop	Seed producer field inspection of seed crop	Official grain crop field inspection
Laboratory Testing	Required	Required	Required
Level of Varietal Purity and Germination Required	High standards as set in seed regulations	Lower standards than for basic, R1, and R2 classes	Varietal purity as determined in grain crop inspection; QDS germination standards

Source: EEFS consultant team.

Seed Quality: Seed Classes Recommendations	Geography
Short-Term (1-2 years)	
Promote the production of QDS seed where basic seed is not available or where other seed classes are not competitive. Define field and laboratory standards for QDS seed based in FAO QDS seed schemes. Support SENASEM to abide by the seed regulations and to request seed producers to declare QDS class when basic seed is not available.	All Provinces
Introduce a new category of emergency seed. A new category of emergency seed should be permitted when no seed of the other categories is available. Draft and adopt clear regulations on emergency seed, based on the current reality on the ground, as well as detailed and transparent SENASEM procedures for this new category. Introduce adapted and effective field inspection and seed testing for this new seed category. Table 3 outlines the differences between the certified, QDS, and proposed emergency seed classes.	National, with current focus on Tanganyika, South Kivu, North Kivu, Ituri

3.3.3 Varietal Diversity

Low varietal diversity. One indicator of a healthy and dynamic seed system is the number and diversity of varieties flowing through the system. Low varietal diversity increases susceptibility to disease and reduces resilience in cropping systems. Despite the large number of seed projects in eastern DRC, there is low level of diversity in terms of the seed varieties being produced. For example, even with a number of projects supporting seed production of beans in South Kivu province, only four varieties of beans were reflected in the records of bean seed fields registered with SENASEM in 2019, and a single variety accounted for more than 80 percent of all registered bean seed fields.[40] Yet INERA Mulungu (South Kivu) maintains a robust set of bean varieties, including 12 for which they produce early generation seed, and staff expressed interest in promoting diversity and farmer choice through increased use of small trials and farm-level engagement strategies. In Ituri, for 2017 and 2018, there were only 17 different seed varieties produced and inspected by SENASEM across seven field crops (beans, maize, cassava, sorghum, groundnut, rice, and soybean), a very small number considering the size of Ituri province and diversity of agroecologies ranging from forest to highlands to savannah. In the southern provinces of Haut-Katanga and Lualaba where commercial seed is more common, seed businesses are producing only one or in a few cases two

[40] See Annex VI for additional data on the number and type of varieties maintained and produced in various provinces.

varieties per crop. By contrast, in neighboring Zambia, there are more than 60 varieties released in the national catalog, 15-20 of which are very common in the market and none with more than 15 percent of national market share.

Increasing the number of varieties available on the market will require a concerted commitment to increasing the capacity of public and private breeding institutions to develop new farmer-preferred and adapted varieties from genetic material available within the DRC and from regional collections, such as national agricultural research programs in Uganda and Rwanda, or from collections held by the CGIAR centers, such as CYMMYT, CIAT, IITA, or the International Potato Center (CIP). It will also require giving famers greater choice in the varieties they use through reducing the role of intermediaries in selecting the varieties available to farmers. In addition to facilitating greater varietal diversity in the region, direct interaction between farmers and seed producers or knowledgeable seed sellers is one of the best weapons against the success of traders who peddle fake seed.

At present, NGOs and projects are buying and distributing seed at scale, and farmers are not at the center of the process by which seed varieties are identified for production and dissemination. There are very limited cases of seed varieties being identified for seed production following adaptation trials involving more than a single variety. The EEFS consultant team witnessed very few instances of efforts to raise awareness of farmers about new varieties or to provide extension and support to encourage varietal use and adoption. There is also no sign that demand estimates are being done to understand what exactly farmers need in terms of seed. Projects that are aimed at delivering new germplasm to farmers should design approaches that bring choice to and empower farmers in deciding what varieties are best for them. For example, seed fairs can be quite beneficial when organized in a way that gives farmers choice and puts seed traders and seed producers in competition.

Seed Quality: Varietal Diversity Recommendations[41]	Geography
Long-Term (>7 years)	
Promote seed distribution strategies that enable farmer choice. Use distribution strategies, such as seed fairs, that promote direct interactions between farmers and seed producers to increase trust and help build a sustainable market system. Train agro-dealers to understand the products they are selling and how to identify fake seed.	All Provinces
Incorporate farmer choice into variety selection for donor seed projects. Incorporate small-scale, widely replicated varietal trials to empower seed producers and provide farmers with options and a voice in the decision of which varieties are supported through development projects. Support INERA and public extension agents to conduct participatory variety selection for locally developed varieties that are not handled by the private sector (e.g., legumes, small grains, roots and tubers) to learn farmers' preferences for varieties of different crops.	All Provinces
Work with public and private extension agents, the CGIAR centers, and donor seed projects to develop effective extension approaches to promote new seed varieties. The introduction of new varieties must be demand-driven to be sustainable. Public and private sector extension actors should promote new seed varieties through demonstration plots, farmer field days, and fairs. For lower-value staple crops, extension support can include improved planting practices, on-farm maintenance, and pest control, as well as post-harvest technologies. For higher value crops, side-by-side comparisons are effective but must also come with a set of best management practices that are promoted by extension providers. CGIAR centers, researchers, extension	All Provinces

[41] See also the recommendations under Variety Development and Maintenance.

Seed Quality: Varietal Diversity Recommendations[41]	Geography
Long-Term (>7 years)	
leaders, and donors should work together to support an increase in coordination and knowledge sharing among relevant seed projects, such as through an annual knowledge-sharing forum.[42]	

3.4 DONOR COORDINATION AND KNOWLEDGE-SHARING

Distortive impact of seed tenders. The magnitude of seed tenders and the short nature of the tender period — often less than 60 days between the tender release and date for seed to be delivered — has created large profit motive for short-term thinking among seed actors (seed traders, seed producers, local NGOs, international NGOs). For example, an international NGO posted a tender at IPAPEL Ituri offices for 92 metric tons of seed on July 1, 2019 for Djugu Territory with a closing date of July 31, 2019, with the condition that all seed requires a certificate of inspection from SENASEM: 39,100 kg of beans (variety M'sole); 600 kg of maize (variety Bambou); and 52,500 kg potato (variety Cruza). The scale of this tender and the specificity of "certified seed" is virtually impossible to meet.

Tenders are awarded based on price competitiveness as well as on quality. The scale and scope of the tenders puts downward pressure on seed prices, and because quality control mechanisms are limited to physical exams, there is a phenomenon of seed producers competing with local grain markets with respect to meeting the pricing and quality standards of tenders. It has become a widespread practice for seed traders to purchase grain, hire individuals to pick out whole grains, package the selected grains, and offer the packaged grain for seed tenders. Grain procured and selected by this process is usually cheaper than seed produced by a farmer group or individual seed farmer. This makes it hard for the seed producer to compete with the grain market with respect to seed tenders. The large size of tenders also limits the participation of small-scale seed producers. This dynamic undermines efforts to promote seed quality and a private seed industry. As a result, the farmers who need quality seed the most are receiving subpar products. A more realistic tender might, for example, be broken down into smaller lots and specify that Quality Declared Seed is acceptable.

Informal or illegal imports further undermine seed quality. There are significant quantities of seed imported into eastern DRC without official paperwork. NPPO staff indicated that only research organizations (such as INERA, CIAT, and IITA) regularly submit the required import documentation. Separately, all of the private seed importers interviewed stated that they operate through formal legal channels beginning with the request for a plant import permit. Nonetheless, the recorded volumes of seed import and number of seed import permits are so low compared to the approximate volumes known to be present in the region, that it suggests imported seed is rarely subject to any official import declaration. The lack of documentation creates a large opportunity for clandestine and fake seed imports and undermines the capacity for mandated government organizations to generate reliable data regarding seed imports. Stakeholders reported frequent instances of fraudulent repackaging of imported seed, particularly with respect to vegetable seed. Market inspections could reduce some of the fake seed on the market, but SENASEM does not have sufficient staff to conduct regular market inspections nor the legal mandate to prosecute any cases of fraud.[43]

[42] The ELAN RDC project piloted initiatives and models that could be shared and expanded in other parts of the country, such as the One Acre Fund model and Field Agents model.
[43] The Ministry of Trade handles the repression of fraud, and there is not yet an inter-ministerial to define how the two institutions will work together on this issue.

Donor Coordination and Knowledge Sharing Recommendations	Geography
Short-Term (1-2 years)	
Introduce a code of conduct to be signed by all NGOs and international organizations engaged in seed importation. It is suspected, based on the volumes of seed produced in response to seed tenders as compared to the official reports of seed imports, that a tremendous amount of seed enters the country illegally to serve the relief market. Even if this seed has been tested and has met quality standards in Rwanda or Uganda, by entering the country illegally, it weakens the role of the plant protection agencies (DPV and SQAV) and does not enable the DRC to have meaningful seed import statistics on which to make investment and budgetary decisions for the seed sector. NGOs and international organizations engaged in seed procurement could help reduce this practice through a signed declaration of commitment to require that all imported seed be declared at the border and provide the necessary documentation. To incentivize compliance with the code, random spot checks should be conducted and a master list of organizations that properly adhere to the code should be maintained.	Tanganyika, South Kivu, North Kivu, Ituri
Establish private-sector-sensitive guidelines for tenders. Establish a working group of seed sector stakeholders (including producers, NGOs, traders, and SENASEM) to set private-sector-sensitive guidelines for tenders. Potential recommendations may include dividing tenders into small lots (e.g., 500 kg instead of 5,000 kg), encouraging the use of seed vouchers and fairs, and opening seed vouchers and fairs to any seed producer or trader who wishes to participate (provided all seed is properly inspected prior to entering the fair). Tenders should be vetted by the working group or other regional or provincial body before being posted and should adhere to best practice, such as allowing a tender to request certified seed (as opposed to emergency seed) only when it remains open at least 120 days.	Tanganyika, South Kivu, North Kivu, Ituri
Increase coordination and knowledge-sharing among donor seed projects. Establish an inter-agency working group to discuss lessons learned, promote collaboration across projects, and improve practices as related to emergency seed. In 2013-2014, the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) facilitated a seed working group in Goma under the Food Security and Nutrition working group run by the FAO and the World Food Programme (WFP). The seed working group provided a forum for humanitarian actors to discuss emergency seed activities. This group has not been active since 2014 but could serve as model.	Tanganyika, South Kivu, North Kivu, Ituri
Medium-Term (3-7 years)	
Conduct a demand analysis based on established seed assessment methodologies for emergency contexts. Considering the large extent of seed being produced, purchased, and disseminated on behalf of farmers in eastern DRC, it is surprising that there have been no inter-agency seed system security assessments (SSSAs) or inter-agency post-distribution monitoring exercises across different seed sector stakeholders and projects in South Kivu, North Kivu, or Ituri, and the most recent SSSA covering Tanganyika was conducted in 2012. USAID and the FAO both have well-established seed security assessment methodologies and tools that could easily be adapted for eastern DRC and carried out in a participatory manner with stakeholders. Fund an inter-agency seed system security assessment with a focus on the territories that receive significant and repetitive seed project support. The study	Tanganyika, South Kivu, North Kivu, Ituri

should be an inter-agency activity supported by a skilled team of facilitators with demonstrated expertise in the methodology, revising tools for the local context, and training staff and national level counterparts in the methodology and approach. Such a study would provide clear evidence concerning farmer demand, how the emergency context has impacted farmers' capacity to access quality seed, and what types of seed interventions can best address farmer seed demand without undermining the private seed sector. Additionally, either the new Seed Law or a directive should require publication of public sector, donor and NGO seed purchase plans and actual procurements by location, quantity and value. This information will enable seed companies to adequately forecast future demand for their seeds and organize seed production accordingly.	

3.5 DOMESTIC AND CROSS-BORDER SEED TRADE

Despite the daunting range of challenges faced by private sector seed producers described throughout this report, there remains untapped seed market potential, both domestically and for export. Creating the space for sustained private seed sector growth will require a holistic approach including more market-oriented approaches to humanitarian seed distribution, national-level seed policy advocacy, stronger seed research and regulatory institutions, and comprehensive agricultural development strategies in each of the target provinces to transform rural farmers from subsistence-based to commercial agriculture. While acknowledging the multitude of factors that limit domestic and cross-border seed trade, the following recommendations focus on specific investments to improve the competitiveness of local seed producers in domestic and regional seed markets, including specific opportunities in maize, bean, Irish potato, and horticulture.

3.5.1 Maize

As discussed elsewhere in this report, Congolese seed companies need access to hybrid maize varieties if they are to successfully compete against the hybrid maize varieties currently imported from Zambia and South Africa. Maize seed market development in eastern DRC has also been hurt by poor conditioning and storage facilities and the emergence the last few years of lethal maize necrosis and fall armyworm. For lethal maize necrosis, there are tolerant varieties such as ZM series, Bamboo, and hybrids from the Uganda National Agricultural Research Organization, but continued vigilance and screening of new maize germplasm is necessary.

3.5.2 Bean

Bean crops cover a quarter to more than a half of all cultivated area in Lualaba, Tanganyika, South Kivu, and North Kivu (and lesser area in the other two provinces). INERA breeders have already conducted significant research into adapting bean varieties to local conditions. INERA Mulungu in South Kivu alone has worked with 42 varieties, and registration is pending for more than a dozen. Yet these collections sit largely unused and forgotten as development projects work with no more than a handful of bean varieties. At the INERA station in Haut-Katanga, the legumes seed collections were covered in dust and the samples not very homogeneous. These collections have the potential to provide much-needed varietal diversity for farmers adapted to different ecologies and rainfall patterns. Beans are one of the crops for which the commercial potential of the seed (OPV) often does not justify the cost of varietal development or purchase of quality early generation seed by the private sector. Yet the private sector might be willing to take over variety maintenance and production for a well-adapted bean variety with sufficient market demand from farmers.

3.5.3 Irish Potato and Sweet Potato

For Irish potato and sweet potato, the largest constraint is the lack of early generation seed production linked back to clean starter material. There is no capacity to reuse potato planting material, which degenerates due to the preponderance of viruses. This feature of potato production creates a commercial opportunity for clean(er) seed production as less viral load is directly linked to higher yields. In the DRC, there is no functioning tissue culture laboratory for in-vitro clean seed production at the start of the seed production cycle since the tissue culture laboratory at Mulungu last functioned in 1994. Imported potato seed currently enters the DRC in North Kivu from Rwanda and Uganda where no inspections are done to control for quality at the border.

3.5.4 Horticulture

Horticulture seed has strong commercial potential, particularly in the southern provinces where there is significant demand in bigger cities. The production of OPV vegetable seed is not technically difficult, and with 100 percent of the current supply deriving from overseas, there are significant opportunities to promote local production. The current market for horticulture seed suffers greatly from the prevalence of adulterated seed in imported seed packaging, and investments in agro-dealer certification and training are strongly needed to reign in these practices.

Domestic and Cross-Border Seed Trade Recommendations	Geography
Medium-Term (3-7 years)	
Support capacity building for local seed companies and seed producer groups. Provide training in business management, marketing, and technical seed production, storage, and handling. Provide matching grants to private seed companies with a focus on seed companies that sell directly to farmers. Support seed companies and seed producer groups in identifying foreign varieties that are well adapted to the DRC and registering those varieties in the national variety catalog.	All Provinces
Bean. Support INERA in conducting participatory variety selection with farmers for new bean varieties after a multi-location screening of the existing INERA collections at Kipopo and Mulungu. The decision on what varieties to grow should be driven by the community and should include replicated variety trials. Facilitate the delegation of early generation seed production to the private sector under the supervision of INERA and promote QDS seed production.	All Provinces
Horticulture. Promote local production of OPV vegetable seed. To curb the widespread practice of repackaging fake vegetable seed, a strict accreditation process for vegetable seed sellers should be established. Strengthen networking among vegetable seed sellers to reward true sellers and punish those selling out-of-date or adulterated seed. Sponsor a public awareness campaign (radio, posters in markets) to raise farmer awareness of fake vegetable seed and the importance to buy from registered vegetable seed sellers.	All Provinces
Maize. Build domestic capacity in INERA, CRM, and the private sector to conduct varietal maintenance and seed production of maize hybrids. Exploit hybrid lines developed by CRM to give Congolese farmers greater ability to compete against imported hybrids and to benefit from genetic research invested locally. Provide marketing support to local seed companies to encourage development of a domestic market and even regional trade. Promote public-private partnerships, such as the one between CRM and Mbeko Shamba, for the development of new maize varieties to compete in seed local markets. Efforts to promote hybrid varieties should be combined with education for farmers on appropriate management practices and facilitating access to the necessary package of inputs to effectively use these varieties.	Haut-Katanga, Lualaba

Domestic and Cross-Border Seed Trade Recommendations	Geography
Long-Term (>7 years)	
Irish potato. A new tissue culture laboratory should be established alongside other investments in a structured early generation seed production process, including appropriate storage facilities and regular testing in a manner appropriate for the DRC context. Support SENASEM in revising draft regulations for the control of Irish potato seed with specific regulations adapted to ILA's current production of true potato seed in Ituri and Mbeko Shamba's imports of potato micro-plantules in Lualaba. Support SENASEM to devise a potato seed certification scheme under public-private partnership with Mbeko Shamba for prospective potato seed production in Lualaba.	All Provinces
Promote seed export opportunities by facilitating registration of Congolese varieties in regional variety catalogs. Despite the overwhelming balance of seed trade in favor of imports, there is an apparent market for Congolese seed in Zambia, as evidenced by reports of Zambian farmers coming to markets in Haut-Katanga seeking Congolese varieties of maize and bean seed. However, Congolese seed companies currently cannot formally export seed to neighboring countries, as Congolese varieties have not yet been registered in the COMESA and SADC variety catalogs. In the short term, work with INERA and local seed companies to prioritize the registration of Congolese varieties with the greatest export potential in regional variety catalogs.	Haut-Katanga, Tanganyika, South Kivu, Ituri
Promote private sector investment in seed production for export in the DRC. In the long term, the lower costs of production and ample land available for cultivation in the DRC will be a competitive advantage regionally. The challenge will be building sufficient capacity for SENASEM to play a respected certification role for the region. For example, the substantial seed export industry in Zambia has developed in part on the ability of national seed inspectors in Zambia to manage certification at regional standards for a huge amount of seed exports. Interest from private seed companies in the region, who recognize the potential to save 30 percent or more in production costs in the DRC, may finally serve as the catalyst for the public and private investment needed to improve the seed certification process to the level of regional standards.	Haut-Katanga, Lualaba

The **Feed the Future Enabling Environment for Food Security** project is a global support mechanism for Feed the Future-focused and aligned Missions and Washington-based USAID offices to address legal, institutional, and regulatory factors that function as market constraints affecting food security.

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ANNEX I: ROADMAP FOR SEED SECTOR DEVELOPMENT

Figure. 4 Roadmap for Seed Sector Development

SeedCLIR Recommendations	PHASE I		PHASE II					PHASE III							
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
NATIONAL AND PROVINCIAL SEED POLICY															
Work with AGRIPEL, producer associations, the local COPROSEMs, and other interested parties to advocate for legal changes necessary to grant SENASEM the official legal mandate of seed authority.															
Work with AGRIPEL, producer associations, the local COPROSEMs, and other interested parties to advocate for passage of the seed law.															
Advocate for consistent application of the import tax exemption for seed.															
Support the GDRC in the adoption of a national seed policy and strategy.															
Support a full review of the seed regulatory framework and procedures.															
Work with AGRIPEL, producer associations, the local COPROSEMs, and other interested parties to advocate for a Plant Breeders' Rights law, including provisions for the licensing of public varieties by INERA breeders.															
NATIONAL SEED AUTHORITY															
Facilitate knowledge-sharing to improve SENASEM management system and organizational structure.															
Develop an integrated seed information management system to manage all SENASEM functions.															
Build SENASEM's overall capacity to implement the management systems, staff training, facilities, and equipment needed to act as an effective national seed authority and accreditation body.															
Support the establishment of the Technical Commission for Admission to the Catalog and the official release and registration of new varieties in the national variety															

Figure. 4 Roadmap for Seed Sector Development

SeedCLIR Recommendations	PHASE I		PHASE II					PHASE III							
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
catalog following proper DUS testing and storing of a reference sample.		■	■	■	■	■	■								
Strengthen SENASEM's capacity in seed testing and, eventually, the accreditation of private laboratories.		■	■	■	■	■									
Strengthen SENASEM's capacity to implement procedures for the accreditation of third-party seed quality control services.							■	■	■	■	■	■			
SEED QUALITY															
Promote the production of QDS seed where basic seed is not available or where other seed classes are not competitive.	■	■													
Introduce a new category of "emergency seed."	■	■													
Support private variety development and maintenance.	■	■	■	■	■										
Support capacity building in breeding and variety maintenance at INERA, particularly for crops with less commercial potential.				■	■	■	■	■	■	■	■	■	■	■	
Work with public and private extension agents, the CGIAR centers, and donor seed projects to develop effective extension approaches to promote new seed varieties.				■	■	■	■	■	■						
Incorporate farmer choice into variety selection for donor seed projects.				■	■	■	■	■	■						
Promote seed distribution strategies that enable farmer choice.				■	■	■	■	■	■						
DONOR COORDINATION AND KNOWLEDGE-SHARING															
Introduce a code of conduct to be signed by all NGOs and international organizations engaged in seed importation.	■														
Establish private-sector-sensitive guidelines for tenders.	■	■													
Increase coordination and knowledge-sharing among donor seed projects.	■	■													

Figure. 4 Roadmap for Seed Sector Development

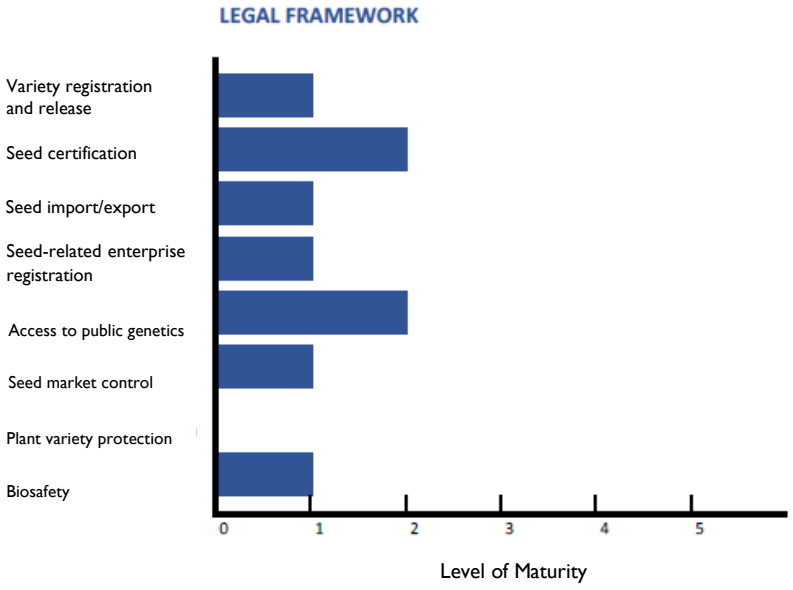
SeedCLIR Recommendations	PHASE I		PHASE II					PHASE III							
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
Conduct a demand analysis based on established seed assessment methodologies for emergency contexts.															
DOMESTIC & CROSS-BORDER SEED TRADE															
Support capacity building for local seed companies and seed producer groups, including specific opportunities in maize, bean, Irish potato, and horticulture.															
Bean. Support INERA in conducting participatory variety selection with farmers for new bean varieties after a multi-location screening of the existing INERA collections at Kipopo and Mulungu. Facilitate the delegation of early generation seed production to the private sector under the supervision of INERA and promote QDS seed production.															
Horticulture. Promote local production of OPV vegetable seed, introduce strict accreditation process for vegetable seed sellers, and strengthen networking among vegetable seed sellers to reward true sellers and punish those selling out-of-date or adulterated seed.															
Maize. Build domestic capacity in INERA, CRM, and the private sector to conduct varietal maintenance and seed production of maize hybrids. Provide marketing support to local seed companies to encourage development of a domestic market and even regional trade.															
Irish potato. A new tissue culture laboratory should be established alongside other investments in a structured early generation seed production process, including appropriate storage facilities and regular testing in a manner appropriate for the DRC context. Support SENASEM to devise a potato seed certification scheme.															
Promote seed export opportunities by facilitating registration of Congolese varieties in regional variety catalogs.															
Promote private sector investment in seed production for export in the DRC.															

ANNEX II. LEGAL FRAMEWORK FOR SEED

With the exception of the outdated General Technical Regulations for Seed Production, Control and Certification for the Major Food and Vegetable Crops of 1997 (Seed Regulations), now in their third draft review, there is no legal framework for seed in force in the DRC. All the legal texts required for a seed sector enabling environment, including the current revision of the Seed Regulations, are in draft form and/or provisionally applied. SENASEM procedures (PATPS) for variety registration, seed certification, and accreditation of laboratories, samplers, analysts, and seed inspectors have been adapted, under a World Bank project, from SADC seed center models. However, SENASEM lacks the organizational capacity and financial and technical resources to apply them. Specific institutions dealing with variety release, such as the Bureau Catalogue National des Varieties (BCNV) or the Technical Commission for Admission to the Catalog (CTAC) seem to exist only in the draft texts – BCNV would be part of an organizational structure of SENASEM not yet defined, and CTAC would be a committee inside the not yet established CONASEM.

A proper Congolese legal and institutional framework for the seed market will need to be drafted by a commission established for this purpose under CONASEM. This framework will require: (1) a well-defined national seed policy and strategy taking into account the needs of all stakeholders and (2) a seed law under which regulations and procedures will be developed as a tool of the national seed strategy. It is not possible to provide the necessary coherence and clarity to the legal framework in the absence of a defined common vision formulated and agreed upon by Congolese seed sector stakeholders, with the support, if necessary, of experienced development partners.

Figure 5. SeedCLIR Measure of the Maturity of the Legal Framework for Seed in the DRC



Source: EEFS Consultant Team.

The following sections analyze the content of the legal framework for all of the key areas of seed regulation, as defined in the draft seed law, draft seed regulations, and PATPS, with respect to their delineation of authority, comprehensiveness and clarity, regulatory burden, and adoption of regional or international norms. Figure 5 shows the level of maturity of the legal framework for each regulatory area as assessed under the SeedCLIR maturity matrix.

Legal Texts Reviewed

- *Proposition de Loi relative a l'activite semencièreen Republique Democratique du Congo* (2017) (Draft Law concerning seed activities in the DRC): **Draft seed law** henceforward.

- *Troisième révision du Règlement Technique Général de la Production, du Contrôle et de la Certification des semences des Principales Cultures Vivrières et Maraîchères* (Third review of the General Technical Regulations for Seed Production, Control and Certification for the Major Food and Vegetable Crops): **Draft seed regulations** henceforward
- *Procedures administratives et techniques des prestations des services du SENASEM, Volume 1* (2015) (Administrative and technical procedures for SENASEM provision of services, **PATPS Volume 1**, 2015): Procedures for seed certification (from registration of seed producers to final lot certification)
- Draft *Manuel des procedures administratives et techniques des prestations des services du SENASEM. Volume 2* (2016) (Draft manual of administrative and technical procedures for SENASEM provision of services, **PATPS Volume 2**, 2016): Procedures for variety registration
- *Manuel des procedures administratives et techniques des prestations des services du SENASEM, Volume 3* (2017) (Manual of administrative and technical procedures for SENASEM provision of services, **PATPS Volume 3**, 2017): Procedures for the accreditation of seed laboratories, samplers, analysts, and field inspectors
- *Décret n° 05/162 du 18 novembre 2005 portant Réglementation Phytosanitaire en République Démocratique du Congo* (2005) (Decree No. 05/162 of 18/11/2005, on Phytosanitary Regulations in the Democratic Republic of Congo).

Additional Legal Texts Referenced in Literature but Unavailable for Review:

In its May 2006 issue, the journal, *La voix du paysan congolais* (No 37, p.4), reported the re-launching of the commission for drafting measures for the implementation of the Agricultural Law (*Commission d'élaboration des mesures d'application de la loi agricole*). The article stated that the commission would continue to review and validate the draft texts listed below concerning seed market regulations. Thirteen years later, none of these draft decrees have been published in the official gazette, and the EEFS consultant team was unable to review their content.

- *Décret n°___du ___ /___ /2013 modifiant et complétant le Décret n°05/ 162 du 18/11/2005, portant réglementation phytosanitaire en République Démocratique du Congo* (TBD) (Decree No ___/___ / 2013 amending and supplementing Decree No. 05/162 of 18/11/2005, on Phytosanitary Regulations in the Democratic Republic of the Congo)
- *Arreté ministériel n°___/ CAB/MIN/AGRIDRAL/2013 du___ /___ / 2013 portant élaboration du Catalogue National des espèces et variétés diffusées en République Démocratique du Congo* (TBD) (Ministerial order on the elaboration of the National Catalog of species and varieties disseminated in the DRC)
- *Arreté ministériel n°___ /CAB/ MIN/AGRIDRAL/2013 du___ /___ /2013 portant inscription des espèces et variétés à diffuser en République Démocratique du Congo* (TBD) (Ministerial order on the registration of species and varieties for dissemination in the DRC)
- *Arreté interministériel n° /CAB/MIN/AGRIDRAL/2013 du ___/___ / 2013 et n°___ /CAB/MIN/FIN/2013 du___/___ /2013 portant fixation de la la taxe à percevoir pour l'inscription des espèces et variétés au catalogue national à diffuser* (TBD) (Inter-ministerial order fixing the tax to be charged for the registration of the species and varieties in the national catalog)
- *Arreté ministériel n° /CAB/MIN/AGRIDRAL/2013 du ___ /___ / 2013 portant modification de l'Arreté ministériel n° 013 CAB.MIN/AGRID/97 du 25/03/1997, portant réglementation technique de la production, du controle et de la certification des semences* (TBD)

(Ministerial order on modification to Ministerial order t n° 013 CAB.MIN/AGRID/97 of 25/03/1997 on technical regulations for seed production control and certification)

- *Arreté ministériel n°___/CAB/MIN/AGRIDRAL/2013 du___ /___ /2013 portant publication de la liste nationale des organismes de quarantaine en République Démocratique du Congo* (TBD) (Ministerial order on the national list of quarantine organisms in the DRC)
- *Arreté interministériel n° / CAB/MIN/AGRIDRAL/2012 du___ /___ / 2012 et n°___/CAB/MIN/RECH/ 2012 DU___/___/2012 portant composition, organisation et fonctionnement du conseil national semencier et de conseils provinciaux semenciers* (TBD) (Inter-ministerial order on the composition, organization and functioning of the National Seed Council and provincial seed councils)

General Aspects

The draft seed law, draft revision of the seed regulations, and the three volumes of SENASEM procedures were drafted independently, under different projects and legislative initiatives. Thus the draft/provisional legal framework lacks internal coherence and is inherently inapplicable in practice. The legal texts need a thorough review to assure that terminology and institutional mandates are properly respected in the following order of importance: (1) draft seed law, (2) draft seed regulations, (3) SENASEM procedures, and (4) SENASEM protocols. Furthermore, the texts should be reviewed for their technical aspects, especially concerning seed sampling and testing.

Some examples of the faults within the draft texts include:

- Article 21 of the draft seed law includes five disconnected paragraphs, and the second and third paragraphs are incomprehensible. The first paragraph refers to the need for official labels on every seed package, the second to storing conditions, the third and fourth to a compensatory fee (meaning unclear), and the fifth discusses label content. The full article should be reviewed.
- The draft seed law uses, in different contexts, the terms "label" and "étiquette" indistinctly. It would be clearer to use only one term or explain the difference between the two terms, if any.

While it seems paradoxical, the main regulatory burden on the DRC seed sector is precisely the absence of a formal regulatory system that could be legally enforced. In this environment, authorities with responsibility in seed markets can only make arbitrary decisions, which creates a high level of opaqueness in the business environment.

According to the introduction of the current draft of seed certification regulations (the third review), the second review, which was made under the project CTB-MINAGRI "Support to the seed sector," endeavored to align the regulations with the SADC HSR. Table 4 compares the current status of adoption of international and regional norms for seed trade in the DRC and neighboring countries.

Table 4. Current Status of Adoption of Regional and International Seed Trade Norms in the DRC and Neighboring Countries

Country	ISTA Membership and Status				OECD Schemes	UPOV Membership	IPPC List of Regulated Pests (3)	PBR Law (2)	Alignment to COMESA STHR (1)
	Individual	Laboratory							
		Name	Status	Scope					
DRC	None	None	-	-	No	No	No	No	No

Table 4. Current Status of Adoption of Regional and International Seed Trade Norms in the DRC and Neighboring Countries

Country	ISTA Membership and Status				OECD Schemes	UPOV Membership	IPPC List of Regulated Pests (3)	PBR Law (2)	Alignment to COMESA STHR (1)
	Individual	Laboratory							
		Name	Status	Scope					
Zambia	2 from SCCI-Official Seed Testing Station	SCCI-Official Seed Testing Station	Accredited	-Cereals and pulses -Grasses -Vegetables -Other agricultural crops	Maize and Sorghum	No	No	2007	Yes
Tanzania	1 from National Seed Testing Laboratory	None	-	-	All schemes	Yes	No	2002	Yes
Angola	None	None	-	-	No	No	Yes	Un-known	Not a member
Uganda	1 from CHEMIPHAR Ltd.	CHEMIPHAR Private seed laboratory	Accredited	-Cereals and pulses -Grasses -Other agricultural crops -Vegetables	-Crucifers and other oil or fiber species -Cereals -Maize and Sorghum -Vegetables	No	No	2015	Yes
Burundi	None	None	-	-	No	No	Yes	2016	Yes
Rwanda	None	None	-	-	No	No	No	2016	Yes

Sources: OECD, International Seed Testing Association, FAO, FAO International Plant Protection Convention, International Union for the Protection of New Varieties of Plants.[44]

Variety Registration and Release

Delineation of authority

Under a draft decree-law to establish the National Seed Council (CONASEM), CONASEM will be responsible for making decisions regarding variety registration applications via one of its two technical commissions, the Technical Commission for Admission to the Catalog (CTAC). In the absence of CONASEM, PATPS Volume 2 includes the terms of reference of CTAC, including its functions and

[44] To access more information, see OECD, *List of Countries Participating in the OECD Seed Schemes*, available at www.oecd.org/agriculture/seeds/documents/list-of-countries-participating-in-the-oecd-seed-schemes.pdf; International Seed Testing Association, *ISTA Members Search*, available at www.seedtest.org/en/members.html; FAO, *FAOLEX Database* available at http://www.fao.org/faolex/en/; FAO, *FAO International Plant Protection Convention* available at www.ippc.int; International Union for the Protection of New Varieties of Plants, *UPOV Members*, available at www.upov.int/members/en/.

composition. Although CONASEM does not yet exist, a provisional CTAC held a meeting in July 2019 to decide on applications for the listing of new varieties and removal of old ones.

PATPS Volume 2 also defines the Bureau of National Catalogue of Varieties (BCNV) within SENASEM as responsible for the management of the national catalog of cultivars grown in the DRC, the conduct of trials (DUS and VCU tests), and the control of varietal purity through "a priori" and "a posteriori" tests. Article 2(d) of the draft seed law requests that the procedures for the registration of plant varieties in the catalog be sanctioned by ministerial order, and Article 11 specifies it should be a joint order of the ministers in charge of research and agriculture. This would leave without effect the mandates of SENASEM and CTAC as defined in the SENASEM draft procedures (PATPS Volume 2) until these are approved by both ministers.

DUS and VAT testing, as specified in the PATPS, are the sole responsibility of SENASEM, which in practice lacks the organizational capacity, expertise, and facilities to put the tests in place. The PATPS do not specifically allow for trials to be entrusted to third-party organizations, nor do they make provision for tests to be carried out privately or for accepting the results from other national seed authorities.

Comprehensiveness and Clarity

The common international understanding of the regulatory function of a variety catalog is the listing of crop varieties that can be traded in a territory. The draft seed law, however, defines the catalog as the list of species and varieties whose seed can be produced in the DRC. The name of the variety catalog (the "National Catalog of Species and Varieties") creates further confusion, as species are not registered in variety catalogs, which would seem to suggest that no seed production is allowed in the country at all. By contrast, the SENASEM procedures for the registration of varieties in the national catalog (PATPS Volume 2) clearly identify only varieties as subject to registration.

Regulatory Burden

The PATPS procedures for variety registration follow international norms and, if applied, would not present an undue burden to the private sector. The current burden is SENASEM's lack of capacity to apply the PATPS procedures, without which variety registration lacks transparency. Under the current practices, SENASEM may request any amount of money for variety registration, based on unknown parameters.

Adoption of Regional or International Norms

In general, the procedures for variety release and catalog (PATPS Volume 2) are based on SADC templates that also conform to COMESA, OECD, and ISTA seed standards (excluding ISTA accreditation and international seed testing certificates) and to a large extent to DUS testing guidelines of the International Union for the Protection of New Varieties of Plants (UPOV).

However, Article 18 of the draft seed law is not compliant with the SADC HSR and COMESA STHR provisions regarding their regional catalogs. Article 18 requires domestic listing of varieties in COMESA and SADC catalogs to allow marketing in the DRC. According to the agreements, varieties in both catalogs should automatically be eligible for marketing in the DRC without further authorization by the GDRC. SADC HSR 2.3.6 and COMESA STHR 29 give the specific conditions under which a member state can apply for permission to prohibit the use of a given variety of the regional catalog in its territory. Article 18 of the draft seed law needs to be reworded to comply with COMESA and SADC seed trade agreements.

In addition, SADC HSR places VCU testing under the responsibility of the applicant and allows third parties to conduct these tests, whereas SENASEM PATPS identifies BCNV as solely responsible for conducting VCU and DUS testing.

Seed Certification

Delineation of Authority

Article 31 of the draft seed law reads: "Quality control and certification activities are carried out at all stages by sworn agents of the Ministry of Agriculture service with seed control and certification under their care." This statement is in contradiction with COMESA STHR and SADC HSR, both of which require field inspectors, seed analysts, and seed samplers to be trained and accredited by the national seed authority. While Article 1 of the draft seed regulations assigns to SENASEM seed control and certification throughout the national territory, it does not give SENASEM all of the powers and responsibilities of a national seed authority pursuant to COMESA STHR and SADC HSR.[45]

The draft seed law also limits the possibility of accrediting third parties to conduct seed certification. For example, in Article 31 (above), where it refers to "by sworn agents of" it should read "by agents accredited by" if accreditation will be allowed. Similarly, Article 4.1.4 of the draft seed regulations states that only official SENASEM inspectors can perform field inspection of basic seed crops. Field inspectors other than SENASEM staff cannot be accredited for the inspection of basic seed crops. Volume 3 of PATPS adopts SADC HSR provisions concerning accreditation of field inspectors, seed samplers, seed analysts, and seed laboratories but does not envision accreditation for official labelling.

Comprehensiveness and Clarity

Article 2(c) of the draft seed law states that the production, import, export, and dissemination of plant-based seeds are subject to quality control.

Classes of Seed

Article 30 of the draft seed law requires all seed intended for marketing in the national territory to be certified under the conditions stipulated by regulations. This means that all seed classes defined in the regulations, including Quality Declared Seed (QDS), are technically considered classes of certified seed.

The definitions of the different seed classes in Article 4 of the draft seed law, particularly those for the R1 (first generation certified seed), R2 (second generation certified seed), and QDS classes, are not homogeneous or coherent, which creates confusion regarding the conditions under which each class can be certified. For example, if QDS is not a class of certified seed, then it cannot be produced from other QDS seed, which is the main feature and purpose of the seed class as originally formulated by the FAO standards.

The definitions of seed classes in Article 3.2 of the draft seed regulations are more consistent with international standards, but could be better defined. For example, chapter 6 of the draft seed regulations only lists seed standards up to Certified R2 seeds yet refers to a class R3. Certified Seed R classes should stop at R1 or maximum R2 in accordance with the draft seed law and with COMESA, OECD, and SADC seed standards. Seed and field standards should also include standards for QDS following international QDS standards based on the FAO's QDS schemes.

Labels

Chapter 6 of the draft seed regulations, which specifies the information required on a seed label, includes certain items that are either unclear or irrelevant for the consumer:

[45] Specifically, SENASEM is not given the requisite responsibilities for variety testing, registration, and release.

- **The weight of the seed lot.** The net weight of the packaging is more relevant to the consumer and is recommended in the SADC HSR as most goods are sold by weight.
- **The origin of the seed.** It is not clear if this refers to genetic origin, farm, or province of production.
- **The "health aspect of the seed."** This characteristic is too subjective; moreover, if the seed is not healthy, it should not have been certified, nor offered for sale.

Crop-Specific Seed Standards

Concerning crop-specific requirements of the draft seed regulations, there is significant room for improvement in terms of coherence, clarity, and technical soundness. This review will not enter into details given the size of the task.

Table 5 presents the availability in PATPS of (1) seed production and control crop specific protocols and (2) DUS testing protocols providing a description of the variety. Both are needed to perform field inspection of seed crops.

Field inspections of hybrid maize seed cannot be performed in the absence of descriptions of the parental lines. The same would apply to composite varieties if the variety is the first-generation offspring of the crossing of components. For the rest of focus crops, the main required procedures for seed certification are available.

Table 5. Availability of Seed Inspection Protocols in the DRC Technical Regulations

Seed Crop	DUS Testing Protocols	Required Background Information for Field Inspection
Maize inbred line	NO	NO
Maize composite	NO	NO
Maize OPV - MISSING	YES	NO
Maize hybrid	YES	NO
Rice	YES	YES
Dry Legumes		
• Beans	YES	YES
• Cowpea	YES	YES
• Soybean	YES	YES
• Groundnuts	YES	YES
Cassava	YES	YES
Sweet Potato	YES	YES
Sorghum		
• OPV	YES	YES
• Hybrid	YES	YES
Potato	YES	YES
Banana	NO	NO
Vegetables		
• Onion	YES	YES
• Tomato	YES	YES

**Required background information for field inspection is: DUS testing protocols and DRC technical regulations for the production, control, and certification of seeds of the main food and vegetable crops (third revision).*

Regulatory Burden

Testing

Article 32 of the draft seed law gives the seed inspector 30 days from sampling to the delivery of the results of laboratory tests. This period is far too long. Daily sampling volumes should be defined in accordance with testing capacity.

SENASEM must sample and certify the quality of final packaged seed. However, the draft seed regulations also require sampling by SENASEM between harvest and conditioning. This type of sampling should only be done at the request of the seed conditioner, which should have access to their own seed testing facilities according to regulations. This requirement creates undue interference by SENASEM in an area that should be the sole responsibility of the seed company.

Labelling

Labelling procedures in the PATPS are unnecessarily complicated and interfere significantly with the operations of the seed company. The procedures require a request for official labels, making up a dossier

for the lot, analyzing the dossier, approving it, printing the labels at SENASEM, and sending the label to the producers. If implemented, this process will likely create a regulatory bottleneck for company operations. Official labels should be under the control and printing of the seed company at the time of packaging, and the certification label should be the identification and the seal required by ISTA rules at the time of sampling. If the seed testing results of the lot do not conform to standards, the labels should be removed from the seed sacks. This procedure would only require SENASEM to assign *a priori* a set of certification label serial numbers to the seed producer or an accreditation procedure for official labelling.

Adoption of regional or international norms

Volume 1 of PATPS, which is based on SADC seed center procedures, attempts to align domestic procedures with the SADC HSR with respect to the registration of seed producers, seed crop registration, field inspection, sampling, seed testing, and labelling. Volume 3 of PATPS adopts SADC HSR provisions concerning accreditation of field inspectors, seed samplers, seed analysts, and seed laboratories.

Seed classes

The certified seed classes as defined in Article 4 of the draft seed law are, in name, the same as the ones defined in SADC HSR. SADC HSR states that "[t]he System will have the following seed certification classes: Pre-basic seed, Basic Seed, Certified Seed (1st Generation), Certified Seed (2nd Generation), and Quality Declared Seed (QDS)" (pg. 4).

Sampling

Seed lot sampling procedures described in draft seed regulations do not follow international common standards. The procedures request two samples from the lot: one for seed testing and another for post-control tests. Normally there should be one single official sample of the lot (the submitted sample). The official sample can later be divided into two or three sub-samples with the use of sample dividers depending on certifications needs. The PATPS adheres more closely to ISTA standards and requires only one sample to be sent.

Similarly, chapter 4 of draft seed regulations contradicts ISTA, SADC, and COMESA standards for the sampling of seed lots. Chapter 4 states: "After the harvest in the field and during conditioning/storage, an official sample is taken from each seed lot *and then* the packages are closed and labeled. This Sampling is done according to the rules of the International Seed Testing Association (ISTA)" (emphasis added). Under international and regional norms, packages must be sealed and labeled *before* sampling. See ISTA Rules Chapter 2, Article 2.5.4.3 and SADC HSR Article 3.3.3, para. 4: "the seed containers should be fastened and sealed at the time of sampling."

Labels

The color of seed certification labels defined in chapter 6 para. 4 of the draft seed regulations does not follow OECD, COMESA, SADC, and globally accepted standards, which, if implemented, would cause significant confusion. In order to conform to regional and international label color standards, label colors defined in the draft seed regulations should be red for certified second generation seed (instead of green) and green for QDS seed (instead of red).

Seed Import and Export

Delineation of Authority

According to Article 25 of the draft seed law, "any import of seeds into the national territory is subject to the issuance of a permit for import or export of seeds by the competent services of the Ministry responsible for of Agriculture, subject to the holding of a prior approval issued by the Minister of Foreign Trade." However, the assignment of this role to a particular competent service is conflicting under current draft law and regulations. Article 27 of the draft seed law defines this competent service as the plant quarantine service (SQAV) of the Ministry of Agriculture ("[q]uality control of imported seeds is ensured

by sworn agents of the plant quarantine service within the Ministry of Agriculture"). However, the phytosanitary regulations currently in force do not refer to a plant quarantine service at all but rather assign all quarantine-related functions to a plant protection service under the Ministry of Agriculture. This confusion in terminology aligns with the team's experience at border checkpoints in the Eastern DRC, where the functions of DPV (plant protection) and SQAV (quarantine) could not be distinguished.

Comprehensiveness and Clarity

Article 2(e) of the draft seed law states "[a]ny seed subject to import, dissemination, or export must be accompanied by a phytosanitary certificate and a quality label and indications of the types of seed." As a general principle, the phytosanitary certificate should only apply in cases of seed import and export. The reference to dissemination (i.e., distribution or diffusion) of seed may lead to confusion and unnecessary burdens.

Article 28 of the draft seed law states that any export of seeds for professional purposes is subject to registration in an exporter register provided for this purpose by the quality control and certification authority. It is unclear what is meant by "seed export for professional purposes" or the need for a registry of seed exporters. If the intention is that every seed export should be registered by SENASEM, it could be expressed more clearly.

The biggest gap in the legal framework for seed trade is the lack of a quarantine pest list. According to the DRC webpage of the International Plant Protection Convention (IPPC), the DRC has not yet defined lists for quarantine or regulated pests. The SADC HSR list of regulated pests for seed could be officially adopted under the Phytosanitary Regulations.

Regulatory Burden

As described elsewhere in this report, the current regulations in force regarding procedures and requirements for seed import do not cause undue burden on the private sector. For example, the absence of a DRC regulated pest list as required by the IPPC is not burdening seed imports, which flow easily into the country on paperwork alone, but at the same time leaves the country unprotected from potential pathogens.

Adoption of Regional or International Norms

Table 4 above presents the membership or affiliation status of the DRC in relation to the main international organizations facilitating international seed trade.

According to the introduction to the draft seed law, it purports to fill any gaps between the DRC's legal framework for seed and its commitments under regional and international agreements. The introduction states: "This law fills the legal gap characterizing the seed subsector in the Democratic Republic of the Congo and fulfills the commitments made to international, regional and sub-regional organizations of which it is a member, notably the OECD, COMESA and SADC, and ASARECA." The text is confusing, as the DRC is not a member of the OECD nor does it participate as a non-member country in the OECD seed schemes for the varietal certification of seeds in international trade. In addition, there are no known commitments based on the DRC's membership in the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) that would need to be addressed by a law.

Most aspects of the regional norms facilitating international seed trade are included in the draft seed regulations. Procedures for variety release and the variety catalog are based on SADC templates that are also compliant with COMESA, OECD, and to a large extent with UPOV procedures for DUS testing. ISTA testing procedures are also adopted, but with no ISTA accredited laboratories in the DRC, exports outside COMESA or SADC will be difficult even after the draft seed regulations are passed. To better integrate with the COMESA and SADC seed markets, the DRC should also adopt their respective common pest lists for seed.

Seed-Related Enterprise Registration

Delineation of Authority

According to the draft seed law, procedures and requirements for registration as a seed producer are set by the Ministry of Agriculture, without which seed production is not allowed. See Article 2(c): "[s]eed production is subject to an agreement issued by the competent services of the Ministry of Agriculture" and Article 67: "[t]he conditions for registration in the register of seed producers are set by order of the Minister of Agriculture." Apart from the requirement for the registration of seed exporters (described above), there are no registration requirements for other seed-related enterprises under the draft law.

Comprehensiveness and Clarity

The draft legal texts use a range of different terminology for the process of registering as a seed producer, which creates unnecessary confusion in what should be a relatively simple process. Article 2 of the draft seed law refers to this this process as "registration in the list of approved seed producers" while the draft seed regulations (Article 2) refer to it as "admission to control." Volume I of PATPS adds further confusion by calling the process a "request of agreement" (démande d'agreage) and using the term "admission to control" to apply to seed crop declaration. PATPS also envisions two different types of agreements, one as a seed production "establishment" and another for seed contract growers. While it is likely that the drafters of the seed law and seed regulations intended to refer to the same list, it would be clearer if the same terminology was used across all legal texts.

Regulatory Burden

Article 3 of the draft seed law defines a seed producer as any natural or legal person regularly registered on the list of approved seed producers held by the relevant department of the Ministry responsible for agriculture. The term "regularly" should be avoided as it is ambiguous and could result in unnecessarily frequent renewals of the registration of seed producers. Article 2.2 of the draft seed regulations foresees the automatic extension of the registration if the seed producer complies with regulations.

The PATPS requires a seed producer to first apply for agreement (the démande d'agreage), then apply annually for admission to control. Only after these two conditions have been satisfied can the producer present a seed crop declaration. This system is inefficient and unnecessarily complicated for the seed producer. The technical requirements under PATPS for the agreement of seed companies are also exceedingly complicated and demanding. They require complete documentation of the quality management systems in place, which would make sense if there is a request for accreditation for self-certification but makes little sense in the context of the DRC where even SENASEM would fail to qualify under these standards.

Adoption of Regional or International Norms

There are no specific requirements in the SADC HSR and COMESA STHR related to seed enterprise registration. However, SADC HSR does require QDS seed producers to be registered under the national seed authority.

Access to Public Genetics

There are no formal procedures or guidelines for private sector access to public genetics in any of the draft texts. In practice, INERA does, at times, informally facilitate the production of basic seed by private companies under its supervision.

Quality Control in the Seed Market

The draft seed law assigns the seed certification authority the tasks of control of the seed market, inspection of sales points, and repression of seed fraud. In the absence of the law, there is no clear authority responsible for this function. SENASEM recently created a bureau for seed market inspection

and seed fraud repression. Before the bureau could begin working, it was closed following the claim of the Ministry of Economy and Trade that repression of market fraud falls under its legal mandate alone. An inter-ministerial decree between the Ministry of Agriculture and the Ministry of Economy and Trade will be needed to clarify the procedures for collaborating on this issue.

At present, there are no quality control inspections of the seed offered for sale in the market. In fact, the ubiquity of fake seeds is the reason given by several seed companies for choosing to suspend their commercial seed business activities in the DRC.

Plant Variety Protection

There is no Plant Variety Protection (PVP) legislation, even in draft form, in the DRC. The draft seed law anticipates such legislation by stating in Article 2(a) that "newly bred varieties are the property of their breeders" and in Article 33 "an organic law on plant variety protection sets the conditions of breeders' rights." However, the draft seed law recognizes intellectual property rights only for new varieties and ignores protection for traditionally bred local varieties. The intellectual property rights associated with the creation of the variety are not defined and, in the absence of a PVP law, cannot be protected. The absence of a PVP law limits the incentives to conduct seed research in the DRC and prevents Congolese farmers from accessing new improved crop varieties.

The DRC is not a member of the Organisation Africaine de la Propriété Intellectuelle (OAPI), the African Regional Intellectual Property Organization (ARIPO), or UPOV. OAPI, ARIPO, and SADC have all developed standard language for PVP laws that could be adapted for the DRC context. The practical implementation of an effective PVP law requires close cooperation with national seed authorities in other countries and access to international variety databases. Joining UPOV will be the only effective approach to protecting plant breeders' rights in the DRC.

Biosafety

The DRC is a party to the Cartagena Protocol on Biosafety to the Convention on Biological Diversity, but there are no references to biosafety in the reviewed legal texts. Biosafety frameworks should be under development as an obligation under the Cartagena Protocol. However, according to the DRC Third National Report on the Implementation of the Cartagena Protocol on Biosafety, there are not specific instruments in place for implementing a national biosafety framework. In the absence of a specific biosafety law and related implementing measures, it is appropriate to state that Articles 7 to 10 of the Cartagena Protocol are not applied in the strict sense of the word. At present, the transit of Living Modified Organisms (LMOs) is not regulated, and it is not possible to bring breeding materials issued from genetic engineering into the country, which limits research capacity in terms of plant breeding.

As declared in the DRC Third National Report on the Implementation of the Cartagena Protocol on Biosafety:

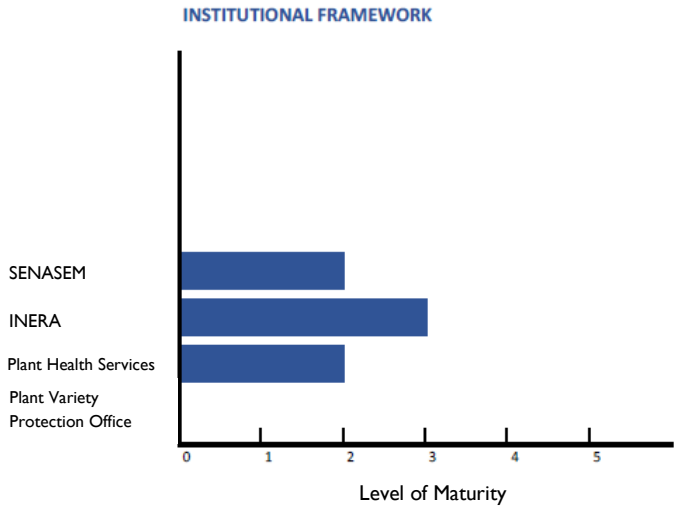
> *With regard to staff permanently assigned to functions related to biosafety, the new organic framework of the Secretariat General for the Environment and Conservation of Nature, approved provisionally, creates within the Department for Sustainable Development, National Competent Authority under the Cartagena Protocol, a new Biosafety Office whose mission is to monitor the implementation of the decisions and recommendations made in the framework of the Meetings of the Parties to the Cartagena Protocol, the management of the national exchange and the monitoring of the implementation of the national biosafety framework.*

ANNEX III: SEED IMPLEMENTING INSTITUTIONS

There are three major institutions working on seed at the national and provincial levels: (1) INERA, under the Ministry of Scientific Research, (2) SENASEM, and (3) DPV and SQAV, which together carry out the functions of a National Plant Protection Organization (NPPO), under the Ministry of Agriculture, Fisheries and Livestock (AGRIPEL). There is no plant variety protection office in the DRC.

Functions concerning the control of seed commerce are under the aegis of the Ministry of Economy and Trade. The import and export of seed are partially regulated by the Office Congolais de Contrôle (OCC), which is also under the Ministry of Economy and Trade.

Figure 6. SeedCLIR Measure of the Maturity of Seed Implementing Institutions in the DRC



Source: EEFS Consultant Team.

The following sections outline the responsibilities, procedures, and resources of the four main seed institutions. Figure 6 shows the level of maturity of each institution as assessed under the SeedCLIR maturity matrix.

1. INERA[46]

The National Institute for Agricultural Research and Studies (INERA) is organized into 15 national programs: five for food crops (maize, cassava, legumes, rice, tuber crops); five for industrial crops (fruits and bananas, cotton, oil palm, coffee, cocoa); two for animal production (livestock, fish farming); and three for support to research (management and conservation of natural resources, conservation of plant genetic resources, research and development). The headquarters of these programs are based at the INERA research centers and experimental stations located throughout the DRC.

At all of the INERA centers and stations, research activities focus primarily on food crops (maize, rice, pulses, tubers). Apart from seed activities carried out through short-term emergency projects, multiyear development programs, and trials carried out in partnership with the International Agricultural Research Centers and the sub-regional networks, research activities are limited to the maintenance of germplasm preserved in situ, with all the associated risks. Research on industrial crops and livestock breeding is currently not being prioritized due to lack of qualified personnel.

In the centers and stations addressed by the EEFS consultant team, there are 84 researchers and research technicians.[47] Most researchers are still in the rank of recruitment (AR-1); the scientific capacity of the researchers is low and Ph.D.-level scientists are rare. As a result, training and retraining needs are even greater.

[46] This evaluation is based on a document produced by INERA in 2013 and has been updated to the extent of the information available during the mission.

[47] There are no INERA research centers or stations in Lualaba or North Kivu provinces.

INERA is responsible for breeding, varietal maintenance, production of breeder, pre-basic, and basic seed, and in practice for the evaluation of varieties through DUS and VCU testing, which is not done by SENASEM. The maintenance of varieties is not performed regularly. The diversity of species and varieties supplied by public agricultural research in the DRC is weak. There is no evidence to show that DUS and VCU evaluations have been carried out before varieties are inscribed in the national variety catalog. INERA is not able to respond to seed producers' demands for pre-basic or basic seed because of lack of funding, which has motivated many scientists and trained technicians to find employment elsewhere or change careers.

Provincial Research Centers and Stations

- **Haut-Katanga: INERA Kipopo Station.** The INERA station in Haut Katanga is located 25 kilometers from the city of Lubumbashi on the Kassapa road, 22 kilometers on the Gulf road, and has an area of 1,500 hectares of which a large part is occupied by a forest and 60 hectares are reserved for food crops. The fish complex is composed of a 35-hectare retention lake and various ponds which occupy 12 hectares. Currently, 55 ponds are operational among the 208 potential ponds at the station. This station also inherited the KANIAMESHI concession (200 hectares), which is located 27 kilometers from Lubumbashi on the Lubumbashi-Kipushi road. This site is essentially a fish research station, but is also involved in food crops and 30 hectares are in operation. In addition, the Kipopo Station administers the Kisanga Station, which is located 12 kilometers from Lubumbashi on the road to Kasumbalesa and has been completely looted by third parties. Kipopo Station houses one research program on fish farming and five program sub-offices: maize, legumes, cassava and tuber plants, resource management, and scientific and technical staff. Current research activities across all crop programs include maintenance and varietal selection; development of new varieties; production of basic seeds; supervision of farmer production practices; and seed systems and gender.
- **Tanganyika: INERA Emiligombe Research Center**. This center is located 30 kilometers from Kalemie. A provincially-appointed center head was accepted by the branch in 2019. A staff of 17 is already in place and will be trained based on the technical and scientific profiles of their positions. The infrastructure of the center is almost non-existent. To be functional, the center will need a building containing an office, a laboratory, and a warehouse equipped with dryers. The center seeks to carry out the following functions: investigating or collecting data on seeds in the province; introducing new varieties and evaluating of their adaptation by comparing them with local varieties and crossbreeding; developing quality varieties and stabilizing them in the province; multiplying basic cuttings of cassava, potato, banana, basic seed rice, maize, beans, groundnuts; and constructing CAPSA in the territories of Moba and Kongolo.
- **South Kivu: INERA Mulungu Research Center.** The Mulungu Research Center is located 32 kilometers from the city of Bukavu, the capital of South Kivu province. The center hosts two research programs: the National Tuber Program (PNRT) and the National Research and Development Program (PNRD). The station is home to eight sub-offices for research programs: Natural Resources Management and Conservation (CBNRM); coffee; breeding; legumes; cereals (rice and maize; fruit and banana; conservation of plant genetic resources; and Unity Research Program on Tuber Plants (sweet potato, potato, and yam).
- **Ituri: INERA Nioka Research Center.** This center is the only structure in zootechnical research that serves the northeastern part of the country and the Orientale province. It is located at an altitude of 1,670 meters and has an area of 12,000 hectares, of which 6,000 hectares is available as pasture for cattle breeding. Ituri is a region with vast agro-pastoral potential. The INERA Nioka Research Center housed the INERA livestock program and served as sub-office for four research programs: tubers; coffee; management and conservation of natural resources; and management and conservation of plant genetic resources. Unfortunately, the INERA Nioka Research Center currently faces extreme difficulties in carrying out its normal operations and

research activities. Following the liberation war (1966) and the aggression war (1998), INERA Nioka suffered immeasurable damage directly from the interethnic war (2001-2003) between the Hema and Lendu peoples, during which all of the germplasm for two widespread species of tubers (potatoes and sweet potatoes) were destroyed. These two species must be revived, and the store that was used for seed storage, destroyed during the war, should be urgently rehabilitated.

Decision-Making

INERA is a public establishment with a working mandate primarily as a breeding institution under the Ministry of Scientific Research.[48] An administrative council manages INERA with yearly budget allocations; the transfer of money has to be done from central direction to the provincial level. Some programs are managed by the center or station at the provincial level. Decision-making requires the collaboration and collegiality between seed sector actors (SENASEM, INERA, the agricultural extension service (SNV), other breeders such as the CGIAR centers (IITA), the University of Lubumbashi, seed producers, and Harvest Plus).

Resources

At all of the stations visited, there is a permanent pressure from the population to occupy the areas ceded by the government to INERA. For most stations, the access roads are in a state of advanced degradation. In all of the stations, nearly all of the buildings have not received regular maintenance and are dilapidated. Most stations have a garage equipped with a mechanical workshop for the repair of vehicles and agricultural machinery; some are equipped with a house generator and/or carpentry shop. However, these garages are no longer functional because they have been emptied of their equipment. The existing generators are out of order or do not work for lack of fuel. Some exceptions exist where there have been contributions from development projects. The absence or poor state of office furniture is a characteristic common to all the stations.

As far as research infrastructure is concerned, the Mulungu and Nioka centers previously housed research laboratories that have been extensively destroyed. Libraries exist in all centers and stations but have not been resupplied for several years. Most of the centers and stations have drying areas, but mobile dryers are non-existent. There are no cold rooms in any of the INERA centers and stations. It is not possible to produce quality seed if the identity of the variety itself is not properly defined and preserved through long-term seed storage or continuous breeding maintenance, and the INERA centers and stations lack the infrastructure to carry out these tasks.

Staff

The staff in place in the centers and stations are insufficient for INERA to accomplish the mission entrusted to it. Indeed, in almost all of the centers and stations, the need for more institutional support is clear but funding commitments have been suspended at INERA as with many other key services of the Congolese government. In addition, the scientific staff in place are generally long-serving public officials who are no longer physically able to carry out fieldwork as per their position. Poor working conditions, including lack of financial resources and a failure to pay salaries on time, have encouraged many younger INERA staff to find alternative employment.[49] A review of the INERA operational staff by service and by research program illustrates the poor placement and understaffing of INERA staff by program and station/center (see Table 6). There is a strong need for increased funding to upgrade working conditions and provide training adapted to the human resource needs for each program, center, or station.

[48] According to the Decree of the Prime Minister n ° 09/46 of December 3, 2009 and in application of the Law n ° 08/009 of July 7, 2008 relative to the Establishments public, INERA is a public institution of a scientific nature. Currently, INERA has a Board of Directors, a Directorate General (DG / DGA), and operates with five centers and five stations.
[49] See État des Lieux des Centres et Stations de l'INERA. Rapport de synthèse, (2013).

Table 6. Number of Scientific Staff by INERA Station/Center and in Public Universities Involved in Seed Sector Research

Institution /Crops	Maize	Rice	Dry Beans	Soybeans	Cowpeas	Sweet Potatoes	Potatoes	Tomato	Onion	Cabbages
INERA Mulungu (South Kivu)	2 scientists (1 of them is a breeder)		5 scientists (2 of them are breeders)		-	4 scientists (no breeders)	-		-	-
INERA Goma (North Kivu)	Only 1 scientist from INERA Mulungu									
INERA Nioka (ITURI)	Only 1 scientist in crop production who plays all the key roles on different crops at the research station									
INERA Yangambi (Tsopo)	4 scientists (2 of them are breeders)		1 (no breeder)		-	-	-		-	-
UEA (Bukavu)	1 PhD breeder scientist	-	-	-	-	-	-		-	-
UCB (Bukavu)	-	1 PhD breeder scientist		-	-	-	-		-	-
UCG Butembo	-	-	-	-	-	1 PhD Breeder scientist	-		-	-
UNIGOMA (North Kivu)	-	-	-	-	-	-	-		-	-
Univ. of Bunia	1 PhD scientist, the domain to be confirmed									

Source: Adapted from État des Lieux des Centres et Stations de l'INERA. Rapport de synthèse. 2013.

Budget

The state budget only covers staff salary, with no allocations for running expenses, national programs, or maintenance of laboratories and equipment. All activities related to seed, such as plant breeding, variety evaluation, and variety maintenance, can only be undertaken under the occasional international cooperation or relief project. These occasional supports to INERA activities do not provide the long-term and sustained funding needed for both variety development and maintenance.

Table 7. Equipment for the Four INERA Stations Visited

Research Station	Province	Research Laboratory	Library	Drying Area	Mobile Dryers	Cold Storage
Nioka	Ituri	Exists, functioning but without capacity for plant health testing	Exists, but no publications	None	None	None
Mulungu	South Kivu	Exists, functioning but without capacity for plant health testing	Exists, but no publications	None	None	None
Kipopo	Haut-Katanga	Exists, not functioning	Exists, but no publications	Exists, not functioning	None	None
Emiligombe	Tanganyika	None	None	None	None	None

Source: Étatsdes lieux des centres et stations de l'INERA (June 2013).

Table 8. Breeding & Early Generation Seed Across the Four INERA Stations Visited

Research Station	Province	Breeding Programs / Activities with Early Generation Seed			
		Roots and Tubers	Maize*	Legumes	Vegetable Seed
Nioka	Ituri	Yes	No	Yes	No
Mulungu	South Kivu	Yes	Yes	Yes	No
Kipopo	Haut-Katanga	No	Yes	Yes	Yes
Emiligombe	Tanganyika	No	No	Yes	No

Source: Étatsdes lieux des centres et stations de l'INERA (June 2013).

**INERA is producing early generation maize seed in North Kivu but not on INERA land.*

Table 9. Technical Staff and Staffing Needs for the Four INERA Stations Visited

Research Station	Province	Technical Staff	Technical Staffing Needs by Staff Category
Nioka	Ituri	13	A0 (1); A1(3); A2 (3); A3 (6)
Mulungu	South Kivu	21	A0 (1); A1(18); A2 (14); A3 (18); G3 (2); L2 (5)

Table 9. Technical Staff and Staffing Needs for the Four INERA Stations Visited			
Research Station	**Province**	**Technical Staff**	**Technical Staffing Needs by Staff Category**
Kipopo	Haut-Katanga	33	A0 (1); A1(18); A2 (14); A3 (18); G3 (2); L2 (5)
Emiligombe	Tanganyika	17	Assessment not available

Source: Étatsdes lieux des centres et stations de l'INERA (June 2013).

Table 9 abbreviations:
AO=Agronomist Engineer (five years of study after secondary school)
A1=Technical Agronomist (three years of study after secondary school)
A2=Agronomist (secondary school graduate)
A3=Agronomist (secondary professional school graduate)
L2=Graduate from a four to five year university program in science, biology, or natural science
Msc=Master of Science (two years of study after L2)

II. SENASEM

SENASEM is the national seed inspectorate and is a service of AGRIPEL. The two main functions of SENASEM are the registration of varieties and seed certification. SENASEM operates under the General Secretary of AGRIPEL at the national level, and there are 10 SENASEM coordination units at the provincial level.

Decision-Making

SENASEM is not empowered to set and consistently apply its own policies and procedures with respect to seed quality control and variety registration. The fact that SENASEM is under the General Secretary and IPAPEL influences its transparency and independence to effectively control seed. The decision-making process and governance at SENASEM are driven by the provincial-level coordinator with what seems to be a low level of participation and strategic input from the other SENASEM staff members. With respect to varietal registration decisions, SENASEM partners with INERA and others seed actors to decide collegially on the basis of available DUS and VCU data.

Rules and procedures allow SENASEM to accredit private or individual inspectors, but with one exception, in practice this is not occurring.[50]

Resources

SENASEM has a national laboratory in Kinshasa, and in principle all provincial-level coordination units have a laboratory. At present, there are five seed laboratories: two in Kinshasa (one at the SENASEM office and another at CEPROSEM that is accredited for vegetable seed analysis) and three others in Bukavu, Goma, and Lubumbashi. These laboratories conduct tests for physical purity, germination, moisture content, and weight of 1,000 seeds. They do not conduct seed health testing. SENASEM does not have a functional laboratory at either the national or provincial level for testing for major diseases and does not work with any accredited reference laboratories to support with testing. The Kinshasa seed laboratory

[50] See a discussion of CEPROSEM in the section on Key Constraints and Recommendations, Seed Quality.

has a cool room for the conservation of reference samples of registered varieties, but the cooling function is interrupted by lack of electricity and/or gasoline for the generator, and the facility does not have a solar power system. Seed testing laboratories are needed for Lualaba, Tanganyika, and Ituri provinces with phytosanitary testing capability and functioning cool rooms.

SENASEM does not have the resources to provide seed inspection services at the scale required by law. In most cases, SENASEM staff have no means of transportation to access seed fields. Many fields are not inspected or certified. The result is that most seed that is identified as certified is actually not quality seed.

There is no database for seed in the DRC, and despite SENASEM having the best source of data nationally and provincially with respect to seed production, none of this data is being put into a database, which makes the utility of the data very low. There is a strong need for an integrated system for the management of seed data that ensures traceability.

Staff

SENASEM lacks young staff, and overall staffing levels are not sufficient in relation to the large territory to be covered. There are currently 33 staff involved in seed control and certification (inspectors and analysts) in Kinshasa, Lubumbashi, Goma, and Bukavu. A total of 156 staff would be needed to extend activities to Kolwezi, Kalemie, and Beni. This is a significant gap in staff coverage and new staff would need to be trained in standard procedures for field inspection and seed testing.

Budget

As with many of the other technical services under AGRIPEL, SENASEM does not receive financial support or an operational budget from the state beyond staff salaries, and only a fraction of staff at the provincial level are considered to be official government employees. Most provincial level staff are compensated through fees for field inspections, which are paid by seed producers. This structure makes it impossible for SENASEM to credibly and independently deliver its mission. Some additional funds from development projects cover logistical and transport costs for visits to seed fields, but rarely do projects support institutional costs at the provincial level.

III. National Plant Protection Organization (DPV and SQAV)

Two institutions, DPV and SQAV, today fulfill most of the functions of a NPPO in the DRC. DPV is a service under AGRIPEL responsible for managing the agricultural production and plant protection units and providing certificates for the import, export, and internal movement of seed and planting material between provinces. SQAV, nominally the quarantine service, lacks basic equipment and legal frameworks (e.g., a national pest list) with which to carry out its function. In practice, the team was unable to distinguish between the roles of SQAV and DPV at various border postings. Both institutions are organized at both the national and provincial levels under AGRIPEL and IPAPEL, respectively. Accordingly, for purposes of this report, these institutions are referred to collectively as the NPPO.

The NPPO in the DRC is not fully functional. The DRC is a signatory of the International Plant Protection Convention (IPPC), the international treaty to secure coordinated and effective action to prevent and control the introduction and spread of pests of plants and plant products. IPPC defines NPPO as the official service established by governments to fulfil the functions specified by the IPPC, the acronym and definition is retaken on SADC and COMESA seed trade agreements. Non-functioning aspects of the DRC NPPO include: pest risk management and defining and updating the regulated pest list; clear procedures for required inspection and testing; and insufficient laboratory capacity and testing for issuance of international phytosanitary certificates.

The mandate of the NPPO was previously granted to the Direction de Production et de Protection des Végétaux (DPPV), the plant protection service of AGRIPEL, as designated in the DRC Phytosanitary Regulations of 2005. The functions of the DPPV as described to IPPC were:

- Elaborating the legislative and regulatory framework relating to the homologation and the certification of the inputs needed for crop production (fertilizers and pesticides)
- Standardization and labeling of agricultural products
- Defining the rules of hygiene with regard to plant products (both raw and processed)
- Ensuring the strict application of regulations
- Organizing the control of the circulation of inputs (fertilizers and pesticides) and plant products at the borders and in the interior of the country
- Organizing the control and inspection of processing units of public and private plant products
- Participating in the activities of international phytosanitary regulatory bodies
- Organizing and coordinating the fight against plagues related to crop pests

Table 10. Phytosanitary Control and Plant Quarantine Posts in the Six Target Provinces of Eastern DRC

Lualaba	Dilolo
	Kolwezi
Haut-Katanga	Likasi
	Lubumbashi
	Kalumbalesa
	Mekambo
	Sakani
	Kasenga
	Pueto
Tanganyika	Moba
	Kalemie
S Kivu	Ubiru
N Kivu	Goma
Ituri	Kasindi
	Mahabi
	Aru

Source: Official data submitted by the GDRC to the IPPC

Standard NPPO functions constituted a small part of the broader DPPV mandate. The DPPV functions have now been split between three separate departments: DPV for plant protection, DPP for plant production, and DAI for agroindustry. NPPO claims to have a presence at the border points in the target provinces listed in Table 10.

Decision-Making

Governance and transparency within the NPPO are hard to establish, as most decisions are made by the general secretariat and the NPPO (DPV) director in Kinshasa, or occasionally by the IPAPEL inspector at the provincial level. The NPPO is not empowered to set and consistently apply its own policies and procedures with respect to the regulation of international seed trade, staff availability, and other related resources, and decision-making is driven by resource constraints.

NPPO processes for issuing certificates related to seed import, export, and internal movement are clear, but in practice the NPPOs issues a very limited number of certificates because most seed entering the DRC is not declared and enters in a clandestine fashion, even when it is imported by donor-funded projects. Only seed associated with research programs – such as from CGIAR centers or national research networks – regularly follows the NPPO norms and documentation requirements for importation or internal movement.

Resources and Staff

The NPPO is supposed to control all seeds and planting material crossing the border or circulating within the national territory, but due to insufficient and under-trained staff and multiple entry points along the DRC's borders with neighboring countries, most imports are not controlled. NPPO

inspection is limited to verification of import documents, as they do not have the equipment or staff to check the quality of imported seeds or planting materials. This limitation creates the risk that infected or poor quality seed will enter the DRC. In many cases, importers can change labels without the knowledge of the NPPO. Computers and software adapted for recording seed import data to ensure traceability are not available.

Regarding the staff recruitment process, most of the NPPO staff are long-serving, and there is a lack of younger staff. However, some young staff were recruited with World Bank support to rejuvenate public sector institutions in the DRC.

Budget

As mentioned by NPPO staff at the national and provincial levels, no budget from the GDRC is allocated to its service, and the fees paid for import permits are insufficient to cover operating costs.

ANNEX IV. LIST OF STAKEHOLDERS CONSULTED

Table 11. Stakeholders Consulted — Kinshasa			
Name	**Organization**	**Title**	**Location**
Evarist Boshab Bompering	AGRIPEL	General Secretary	Kinshasa
Kandu Kasongo Clément	SENASEM	National Coordinator	Kinshasa
Willy Kaja	SENASEM	Deputy Coordinator	Kinshasa
Kisopa Ndjubu Sylvain	SENASEM	CD Catalogue National	Kinshasa
Kalala Bwanga	SENASEM	CB Controle Autres Filières Semencières	Kinshasa
Kinyamba Toko Jérome	SENASEM	CB Contrôle Filière Maraichères	Kinshasa
Daniel Lunza	INERA	Chercheur	Kinshasa
Daniel Dibwe	INERA	Chercheur	Kinshasa
Ignace Guka	SNV	Director of Extension	Kinshasa
Sylvain Bidiaka	HarvestPlus	Country Manager	Kinshasa
Willy Tata-Hangy	IITA	Research Associate	Kinshasa
Antoine Frangoie	IITA	Research Associate	Kinshasa
Dan Sumbu	IITA	Research Associate	Kinshasa
Sikirov Mawitala	IITA	Plant Breeder	Kinshasa
Pierre Bukasa	UNAGRICO	Président	Kinshasa
Jaqueline SADEL	UNAGRICO	Experte en Contrôle	Kinshasa
Kabeya David	UNAGRICO	Ingenieur Agronome Semencier	Kinshasa
Pierre Mangila	UNAGRICO	Expert en Homologation	Kinshasa
Yengo Jean Marie	UNAGRICO	Responsable Provincial Kinshasa	Kinshasa
Ndundi Lepis	UNAGRICO	Relation Publiques	Kinshasa
Lufuankenda	UNAGRICO	Vétérinaire	Kinshasa
André Mathunabo	CARITAS	Ingenieur Agronome	Kinshasa
Katanga Sylvain	CARITAS	Coordinateur de Projet	Kinshasa
Michel Ngongo	FAO	Chargé de Programme	Kinshasa
Sabi Oleko	FAO	Consultant National	Kinshasa
Elofa Junior	FAO	Chargé des Opérations d'Urgence	Kinshasa
Phemba Phezo	FAO	Chargé des Projets	Kinshasa
Bernard Musangu wa Mukendi	ELAN RDC/DAI	Ingenieur Agronome	Kinshasa
Aboubacar Guindo	WFP	Program Officer	Kinshasa
Valeriane Ndena	WFP	Program Policy Officer	Kinshasa
Bienvenue Kubindana Ekou	CEPROSEM	Directeur Technique	Kinshasa

Table 12. Stakeholders Consulted — Haut-Katanga			
Name	**Organization**	**Title**	**Location**
Kakudji Baudouin	Ministry of Agriculture	Provincial Inspector	Lubumbashi
Ngandu Jean Felix	SENASEM	Coordonateur Provincial	Lubumbashi
Luhembwe	SENASEM	Inspecteur Semencier	Lubumbashi
Kazadi Nay Watene Stéphane	SENASEM	Inspecteur Semencier	Lubumbashi
Kasanga Lenge	SENASEM	Inspecteur Semencier	Lubumbashi
Kabol Musul	SQAV	Coordonateur Provincial	Lubumbashi
Ir Kalenga Kalle	SNV	Coordonateur Provincial	Lubumbashi
Kitungwa Mbaye	SNV	Agent	Lubumbashi
Ms. Louise Chinish	CTD	Coordinator	Lubumbashi
Ms. Tshela Kabanishi	MIMOSA	Director	Lubumbashi
Ms. Ange Kanonga	MIMOSA	Manager	Lubumbashi
Ms. Helène Divova	MAYDIVE	Coordinator	Lubumbashi
Kabey	INERA-Kipopo	Chef de Station	Lubumbashi
Iluna Maloba	INERA	Chef d'Antenne Legumineuses	Lubumbashi
Lucien Nyembo	Université de Lubumbashi	Faculté d'Agronomie	Lubumbashi
Aram Ng'ombe	Seed-Co	Regional Sales Manager	Lubumbashi
Kilumba	CRM	Directeur Général	Lubumbashi

Table 13. Stakeholders Consulted — Lualaba			
Name	**Organization**	**Title**	**Location**
Louise Ilunga Mweleshi	IPAPEL	Ministre Provincial de l'Agriculture	Kolwezi
Tshinyeta Valentin	IPAPEL	Inspecteur Provincial de l'Agriculture	Kolwezi
Kireru	SAGRICIM	Chef de Ferme Semencière	Lubudi (rencontré à Lubumbashi site très éloigné pas possible de visiter à cause de la courte durée de la mission)
Walter Coutenier	MBEKO SHAMBA	Chef de Ferme Semencière	Fungurume
Mme Gisele Kaji	Extension Mimosa au Lualaba	Agriculteur Contractuelle de Mimosa	Hinterland de Kolwezi

Table 13. Stakeholders Consulted — Lualaba			
Name	**Organization**	**Title**	**Location**
Tshishiku Jean Pierre	Agronome chargé de la production de semence de base	Mimosa	Hinterland de Kolwezi
Dr. Tshibangu	Agrovet MEGA	Agro-Dealer	Hinterland de Kolwezi

Table 14. Stakeholders Consulted — Tanganyika			
Name	**Organization**	**Title**	**Location**
Pr Lwamba Balimwacha Jules	Ministère provincial de l'Agriculture, Élevage, Environnement et Développement Rural, Province du Tanganika	Ministre Provincial de l'Agriculture, Élevage, Environnement et Développement Rural	Kalemie
Banza	IPAPEL	Inspecteur Provincial de l'Agriculture	Kalemie
Nyange Augustin	SENASEM	Analyste Semencier	Kalemie
Tambwe Muningilwa	SENASEM	Inspecteur Semencier	Kalemie
Serkali Maliba Alimasi	INERA	Chef de Station	Kalemie
Serge Kongolo	INERA	Chef de Bureau Intendance	Kalemie
Kaboza Yamba Yamba	INERA	Administratif et Financier	Kalemie
VALENTINE N. ALOBWEDE	Food for the Hungry	Program Manager	Kalemie
Augustin Moonde	Food for the Hungry	Assistant Program Manager	Kalemie
Markus Berggren	GIZ	Chef de Projet	Kalemie

Table 15. Stakeholders Consulted — South Kivu			
Name	**Organization**	**Title**	**Location**
Ben Lentz (met Mergo Mbeya Deputy CEO)	Tetratech FFP-funded project	CEO	Bukavu
Jean Daniel and his food security team	Mercy Corps	CEO	Bukavu
Filbert LEONE by Skype	FH	Food Security Manager	Based in Bukavu but in Kalemie during field mission
Jonathan Byakombe and his Deputy Coordinator	SENASEM South-Kivu	Coordinator	Bukavu

Table 15. Stakeholders Consulted — South Kivu			
Name	**Organization**	**Title**	**Location**
Antione Lubobo Kanyenga	Harvest Plus	Coordinator and National Representative	Bukavu
Nocy Kijana and her team (Nzama Jaimbo, Eloi Cinyabuguma, Ruffine Batumike)	INERA	Research Center Director	Mulungu, Bukavu
MUHIGIRWA SANGWA	IPAPEL Sud-Kivu	Inspector	Bukavu
Herman Mutabataba	AGRIFORCE, ADVS, COPROSEM	Coordinator	Bukavu
Flory Mbolela	FAO	Bukavu Officer	Bukavu
Etienne NGOMA MAKIDI	COMEXAS AFRIQUE	Former MIDEMA Agri Maintenance	Bukavu
Eulethere Musege	FEC South-Kivu	Responsible Agri	Bukavu
Mali Lutombo	Maison ISANDA	Coordinator	Bukavu
BugandwaJean marie	ASOP	Food Security Manager	Bukavu
Kadahano Mugaruka	COPAM	Coordinator	Bukavu
Neto Mwendilungu	UEFA	Field Assistant	Bukavu
Vumilia Byamungu Veronique	APAFED	Coordinator	Bukavu
Pilipili Muzerwa pascal	Sensasem South-Kivu	Inspector	Bukavu
Tunga lwano Raymond	SENASEM South-Kivu	Inspector	Bukavu
Mudwanga Elisée	GAP KIVU	Coordinator	Bukavu
Osée Mundola	Fonimis	Director	Bukavu
Faraja Lunye Lunye	SARCAF	Field Assistant	Bukavu

Table 16. Stakeholders Consulted — North Kivu			
Name	**Organization**	**Title**	**Location**
KENDA KENDA Jean Bosco	SENASEM North-Kivu	Coordinator	Goma
Fikiri Henri	SENASEM North-Kivu	Inspector	Goma
Paterne Mbilizi	SENASEM North-Kivu	Inspector	Goma
Audry MUKE	INERA point focal NK	Researcher	Goma
Ngongo Mulangwa Laurent	FAO	Food Security Manager	Goma
Adolphe	WFP	Food Security and Nutrition Coordinator	Goma
Eddy	Caritas	Program Manager	Goma

Table 16. Stakeholders Consulted — North Kivu			
Name	**Organization**	**Title**	**Location**
Ngango Bahati André	AGROVET	PDG	Goma
Guy MAUNGA	SQAV NK	Coordinator	Goma
Buhendwa Nathalie	Ets Buh	Coordinator	Goma
Baraka	Ets Baraka	Coordinator	Goma
Faida Shingwa	NASECO	Coordinator Goma	Goma
Alfred Mutundi	Consultant TASSAI	Consultant	Goma
Akilimali Benjamin	Ets Enth Business	Coordinator	Goma
AMANI NK	Ets AMANI	Coordinator	Goma
Alfonse Amundala Tambwe	Ets ALFO Trading	Coordinator	Goma
Tshongo Mwamini	Job Seed Company	Coordinator	Goma
Jean Baptiste Kimana	Ets SEMKI	Coordinator	Goma
Paul MUHASA and his collaborator	CEDERU	Coordinator	Goma

Table 17. Stakeholders Consulted — Ituri			
Name	**Organization**	**Title**	**Location**
Bonaventure Lokadi	IPAPEL Ituri	Inspector	Bunia
Moise Muhindo	FAO Ituri	Ituri Officer	Bunia
Gabrielle UZELE	SENASEM Ituri	Coordinator	Bunia
Yenga Posho	SENASEM Ituri	Monitoring and Evaluation	Bunia
Kandole Jean Pierre	SENASEM Ituri	Certification Service	Bunia
Robert Bisangbulu	SNV Ituri	Assistant	Bunia
Jules Amegowa Lendunga	DPPV	Chief of Service	Bunia
Floribert Losinu	SNV	Coordinator	Bunia
Richard Mamolodya	SNV	Extension Service	Bunia
Consolée Nzani Machozi	SNV	Agri-Supplies Service	Bunia
Jean Corneille Beyono	SQAV	Coordinator	Bunia
Désiré Shabani Mashukuru	DPPV	Service Chief	Bunia
Nicolai Rodeyns	NASECO seeds	Managing Director	Bunia and Kampala
Roger	NASECO seeds	Ituri Coordinator	Bunia
Dr. Katunga Musale	INERA NIOKA	Director	Nioka
Beatrice Bive	AMAB	Coordinator	Bunia
Baudouin PIRONG'HA	RIMA	Coordinator	Bunia, Mahagi

Table 17. Stakeholders Consulted — Ituri			
Name	**Organization**	**Title**	**Location**
Mbulula	Ets MB	General Director	Bunia
Dr. Simon Mandro	BEAD	Coordinator	Bunia, DJUGU
Mme Louise Baraka	Ets Baraka Ya Mungu	Coordinator	Bunia
Jimmy BASARA	Ets Green House	Field Assistant	Bunia

ANNEX V. BRIEF HISTORY OF DONOR ENGAGEMENT IN THE DRC SEED SECTOR

There is a long history of donor engagement in the DRC seed sector, including significant investments from the World Bank, UNDP, FAO, the Belgian Technical Cooperation, African Development Bank, and more recently DFID. Beginning in the late 1980s, donors supported the establishment of government-run seed farms in eight areas around the country. In the 1990s, this approach shifted towards support for the privatization of the sector, which continues to this day.

Despite numerous seed sector investments, donor impact has been muted by a lack of continuity. Recurrent instability in the country has limited the confidence of donors to carry out actions in the medium and long term. Instead of a coordinated approach supported by a national seed strategy, seed sector investments are governed by short-term donor projects. Synergy between projects is weak, and the lack of long-term investment in institutional capacity building reduces the impact of investments in staff training or capital improvements. For example, a recent World Bank project helped draft sound administrative and technical procedures for SENASEM, yet the institution has no capacity to implement them. In another instance, a donor-funded cold chamber for storing variety reference samples that was installed in a SENASEM facility is now being used as storage room. Finally, donors are supporting updates to the initial national variety catalog, produced by a Belgian project in 2012, despite the lack of sufficient testing data to properly identify the varieties under evaluation.

Given the weak state of the sector, the GDRC has been reluctant to withdraw completely from seed production and distribution. For example, the GDRC regularly purchases and distributes free seed as part of annual agricultural programs. In addition, seed interventions have become a regular component of the frequent donor humanitarian and agricultural emergency programs in the eastern DRC, which creates pressure to promote seed production for humanitarian tenders regardless of SENASEM's capacity to ensure seed quality.

In the absence of quality controls, private seed traders position themselves to seize market opportunities while ignoring the necessary rigor attached to the production and sale of quality seed. Producers of high-quality seed cannot compete, and the seed bought and distributed by donor projects and government programs is generally of very poor quality. Most farmers, whose main interaction with commercial seed is through free government or donor handouts of substandard seed, see little reason to spend money on commercial varieties and continue to follow traditional seed-saving and subsistence farming practices.

The establishment of a seed marketing chain requires continuous and concerted action by donors and the GDRC, backed by legislation that protects seed producers and farmers, as well as strengthening of the capacities of the major seed regulatory institutions, including sustainable budgets, better organization, and staff training. In addition, donors need better mechanisms for sharing lessons learned to ensure the mistakes of the past can be avoided and to create institutional memory despite short program cycles.

The following sections, while by no means an exhaustive review of donor engagement, briefly summarize some of the key donor investments in seed sector development in the DRC over the past 30 years.

I. 1980s

Initial support for the seed sector was provided by the UNDP, FAO, and World Bank through the IDA/1609/ZR and PNUD/ZAI/83/003/CM projects. These investments led to the creation of the National Seed Fund within the Ministry of Agriculture (BUNASEM) in 1987. The projects established eight seed farms equipped with means of production and packaging.[51] Initially, these entities were established by

[51] The eight seed farms comprised the following: 1. Lombo in Bas Congo, 2. Mpoyi in Kasai Oriental, 3. Lusanga in Bandundu, 4. Sagricim and 5. Fungurume (Mbeko Shaba) in Katanga, 6. Dingila in Eastern province, 7. Bili in Equator province, and 8. Kisamba in Maniema.

BUNASEM with the exception of the Katanga farm, which was privately held. Cereal production took place directly on the farm, while other crops, such as legumes, were produced by farmers under contract.

While seed production was easily mastered, a bottleneck quickly developed in seed sales as the farms lacked a commercial strategy to generate access to the seed for small farmers. These foundational investments in the seed industry did not survive as subsequent politico-military events led to looting and the suspension of donor investment in the DRC.

II. 1990s

Investment in the seed sector resumed in 1992 with the FAO ZAI/92/002 (Assistance to Seed Production) project and the 1996 FAO ZAI/96/0 (PNASAR) project. These projects recommenced seed farm production with a focus on production for commercialization, the strengthening of seed control and certification, and initial establishment of SENASEM facilities in some provinces. The original seed farms were privatized, and the projects funded varietal maintenance, varietal diversification, and even the creation of hybrid lines.

In 1996, the UNOPS National Program Approach to Food Security and Rehabilitation began, for which seed was a subprogram among others such as agronomic research, extension, agricultural feeder roads and agricultural mechanization. Before it could really get underway, the program was cut in 1997 with the overthrow of Mobutu.

III. 2000s

After a period of inactivity, cooperation between the DRC and its development partners resumed in 2002. Financing from the World Bank made it possible to start a multisectoral program of rehabilitation and reconstruction (PMURR), which included a substantial agricultural and seed component. This program affected the Sud-Ouest block controlled by the Kinshasa government at the time. The program had sub-components for seed, small livestock, and rural roads. Under the seed component, the program supported private operators in establishing seed companies or NGOs for seed production. The program facilitated engagement with provincial agricultural inspectorates and SENASEM and provided funding and local technical support. Despite some positive results, there was no continuity after the program ended.

The resumption of bilateral cooperation between the DRC and its historical partners, such as the Belgian Technical Cooperation (BTC), made it possible to implement two structural projects to support capacity development for SENASEM and INERA from 2006 to 2013. The Seed Selection Support (ASS) project helped to restore SENASEM's certification capabilities by establishing a national laboratory and 10 provincial laboratories, training seed inspectors and analysts, publishing an initial national variety catalog, and supporting the first draft of a seed law. The Plant Production Support (APV) project re-equipped a limited number of INERA stations (including Nvuazi, Kiyaka, Ngandajika, Kipopo, and Yangambi) to support the varietal maintenance and basic seed production needs for the ASS project.

During the same period (2006-2012), the African Development Bank funded the Agricultural and Rural Sector Rehabilitation Project (PRESAR) project, which focused on infrastructure (rural roads, storage depots, and the construction of markets), rural equipment, and support to seed groups in the provinces of Bas Congo and Bandundu.

IV. 2010s

In the past decade, the CGIAR centers (including IITA and Harvest Plus) have supported INERA in the production of basic seeds, as well as the introduction of new varieties of maize, beans, and cassava tailored to specific nutritional or phyto-pathological objectives.

The UK Aid-funded ELAN RDC project (2015-2018) supported the promotion of variety maintenance and basic seed production by the private sector through APSKA, an association of Katanga producers,

under the supervision of INERA. The project also strengthened private sector marketing techniques and facilitated the establishment of COPROSEMs in Katanga and the Kivus.

From 2013-2019, the World Bank implemented the West Economic Growth Pole (PDPC), which took a value chain approach to the development of the cassava, oil palm, and rice sectors in the Kongo Central. The project established farmer cooperatives that source seed from existing seed producers in the region who in turn received basic seed from INERA. The raw materials from the farm fed into a processing chain for value-added products such as palm oil, milled rice, and cassava flour.

In eastern DRC (including North and South Kivu, Ituri, and Tanganyika provinces), the World Bank currently implements the PICAGEL program, which promotes seed production with the support of SENASEM and INERA for the production of basic seeds.

ANNEX VI. REFERENCE DATA ON SEED SYSTEM SIZE AND PERFORMANCE

Seed data in the DRC is scarce, and different sources of the same information often conflict. Nonetheless, the EEFS consultant team was able to gather certain statistics from the different datasets collected by SENASEM, INERA, seed producers, and development project implementing organizations. These data are included below, along with their sources.

HAUT-KATANGA

Table 18. Certified Seed Production R1, 2018-2019 (Hectares)

Seed Producer	Maize	Maize Harvest +	Rice	Bean	Bean Harvest +	Groundnut	Soybean	All Crops
AFME	10	-	-	-	-	-	-	**10**
Bon Berger	10	-	-	-	-	-	2	**12**
MAYDIVE	4	-	-	-	-	1.5	3	**8.5**
MIMOSA	20	-	-	2.5	-	3.5	1	**27**
SOURCE	10	-	-	-	-	-	-	**10**
NYOTA	6	-	0.8	-	-	-	1.5	**8.3**
Safari International	1.5	-	-	-	4	-	-	**5.5**
MAISON SINAI	4	-	-	-	-	-	-	**4**
FERKAL	-	3	-	-	2.5	-	-	**5.5**
ITAK/KATANGA	-	-	-	3	-	-	-	**3**
INERA/KIPOPO	-	1	-	-	-	-	-	**1**
ELIORE	-	3	-	-	1	-	-	**4**
SOD/SAFARI	-	-	-	-	4	-	-	**4**
Total	**65.5**	**7.0**	**0.8**	**5.5**	**11.5**	**5.0**	**7.5**	**102.8**

Source: SENASEM field inspection data.

Table 19. Certified Seed Production R1, 2017-2018												
Seed Producer	Maize		Rice		Bean		Groundnut		Soybean		All Crops	
	Area (ha)	Seed Production (t)	Area (ha)	Seed Production (t)	Area (ha)	Seed Production (t)	Area (ha)	Seed Production (t)	Area (ha)	Seed Production (t)	Area (ha)	Seed Production (t)
AFME	10	25	-	-	-	-	-	-	-	-	10	25
Bon Berger	10	25	-	-	5	5	-	-	2	3	17	33
CTD	1.5	3.8	-	-	-	-	-	-	-	-	1.5	3.8
MAYDIVE	4	9.5	-	-	-	-	1.5	2.1	-	-	5.5	11.6
MIMOSA	20.5	56.3	-	-	-	-	-	-	2.5	3.8	23	60.1
SOURCE	5	10	-	-	-	-	-	-	3	3	8	13
SINAI	3	6	-	-	-	-	-	-	-	-	3	6
NYOTA	6	14	1.5	2	-	-	0.5	0.2	1.5	1	9.5	17.2
CRM/OP UMOJA	2	3	-	-	-	-	-	-	-	-	1.5	3
INERA/KIPOPO	3	6	-	-	-	-	-	-	-	-	3	6
ITAK/KATANGA	-	-	-	-	3	2.4	-	-	-	-	3	2.4
Total	**64.5**	**158.6**	**1.5**	**2.0**	**8.0**	**7.4**	**2.0**	**2.3**	**9.0**	**10.8**	**85**	**181.0**

Source: SENASEM field inspection data.
Table 19 abbreviations: ha=hectares, t=metrics tons.

Table 20. Certified Seed Production R1, 2016-2017													
Seed Producer	Maize			Rice		Bean		Groundnut		Soybean		All Crops	
	Area (ha)	Seed Production (t)	Unsold Seed (t) *	Area (ha)	Seed Production (t)	Area (ha)	Seed Production (t)	Area (ha)	Seed Production (t)	Area (ha)	Seed Production (t)	Area (ha)	Seed Production (t)
AFME	8	10	8	-	-	-	-	-	-	-	-	**8**	**10**
Bon Berger	18	47	20	-	-	5	4.2	-	-	-	-	**23**	**51.2**
ITAK	-	-	-	-	-	5.5	7.4	-	-	-	-	**5.5**	**7.4**
MAYDIVE	5	15.8	1.5	-	-	-	-	3	3.8	2.3	2.9	**10.3**	**22.5**
MIMOSA	33	89.3	46.5	-	-	-	-	-	-	1	1.5	**34**	**90.8**
NYOTA	6	13.2	6	1.5	1.4	-	-	0.5	0.2	1	1.3	**9**	**16.1**
SOD/Safari	2	5.2	-	-	-	-	-	-	-	-	-	**2**	**5.2**
Sinai	2.5	2	-	-	-	-	-	-	-	-	-	**2.5**	**2**
Source	5	12.2	5	-	-	-	-	-	-	-	-	**5**	**12.2**
Total	**79.5**	**194.7**	**87**	**1.5**	**1.4**	**10.5**	**11.6**	**3.5**	**4**	**4.3**	**5.7**	**99.3**	**217.4**

Source: SENASEM field inspection data
** Tons of 2016-2017 seed production, carried over, retested, and re-certified in 2018*
Table 20 abbreviations: ha=hectares, t=metrics tons.

SOUTH KIVU

Table 21. INERA Mulungu: Varietal Development Partnerships for Target Crops			
Crop	**Number of Varieties Developed**	**Source of Germplasm**	**Funding Partner and Year**
Maize	20 (4 have been registered)	CYMMYT Kenya, Uganda NARO	AGRA (2016)
Soybean	2	IITA	Nitrogen for Africa (N2A) (2012)
Irish potato	4 (2 have been registered) 23 (3 have been registered)	International Potato Center (CIP) Nairobi Rwanda, Burundi, Uganda, and the Netherlands	CIP Nairobi (2014) FOPAC (2015)
Sweet potato	13 (4 have been registered) 5	CIP	University of Graben in Butembo, North Kivu (2013) Self-financed, with participatory selection
Bean	42	CIAT	CIAT's Pan-African Bean Research Association (PABRA)

Source: Key informant discussion with INERA Mulungu (July 16, 2019).

Table 22. INERA Mulungu: Varietal Maintenance of Beans	
Bush Bean	**Climbing Bean**
HM 21-7*	NEV 131-1
Nabe 4	MAC44*
RW1668	RMV1129*
Munyama	CODMLV095
RWR2154*	CODMLV096
RWR2245*	Namulenga*
Moore88001*	-
CODML001*	-

Source: Key informant discussion with INERA Mulungu (July 16, 2019).
**Varieties currently under pre-basic seed production.*

Table 23. INERA Mulungu Seed Production (Kilograms)		
Seed	**2017**	**2018**
Beans	13,763	11,817
Maize	11,795	4,166

Table 23. INERA Mulungu Seed Production (Kilograms)		
Seed	**2017**	**2018**
Irish potato	5,040	5,776
Soya	351	876

Source: INERA Mulungu, email correspondence following key informant discussion (July 16, 2019).

Table 24. Key INERA Seed Production Partners in North and South Kivu	
North Kivu	**South Kivu**
CEDERU (Kibutu)	Agri-Force
Capsa Luhoto (Butembo)	PADEBU
JOB (Rutchuru)	CBKMUKU
SYDIP	CP IDJWI
NRTH Business	GAP

Source: Key informant discussion with INERA Mulungu (July 16, 2019).

Table 25. Production of Certified Seed by International Organizations in South Kivu Province					
Organization, Project Name	**Crops**	**Location**	**Number of Households**	**Source of Basic Seed**	**Dissemination Modality**
World Bank, STEP program (2016-2020)	Beans, rice, cassava, banana	Wallungu and Mwenga Territories	2,500 (through 80 farmer groups)[52]	INERA	Farmer groups provide seed to members
FAO/World Food Program, P4P project (2018-2022)	Beans, rice, cassava	Uvira and Kalehe Territories	1,200 (60 farmer groups)	INERA	25-30 community-owned seed boutiques and agro-dealers
FAO	Maize, beans, soya, sweet potato	Kalehe and Fizi Territories	250 (13 farmer organizations)	Harvest Plus (maize and beans); CEDERU (sweet potato)	Farmer groups provide seed to members
Food for the Hungry (2016-2021)	Maize, soybean, beans	Wallungu Territory,[53] two territories	40 seed producers	All varieties for seed production from Harvest Plus	Seed is sold through agro-dealers supported by program

[52] ISANDA, an NGO based in Mwenga Territory, works with 45 farmer organizations to produce rice, bean, and cassava seed for the STEP program.

[53] The project is also working in two territories in Tanganyika province.

Table 25. Production of Certified Seed by International Organizations in South Kivu Province					
Organization, Project Name	**Crops**	**Location**	**Number of Households**	**Source of Basic Seed**	**Dissemination Modality**
		in Tanganyika			
Mercy Corps (2016-2021)	Maize, soybean	Kabare and Kalehe Territories	72 seed producer organizations and 240 farmer field schools	All varieties for seed production from Harvest Plus	Seed is sold through agro-dealers supported by program
Harvest Plus[54]	Maize, beans	Kabare, Kalehe, and Wallungu Territories	14 seed producer organizations	Harvest Plus (in collaboration with INERA)	>90% sold to projects (World Vision, Food for the Hungry, Mercy Corps, FAO)
GAP (large landowner)	Beans, rice, soybean, cassava	Wallungu Territory	1,000[55]	Harvest Plus, INERA	Harvest Plus, ICRC, FAO, INERA

Source: Key informant discussion with South Kivu seed producers and SENASEM South Kivu (July 17, 2019).

Table 26. Active Seed Producer Organizations by Territory in South Kivu	
Territory	**Number of Seed Producers**
Uvira	54
Kalehe	9
Kabare	19
Walungu	11
Fizi	15
Idjwi	2
Mwenga	8
Total	**111***

Source: Adapted from data provided by SENASEM South Kivu.
**Producer organizations working in more than one province are counted once for the total.*

[54] Across eastern DRC, Harvest Plus has identified 17 bean varieties that are high in iron and four maize varieties high in Vitamin A. Harvest Plus maintains warehouses and is active in disseminating Harvest Plus seed in Kabare, Kalehe, and Wullungu Territories through USAID-funded projects. Harvest Plus has a warehouse of 1,6 tons of basic bean seed and 184 tons of certified seed. They also have 18.6 tons of certified maize seed in their warehouse and 1.6 tons of basic maize seed. More than 90 percent of the seed produced by Harvest Plus partners and sold by Harvest Plus is purchased by projects.

[55] Harvest Plus and IITA lease part of the land to produce seed.

Table 27. Registered Seed Fields by Crop for South Kivu 2019		
Crop	**Number of Fields Registered for Inspection**	**Total Number of Varieties**
Cassava	108	5
Maize	32	3
Beans	43	3
Beans (basic seed)	14	10
Rice	8	5
Groundnut	4	2
Soya	24	1
Sweet potato	1	1
Potato	1	1
Spinach	1	1
Amaranth	1	1
Banana	1	2

Source: Adapted from data provided by SENASEM South Kivu.

Table 28. Registered Maize Seed Fields by Variety for South Kivu 2019			
Variety	**Total Fields**	**Total Hectares**	**Estimated Percent of R1 Seed**
SAM4VITA	11	9.15	26%
ECAVEL1	10	19	55%
ZM59	9	3.5	10%
ZM627	1	2	6%
MZ65	1	1	3%
Total	**32**	**34.65**	**100%**

Source: Adapted from data provided by SENASEM South Kivu.

Table 29. Registered Bean Seed Fields by Variety for South Kivu 2019			
Variety	**Total Fields**	**Total Hectares**	**Estimated Percent of R1 Seed**
HM21-7	35	41.25	83%
RWR 2245	4	6	12%
Namulenga	4	2.25	5%
Total	**43**	**49.5**	**100%**

Table 29. Registered Bean Seed Fields by Variety for South Kivu 2019			
Variety	Total Fields	Total Hectares	Estimated Percent of R1 Seed

Source: Adapted from data provided by SENASEM South Kivu.

NORTH KIVU

Table 30. North Kivu Seed Producers & Seed Traders 2018–2019				
Organization	Crops	Varieties	Volume	Clients
Ets Buhendwa	Maize	ZM 625	30,000 kg	Harvest Plus (40-70%); FAO (10-30%); INERA Mulungu (5%); Other (20%)
	Beans	RWR 2245; RWR 45	6,000 kg	
Ets Baraka	Maize	ZM627; ZM 625; Mudisha 3	130,000 kg	Mercy Corps (25%); CEDERU (10%); CAP TUJITEGEMEYA (15%); FAO (20%). COPAB (15%), Farmers (15%)
	Beans	HM21-7; Namulenge; NAB4; G59	7,000 kg	
	Soya	Not specified	1,000 + kg	
EMTH	Maize	ZM627; SAM4 Vita	50,000 kg	AKIFAR Seed Traders (50%); FAO (20%); WorldVision (15%); farmers (10%)
	Beans	Kabulengeti; G59; M'SOLE; MAC44; Namulenge	25,000 kg	
	Soya	Imperial	40,000 kg	
Plantation ANANY (seed company)	Maize	ZM625; ZM627; SAM4 Vita	60,000 kg	Harvest Plus buys 100% of HM21-7 and SAM4VITA.
	Beans	HM21-7; RW2245	10,000 kg	
	Soya	Imperial	10,000 kg	
	Rice	Nerica 4	2,000 kg	
Alpho Trading	Maize	Kasai 1; Bamboo; Bazooka	22,000 kg	FAO (50%); WorldVision, ActionAid, Mercy Corps, Premier Logistique (40%). Farmers (10%).
	Beans	G59; Kabulengeti	20,000 kg	
	Irish potato	Carolus	18,000 kg	
	Vegetable seed	Cabbage, eggplant, amaranthe, tomato	600 kg	
JOB Seed (seed company)	Maize	ZM625	60,000 kg	FAO (30%); Fonds Sociale (20%); Farmers (50%).

Table 30. North Kivu Seed Producers & Seed Traders 2018–2019				
Organization	**Crops**	**Varieties**	**Volume**	**Clients**
Ets Semki	Maize	ZM625;ZM627	50,000 kg	NGOs and Projects (30%), Farmers (70%).
	Rice	Nerica 4	2,500 kg	
	Soya	Imperial	5,500 kg	
CEDERU	Maize	Mudisha 3; ZM625	7 ha	WorldVision (75%); FAO (20%); Farmers (5%).
	Beans	HM21-7	2 ha	
	Sweet Potato	Elengi; Mugande	Not specified	

Source: Roundtable discussion with seed stakeholders on July 20, 2019 in Goma.
Table 30 abbreviations: kg=kilograms, ha=hectares.

Table 31. Summary of Lab Tests Carried Out by SENASEM Goma					
Requestor	**Seed Provider**	**Crop**	**Variety**	**Number of Samples**	**Total Quantity From Which Samples Were Drawn**
Mercy Corps	Maison Juudi	Irish potato	Kiningi	10	18,400 kg
FSRDC	Maison Juudi	Irish potato	Kiningi	2	5,500 kg
FAO	INERA / Mulungu	Beans	HM21-7	1	200 kg
			Nabe 4	1	1,000 kg
			G59	2	7,400 kg
			Kasoda	2	5,000 kg
			Ndungureho	2	1,870 kg
			Namulenga	2	190 kg
Mercy Corps	ETS Baraka	Maize	ZM 627	1	1000 kg
FAO	INERA / Mulungu	Maize	ZM 625	2	8,330 kg
FAO	INERA / Mulungu	Soya	Imperial	2	5,000 kg
FAO	Alpho Trading	Onion	Red Creole	1	1,150 g
		Cabbage	Globe Master	1	50 g
			F1	1	50 g
		Garlic	n/a	1	1,330 g

Source: SENASEM North Kivu.
Table 31 abbreviations: kg=kilograms, g=grams.

Table 32. Registered North Kivu Seed Producers for Season B 2019					
Organization	**Location**	**Crop**	**Variety**	**Total Hectares**	**Production Estimate**
Ets Juudi	Masisi (Katale)	Irish potato	Kinigi; Penape	18	164,000 kg
Ajecdei	Masisi (Sake)	Irish potato	Kinigi	7.5	60,000 kg
Ets Bariaka	Rutshuru (Biruma)	Maize	Mudishi 3; ZM625; ZM627	34.25	102,750 kg
		Beans	HM21-7; Namulenga; MAC44	3.35	3,080 kg
		Soya	Maksoy 3	1	1,200 kg
Enth Business	Rutshuru (Bunhangula)	Maize	ZM625; SAM4VITA	20	60,000 kg
		Beans	Kabulengeti; MAC44; Kasoda; G59	25	24,000 kg
		Cassava	Sawsaw; Mayombe; Kindisa	3.5	50,000 linear meters
Apama	Rutshuru (Tongo)	Sweet potato	Elengi; Mugande; Kenya Spot 4; Irene	2	180,000 cutttings
		Maize	ZM625	2	6,000 kg
		Beans	M'SOLE; G59; HM21-7	4	13,200 kg
		Cassava	Sawasawa; Mayombe; Kindisa; Nabana	8	120.000 linear meters
Apae	Beni (Bingo)	Rice	Nerica4	7	28,000 kg
Coomuseriz	Beni (Kyatsaba)	Rice	Nerica4	5	20,000 kg
Mr. Yoasi	Beni (Mantumbi)	Rice	Nerica4	3	12,000 kg
Mr. Kagheni	Beni (Mantumbi)	Rice	Nerica4	1.2	5000 kg
COMSAK	Butembo (Katondi)	Irish potato	Carolus; Kinigi	4	32,000 kg
GPS	Butembo (Nyabili)	Irish potato	Carolus; Kingi; Kirundo	5.5	44,000 kg
FOPAC	Goma	Irish potato	Kiningi	1	8,000 kg

Source: Adapted from data provided by SENASEM North Kivu.

Table 32. Registered North Kivu Seed Producers for Season B 2019					
Organization	**Location**	**Crop**	**Variety**	**Total Hectares**	**Production Estimate**

Table 32 abbreviations: kg=kilograms, g=grams.

ITURI

Table 33. Volume of Seed Production Inspected by Ituri SENASEM in 2017 and 2018										
	Beans		Maize				Rice		Soya	
	Kabulengeti (kg)	Pigeon Vert (kg)	Kasai I (kg)	Bambou (kg)	Bazooka (h)	Wanack (h)	Liyoto (kg)	Nerica 4 (kg)	Liyenge (kg)	Imperial (kg)
2017	**65,875**	**11,675**	**2,150**	**3,700**	**115,000**	**33,000**	**10,022**	**4,530**	**10,016**	**-**
R1	64,825	10,875	2,150	-	-	-	-	1,630	-	-
R2	1,350	-	-	-	115,000	33,000	-	2,900	10,016	-
QDS	-	-	-	3,700		-	-	-	-	-
2018	**127,375**	**0**	**36,300**	**80,588**	**120,000**	**-**	**6,400**	**26,505**	**-**	**2,400**
R1	6,375	-	-	-	120,000	-	-	-	-	-
R2	121,000	-	36,300	-	-	-	-	14,500	-	-
QDS	-	-	-	80,588	-	-	6,400	12,050	-	2,400

Source: SENASEM Ituri.
Table 33 abbreviations: h=hectares, kg=kilograms

Table 34. Volume of Basic Seed Production Inspected by Ituri SENASEM in 2016, 2017, and 2018 (Kilograms)					
Year	**Type**				
	Beans		**Irish Potato**		
	Kabulengeti	***Pigeon Vert***	***Victoria***	***Hybride Sol 002***	***Hybride Sol 001***
2016	2,775	1,575	-	-	-
2017	-	800	-	-	-
2018	-	-	4,800	397	429

Source: SENASEM Ituri.

Table 35. Scale and Scope of Seed Production by Ituri-Based NGOs			
Local NGO	**Number of Seed Producer Groups**	**Territory**	**Crops**
AMAB	53	Djugu, Irumu	Beans, maize, cassava
CAD	56	Mambasa, Djugu	Beans, maize
RIMA	132	Mahahgi, Aru	Rice, maize
PAA	53	Djugu	Beans, maize, sweet potato
BEAD	8	Irumu	Rice, beans, cassava

Source: Adapted from data provided by SENASEM Ituri.

Table 36. Number of Seed Laboratory Tests Conducted by Ituri SENASEM in 2017 and 2018		
Crop	**2017**	**2018**
Beans	25	71
Maize	14	28
Groundnut	3	9
Rice	4	8
Sorghum	1	2
Vegetable Seed	4	20
Soya	0	1
Total Tests	**51**	**139**

Source: SENASEM Ituri.

Table 37. Major Seed Tenders for 2018 in Ituri Province		
Trader	**Quantity (Metric Tons)**	**Crops**
ETS Akiphar	300	Beans, maize, vegetable seed
ETS Baraka	125	Beans, Irish potato
ETS MB	70	Beans, maize
Greenhouse	16	Beans, vegetable seed

Source: Key informant discussion with seed sector stakeholders and SENASEM Ituri in Bunia: July 24, 2019.