



FEASIBILITY STUDY FOR THE DEVELOPMENT OF PUBLIC-PRIVATE SEED DELIVERY SYSTEMS IN CAMEROON



**NATIONAL STUDIES OF EXISTING SEED SYSTEMS IN CAMEROON
AND THEIR POTENTIAL FOR IMPROVEMENT**

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ABBREVIATIONS AND ACRONYMS

- ACA:** African Cashew Alliance
- ACEFA:** Program to Improve the Competitiveness of Agropastoral Operations
- ACOSEC:** Cameroon Seed Trade Association
- AIMDP:** Agricultural Investment and Markets Development Support Project
- ANAFOR:** National Forestry Development Agency
- ANOR:** Standards and Quality Agency
- APESS:** Association pour la Promotion de l’Elevage au Sahel et en Savane
- AVC :** Agriculture Value Chain
- AVRDC:** World Vegetable Center
- CAPEF:** Chamber of Agriculture, Fishery, Livestock and Forest
- CCIMA:** Chamber of Commerce, Industry, Mines and Crafts
- CDC :** Cameroon Development Corporation
- CERPAH :** Centre spécialisé de Recherche sur le Palmier à Huile
- CGIAR:** Consultative Group for International Agricultural Research
- CIAT:** International Center for Tropical Agriculture
- CIP:** International Potato Center
- CIRAD:** International Cooperation Center of Agricultural Research for Development
- CODAS CARITAS:** Comité Diocésain des Activités Sociales Caritatives
- CONSOV :** Conseil National des Semences et Obtentions Végétales
- DESA:** Direction of Agriculture Statistics and Investigations
- DRCQ:** Directorate for Regulation and Quality Control of Inputs and Agricultural Products
- DSCE:** Cameroon’s Growth and Employment Strategy document
- DSDSR:** Strategy Document for Rural Sector Development
- FAO:** Food and Agriculture Organization
- FASA:** Faculté des Sciences Agricoles
- GIZ:** Gesellschaft für Internationale Zusammenarbeit (German Cooperation)
- GMR:** Grénier du Monde Rural
- ICRAF:** World Agroforestry Center
- IITA:** International Institute of Tropical Agriculture
- INADES:** Institut Africain pour le Développement Economique et Social

IRAD: Institute of Agricultural Research for Development

MIDENO: North West Development Authority

MIDEVIV: Mission for the Development of Food, Vegetable and Fruit Crops

MINADER: Ministry of Agriculture and Rural Development

MINCOMMERCE: Ministry of Trade

MINEPAT: Ministry of the Economy, Planning and Regional Development

MINEPDED: Ministry of Environment, Nature Protection and Sustainable Development

MINEPIA: Ministry of Livestock, Fisheries and Animal Industries

MINFOF: Ministry of Forestry and Wildlife

MINPMEESA: Ministry of Small and Medium-Sized Enterprises, Social Economy and Handcrafts

MINRESI: Ministry of Scientific Research and Innovation

NGOs: Non-Governmental Organizations

PACA: Projet d'amélioration de la Compétitivité Agricole

PADFA : Projet d'Appui au Développement des Filières Agricoles

PAPA-RFCC : Programme d'Amélioration de la Compétitivité Agricole, Relance des Filières Cacao-Café

PAP-MVQ/MINADER : Projet d'Appui à la Production du Matériel Végétal de Qualité

PEA-Jeunes: Program for the Promotion of Agropastoral Youth Entrepreneurship

PIDMA: Agricultural Investment and Market Development Project

PLANOPAC : Plateforme Nationale des Organisations Professionnelles Agro Sylvo Pastorales et Halieutiques du Cameroun

PNDSA: National Seeds Development Plan

PNIA: Agriculture National Investment Plan

PNSV: National Plant Seed Policy

PNVRA: National Program for Agricultural Extension and Research

PRASAC : Pôle Régional de Recherche Appliquée au Développement des Systèmes Agricoles d'Afrique Centrale

PRFP : Programme de Relance du Programme Plantain

PRFPT : Projet de Relance de la Filière Pomme de Terre

PRODEL: Projet de Développement de l'Élevage

PRODERiP : Projet de Développement de la Riziculture Pluvial de Plateau en Zone de de Forêt à Pluviométrie Bimodale

PSN: National Seeds Policies

RHORTICAM: Réseau des Horticulteurs du Cameroun

RPGAA : Ressources phytogénétiques pour l'alimentation et l'agriculture

SAILD: Service d'Appui aux Initiatives Locales de Développement

SAPEP: Smallholder Agricultural Productivity Enhancement Program

SDRSQV: Sub Department of Seed and Plant Quarantine Regulation

SDRSQV: Sub-directorate of Seed Regulation and Plant Quarantine

SEMRY : Société d'Expansion et de Modernisation de la Riziculture de Yagoua

SND: National Development Strategy

SOECAO : Société de développement du Cacao

SOECOTON: Cotton Development Corporation

SOWEDA: South West Development Authority

SSG: Seed Systems Group

TFP: Technical and Financial Partner

UCCAO : Union Centrale des Coopératives Agricoles de l'Ouest

UNVDA: The Upper Nun Development Authority

USAID: United States Agency for International Development

WFP: World Food Program

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I. INTRODUCTION AND BACKGROUND

I.1. Introduction

Population growth, persistently high levels of malnutrition, low agricultural productivity, and stagnating rural economies are major concerns facing the African continent, and have been the focus of significant investment by donor agencies and African governments alike for decades. Among the interventions targeting the lives and livelihoods of poor, smallholder farmers directly, few have shown as much promise as the adoption of seed of higher-yielding, locally-adapted crop varieties.

Unfortunately, Africa has suffered decades of failed attempts at seed supply which focused on government-operated supply systems, community-based seed supply, or interventions by multi-national seed companies, none of which proved capable of operating sustainably or at a scale sufficient to reach a majority of farmers. Recently, however, a model has emerged which focuses on building the capabilities of local, private seed entrepreneurs, private, village-based input vendors, and national public crop breeders to work in a complementary fashion within a seed value chain which delivers certified seed of new crop varieties bred by international and national breeding institutes to local, smallholder farmers. The establishment of these public-private seed supply systems has increased seed supply and contributed to increased average crop yields of major food crops in a number of countries across the continent.

However, many African countries with significant agricultural potential have so far been left behind in the shift to public-private seed systems, and, as a result, have shown little or no progress toward improving food security or rural economic growth. Fifteen such countries have been identified with a total population of approximately 320 million people, which are home to an estimated 38 million farmers. In order to bring the benefits of improved seed to these farmers, as well, the Seed Systems Group (SSG) proposes to undertake feasibility studies for seed systems development in these countries and to intervene in least 10 of them with the highest probably of success over a period of 10 years.

This study provides a synthesis of data, information, and ideas gathered in relation to crop breeding, seed supply, agricultural extension and related farmer awareness building activities, and rural input supply networks in Cameroon as well as proposed intervention for the improvement of the seed sector in the country.

I.2. The study area background

Cameroon is located in West Central Africa. The population of Cameroon is approximately 25 million. The capital city is Yaounde. Both French and English are considered official languages. Cameroon is referred to as “Africa in miniature” due to its diverse geographical and cultural features. Its topography comprises mountains, deserts, forests, savannas, rivers, and beaches. The country’s south-western region has a coastline on the Atlantic Ocean. The climate of Cameroon is humid, tropical in the coastal area and semi-arid to in the north. There are periods of intensive rainfall and high temperatures in the plains while the highlands are cooler.

Cameroon is administratively divided into 10 regions. The regions are sub-divided into 58 divisions, which are further divided into sub-divisions, and each sub-division has a number of districts. Although Cameroon is the fifth-biggest oil producer country in sub-Saharan Africa, the agriculture sector remains most important for its economy, as it accounts for about half of total exports. During the colonial period, commercial crops like cacao, coffee, banana and rubber were grown on large plantations. Cameroon experienced a type of Green Revolution in 1972 when mono-cropping and the use of heavily-subsidized fertilizers and pesticides, backed by convenient credit, were encouraged by the government’s policy. However, the focus of this activity remained confined to the production of export crops. Later, in 1986, as the prices of crops like cacao and coffee fell drastically in the international market, poverty and food insecurity struck Cameroon leading to serious crisis and forcing the government to change its policy.

Currently, agriculture in Cameroon is re-emerging as a promising industry, and young people are returning to the land, thanks to the government’s effort and some donor-funded projects. Presently, the important food crops are **plantains, cassava, maize, sorghum and millet**. While the main cash crops cultivated include **cocoa, coffee, cotton, bananas, rubber, palm oil and kernels, and peanuts**. Currently, Cameroon is the sixth-largest cocoa producer in the world. Agricultural practices of most smallholder farmers, however, remain mostly traditional in nature.¹

¹ <https://www.g-fras.org/en/world-wide-extension-study/africa/central-africa/cameroon.html> 11-10-2020

I.3. Government initiative for the development of agriculture

In recent years the Government of Cameroon has undertaken many initiatives to improve its agriculture sector. These include the development of strategy documents and policy instruments which serve as reference frameworks for the interventions of actors in the agricultural sector during specific periods.

- **Cameroon's Growth and Employment Strategy document (DSCE 2010 - 2020)**

For the period 2010-2020, the "Vision 2035" has served as a growth and employment strategy document (DSCE) which aims to make Cameroon an emerging country, democratic and united in its diversity. This vision is translated in the agricultural sector by a revolution consisting in moving from extensive agriculture to intensive, modern and mechanized agriculture, which should lead to an increase in the productivity of agricultural activities and make Cameroon the breadbasket of central Africa.

The interventions in the growth and employment strategy document to meet the needs of the agricultural sector are as follows:

- to make accessible and available the production factors, particularly land, water and agricultural inputs;
- to promote access to technological innovations, in particular by strengthening the research/extension linkage;
- to develop the competitiveness of production chains.

- **The Rural Sector Development Strategy Document (DSDSR)**

The expected results of the DSCE have been spelled out in the Rural Sector Development Strategy Documents (SDSR), and are reflected in the contribution of the rural sector to:

- Ensure security and self-sufficiency in domestic consumption;
- Supply the processing industry and create a market and internal consumption for the extraverted sectors;
- Develop exports with a view to improving the balance of trade.

- **National Agriculture Investment Plan (PNIA 2014 – 2020)**

PNIA is the national planning framework for national and external funds for the development of the rural sector. It takes into account the needs, achievements, investment gaps, and the functioning of the sector over a seven-year horizon. It brings together all current programs and projects and must generate new interventions.

Its general objective is to make the rural sector an important engine of the national economy which creates decent jobs and wealth to meet internal and external demand, while ensuring the food and nutritional security of the populations in a context of sustainable development. More specifically, it aims to:

- Make the products of the Cameroonian rural sector more competitive and enable them to gain additional shares in sub-regional and international markets while allowing satisfactory coverage of food and nutritional needs;
- Make the fundamental factors of production more efficient by optimizing the use of land and water resources, improving the living environment of rural producers and their connection to markets, improving access to materials, equipment and adapted financing;
- Optimize the sustainable use of natural resources for the balanced promotion of all sectors, taking into account the constraints of environmental preservation and adaptation to climate change; and
- Create favorable conditions for the development of the sector by improving governance by involving all the stakeholders concerned, in order to effectively and efficiently ensure planning, programming, budgeting, mobilization of financing, implementation and monitoring -evaluation of the development of the rural sector.

In the modernization process envisaged in this strategy for the agriculture sector in Cameroon, improved seed is recognized as the factor of production that determines the upper limit of crop yield. It was therefore agreed that special emphasis should be placed on making quality seeds available to the country's farmers in sufficient quantity, in a timely manner and at reasonable prices.

The government option underlying this policy is to promote the emergence of an economically viable private seed sector that can sustainably meet farmers' demand for quality seeds. This logic is consistent with the strategies and policies that the government is pursuing to make the agricultural sector the spearhead of its socio-economic development.

- **The Support Program for the Renovation and Development of Vocational Training in the Agriculture, Livestock and Fisheries Sectors (AFOP)**

The purpose of this program is to contribute to youth employment and the inclusive and sustainable growth of rural areas in Cameroon.

Specifically, the program aims to perpetuate the renovated system of training and professional integration in the agriculture, livestock and fishing sectors.

- The first phase of the program (2008-2012) succeeded in stimulating a promising dynamic in the rural environment by closely linking vocational training and economic projects of the beneficiaries of the device.
- The second phase of the program (2013-2016) was to continue this modality in all the renovated centers and schools and to complete this phase of project development with additional phases with a view to the harmonious implementation of the project.
- The third phase of the program (2017 - 2021) focuses on consolidating knowledge and empowering training centers

- **Program to Improve the Competitiveness of Agropastoral Operations (ACEFA)**

ACEFA is one of the three programs financed under the debt reduction contract (C2D) in the field of agriculture and food security in Cameroon

- Phase 1: Pilot phase that took place between 2008 – 2012
- Phase 2: Extension phase that runs from 2013 - mid 2017
- Phase 3: Consolidation, The Consolidation and Sustainability Program Consolidation and sustainability (mid 2017 to 2022).

The phase 3 operates as a continuation of the ACEFA Program. It pursues three objectives:

- i) Improve the income of family farms by consolidating and improving the public agropastoral advisory system
- ii) Modernize the production apparatus (equipment, buildings, infrastructure) by financing the investment projects of producer organizations
- iii) Institutionalize the agro-pastoral advisory system by creating an agency co-managed by Professionals and the State and strengthen the representation capacity of producers so that they actively participate in consultation, steering and management of development actions and agricultural policy development.

- **PEA-Jeunes**

It is in this context that the Cameroonian Government requested support from the International Fund for Agricultural Development for the design and implementation of the Program for the Promotion of Agropastoral Youth Entrepreneurship (PEA-Jeunes).

The PEA-Jeunes aims to support the development of profitable businesses managed by young men and women, in promising agro-pastoral sectors, to contribute to the development of efficient agriculture, fight against rural poverty and improve food security.

Specifically the aims are to:

- Provide adequate financial and non-financial support for the creation and management of successful agro-pastoral enterprises by young people;
- Promote the development of a political, organizational and institutional framework favorable to the creation and development of agropastoral youth enterprises;

- **National Agricultural Seed Development Plan (PNDSA 2020 – 2025)**

The PNDSA is a document in line with the PNSV guidelines. By identifying the priority sectors and the actors involved as well as estimating the necessary resources and programming their mobilization the PNDSA sees itself as the PNSV's primary operational tool.

The PNDSA sets itself the following objectives: (i) establish the list of priority sectors on the basis of objective criteria, (ii) identify the actions necessary to remove the various constraints to the development of the seed sectors selected as priorities, (iii) define the role various actors in the production of priority seeds and coordination of actions to be carried out, (iv) estimate the resources necessary for the implementation of the Plan and plan their mobilization.

The quantities and qualities of the plant material resulting from the implementation of this Plan are then transmitted to the competent institutions in the field of Extension and Agricultural Advisory which then take over for the achievement of the strategic objectives of the Government on the horizon. 2030. This document was presented to the actors of the actors of the seed value chain for validation on September 1st 2020 and finally to CONSOV on September 24th 2020.

- **The Rural Sector Development Strategy (SDSR) /National Agriculture Investment Plan (PNIA) (2020 - 2030)**

In 2019, as part of the formulation of the second phase of the national development vision for 2035, the Government of Cameroon committed to review and / or update existing sector strategies. The Rural Sector Development Strategy document coupled to the National Agriculture Investment Plan 2020-2030 was therefore validated recently on October 10, 2020. According to this strategy, four levers need to be accelerated:

- Development of crop sectors
- Development of infrastructures through the opening up of agricultural basins

- Improving the business environment in agriculture to attract the private sector
- Promotion of food security through the organisation of small producers and farmers' associations.
- **National Development Strategy (SND 2020 – 2030)**

The DSCE having expired, the SND30 constitutes the new frame of reference which succeeds for the period 2020-2030. This periodicity was chosen to better articulate the strategy with the global goals agenda of Sustainable Development (SDG), but also to stabilize planning horizons and integrate the delays recorded in the implementation work of the DSCE.

I.4. Scope for the development of agriculture

Agriculture is a key sector of the Cameroonian economy. It ensures its self-sufficiency in food as well as foreign currency at the same time. In this sense, it contributes 22.9% to the GDP and employs more than 62% of the working population.²

Cameroon is “Africa in miniature”, with fertile land suitable for all types of crops. The climatic nuances (equatorial climate - humid tropical - dry tropical), as well as the soil, generate a rich agricultural potential of diversity. Moreover, the range of cultivated products extends from food crops (such as millet, sorghum and manioc) to export crops (bananas, cocoa, pineapple, cotton, etc.). At the same time, a few non-traditional crops have made their appearance in recent decades, such as potatoes and onions. Some sectors are indeed in full expansion, participating fully in the country's growth. This is the case of the plantain and dessert banana exported on the international market and contributing 1.5% of the GDP. However, Cameroon's rich agricultural potential is still under-exploited. With a surface area of 475 442 km², the country has 7.2 million hectares of arable land, of which only 25% has been exploited so far. 75% remains unexploited and is already attracting the interest of many foreign investors. The irrigable land potential is estimated at 240 000 hectares, but only 33 000 hectares are currently irrigated.³

An assessment of the agricultural sector shows that Cameroon has great agricultural potential whose productivity remains below the real possibilities.

² <https://www.mediaterre.org/actu,201909271419266.html>

³ MINADER

II. CROP PRODUCTION SYSTEMS

II.1. Major staple food crop production, crop yields, and trends

The government has selected and classified certain crops as priorities, according to their economic importance. The following table shows the evolution in production of these crops.

Table 1: Evolution of the production of the priority crops 2014 - 2018

CROP/YEAR	Annual Production (t)				
	2014	2015	2016	2017	2018
Cacao	281 196	287 315	330 412	331 149	335 850
Arabica coffee	8 020	6 504	7 024	7 106	7 418
robusta coffee	37 115	27 094	29 762	27 188	27 797
Palm oil tree	211 138	227 755	277 732	386 997	398 038
cashew	NA	NA	NA	NA	108
Cotton	295 144	248 115	240 093	254 121	320 063
Maize	2 062 952	2 070 572	2 101 631	2 187 570	2 199 127
Millet/sorghum	1 735 040	1 040 902	1 144 992	1 138 243	1 232 490
Rice	201 090	278 281	311 674	339 076	313 678
Cassava	4 600 706	5 224 734	5 285 031	5 290 061	5 317 834
Plantain	3 834 180	4 077 344	4 280 305	4 394 220	4 503 078
Potato	224 562	346 332	384 429	399 621	408 525
Pineapple	183 148	212 257	227 566	244 963	251 831

Source: MINADER/DESA INS, MINEPAT (SND), PNDSA

II.2. Description of the country's main agro-ecologies and their cropping systems

II.2.1. Description of the country's climate

Cameroon is located between latitudes 2°N and 13°N. It has a wide range of climatic types from the wet southern regions near the equator to the dry northern ones around the Lake Chad basin.

There are two main climatic types, the equatorial and the tropical, which are divided into the following sub-types.

- **Guinea equatorial:** Covering nearly one-third of Cameroon, this climatic type is found in the southern part of the country, much of which belongs to the southern plateau. Part of it extends to the southern limit of the Adamawa Region. This climatic type has rainfall all

year round and is noted for its double maxima (annual rainfall 1500 to 2000mm; average annual temperatures about 25°C; high relative humidity).

- **Equatorial monsoon:** This climatic type extends from the coast around Kribi and covers part of the western high plateau. The annual rainfall ranges from 2000 to 10,000mm, being especially high where Cameroon's volcanic massif comes close to the coast. Debundscha with nearly 10,000mm per year is the second rainiest place on the earth after Chirapunji in India. The amount of rainfall decreases from the coastal areas towards the interior highlands (Limbe 4000mm, Dschang 3000mm and Bamenda 2000mm). The average annual temperature for this high altitude climatic type is about 21°C, with a mean range of 22°C.
- **Tropical humid:** As rainfall decreases northwards the lowland and highland equatorial climate gives way to the tropical humid type (Sudan climate). This extends from the southern regions to the 900mm isohyet in the northern regions. Rainfall is spread over about four or five months only, while the other months are dry. The vegetation types reflect the rainfall distribution.
- **Sudano-Sahelian:** This is the northernmost climatic type, extending from Maroua to the Lake Chad basin. It is characterized by a short rainy season and a marked dry season (rainfall from 900mm around Maroua to 500mm around Kousseri, and 400mm around the shores of Lake Chad; mean annual temperatures 28°C).

II.2.2. Agro-ecological zones of Cameroon

Based on the climatic conditions, the vegetation, soils and altitude, Cameroon has been divided into five agro-ecological zones (IRAD Cameroon, 2008). The agro-ecological zones and principal crop and livestock activities are as follows (Figure 1):



Figure 1: Agro ecological zones of Cameroon and research structures (Source: IRAD, 2008)

- **Sudano-Sahelian Zone:** This zone is characterized by monomodal rainfall from above 1,000 mm south of Garoua to less than 800 mm north of Garoua (less than 500 mm around Lake Chad). The vegetation growth period here is 180 to 110 days and crops grown are millet, sorghum, irrigated rice, peanuts, sesame, and cotton while livestock includes cattle, sheep, and goats.
- **High Guinean Savannah Zone:** Characterized by monomodal rainfall of 1,600 mm (Ngaoundere) with a rapid decrease towards the north. Its vegetation growth period is 240 to 180 days and crops grown include sorghum, maize, peanuts, and robusta coffee in the south in low topographic locations. Livestock in this zone is mainly cattle.
- **Western High Plateaus Zone:** The monomodal rainfall here is 2,000 to less than 4,000 mm with vegetation growth period of 280 days. Crops grown are maize, rice, plantains,

bananas, cassava, taro, cocoyams, potatoes, vegetables, arabica coffee. Livestock includes cattle, pigs, poultry, goats, and sheep.

- **Humid Forest Zone with Monomodal Rainfall Regime:** In this zone, rainfall is 3,000 to less than 4,000 mm and the vegetation growth period is more than 300 days. Crops grown include oil palm, robusta coffee, cocoa, rubber, roots and tubers while livestock is essentially pigs and goats.
- **Humid Forest Zone with Bimodal Rainfall Regime:** Here, rainfall is 1,600 to 2,000 mm (IRAD, 2008) and the vegetation growth period is 300 days. Crops grown are robusta coffee, cocoa, oil palm, roots and tubers, and maize. Livestock includes pigs and goats

II.2.3. Cameroon's agriculture: farming system and crop diversity

Agriculture occupies about 2.3 million hectares (15 %) of a total of more than 15 million hectares of cultivable land. Therefore, the overall pressure on land is low. Migration from rural to urban areas is considerable and selective by age, sex, and education. The age distribution of the farm population from the 1984 Agricultural Census shows a distinct drop off in the relatively productive 25-44 age range, and females outnumber males among those aged 15-54 and especially in the 25-44 age range. Thus, the burden of food production is being placed on an ever smaller portion of the population, and this farm population is increasingly devoid of prime-aged males. However, food security is good over most of the country, even though it is precarious in the Far North. Furthermore, population pressure has been severe enough in some areas of high agricultural potential, such as the West and Northwest regions, that increasingly marginal land has been cultivated; particularly very steep slopes where soils are liable to erode rapidly.

Cameroon is dominated by inter-tropical vegetation with a humid southern forest and a central savanna as well as mountain forests and prairies. Of the total surface area, 11 % is located in a "dry savanna" type zone, 20% in a "humid highland savanna" zone and 58% in a "humid dense forest" zone, the remainder being in transition zones. Of the 175,000 km² of non-degraded closed forest, 140,000 km² are considered exploitable.

The crop diversity in Cameroon is very rich and contributes to the country's food security. The large varieties of ecosystems support a wide range of crops which include staple crops (maize, rice, sorghum, cassava, potato, plantain, common bean, groundnuts...) fruits, vegetables, spices and medicinal plants. Although the main food items are generalized, there is a wide range on the

choice food items particularly the vegetables and spice food items. In the Cameroon tradition, every ethnic group identifies itself with a range of foods and vegetable crops.

II.3. Current status of agricultural extension activities

II.3.1. Level of capacity of public extension system

There are several institutions providing extension/advisory services in Cameroun, however, the major ones are:

- i. Public services under the supervision of Ministry of Agriculture and Rural Development (MINADER) and Ministry of Livestock and Animal Production (MINEPIA).**

The Ministry of Agriculture and Rural Development has a number of responsibilities to develop the agriculture sector. Some of its functions related to agricultural extension are: disseminating information and advice to farmers; checking agricultural and cooperative education; supervising private agricultural education in conjunction with the Ministry of Vocational Training; and managing farmers and agricultural extension.

- ii. Agricultural value chain (CVA) schemes linked to the specific crops**

CVA's public interventions are located in projects financed by the public investment in support of Technical Financial Partners (TFPs) (PNVRA, Potato Project, Project to revive the plantain sector, etc.) and projects financed by TFPs (ACEFA, PIDMA, PACA, PRODEL, PAPA, etc.).

The National Program for Agricultural Extension and Research (PNVRA)

The National Program for Agricultural Extension and Research (PNVRA), located within the Ministry of Agriculture and Rural Development, was for many years the main public agency for providing extension services to the farmers in all 10 regions of the country. Components of PNVRA's program were:

- Agricultural extension.
- Training and development of human resources.
- Support to producer organizations and associations.
- Partnership with the private sector.
- Agricultural research.

- Village community participatory pilot development operations.
- Monitoring and evaluation (M&E) and impact assessment of the extension program.

All relevant ministries and certain international NGOs were involved in PNVRA, which received funding not only from the government, but also from external research-based sources such as CGIAR (Consultative Group for International Agricultural Research), CIP (International Potato Center), and CIRAD (International Cooperation Center of Agricultural Research for Development). Currently, activities of PNVRA have stopped due to lack of funding and extension activities are now continued to a certain extent by projects such as ACEFA, Potato project, PROSAVA, and PIDMA.

iii. Other public entities providing extension services

○ Chamber of Agriculture, Fishery, Livestock and Forest (CAPEF)

The Chamber of Agriculture, Fishery, Livestock and Forest (CAPEF) replaced the 20 years old but largely ineffective Chamber of Agriculture, Animal Husbandry and Forests of Cameroon in 2009. CAPEF is located within the Ministry of Agriculture and Rural Development. The Chamber's key role is to support the interests of producers in the sectors of agriculture, fishery, livestock and forests, develop partnerships with investors and facilitate the training of farmers.

○ Research structures (IRAD and International Centers and some projects)

They continue to renew the messages to producers, processors and development projects. However, this concerns mainly technical innovations, rather than consulting and intervention tools / approaches. IRAD has many researchers and technicians spread over the whole territory and mobilized by the sectors of agriculture, animal husbandry, product processing and forestry. IRAD's secondary objectives are to promote the valorization and make available to users technological packages that meet their needs; to generate all the information that has an impact on agricultural development.

• Société de Développement du Coton du Cameroun (SODECOTON)

SODECOTON is a semi-autonomous public extension organization, based in Garoua, operating in North Cameroon. Its mandate is to promote cotton cultivation among the peasants in the North and the Far-North Regions. SODECOTON has number of extension staff and plays an important role in supporting, and training of producers involved in cotton cultivation.

II.3.2. Level of activity by non-governmental and private sector entities in agricultural extension

Research structures (IRAD and International Centers) and some projects and NGOs continue to renew the messages to producers, processors and development projects. However, this concerns mainly technical innovations, rather than consulting and intervention tools / approaches. In terms of information dissemination, there are several rural radio stations broadcasting agricultural information. In addition, SAILD, IRAD, the CAMAGRO platform and various blogs provide a wide range of information on agriculture and livestock in Cameroon but not all publications are accessible online.

Private sector

The private agricultural advisory and extension services are very diverse and managed by commodity chains POs, NGOs, international research structures on an experimental basis and agro-providers.

Organized commodity chains have succeeded in managing their agricultural value chain (AVC) systems over time. The cotton sector operates two complementary AVC systems comprising about 150 field agents in direct contact with cotton producers: SODECOTON's technical extension agents and CNPC-C's salaried facilitators. The latter provide advice to cotton GPs, cereal banks and women to improve the profitability of IGAs. The cocoa sector, which generates much higher added value than the cotton sector, has few sustainable advisory and extension services. Some employees of cooperative unions organize training sessions for cocoa farmers. SODECAO has refocused on the production of quality seedlings. It intervenes with its field staff by specifically providing the technical advice necessary to ensure the proper planting of young plants of the selected varieties it produces. The rest of AVC activities are organized by short-term projects financed by FODEC.⁴

The coffee sector with the UCAOA has seen the disappearance of its extension system following the coffee crisis of the 1980s and 1990s. National NGOs such as SAILD, INADES and CODAS CARITAS, are the main NGOs that have developed original but numerically limited forms of AVC. These schemes are also very dependent on TFP funding. Finally, national and international

⁴ Elaboration concertée de la politique publique de conseil et de vulgarisation agricoles Volume 1 : Rapport du diagnostic du conseil et de la vulgarisation agricoles au Cameroun, Avril 2017

research centers have contributed to renewing AVC approaches, particularly ICRAF and IITA. The Rural Resource Centers (RRCs) promoted by ICRAF propose to

- (i) advisory tools in the field of perennial crops and high value-added trees management and especially
- (ii) an approach to ensure the sustainability of the resource center itself by creating agricultural services. The IITA and the cocoa cooperatives have adapted the Champ Ecoles approach to the situations of perennial crops. This method of action-research and advice to producers is now taken up by IRAD.

Non-governmental organizations

Although there is no NGO in Cameroon that provides extension advice to the farmers on regular basis, a number of NGOs are active in extension or extension type activities. Many of them focus on sustainable agriculture following participatory approaches for rural development. Names of a few popular NGOs are given below:

- SAILD, INADES and CODAS CARITAS are some NGOs of national scope that have developed original Agricultural Value Chain extension activities, but they are numerically limited.
- Key Farmers Cameroon is a non-profit, self-help umbrella organization of 50 autonomous groups and about 1,200 individual members. Its mission is to promote sustainable agriculture and rural development. This NGO has been very active in agricultural extension, research and training of farmers. Its extension activities cover individual farm visits, group demonstration farms, farmers' exchange visits, exhibitions, training, workshops, farm trials, and collaboration with government services and institutions.
- Center for Environment and Rural Transformation (CERUT): This NGO was founded in 1990 and is located in Limbe. Its goal is to empower local people through training and extension work for the elimination of socially unjust practices that result in poverty and land degradation.
- Integrated Rural Community Center for Agriculture (IRCCA): It is an autonomous self-help group, located in Meluf-Kumbo. IRCCA's mission is to promote the development and adoption of sustainable appropriate technologies, practices and diversification in rural agriculture.

- Strategic Humanitarian Services (SHUMAS): This NGO, based in Bamenda, North West Region, promotes integrated sustainable rural development with the aim of improving living standards of poor, disadvantaged people, in particular women and children. SHUMAS works in partnership with other NGOs and is active in the areas of primary schooling, social welfare, agriculture, health care, women's issues, forestry and organic farming.
- Group of NGOs for Food Security and Rural Development (COSADER - Collectifs des ONG pour la Sécurité Alimentaire et le Développement Rural):

Farmers-based associations, cooperatives and societies

There are considerable number of farmers' associations and cooperatives in Cameroon. Many of them act as commercial companies, but at the same time are involved, directly or indirectly, in providing extension and marketing advice to their members. Descriptions of some of the associations and cooperatives are given as follows:

- Associations de Producteurs et de Stockeurs de Cereales (APROSTOCs): These associations, formed under the Développement Paysannal et Gestion des Terroirs (DPGT Project) in Northern Cameroon, are gradually acquiring a network of farmer advisers who support the improvement of Muskwari sorghum cultivation. These informal networks disseminate information based on farmers' knowledge and experience. Farmer advisers are members of the same community which they serve. They call upon recognized and influential farmers to assist in conducting training and technical trials. The service is partially financed by the beneficiary farmers.
- South West Farmers Association, Ltd.: This association was registered as a company in 1990. It has about 700 employees and deals in lime, plum, okra, watermelon, cabbage, banana, plantain, coco and yams. It is involved in export business.
- North West Farmers' Organization (NOWEFOR): This association was established in 1995, and has been striving to support the production of garden crops and livestock for small scale farmers in the North West Region of Cameroon. It is the largest farmers' organization in the region, and its activities include capacity building and facilitating access to inputs and markets.
- Other farmers-based organizations in Cameroon are Cocoa Farmers' Organizations (such as ONPCCC Farmers' Association with about 53,000 member farmers), Cameroon

Association of Rural and Community Radio (CARCOR), Salma Farmers' Association (SALMA; mostly in horticulture), Farmers' Association of Cameroon (CFPC), and Cameroon National Confederation of Cotton Producers (CNPC-Cameroon-Confederation)

Although there is a wide variety of AVC devices in the field, the coverage rate of producers remains very low at present. It is estimated that the vast majority of producers are currently not reached by these devices and receive only sporadic information obtained from markets or via rural radio, or on a very ad hoc basis. In the absence of nationwide monitoring and evaluation systems, there are no accurate consolidated figures (number of field extension advisors, level of training, time actually spent with producers doing advisory work, etc.).

Table 2: Assessment of the number of field extension workers and their supervisors

Structures and devices of the agricultural value chain	Field agents	Regional Supervisors
Mechanisms under the direct supervision of MINADER and MINEPIA (PNVRA, ACEFA agents, Project CDDs, AFOP youth integration counselors, etc.).	2 000	500
Public and para-public development company of related value chains and POs; Cotton (140 field agents + 30 supervisors) Rice (30 + 10) Livestock (0, 10)	170	50
NGOs (fixed-term contracts for projects, permanent employees): APESS, SAILD INADES, etc.	100	30
OP without counting the farmers and stockbreeders relay: NOWEFOR, PLANOPAC, Resource Centers	130	30
Total	2 400 to 2600	610
Total number of family farms 2.6 to 3.3 million		
Coverage rate (No. of FAEs / No. of field agents/) 1 field agent per 1,000 to 1,270 producers		
Number of family farms affected by AVC Projects/Programs		
200,000 to 300,000 depending on sources		
Management ratio (field officers/FAEs recommended) 1 agent for 76 to 115 producers		

Taking into account all the different systems (Ministries and projects under supervision, public, parapublic and private companies, PO, ...) but not counting the number of farmers and pastoralists, the number of field agents dedicated to VCA is estimated at between 2,400 and 2,600 for the whole of Cameroon. The coverage rate of the national AVC system would therefore be estimated at 1 extension advisor per 1000 to 1270 (variable according to the total number of FTEs selected for these evaluations). In practice, this rate would probably be lower since the "advisors-vulgators" are also assigned to other tasks (campaign monitoring, statistics, management of input distribution, etc.) and do not devote a full time to AVC tasks. The contribution of "private" schemes remains low because the number of extension counselors reporting to this type of structure is estimated to be around 400 for the entire country.⁵

II.4. Level of adoption of improved crop varieties, by crop

Studies on adoption level of improved varieties in Cameroon has not been carried out for many crops. However, based on the experience of some crop specialist it can be stated that in general, the level of adoption of improved varieties in Cameroon is not as expected.

II.5. Level of utilization of fertilizer and manures

Table 3: Evolution in importation of fertilizers (in tonnes) by products in Cameroon from 2013 to 2017

Fertilizers	2013	2014	2015	2016	2017
Ammonia, anhydrous	42.8	24.1	17.8	8.1	21.5
Ammonium nitrate (AN)	1898.9	1397.1	4935.0	1864.2	1728.8
Ammonium sulphate	23613.4	24973.2	55968.5	27612.7	36602.8
Diammonium phosphate (DAP)	6622.0	8620.4	19654.4	17851.3	15873.8
Fertilizers n.e.c.	2608.8	49.3	1640.0	437.7	558.9
Monoammonium phosphate (MAP)	728.3	1526.9	1775.0	1125.0	650.0
NPK fertilizers	44292.1	55338.5	26528.2	28591.6	10878.5
Other nitrogenous fertilizers, n.e.c.	774.4	1198.5	426.6	1332.2	461.8
Other NP compounds	50.7	0.3	2134.6	1.3	60.8
Other phosphatic fertilizers, n.e.c.	22.1	819.2	299.8	107.0	250.0
Other potassic fertilizers, n.e.c.	0.0	26.0	98.0	19.6	26.0

⁵ Elaboration concertée de la politique publique de conseil et de vulgarisation agricoles Volume 1 : Rapport du diagnostic du conseil et de la vulgarisation agricoles au Cameroun, Avril 2017

Phosphate rock	300.2	305.1	1184.2	1202.2	1741.5
Potassium chloride (muriate of potash) (MOP)	14589.9	24255.4	43525.3	29574.4	38208.9
Potassium nitrate	12.0	24.0	54.1	25.2	26.2
Potassium sulphate (sulphate of potash) (SOP)	5357.9	759.6	3135.5	290.1	373.5
Superphosphates above 35%	600.0	398.3	104.0	50.0	301.0
Urea	57988.5	31627.2	52580.3	56761.0	74057.1

Source: FAOSTAT

Table 4: Import of phytosanitary products

Products	2011	2012	2013	2014	2015
Herbicides, insecticides, fungicides and rodenticides, germination inhibitors, ...flycatchers (t)	11 015	11 141	12 600	15 221	16 439

Source: MINCOMMERCE Statistical Yearbook on trade 2016

II.6. General observations on the system for marketing surplus production of staple crops

In the past years, most of the staple food crops produced were used for subsistence and sold in local markets. With the increase in the use of agricultural inputs, and the gradual intensification of cropping systems, there has been an increase in production. Food crop producers now need to find markets for their surplus production. Increasingly, apart from being disposed of in local markets, this production is bought in villages by resellers and is transported to big cities where the demand is growing due to population growth or in neighboring countries (Gabon, Chad, Central African Republic, Equatorial Guinea). Cameroon is the most important market in the CEMAC zone, accounting for nearly 50% of the GDP. Millet, sorghum, rice, yam, cassava, fruits (e.g. pineapple, papaya, oranges), fresh vegetables and plantain are the most staple food crops produced for both domestic consumption and for exports to countries within the central African region.

II.7. Recent trends in development of markets for staple food crops

More recently, some initiatives have been put in place by the government and some projects in order to improve access to the market of major staple food crops by farmers. One of these initiatives is led by the Agricultural Investment and Market Development Project (PIDMA) Project.

Through the establishment of partnerships between producer organizations and local food companies, subsistence production of cassava, maize and sorghum in Cameroon is being transformed into commercially-orientated and competitive value chains. As part of a public-private sector initiative, farmers are being supplied with improved seeds in order to increase production and provide quality raw materials to national bakeries and breweries. As a result, over 8,000 farmers are now accessing steady and reliable markets, while the local businesses have been able to significantly reduce their import bills for flour and raw products.

III. STATUS OF SEED SUPPLY IN CAMEROON

III.1. History of seed supply in Cameroon

The Government of Cameroon has always paid particular attention to the production and distribution of seeds and seedlings to farmers. Immediately after independence, the State based its seed policy and program on a network of multiplication farms for the dissemination of plant material throughout the country.

In 1980, a National Seed Plan was elaborated with the assistance of FAO (Bellon Mission). Its implementation was entrusted to the Mission for the Development of Food, Vegetable and Fruit Crops (MIDEVIV), which was transformed for the circumstance into the Mission for the Development of Seeds and Food Crops by keeping the same acronym MIDEVIV.

The new MIDEVIV was restructured into three operational units: Food Seed Project North (USAID Assistance), Food Seed Project South (UNDP/FAO/FAC Assistance), Coffee-Cocoa Seed Project (UNDP/FAO/FAC Assistance), Coffee-Cocoa Seed Project (UNDP/FAO/FAC Assistance), and Coffee-cocoa seed project (Belgian Assistance).

The UNDP/FAO project: WRC/87/013, "Assistance to Seed Production" (1988-1993) assisted MIDEVIV in the production of food crop seeds in the Southern region.

In 1990, within the framework of structural adjustment and the cessation of USAID funding, the Government took the decision to dissolve MIDEVIV and liberalize the production and marketing of seeds and seedlings.

In April, 2001, a national seed program was developed by the Government followed by a feasibility study of a project to support this program in August, 2001, carried out within the framework of Project TCP/CMR/9116A. On the basis of this study, negotiations for the financing of its implementation with donors are underway.

From September 2004 to June 2006, Project TCP/CMR/3002 (A) assisted farmers' organizations in the North and Far North in the multiplication and dissemination of healthy rice seeds. In July, 2006, project TCP/CMR/3102 "Support to Farmers' Organizations for the Propagation and Dissemination of Early Varieties of Maize, Sorghum and Millet in the Northern and Far North Provinces" was implemented.

With the liberalization of seed production and marketing, this implies the marketing of seeds by private economic operators (seed multiplication farmers' groups, seed production cooperatives, seed production and marketing multinationals). It should be emphasized that market mechanisms for seed transactions were deficient. The market alone cannot regulate the seed activity because the buyer (farmer) is not able to assess the quality of the product (seed) offered to him/her in the bag (there is an asymmetry of information). Thus, the intervention of the State by an entity independent of the parties involved (seed producers and user farmers) was justified to regulate the seed activity among others through certification and quality control.

Seed certification is defined as the outcome of an inspection and control system carried out throughout the different stages of multiplication and conditioning to guarantee their genetic and technological quality. Public action (structure in charge of seed certification and quality control) by applying seed regulations offers a legitimate protection of each of the actors involved: protection on the one hand of the seed multiplier, conditioner and distributor against unfair competition, and on the other hand of the farmer against fraud, negligence and accidents on the part of seed operators.

Thus, after several consultation meetings with private seed operators (groups of farmers' organizations, seed multiplication groups, managers of seed establishments), researchers of the national research service and international agricultural research institutions, a text governing seed production and marketing in Cameroon was elaborated and promulgated by Law n° 2001/013 of July 23, 2001 relating to seed activity. To date, the implementing texts signed are as follows:

- Decree N° 2005/153 of May 04, 2005, on the creation, organization and functioning of the National Council for Seeds and Plant Varieties;
- Decree N° 2005/169 of May 26, 2005, on the creation, organization and management of the Seed Fund which is a trust account to support seed development, seed research and local seed development and conservation. It is placed under the authority of the Minister in charge of Agriculture.

- Decree N° 2005/3090/PM of August 29, 2005, fixing the quality and missions of sworn agents in charge of seed control and certification;
- Decree N° 2005/3091/PM of August 29, 2005 fixing the modalities of production, quality control and seed certification;
- The joint decree N° 380/MINADER/MINCOMMERCE of August 7, 2006 fixing the specifications for the production, importation and marketing of seeds;
- The joint order N° 381/MINADER/MINCOMMERCE of August 7, 2006 fixing the general standards of chemical treatment, storage, packaging and labeling of seeds.
- Decision No. 537/MINADER/SG/DRCQ/SDRSQV of September 7, 2006 approving the technical regulation for the collection of official seed samples;
- Decision No. 538/MINADER/SG/DRCQ/SDRSQV of September 7, 2006 approving the official technical regulation for the production, control and certification of seeds of some legumes (groundnut, soybean, cowpea and bean);
- Decision No. 539/MINADER/SG/DRCQ/SDRSQV of September 7, 2006, approving the official technical regulations for the production, control and certification of seeds of some vegetatively propagated species (potato, banana, cassava and sweet potato);
- Decision No. 540/MINADER/SG/DRCQ/SDRSQV of September 7, 2006, approving the official technical regulations for the production, control and certification of seeds of some cereals (composite maize, hybrid maize, rice and open-pollinated sorghum);
- Decision No. 541/MINADER/SG/DRCQ/SDRSQV of September 7, 2006 approving the official technical regulations for the quality control of certain vegetable seeds.

The implementation of this law and its implementing texts required the training of seed inspectors, controllers, analysts and laboratory technicians and also the equipment of the National Seed Testing Laboratory (already built and approved) of the Ministry of Agriculture and Rural Development.

To remove constraints in the implementation of Cameroon's seed legislation, the Ministry of Agriculture and Rural Development put in place an official seed control and certification system with the objective of guaranteeing to the final user of seeds (farmer) a level of quality and promote genetic progress. The Government of Cameroon requested and obtained technical assistance from

FAO for the training of seed control and certification agents, the equipment of the national seed laboratory and the means of locomotion of seed control and certification agents.⁶

III.2. Recent and ongoing activity in the improvement of crop varieties

For more than two decades, variety creation has been slowed down, probably due to the insufficient number of breeders/breeders within IRAD and the lack of financial means. Thus, public research is more and more oriented towards introductions/adaptations in collaboration with international agricultural research institutes (IITA, AVRDC, PRASAC, ICRAF, etc...) as well as towards creation. Pre-basic and possibly basic seed production actions are diffuse in research programs (cereals program, legumes program, roots and tubers program, etc...), the separation between research program and seed production is not always clear-cut and clear-cut. Not only are the production costs of these pre-basic and basic seeds high, but this production tends to distract researchers from their work of variety creation.

The National Agricultural Investment Plan seeks as part of its objectives to develop research on improved, high-yielding varieties in order to boost the competitiveness of farms. Several actors are involved in the improvement of varietal species:

- **The research institutes (national and international)**

They are in charge of developing new improved varieties for different crops, to maintain those varieties and to make the seeds available to seed producers. They are also in charge of genetic resources conservation.

Most of the plant variety development activities are carried out at the Institute of Agricultural Research for Development (IRAD). The major active breeding programs at IRAD are on maize, sorghum, cowpea, cocoa, palm oil and cotton, sometimes in collaboration with national or international partners.

- **The Ministry of Agriculture and Rural Development**

It is in charge of seed regulation and control of the variety release process and the dissemination of varieties to farmers. The Ministry has taken many actions towards the improvement of varietal species:

- An Official Catalogue of Species and Varieties was instituted in which plant varieties developed or introduced in Cameroon are registered. Number of varieties

⁶ FAO (2009), Projet d'appui au renforcement des capacités pour le contrôle de la qualité et la certification des semences

of different crop species were registered all in List C. These varieties will undergo DUS and VCU tests before they are registered in list A.

List A is made of varieties that have successfully passed DUS and VCU tests in Cameroon and other countries with the same agro-ecological conditions and DUS testing guidelines.

List B is a waiting list in which DUS-tested varieties are registered in other countries with DUS test guidelines equivalent to those in force in Cameroon. List B varieties may be accepted for certification in awaiting the outcome of the VCU.

List C is a provisional list in which varieties and species formerly known are entered and popularised on a large scale before the entry into force of the official decree. They may be marketed as standard seed and subject to quality control.

Once these varieties pass the DUS tests successfully they are included in List A.

VCU is assumed in the absence of evidence to the contrary.

- Elaboration and validation of official technical regulations for the DUS and VCU tests for some crops, in order to complete the variety registration process.

- **The National Council for Seed and Plant Varieties (CONSOV).**

In 2001, Cameroon adopted a law on seed production and marketing. In 2005, the country created the National Council for Seeds and Plant Varieties (CONSOV) by decree N° 2005/153 of May 4, 2005, of the President of the Republic of Cameroon. This body is in charge of promoting and organizing a reliable seed sector and stimulating its development. The Council was also founded to regulate and control the registration of new varieties, protect farmers from the sale of counterfeit products and facilitate the production and marketing of quality seeds in the country. In addition, as part of its national seed policy, it encourages the development and promotion of new plant varieties.

- **The National Seed Funds**

A Seed Fund was created by decree N° 2005/169 of May 26, 2005 of the President of the Republic of Cameroon in application of law N° 2001/014 of July 28, 2001 relating to the seed activity. It was created in order to support the development of seed activities, seed research, and the development of new varieties and preservation of local seeds.

III.3 Current options for smallholder farmers to access improved and certified seeds

In Cameroon, there are two types of seed system namely:

- **The informal seed system**

In this system, the producers themselves produce, disseminate and procure seeds from their own harvest or through exchange and barter within their own or neighboring communities. Seed can be of varying quality. The informal system is rarely monitored or subjected to government policies and regulations. The informal seed system plays an essential role in Cameroon, including seed supply for secondary crops. However, with the emergence of new markets, reduced rainfall, and the emergence of new pests and diseases, producers need a wider diversity of crops and varieties that are still not available in the informal seed system.

- **The formal seed system**

The formal seed sector is composed of public entities, agricultural institutions, non-governmental organizations, small businesses and private seed companies engaged in various seed-related activities. The private seed sector is slowly emerging in Cameroon. The sector is subjected to national policies and regulations and involves various stakeholders. Through the chain of interdependent activities (research, multiplication, processing, distribution, transport, storage and marketing of seeds), seed products obtained are of a well-defined quality in terms of genetic purity and physiological, physical and phytosanitary quality. The role of the private sector in a formal system is normally focused on the production and marketing of seed, respecting the requirements of quality assurance.

In the simplest model, farmer cooperatives buy basic seeds from national authorities or international research institutes. The members then multiply, distribute the seeds among themselves, and sell them to neighboring farmers. The more developed cooperatives establish partnerships with national or international research institutes to test and select varieties, and collaborate with seed companies, NGOs and government agencies to distribute seed.

Sometimes seed is distributed directly to farmers or to farmers associations by the government or NGOs. This free distribution, however, is widely viewed as a hindrance to the emergence of a private seed sector in Cameroon. For instance, in March 2017, during the launching of the cropping season the government distributed 5.4 million cassava cuttings, three million banana and plantain suckers, 1,000 MT of maize seeds, 725 MT of rice seeds, 500,000 yam seedlings, two million mature cocoa seedlings, 2.5 million mature coffee seedlings, and 600 MT of Irish potato seeds.

The actors involved are of several types:

- Numerous small actors, either individually or other associations, who produce small, sometimes derisory quantities and concentrate on maize seed, cocoa seedlings, cassava seed, potato seed, oil palm seedlings. These producers often limit themselves to a single speculation. Not always having access to quality basic seed, they are generally unreliable. However, this group of mostly women is not to be rejected out of hand, as they are driven by a certain willingness and can be contractual multipliers for seed companies.
- Small and medium enterprises that specialize in the production of seeds of all species. This group of producers emerged after the disengagement from seed production and marketing with the dissolution of MIDEVIV and has, with a lot of initiative and technicality, tried to occupy this promising niche. They include institutions, cooperatives, SAR, and SA etc...

Examples include GIC-AOUDI Sanguéré (North), AFRISEM (West), etc..... These are competent professionals who are generally technicians and engineers from IRAD or MINADER in function or retired. They work with salaried staff. Their limitations are : (i) lack of financial management, (ii) under-equipment for post-harvest operations (dryer, cleaners/separators, milkers, etc.), (iii) lack of access to credit suitable for agriculture, (iv) exploitation of land that does not belong to them without an emphyteutic lease contract, (v) lack of access to credit suitable for agriculture.

- Some projects/programs (PRFP, PDVBP, PADFA, PNFM, PPMVCC, PRFPT, PRODERPP etc...) and development companies (UNVDA, MIDENO, SOWEDA etc...), MINADER farms, IRAD produce seeds with direct subsidies from the State, thus creating unfair competition to the already financially fragile private sector.

III.4. Number and descriptions of private seed companies operating in the country and their annual supply

Officially, according to Access to Seeds Index, last updated April 2019, 13 seed companies are selling their seeds in Cameroon (Table 5). The seeds are mostly vegetable seeds. Only one of these seed companies (Semagri) is headquartered in the country. The others distribute seeds in Cameroon through local distributors.

Semagri is planning to start local seed production activities in addition to the importation.

Four companies have test centers, three companies offer extension services, and two operate breeding centers. None of the companies in the country have processing sites. Only Semagri is a local company that partners with the Senegalese company Tropicasem. It is one of the few companies that extensively conducts trials for vegetable seed varieties at its station in Douala. As with other examples, it imports vegetable seeds and distributes them throughout the country. Rhoticam (Réseau des horticulteurs du Cameroun) represents a network of actors in horticulture seeds in Cameroon. Pop Vriend Seeds is another example of an international vegetable seed company that is distributing seeds in Cameroon through local distributors.

DowDuPont, though its brand Pannar, is active in the country and represented by the company Farmer House. Farmer House is also involved in vegetable seeds. JACO is a company that mainly offers other agricultural inputs, with a small portfolio in vegetable seeds.

Apart from the seed companies listed in Access to seed index document, there is a local seed company Grenier du Monde Rural (GMR), based in the West Region which imports hybrids maize and vegetable seeds but also produce seeds locally. This company has a capacity of 12 hectares, 8 of which are used for seed production. GMR does not involve smallholders in these activities. The quantities of vegetable seeds produced locally per year by GMR are around:

- 400-450 kg of Okra seeds
- 300 kg of black nightshade seeds
- 200 kg of green bean seeds
- 14 tonnes of maize composites

Table 5: Seed companies identified as sources of seeds sold in Cameroon

Company	Range of culture		Company activities in the country					
	Major crop	Vegetables	Variety improvement site	Test site	Seed production	Processing site	Sales	Extension services
Bayer				✓			✓	✓
Bejo		✓					✓	
Corteva Agriscience	✓						✓	
East-West seed		✓					✓	
Enza Zaden		✓					✓	
Limagrain		✓					✓	
Nongwoo bio		✓					✓	
Pop Vriend Seed		✓		✓			✓	
Sakata		✓					✓	
Seed Co							✓	
Semagri		✓	✓	✓	✓		✓	✓
Technisem		✓	✓	✓	✓		✓	✓

Source: Access to Seeds Index, last update April 2019

Table 6: Other seed suppliers

Company	Range of culture		Company activities in the country		
	Major crop	Vegetables	Breeding	Seed production	Sales
Agroplants	✓				✓
Farmers House	✓	✓			✓
JACO		✓			✓
Jardin des agriculteurs	✓	✓			✓
Phytograines	✓	✓			✓
Rhoticam		✓			✓

Source: Access to Seeds Index, last update April 2019

The table 7 shows the quantity of seeds officially imported in Cameroon in 2019-2020. It should be noted that a part from IRAD, IITA and PRODERIP which import small quantities of seeds for research purpose, all the other importers are doing it for commercial purpose.

Table 7: Seeds imported in Cameroon, quantities, exporting countries and importers (2019-2020)

Crops	Quantities imported	Exporting countries	Importers
Pre-germinated oil palm seeds	97,000 seeds	Indonesia	- CAMSEED SA
Maize seed	290,096 kg	Brazil, India, South Africa, Zimbabwe; Thailand, Mexico	- IRAD, - THE FARMERS HOUSE, - ARYSTA, - GMR Sarl,
Potato Seeds	25 661 tonnes	France, Germany, Holland	- DISEF Suarl, - GIG JEAN, - GROUPEMENT COOPERATIF AGRICOLE DU MBAM
Rice seed 41 kg	41 kg	Senegal, Japan	- IRAD, - PRODERIP (Project in MINADER)
Vegetable seeds	47 988 kg	France, India, Burkina Faso, USA, Australia, Poland, Italy, China, Thailand, South Africa, Senegal, Chile,	- DISEF Sarl, - ARYSTA, - SOLEVO SA, - SEMAGRI, - GMR Sarl, - FIMEX International, - HORIZON PHYTO PLUS, - RHORTICAM Sarl, - JACO SA, - WORLD VEGETABLE CENTER,

			- PROLEG
Cacao - Coffee	260 clones and plant material	United Kingdom and Nicaragua	IRAD
Fruit tree plants	14,200 seedlings	Israel	CRIFAT (NGO)
Fodder seeds	449 kg	France, USA, KENYA	IRAD, SEMAGRI
Soybean, cowpea	54 kg	Nigeria, Zimbabwe	IRAD, IITA
Sunflower seeds	30 kg	Argentina and South Africa	- ARYSTA, - DJIETCHEU Xavier
Vitro plants of plantain	720 700 vitroplants	France, Cote d'Ivoire, South Africa, Israel	- BOH PLANTATION LIMITED, - - PHP, - SOCIETE AGRICOLE DE MBANGA
Cashew seed	6 500 kg	Cote d'Ivoire	- SIRUS, - PCRN (Political Party)
Pineapple suckers	110 400 suckers	Ghana	- BCL

Source: DRCQ

III.5. Other non-governmental organizations and farmers' organizations involved in seed production and distribution.

Imports of seed for local production are generally made by private Seed Establishments (SEs) representing international firms, e.g. Farmer's House, a subsidiary of the PANNAR Seed Company in South Africa for maize hybrids (PAN12, PAN 53), and TECHNISEM for certain vegetable species. The import markets for vegetable seeds and the entire vendors/distributors are managed by companies like SEMAGRI. However, other companies that deal with agricultural products such as JACO, AGROPO, etc. also import vegetable seeds and serve as distributors although not specialized. The seeds are imported in large quantities and the packaging is done locally and redistributed to the local points of sale that we call here agro-distributors / retailers.

The system of production and distribution of seeds and seedlings is made up of a small number of agro-industrial importers/suppliers (SOLEVO, JACO, FIMEX, Poultry Farm of Mvog Betsi...) and development projects of State channels. This system is considered unsatisfactory in view of the non-availability of basic seeds for a significant number of producers.

Apart from these seed companies, there are local vegetable seed producers in:

- The informal sector who obtain seeds from previous crops before processing them
- The formal sector who buy basic seeds from research institute multiply and sell to the producer or NGOs...

Seed Multipliers provide:

- The multiplication of basic and certified seeds and seedlings;
- Collection, conditioning and treatment of seeds and seedlings;
- Marketing of seeds and seedlings;

The direct actors in the production chain of quality plant material are listed in relation to their respective segments of activities in the table below:

Table 8: Summary presentation of the actors involved in seed production in each priority sector

Crop	Production of Commercial seeds	Production of Basic seeds	Production/ introduction of Breeder seeds
Cashew	ANAFOR, SODECOTON, Agricultural Gic ribaou	IRAD, CIRAD	IRAD, MINADER
Pineapple	RHORTICAM	IRAD	IRAD
Banana	Ferme de Mbouroukou	IRAD, IITA, CARBAP	IRAD, IITA, CARBAP
Cocoa		Ferme de Mengang, Ferme de Nkoéuvone ⁷ Ferme d'Abong Mbang ⁸	IRAD, CIRAD
Arabica Coffee		CIRAD, IRAD	CIRAD, IRAD
Robusta Coffee		CIRAD, IRAD	CIRAD, IRAD
Cotton	SODECOTON	IRAD, SODECOTON	
Palm oil	LRC de PAMOL, CEREPAH de l'IRAD Dibamba et SOCAPALM, CDC,	IRAD	
Maize	Ferme de Sanguéré, Wakwa, Galim, Santa coffe Eastate, Abong Mbang, Mbouroukou, Nkolo sanaga	IRAD, IITA	IRAD
Cassava	Ferme de Ngalane, nkolo Sanaga	IRAD, IITA	IRAD, IITA
Sorghum	Ferme de Gazawa	IRAD	IRAD
Potato	Ferme de Wakwa, santa Coffee Estate, AFRISEM	IRAD, IITA, CIP	IRAD, IITA, CIP
rice	Ferme d'Avangane,	SEMRY, UNVDA	IRAD

Source : PNDSA

⁷ S

⁸ ES

Importers and Exporters are in charge of:

- Import and export of seeds and seedlings;
- The collection, conditioning and treatment of seeds and seedlings;
- The marketing of seeds and seedlings.

They are mainly made up of research organizations (IRAD, IITA, etc.) and private operators (EI, GAEC, etc.) which the State (MINADER) may temporarily replace for general interest needs.

The roles of the Distributors are:

- Collection and marketing of seeds and seedlings;
- Seed storage.

IRAD Policy on production and supply of basic seeds

In the past, the production and supply of basic seeds of crop varieties was the mandate of research institutes (IRAD, IITA...). These basic seeds were made available to seed producers or cooperatives for multiplication and production of certified seeds. No agreement has been signed so far between IRAD and other entities to produce basic seeds. However, in the National Plant Seed policy validated in 2018, the role of the private sector has been extended from production of certified seeds only to the production of basic seeds as well. This therefore gives an opportunity for collaboration between research institutes and private sector for basic seed production and supply.

Table 9: Seeds companies, their main activities and major seeds produced

Seed companies	Main activities	Major seeds	Location
AFRISEM	Seed importation, seed multiplication and commercialization to farmers	Maize, potatoes, fruits plants, beans, soy bean, palm trees,	Adamawa (Ngaoundere)
SEMAGRI	Seed importation, seed production, commercialization and capacity building of farmers	Tomatoes, oignon, water melon, cabagge, carrot, egg plant, cuccumber,...	Littoral (Douala)
Grenier du monde rural (GMR)	Production and importation of seed and others agricultural inputs	Maize, Okro, green beans	West (Bafoussam)
FARMER'S HOUSE	Seed importation	Maize hybrids	North West (Bamenda)

III.5.1. Facilities available for seed processing and packaging

Seed processing and packaging activities are undertaken by seed producers. However, this step is also under the control of the seed certification service. Seed packaging in Cameroon is still approximate. Each seed producer chooses its own packaging based on the recommendations of DRCQ.

In most cases, seed processing activities in Cameroon are carried out manually, however some equipment is available in the country (Table 10). Some small maize and beans shelling machines that are imported or locally manufactured are available in the market. Some forms of mechanical maize and beans shellers are also in use.

There are also several high-level seed processing facilities in Cameroon. Some are private, belonging to private individuals or to farmers group while others are public, provided by the government or some projects. For instance, two mobile maize seed conditioning stations were made available to maize producers in Obala in 2013 by the Cameroon Seed Fund. The aim was to increase the supply of quality certified seeds. These machines can process 20 MT of maize per

hour and are equipped with, among other things: a tank that can hold 100 kg of seed to be processed; trap doors that take the maize at the entrance; two lifts; different sieves for grading the seeds; a coating machine to mix it with chemicals; and outlets once the process is completed. The maize is then transferred to the multipliers, which will carry out the packaging. These processing units belong to MINADER. One unit is still in use while the other needs to be repaired.

To improve processing, packaging and seed quality the Government of Cameroon equipped some seed production farms of MINADER by processing unit center. Seven operational units for treatment and seed processing are available even though some of them require repair. These units are used by these seeds production farms and can be opened to cooperatives and seed producers when necessary. Table 10 below shows distribution of this equipment across the country.

The PIDMA Project has also equipped some cooperatives under their umbrella with seed processing equipment. These equipment are used by their member and they can also be used to provide services to other producers.

At IRAD, there are maize and beans shellers and two dryers. Sorting, grading of seeds, treatment and packaging are done manually.

Table 10: Seed processing units and their location

Region	Location	Equipment	Owner	Nature	Provider
Centre	Ntui	Seed Dryer (MINIDRY MD4-E)	IRAD	Public	PIDMA Project
	Obala	Two Maize seed processing stations: - 1 Dorez Unit without generator and - 1 chinese Unit (to be repaired)	MINADER	Public	National Seed Fund

	Bandjock	Maize seed processing equipment	M. Nkolou	Private	Personal
West	Foumbot	Seed Dryer (MINIDRY MD4-E)	IRAD	Public	PIDMA Project
	Bangangté	Semi-automatic Processing and packaging unit for vegetable seeds	Grenier du Monde Rural	Private	Personal
Far North	Maroua	Sorghum conditioning station	Cooperative	Private	PIDMA Project
		1 Dorez processing unit with generator	MINADER	Public	Government
North	Garoua	1 chinese Unit (to be repaired)	MINADER	Public	Government
South	Ebolowa	1 Dorez processing unit with generator	MINADER	Public	Government
East	Bertoua	1 Dorez processing unit without generator	MINADER	Public	Government
North West	Santa	1 Dorez processing unit with generator	MINADER	Public	Government
South West	Muyuka	1 Dorez processing unit with generator	MINADER	Public	Government

III.5.2. Tonnages of maize seeds and cassava cuttings certified and marketed in 2018, 2019 and 2020.

Table 11: Number of Seed producers and availability of certified maize seed (composite and hybrid varieties) inspected in the first and second cycle of the 2018 and 2019 years in the southern zone.

Regions	2018		2019	
	Number of registered seed producers	Quantity (tons)	Number of registered seed producers	Quantity (tons)
West	40	241	35	253.5
Adamawa	16	524	18	695.1
Centre	41	343.5	16	124.2
South	7	40	6	14.225
East	3	289.5	7	143.5
North-west	16	83.5	13	87
South-west	11	63	11	90
Littoral	16	114	13	78.5

Source: PIDMA journal of seed producers 2019 and 2020

Table 12: Number of Seed producers and availability of certified maize seed (composite and hybrid varieties) inspected in the first and second cycle of the 2018 and 2019 years in the southern zone.

Regions	2018		2019	
	Number of registered seed producers	Quantity (cutting)	Number of registered seed producers	Quantity (cutting)
West	1	100 000	1	160 000
East	9	5 803 000	/	/
Centre	15	6 605 500	13	4 750 000
South	11	3 170 000	4	2 300 000
Littoral	5	1 300 000	5	1 700 00

Source: PIDMA journal of seed producers 2019 and 2020

Table 13: Certified maize seeds (composite and hybrid varieties) available for the 1st agricultural season of 2020 in the southern zone (Adamaoua, Center, East, South, Littoral, West, North-West and South-West)

Regions	varieties	Quantity (tonnes)
West	CHC 201 (KASSAI)	98,5
	CHC 202 (ATP)	29,5
	CHC 203	22,5
	CHH 101	18,5
	CMS 8704	2
	SHABA	78
	Sub-total	249
North-West	CHC 202 (ATP)	176
	CHC 201 (KASSAI)	24
	SHABA	1
	Sub-total	201
South	CHC 202 (ATP)	2
	CHC 201 (KASSAI)	2
	CMS 8704	12,725
	Sub-total	16,725
South-west	CHC 203	25
	CMS 8704	65
	Sub-total	90
Centre	CHC 201 (KASSAI)	0,88
	CHC 202 (ATP)	7
	CHC 203	1,4
	CHH 101	2,7
	CHH 108	0,9
	CHI 001	0,2
	CMS 8704	104,9
	PVASYN6 (biofort)	14
	Sub-total	131,98
Littoral	CMS 8501	2
	CMS 8704	73,5
	Sub-total	75,5
Adamawa	CMS 2019	92,5
	CMS 8501	75
	CMS 8704	475,1
	SHABA	176,4
	Sub-total	819
TOTAL		1583,205

Source: PIDMA journal of seed producers 2020

Table 14: Certified cassava cuttings available for the 1st agricultural season of 2020 in the southern zone (Center, East, South, Coast and West)

Regions	Varieties	Quantity (cuttings)
West	92/0326	60000
	92/0057	100000
	Sub-Total	160000
Centre	8034	750000
	8061	250000
	01/1797	100 000
	92/0326	1150000
	95/0109	1010000
	96/1414	550000
	Biofortified (I070593)	100000
	TME 693	260000
	TME 419	580000
	Sub-Total	4750000
Littoral	8034	980000
	1070539	50000
	92/0326	1570000
	95/0109	200000
	96/1414	200000
	Local	600000
	TME/419	50 000
	Sub-Total	3600000
South	92/0326	2000000
	Sub-Total	2000000
TOTAL		10 510 000

Source: PIDMA journal of seed producers 2020

III.5.3. Number of agro-dealers currently in operation, by region

Table 15: Number of Agro-dealers by regions registered at DRCQ

Regions	Number of Agro-dealers registered at DRCQ		
	Companies registered in the register of operators of the fertilizer sub-sector in Cameroon	Companies distributing pesticides and phytosanitary treatment devices in Cameroon	Seed cooperatives/producers
Far North	/	1	6
North	/	5	4
Adamawa	/	10	6
Centre	23	129	281
South	1	6	38
Littoral	22	96	30
South-west	/	13	10
North-west	1	1	39
West	10	166	99
East	/	2	24

Source: MINADER/DRCQ, 2020

Table 16: Evolution of number of seeds producers from 2014 to 2017

	2014	2015	2016	2017
Cassava	30	212	46	46
Maize	116	659	129	111
Rice	3	48	2	2
Millet/Sorghum	/	27	0	29
Cacao	1	17	19	51
Plantain	1	44	15	/

Source: MINADER/DRCQ

III.5.4. Importation of seed – sources and quantities for each major crop

Imports of seed are generally made by private Seed Establishments (SEs) representing international firms, e.g. Farmer's House, a subsidiary of the PANNAR Seed Company in South Africa for maize hybrids (PAN12, PAN 53), SEMAGRI and TECHNISEM for certain vegetable species.

III.5.5. Overall prospects for improving seed supply through a public-private model

The seed policy is one of the framework elements of the Agricultural Development Strategy. It advocates the disengagement of the State from the functions of production of market goods and services to allow the development of a responsible and efficient private sector.

The seed policy is based on the following strategic axes:

- Privatisation of the production and marketing of seeds and seedlings,
- Definition and distribution of the tasks of the different actors within the sector,
- Establishment of a flexible and incentive-based institutional and regulatory framework.

❖ The actors

With regard to the orientations set within the framework of the New Agricultural Policy, the functions within the seed sector are distributed as follows:

Table 17: Actors and functions of the seeds sector

ACTORS	FUNCTIONS
private Sector: Breeder, contractual multipliers, conditioner collectors, importers and distributors of seeds and plants grouped within the Cameroon Seed Trade Association (ACOSEC)	<ul style="list-style-type: none"> - Varietal and conservative selection; - Description of the varieties created or introduced; - The multiplication of seeds and plants; - The collection, packaging and treatment of seeds and plants; - The marketing of seeds and plants; - Import and export of seeds and plants.
Public agricultural research: (Cellule Semences/IRAD)	<ul style="list-style-type: none"> - Creative and conservative selection; - The maintenance of all commercial or non-commercial varieties of cultivated plants and wild relatives and the production of pre-bases; - Multi-local testing of new varieties in collaboration with the services responsible for the control and certification and promotion of seeds of the Ministry in charge of Agriculture.

<p>The Ministry of Agriculture and Rural Development: (Department in charge of development of seeds and plants and Department in charge of regulation, control and certification of seeds and plants)</p>	<p>The implementation of the national seed program and seed legislation:</p> <ul style="list-style-type: none"> - Promotion of the production and use of certified or selected seeds; - The approval of varieties in conjunction with the National Council for Seeds and Plant Varieties; - Maintaining the National Catalog of Species and Varieties; - Maintaining the file of professionals with a seed activity in Cameroon; - Monitoring the application of the seed law and its application texts; - The control and certification of seeds in order to guarantee their quality vis-à-vis farmers; - Control of the marketing of seeds and plants; - The registration, on a proposal from the National Council for Seeds and Plant Varieties, of species and varieties in the Official Catalog of Species and Varieties.
<p>The National Council for Seeds and Plant Varieties (CONSOV): (joint State / private body)</p>	<p>It is an advisory body placed with the Minister in charge of Agriculture in order to advise the Government on all matters concerning the sustainable development of the seed sector, it is responsible for:</p> <ul style="list-style-type: none"> ❖ - To give an opinion on draft laws and regulations relating to the seed activity; ❖ - to propose the registration or deletion of species and varieties in the Official Catalog of Species and Varieties.

❖ The institutional framework

The institutional framework of the seed sector brings together the structures and institutions concerned with the implementation of the national seed program and seed legislation.

- The National Council for Seeds and Plant Varieties (CONSOV) is a State/private sector consultative body responsible for monitoring the coordination of the activities of the various actors in the seed sector, as such, it aims to:
 - advise the Government on all matters concerning the sustainable development of the seed sector,
 - issue an opinion on draft laws and regulations relating to the seed activity,
 - propose the registration or cancellation of species and varieties in the Official Catalog of Species and Varieties,

- issue an opinion on the introduction into the national territory of new technologies, including genetically modified organisms (GMOs) relating to plant material. The composition of the National Council for Seeds and Plant Varieties ensures a broad representation of economic operators. It thus creates the conditions for a wide participation of the private sector in the implementation of seed policy. This allows the Minister of Agriculture and Rural Development to take the best decisions in terms of regulation of the seed and plant sector.

The Directorate in charge of support for the production and promotion of the use of seeds and plants of the Ministry of Agriculture and Rural Development, this structure is responsible for:

- The definition, formulation and implementation of the seed sector development policy,
- The development and monitoring of projects to promote the production and use of seeds and plants,
- The management of emergency aid for seeds and plants for farmers in the event of a disaster,
- The search for funding in favor of private seed operators.

The Directorate in charge of regulation, quality control and certification of seeds and plants of the Ministry of Agriculture and Rural Development, this structure is responsible for:

- Monitoring and implementation of international conventions relating to seed activity and plant genetic resources for food and agriculture,
- The instruction of seed and plant certification files,
- The development of draft standards for the certification of seeds and plants produced locally,
- The development of projects for quality control standards for seeds and plants marketed in the national territory,
- The organization and monitoring of the control and certification of seeds and plants.
- The objective of this structure, whose main role is the certification of seeds and plants, is twofold: to guarantee the end user a sufficient level of quality and to promote genetic progress in plant material.

The Cameroon Seed Trade Association (ACOSEC) is a national grouping of seed professionals comprising breeders multiplier farmers, conditioners and distributors of seeds and plants. It works to:

- Ensure permanent consultation between the different professional groups and between the inter-professional body and public authorities,
- Organize production and marketing in technical, economic and regulatory terms,
- Promote the expansion of the seeds and plants sector in Cameroon and the sub-region.

The regulatory framework

As part of the State's disengagement from the production and marketing of seeds and plants, the development of a legal framework is necessary to safeguard the general interest of the various actors in the sector. This is how the President of the Republic promulgated Law No. 2001/014 of July 23, 2001 relating to the seed activity. This law takes into account the two principles defined in the institutional and regulatory aspect of the Rural Development Strategy Document, namely, incentive and flexibility:

The seed law is an incentive:

- It does not impose an entry barrier on the seeds and plants market; the conditions of access and exercising of seed activities are simplified as much as possible. The freedom to exercise activity is available to any natural or legal person. It is simply subject to a simple declaration of activity;
 - It closely associates the private seed sector, breeders, multipliers, conditioners, and distributors of seeds and plants with the management of the sector;
 - It provides for incentive measures in the financial, fiscal-customs, land, state and logistics fields in order to promote private investment in the seeds and plants sector;
 - It offers protection to breeders and seed establishments against unfair competition by taking into account the provisions of Annex 10 (Plant Variety Protection) of the revised Bangui Agreement.
- ❖ The seed law is also flexible: the law and its implementing decrees establish the general technical-legal principles of the production and marketing of seeds and plants of all categories and grant the Minister of Agriculture and Rural Development the necessary powers to make applicable the technical regulations for production, quality control and certification of each species or group of species of seeds and plants. These technical

regulations, regularly amended after consulting the National Council for Seeds and Plant Varieties (CONSOV), as needed, as the seed activity in Cameroon develops,

The proposed certification system does not automatically apply to the production of all seeds and plants placed on the market. The certification of seeds will be done gradually by species or groups of species, taking into account the public interest as well as the technical, social and economic constraints of the various actors and farmer users. However, all certified or non-marketed seeds are subject to quality control.

IV. NATIONAL AGRICULTURAL RESEARCH SYSTEM

IV.1. Public institutes and universities actively engaged in crop breeding

In Cameroon, the Institute of Agricultural Research for Development (IRAD) conducts research activities on improving the potential of certain crops. In addition, some State Universities (University of Dschang, University of Yaoundé I, University of Buea, University of Bamenda, and the University of Maroua) have a Department of Agriculture and have among their lecturers plant breeders. But there is no active breeding program. They usually rely on breeding programs of the research institutes for practicals or internships in the field of plant breeding.

There is no sustainable breeding program for vegetable crops. This is due to insufficient human resources in the national research institute, especially those specialized in vegetable breeding. World Vegetable Center and some universities are currently conducting trials on the adaptation of vegetable varieties in some parts of Cameroon with the intention of disseminating well-adapted varieties to farmers.

IV.2. Nature of recent or ongoing crop improvement activities

The current active breeding programs in Cameroon are at the Institute of Agricultural Research for Development (IRAD) which conducts research activities on improving the potential of cereals (maize and sorghum), legumes (cowpea), cocoa, and palm oil. IRAD is also working with some international research institutions in order to introduce improved varieties for testing for their adaptability and dissemination to farmers, including IITA for maize and cassava, CIP for potato, CIAT/PABRA for common beans, Africa Rice for rice, the Soybean Innovation Lab, University of Illinois for soybean, and ICRISAT for Sorghum.

IV.3. Level of capacity of public breeding institutions

The only public breeding institution in Cameroon is IRAD, which conducts research activities in all areas of plant and animal production in order to meet the needs and aspirations of all development actors in Cameroon. IRAD's genetic improvement and seed production programs in the past years were very well-developed, especially in the breeding of cereals (maize, rice, sorghum), roots and tubers and plantain banana (potatoes, sweet potato), legumes and vegetable crops (soybean, cowpea, beans, groundnut), industrial crops such as cocoa, oil palm, cotton. However, due to an on-going reduction in human and material resources, IRAD now focuses mainly on the improvement and production of seed of cereals, legumes, roots and tubers. Nevertheless, for plant breeding and seed production, IRAD has enough land as well as some agricultural infrastructure and equipment. IRAD's major problem remains the lack of human resources in the field of crop improvement and seed production. Despite the recent recruitment of several waves of young researchers, they need to strengthen their capacity in the field.

Financial resources are also limited, and despite the resources allocated by the government, IRAD regularly depends on external funding sources (projects) for research and seed production activities.

Table 18: Location of IRAD research Center structures and their potential crops

N ^o	Research Centers	Ecological zones	Potential crops
1	Regional Centre for Agricultural Research of Maroua	Sudano-Sahelian Zone	maize, sorghum, millet, groundnuts, onion, sesame, cotton, rice, soybean, cowpea, cotton
2	Regional Centre for Agricultural Research of Wakwa	Guinean Savanna Zone	maize, yam, potato, wheat, sweet potato, cassava, cowpea, rice
3	Regional Centre for Agricultural Research of Mbal Mayo	Humid Forest Zone with Bimodal Rainfall Regime	maize, cassava, plantain, desert banana, yam, soybean, rice, cocoa, coffee, pineapple, fruits trees, okra, pepper
4	Regional Centre for Agricultural Research of Ekona	Humid Forest Zone with Monomodal Rainfall Regime:	maize, cassava, plantain, desert banana, yam, soybean, rice, cocoa, coffee, pineapple, fruits trees, okra, pepper, traditional vegetable
5	Regional Centre for Agricultural Research of Bambui	Western High Plateaus Zone	maize, cassava, plantain, desert banana, potato, common bean, wheat, soybean, yam, rice, cocoa, coffee, groundnuts, pineapple, fruits trees, okra, pepper, traditional vegetable

Source: IRAD

In addition to these five regional research centers, IRAD has a specialized station on palm oil research located in Dibamba, where breeding activities are carried out on palm oil as well as seed production activities.

IV.3.1. Human resources

IRAD's scientific staff consists of 347 Researchers and 72 technicians. More than 50% of this workforce is made up of newly-recruited researchers who are not yet specialized. Only 60 (17%) of researchers are PhD holders. It should be noted that IRAD has only six plant breeders with PhD. It is therefore necessary to train most of them in priority research areas such as crop improvement or seed technology. The tables below shows the number of personnel at IRAD and those engaged in crop improvement at IRAD.

Table 19: IRAD scientific and technical personnel

Category	Number	Percentage
PhD	60	14.6
MSc.	210	51.1
Engineers	69	16.8
Technicians	72	17.5
Total	411	100.0

Source: IRAD

Table 20: IRAD scientific personnel engaged in crop improvement (number per crop)

Crop	PhD	MSc.	BSc.	Technician
Beans	0	2	0	2
Soybean	1	3	0	1
Cowpea	3	2	0	3
Maize	1	5	0	5
Rice	0	3	1	1
Sorghum	1	2	1	3
Wheat	1	1	0	1
Cassava	1	1	0	1
Potato	0	2	2	1
Banana, fruits & vegetables	1	1	0	1
Cotton	1	1	1	2
Palm oil	3	3	2	2
Cocoa	1	2	1	2
Coffee	1	2	1	2

IV.3.2. Infrastructure

IRAD possesses a number of infrastructure in all its operational structures distributed over the country. These are used for crop improvement and seed production among other activities. The most important are:

i) Laboratories

IRAD has 17 functional laboratories located in all the five agroecological zones.

- One Biotechnology laboratory in Maroua;
- Two tissue culture laboratories of Ekona and Bambui;
- Two soil laboratories in Yaoundé and Ekona;
- Four plant pathology laboratories in Yaoundé, Bambui, Ekona, Maroua;
- Four food technology laboratories in Yaoundé, Garoua, Bambui and Wakwa;
- One entomology laboratory in Yaoundé;
- One biological control laboratory in Yaoundé;
- One rubber technology laboratory in Ekona;
- One Lipids analysis laboratory in Dibamba.

ii) Screen houses

IRAD has six screenhouses to complement the work of the biotechnology laboratory and the tissue culture labs. There are two screenhouses in Yaounde, one in Maroua, one in Bambui, one in Njombe, one in Ekona.

iii) Cold room

IRAD has five cold rooms (in Yaounde, Garoua, maroua, Ekona and Bambui) but none of them are functional, and the breeding programs are using deep freezers to conserve their genetic resources. This situation causes regular losses of varieties in the germplasm.

IV.4. Recent or ongoing collaborations with private sector in seed supply

The seed value chain in Cameroon is made up of a certain number of links through which the seed undergoes transformations that give it added value. These transformations are undertaken by actors who complement each other, each playing a specific role. The table below presents the links of the Seed Value Chain (SVC), the actors involved in the links and the roles (responsibilities) they play in the value chain.

Table 21: Typology of seed value chain (SVC) actors and their responsibilities

Links of the seed value chain	Actors involved	Roles
Varietal selection and varietal breeding	National agricultural research system (IRAD, IITA, AVDRC, CIRAD, CARBAP, CIRAD), Seed companies (SEEDCO, SEMAGRI, LIMAGRAIN)	<ul style="list-style-type: none"> ○ varietal creation; ○ varietal conservation and maintenance; ○ description of the varieties created or introduced; ○ production of stem seeds ○ production of pre-basic and possibly basic seeds
Conduct of tests homologation	National agricultural research system (IRAD, IITA, AVDRC, FASA, CARBAP, DSS-TS/UYI)	<ul style="list-style-type: none"> ○ conduct of VCU and DUS tests; ○ Conduct of adaptability tests
Multiplication of Seeds	IRAD, IITA, AVDRC, private seed producers (OP, individus, SOCAPALM), Public and parastatal organizations (PAMOL, CDC, SODECAO, SEMRY, UNVDA, ANAFOR, SODECOTON), MINADER farms, Programs and projects (PAP-MAVQ), ONG.	<ul style="list-style-type: none"> ○ Multiplication of basic and certified seeds and plants; ○ Collection, treatment and conditioning of seeds and plants; ○ Marketing of seeds and plants; ○ Import and export of seeds and plants.
Cleaning, calibration, processing and conditioning of seeds	-maize conditioning center in Bachenga / Mbandjock (Private) - MINADER seed treatment units (Obala, Santa, Sanguere, Muyuka,)	<ul style="list-style-type: none"> ○ Drying, stripping, grading, cleaning, treatment and conditioning of seeds
Import and Export	<ul style="list-style-type: none"> ○ Exporters (IRAD, IITA) ○ Importers (Socapalm, CDC, Farmer's house, Semagri, Arysta life science, Proleg, Green field plantation Ltd, Star agricseedCamLtd, PHP, TenchiEvolutionsarl, GIZ, Agro industriel) 	<ul style="list-style-type: none"> ○ Import and export of seeds and plants; ○ multiplication of basic and certified seeds and plants; ○ collection, conditioning and treatment of seeds and plants;

		<ul style="list-style-type: none"> ○ marketing of seeds and plants.
Certification and quality control	MINADER (SDRSQV, LNAD)	<ul style="list-style-type: none"> ○ Certification of seeds and plants ○ Analysis of the quality of seeds and plants ○ Seed quality control and plants
Distribution	<ul style="list-style-type: none"> ○ IRAD, IITA, Project and ○ MINADER programs, NGOs, Seed multipliers, Traders ○ Public and parapublic organizations (PAMOL, CDC, SODECAO, SEMRY, UNVDA, ANAFOR, MIDENO, SOWEDA, SODECOTON) ○ Large plantations (SOCAPALM, Swiss Farm, PHP) ○ Large plantations; ○ Producer organization ○ Isolated farmers 	<ul style="list-style-type: none"> ○ The marketing and distribution of seeds and plants.
Consumption / Food production	<ul style="list-style-type: none"> ○ MINADER programs, NGOs, Seed multipliers, Traders 	<ul style="list-style-type: none"> ○ Consumption of seeds and plants for food production

IV.5. Current status of crop variety licensing arrangements with the private sector

Despite the fact that IRAD has protected in 2012 17 varieties of different crops with African Intellectual Property Organization (OAPI), no arrangement has ever been made with any private company to transfer these breeder's right. This could be explained by the fact that IRAD is a public institution. Yet the transfer of these rights to the private sector would have allowed to obtain royalties that would serve as a return on investment and finance varieties development activities. All these protected varieties are used by private seed producers for commercial purpose without any constraints.

Table 22: IRAD Crop varieties protected at OAPI

CROP	Number of varieties protected	Year
Maize	7	CHI001, CHI002, CMS8704, CMS8501, CHC202, CHC201, COCA-SR
Sorghum	1	CS54
Cowpea	2	CRSP-NIEBE, LORI-NIEBE
Sweet potato	2	TIB1, IRAD1112
Groundnut	3	CGS383, CGS310, CGS1272
Cassava	2	8017, 8034

The table below shows the number of varieties in collections and disseminated on the main target crops of the national varietal selection. It can be seen that the seed sub-sector has a fairly rich genetic potential consisting of clones, varieties and hybrids, despite the very low demand for seed. This is a strength that ensures the sustainability of the system.

Table 23: IRAD varieties available for seed production

Crops	Varieties	Observation
Maize OPVs	CMS8704, CMS8501, CHC201, CHC202, COCA-SR, SHABA, CMS2019, CMS9015, ADVANCED NCRE, EVDT-W, BSR PVA SYN6, PVA SYN13, ACRO06 CMS8806, CHC203	PVA SYN6, PVASYN 13 and ACRO06 were introduced from IITA
Maize hybrids	CLH103, CHH105, CHH101, CHH300.	
Cassava	8034, 8017, 8061	
Sorghum	CS-95, Damougari, S-35, CS-54, DOURRA, Zouaye, CS-61	
Rice	TOX 3145-34-3-2, IR 46, NERICA L 4, ITA 300, NERICA L56 NERICA L 36, NERICA 3, NERICA8,	All NERCA varieties were introduced from Africa Rice and evaluated in Cameroon

	NERICA 9, ORYLUX6, NERICA L60, NERICA 13,	
Common beans	GLP 190 (mac-mac), PH 201, PH 274, PH 495, PH 320 , Ty 3396-12, MEX-142 Eca Pan 021, Mac 55, Mac 33, KJ4/3, Nitu (G16157), PB (Petit Blanc), NUA-99 , B.G.G, DOR-701 , P.N.N, NUV-109-2	Many of these varieties (in bold) were introduced from CIAT
Groundnuts	ICGV 86003, JL 24, MANIPENTAR, 28-206, IB 66, M 513 77-1, 55-437, IB 66, K32 37-80, CGS 269, CGS 1272,	
Potato	MAFFO, IRAD 2005, Bambui Wonder, Cipira, Tubira, Jacob 2005,	
Plantain	Essong, Elat, Big Ebanga, French clair, Bâtard	
Palm oil	TENERA, DURA, PESIFERA	

Table 24: Plant species (Crops) targeted and number of varieties in collection (registered) and used in seed production

CROP	Number of registered varieties	IRAD registered varieties used in seed production	Variety types
MAIZE	27	CMS 8501, CMS 8704, VROUMSIA Thinaye (CMS 8806) CMS 9015, SHABA, KASAÏ-SR, COCA-SR, BSR-81, CHC 202 (ATP), HOGBE LEND (CHC 201), ACRO06, PVA SYN6	OPVs
		CHH 101, CHH 105, CLH 103, CHH300	HYBRIDS
SORGHUM/MILLET	8	CS-95, Damougari, S-35, S-54, DOURRA, Zouaye	Mixture of sorghum and millet varieties
RICE	19	TOX 3145-34-3-2, IR 46, NERICA L 4, ITA 300, NERICA L56 NERICA L 36, NERICA 3, NERICA8, NERICA 9, ORYLUX6, NERICA L60, NERICA 13,	Mix of rainfed lowlands and irrigated rice varieties
POTATO	13	CIPIRA, TUBIRA, SPUNT, DIAMANT, PAMINA, MONDIAL	Mixture of IRAD varieties (CIPIRA, TUBIRA) and imported varieties
CASSAVA	11	8034, TME 419, 95/0109, 96/1414, 92/0326	Varieties developed by IITA and popularized by MINADER except IRAD 8034

COCOA	4	IMC 60, F16-7, CF2-74, F28-7	-HYBRID
PLANTAIN		FRENCH, ESONG, EBANG	The majority of local improved varieties are owned by CARBAP and IITA
OIL PALM TREE	3	TENERA, DURA, PESIFERA	The 3 improved varieties commonly used are developed by IRAD Dibamba.

V. NATIONAL SEED POLICY FRAMEWORK

V.1. Documents which control the supply of seed

Cameroon has a legislative framework that guarantees the quality of seeds and seedlings on the market. The related activities are based on the law n°2001/014 of July 23, 2001 relating to seed activity. This law is supplemented by several regulatory texts in the form of decrees, orders, decisions, etc. In addition, a seed policy document has been validated in 2018, defining not only the institutional and legislative framework of seed activity but also the role and responsibilities of the different stakeholders. To date, the implementing texts signed are as follows:

- Decree N° 2005/153 of May 04, 2005 on the creation, organization and functioning of the National Council for Seeds and Plant Varieties;
- Decree N° 2005/169 of May 26, 2005 on the creation, organization and management of the Seed Fund which is a trust account to support seed development, seed research and local seed development and conservation. It is placed under the authority of the Minister in charge of Agriculture.

- Decree N° 2005/3090/PM of August 29, 2005 fixing the quality and missions of sworn agents in charge of seed control and certification;
- Decree N° 2005/3091/PM of August 29, 2005 fixing the modalities of production, quality control and seed certification;
- The joint decree N° 380/MINADER/MINCOMMERCE of August 7, 2006 fixing the specifications for the production, importation and marketing of seeds;
- The joint order N° 381/MINADER/MINCOMMERCE of August 7, 2006 fixing the general standards of chemical treatment, storage, packaging and labeling of seeds.
- Decision No. 537/MINADER/SG/DRCQ/SDRSQV of September 7, 2006 approving the technical regulation for the collection of official seed samples;
- Decision No. 538/MINADER/SG/DRCQ/SDRSQV of September 7, 2006 approving the official technical regulation for the production, control and certification of seeds of some legumes (groundnut, soybean, cowpea and bean);
- Decision No. 539/MINADER/SG/DRCQ/SDRSQV of September 7, 2006, approving the official technical regulations for the production, control and certification of seeds of some vegetatively propagated species (potato, banana, cassava and sweet potato);
- Decision No. 540/MINADER/SG/DRCQ/SDRSQV of September 7, 2006, approving the official technical regulations for production, control and certification of seeds of some cereals (composite maize, hybrid maize, rice and open-pollinated sorghum);
- Decision No. 541/MINADER/SG/DRCQ/SDRSQV of September 7, 2006 approving the official technical regulations for the quality control of certain vegetable seeds;
- The National seed catalogue of varieties and plant species;
- The national seed plan;

V.2. Recent or ongoing activities aimed at improving seed supply

- The Quality Plant Material Production Support Project (PAP-MVQ) was put in place by the Government. The overall objective of the project is to improve the availability of Quality Plant Material. Specifically, it aims to:
 - Increase the production level of Quality Plant Material (QPM);
 - Strengthen the capacities of actors in the production of QPM;

- Acquire infrastructure and make good use of technological equipment for the production, storage and conservation of QPM;
 - Increase the dissemination of quality plant material on the national territory.
- The CONSOV meeting: From 23rd to 25th September 2020, the 8th and 9th Sessions of the National Council for Seeds and Plant Varieties (CONSOV) were held in Yaounde and Mbalmayo in the presence of the 27 members of the Council and four special guests. The agenda covered the examination of DUS and VCU testing protocols for potato, maize, onion, cowpea and watermelon varieties (8th Session) and the examination of the draft National Plan for the Development of Agricultural Seeds as well as the draft of the Official Technical Regulations (RTO) for production and certification of citrus seedlings, Avocado, Mango, Cashew and Pineapple plants (9th Session).
 - Release of the first Catalogue of Plant Species and Varieties to help growers choose appropriate varieties.
 - Inclusion of existing varieties in List C of the catalogue pending DUS and VCU tests for inclusion in List A.
 - Capacity building of researchers and research technicians on seed production of certain crops at IRAD.
 - Regular capacity building of MINADER staff (extension workers, seed inspectors...) for better support of seed producers and seed certification.
 - Organisation of seed fairs and Farmer Field Schools by the Ministry of Scientific Research and Innovation.
 - Capacity building of cooperatives and farmer's organisations on seed production (e.g. by PIDMA Project/MINADER)
 - Registration of seed growers and elaboration of the seeds journal with quantities of seed produced. This journal is distributed to all actors of the seed value chain.
 - Support by PIDMA projects of IRAD and some cooperatives with some equipment to improve the quality and quantity of seed produced.

V.3. Process for the official release of improved crop varieties

The law relating to the seed activity stipulates in its article 10, paragraph 1, that an Official Catalogue of Species and Varieties is instituted in which are registered the plant varieties developed or introduced in Cameroon according to the modalities fixed by regulation.

Generally, for a crop variety to be released in Cameroon, the following steps are necessary:

i) The promoter has to apply to the Ministry of Agriculture and Rural Development (MINADER) stating all the attributes of the new variety. The operator must provide a descriptive sheet of the variety to be introduced. This descriptive sheet must include:

- The phenotypic description (available from the breeder/maintainer);
- The agronomic description under Cameroonian conditions (adaptability to different agro-ecologies): Grain yield; Resistance to the main diseases;
- Organoleptic/nutritional characteristics

ii) MINADER then requests supplementary tests (DUS and VCU). iii) If these tests are successful, the variety is added in the National Catalogue of Species and Varieties of Cameroon and iv) MINADER officially releases the variety to the Cameroonian public. The duration of the release process is not predefined, but depends on the crop species and also on the periodicity with which the CONSOV is organised. For the DUS test, the variety is evaluated for two independent growing cycles. The registration in the National Catalogue follows when the national commission for varieties registration is held. It should be noted that, unlike in the past, that commission is planned to be held on a regular basis, at least once every year.

V.4. Procedures for seed certification

The seed control and certification process is essential in the production and marketing of certified seed. Seeds and plant materials are governed in Cameroon by a well-developed regulatory framework. It is law n° 2001/014 of July 23, 2001 relating to seed activity and its decrees and application decrees. This framework covers all aspects of seed activity including regulation, certification, control, practice, transactions and organization. Seed control is carried out at all stages and in all places of production, from the field to the shop of the producer or distributor previously admitted to the control. Laboratory checks enable the seed inspection and certification service or any other approved body to ensure that the seed submitted to it:

- Have a minimum requirement of varietal or genetic specific purity;

- Have a good physiological and health status;
- Meet, where appropriate, the required technological standards;

The required standards are set out in the various technical regulations. The number of checks and the vegetative stages at which they must be carried out vary according to the crop. The seed regulation is considered good and complete by professionals in the field of seeds and plant materials ⁹

In practice, the procedure for seed certification is as follows:

The technical investigation

This consists in verifying that the declarant meets the conditions of the specifications (Joint Order N° 380/MINADER/MINCOMMERCE of 07 August 2006). As soon as the seed activity declaration is received, the Seed Administration has 60 days to carry out a technical survey at the declarant's expense (from the date of deposit of the survey fees). At the end of the technical enquiry with a favourable opinion, the Seed Administration issues a certificate of exercise of the seed activity. This certificate is valid for a period of 03 years, renewable under the same conditions.

Seed crop declaration

It is the materialisation of the multiplier's intention to produce plant material. It consists for the latter to fill in four copies of a (non-stamped) seed crop declaration form approved by the DRCQ at the beginning of each crop cycle or agricultural season.

Seed fee

The seed grower must pay a seed fee related to certification operations at the time of filing his crop declaration at the regional office level. A report on the distribution of crop declarations is drawn up with a view to allocating seed plots to seed inspectors/controllers.

Seed inspection

Seed crops must be placed throughout the production process under the inspection of sworn agents of the Seed Administration. The inspection is carried out in the presence of the seed grower or his representative. In case of refusal of an inspection, the seeds from these crops shall not be accepted for certification.

⁹ IRAM, 2017. Cameroun Evaluation des risques agricoles Rapport Final, Avril 2017.

Estimation of quantities and sampling

At harvest, the inspector and the producer estimate the quantities of seed produced and the corresponding official labels. Samples are taken for analysis in the laboratory

Quality certification of seed batches

After successful laboratory tests, a seed batch quality certificate is issued to the breeder and official labels are affixed to the seed batches.

Other steps of the procedure are control of storage, packaging, handling of register of seed transactions and commercialization.

V.5. Current status of the regulatory agencies in charge of seed certification

Seed certification is done by the Sub-directorate of Seed Regulation and Plant Quarantine (SDRSQV). It is under the Directorate for Regulation and Quality Control of Inputs and Agricultural Products (DRCQ). DRCQ is a Directorate attached to the General Secretariat of the Ministry of Agriculture and Rural Development. When it was created, its mission was to provide expertise in the implementation of regulatory frameworks for agricultural inputs and products. Today it is extending its expertise into the production of phytosanitary certificates and the implementation of national projects supported by partners. The actual mission of DRCQ is to improve the quality of agricultural inputs and products not only for foreign countries, but also for regions of the national territory.

The state system is completed by the National Council for Seeds and Plant Varieties (CONSOV) which is a multipartite structure composed of MINADER, other public administrations, the private sector, producers and civil society.) The Cameroonian state also participates in the international management of the quality of agricultural inputs and the conformity of products to international standards. This mechanism is supposed to ensure a total coverage of the national territory and guarantee a healthy, efficient and effective seed and plant material sector.

i. Active personnel

Institutionally, SDRSQV (under the Directorate for Regulation and Quality Control of Inputs and Agricultural Products (DRCQ) is responsible for quality control and seed certification has a central level:

- a seed certification service comprising a head of service and two design engineers;
- a seed quality control service comprising a head of department and two research engineers;

- A national seed analysis laboratory comprising a head of laboratory and two research engineers;
- The Assistant Director, the heads of service and the study engineers are national seed inspectors;
- The Head of seed analysis laboratory are seed analysts and laboratory technicians.

At the level of each Region, there is a Head of Office (seed inspector) for seed control and certification, assisted by a seed inspector and two seed controllers.

The DRCQ has a network of sworn seed inspectors and controllers in the country's central and decentralized services. Controllers are mainly with the level of agricultural technicians while inspectors have the level of engineer in agriculture. However, the number of these agents which is 58 for all regions and 20 at the central level is not sufficient to cover the demand in terms of seed plot inspections. In addition, the means of transport to visit the seed production plots which are generally in rural areas, are not sufficient despite the efforts made by government through the National Seed Funds which is responsible of financing this activity. It should be noted that seed control and certification agents are generally based in MINADER regional offices and must be deployed in divisions and subdivisions.

Table 25: Number of seed control and certification agents available at the regional and central level

Localization	Number of inspectors	Number of controllers	Total	Minimum required
Far North	1	6	7	10
North	4	2	6	10
Adamawa	3	2	5	10
Centre	3	8	11	10
East	2	3	5	10
South	1	2	3	10
North West	0	3	3	10
South West	1	4	5	10
West	2	4	6	10
Littoral	3	4	7	10
Directorate of DRCQ	6	14	20	
Total			78	

Source: DRCQ

ii. Infrastructure

The Directorate for Regulation and Quality Control of Agricultural Inputs and Products is made of offices and laboratories. There is one National Laboratory and 10 laboratory posts (one in each of the Regions). DRCQ also has a farm serving as testing areas at the level of the Directorate. The National laboratory has four components: seed analysis, fertilizer and soil analysis, analysis of phytosanitary products, and analysis of agricultural products.

The seed analysis component carries out the following type of analysis: moisture content, specific purity, weight of 1000 seeds, germination percentage, viability and Health status. The regulatory bases of the analyses are the following: ISTA standard, Seed Law (Law No. 2001/014 of 23 July 2001) and CODEX standard.

Although seed regulations in Cameroon and the state mechanism for their implementation are considered quite satisfactory, the application of this legislative framework remains problematic. According to the concurring opinions of some institutions and resource persons the biggest problem of seed regulation implementation in Cameroon would be due to the weak mastery of the law and the lack of professionalism of actors. Also, abuses and differentiated treatment regarding the application of the law were mentioned¹⁰. The situation since this study has not changed much despite the efforts made by the government to improve the seed sector.

V.6. Current status of basic (foundation) seed supply

According to the seed law basic (foundation) seeds are mainly produced by research institutes (currently the National research institute (IRAD) and IITA). The recent National Plant Seed policy has extended the role of the private sector from production of certified seeds only to the production of basic seeds as well.

¹⁰ IRAM, 2017. Cameroun Evaluation des risques agricoles Rapport Final, Avril 2017.

Table 26: Annual basic seeds produced by IRAD between 2014 and 2017 for some crops

Crop	Unit	Year			
		2014	2015	2016	2017
groundnut	Kg	5,000	10,000	8,000	-
Plantain	suckers	-	-		15,000
Beans	Kg	25,000	20,000	15,000	56,000
Yam	minisets	-	-	-	22,000
Maize	Kg	400,000	240,000	188,000	233,000
Cassava	Cuttings	3,000,000	3,000,000	3,200,000	4,200,000
Cowpea	Kg	10,500	12,000	10,000	15,000
Potato	Kg	40,000	56,000	56,000	146,000
Rice	Kg	25,000	78,000	40,000	182,000
Soybean	Kg	4,000	8,000	10,000	10,000
Sorghum	Kg	40,000	40,000	28,000	176,000

Source: IRAD Annual reports

It should be noted that basic seeds are normally used to produce certified seeds of first generation. However, sometimes they are sold directly to crop producers due to the lack or delay in demand from producers of certified seeds.

V.7. Procedures for production and supply of basic seed¹¹

The "Practical Guide to Administrative Formalities for Entrepreneurs in Cameroon", which is a compendium of administrative procedures, sets out the steps necessary for a company to carry out an activity in a given economic sector states the procedures for production and commercialization of seeds in general as follows:

• ¹¹ MINPMEESA (2008), Guide pratique des formalités administratives à l'intention des entrepreneurs au Cameroun

Activity 1: Marketing and distribution of seed products

Authorization Payable	Seed activity certificate
Pre-requisite	<ol style="list-style-type: none">1. Have land located in a geographical area favorable to the cultivation envisaged;2. Have a permanent technical staff (provide a list of supported staff with the necessary justifications to the service responsible for seed control and certification)3. Have staff specialized in conservative breeding (provide the list of staff supported by the necessary justifications to the service responsible for seed control and certification)
Place of deposit / withdrawal	Central mail from the Ministry of Agriculture
Reference text	Joint Order No. 380 / MINADER / MINCOMMERCE of August 7, 2006 setting specifications for the production, import and marketing of seeds

Activity 2: Seed production

Required authorization	Seed activity certificate
Prerequisites	<p style="text-align: center;">A. Structures producing dry seeds must meet the following conditions</p> <ol style="list-style-type: none"> 1. In case of production of pre-basic and basic seeds, have a plot for the conservation of propagated plant material; 2. Have a quantity of basic seeds related to the production program of certified and standard seeds and justify their origin 3. Have a packaging line related to the planned production program and which must include at least: <ul style="list-style-type: none"> - A drying area or possibly a dryer, - A cleaner / separator / calibrator, - Seed treatment equipment, - Weighing and bagging equipment; 4. Have an area or a shed to receive raw seeds, premises to store the seeds produced, and the stocks carried over in good conservation conditions to maintain an adequate level of humidity and good sanitary conditions. These premises must be isolated from any store which may contain seeds for consumption; 5. Have a laboratory for self-checking equipped with standard analysis equipment, in particular tests for germination, purity, humidity and sanitary status; 6. Have one or more accessible fields and operating equipment in the event of controlled multiplication. In the event of multiplication by multiplier farmers, they must meet the conditions set out in Article 5 <p style="text-align: center;">B. Seed producers must meet and comply with the following conditions:</p> <ol style="list-style-type: none"> 1. Have easily accessible seed multiplication fields; 2. Comply with isolation standards; <ul style="list-style-type: none"> - Possibly have the means for irrigating the seed multiplication fields;

- Keep the packaging labels, invoices and delivery notes justifying the origin of acquisition of the mother seeds to be multiplied until the first field inspection;
- Place a sign next to each multiplication plot with the following information:
 - the species and variety,
 - the category,
 - the batch number,
 - the area sown in hectares.

C. Establishments producing pre-basic and basic seed potatoes must have a vitro plants center composed of:

- A culture medium production unit;
- A sterile transplanting unit;
- A plant breeding unit;
- A tuberization unit;
- A sanitary test unit

In the event of the production of certified potato plants, the producing establishments must have an easily accessible storage and packaging center equipped with:

- A storage store of 3m³ / tonnes at positive temperature and controlled humidity suitable for storing potatoes;
- A handling area of 0.5m² / tonne well sheltered from the rain and the sun's rays and well ventilated in order to preserve the quality of the plants;
- - A storage depot for packaging products such as bags and treatment products;
- - A packaging unit for carrying out the following operations:
 - sorting,
 - treatment of plants,
 - calibration,

- bagging,
- weighing

D. Structures producing cassava cuttings, sweet potato, banana suckers and yam, cocoyam and taro seed must meet the following conditions:

In case of production of pre-basic and basic plant material:

- have a laboratory whose equipment allows the sampling of meristems, the production of plants in vitro and the performance of health tests;
- have insulating cages for the production of pre-basic plants;
- have a refrigerated storage capacity in relation to the production volume in the event of production of pre-basic and basic equipment.

In case of production of certified plant material:

- stock up each year with basic equipment for the production of certified cuttings, suckers and seeds;

- have one or more accessible fields;
- have operating equipment and production collection;
- have a unit for collecting and sorting cuttings, suckers and seeds.

D. Establishments producing market garden plants must meet the following conditions:

- Have a well-sheltered plot with an area of at least 500m for the production of bare root plants;
- Have greenhouse shelters with a minimum area of 50 m for the production of seedlings in plugs or pots and specialized equipment.

E. Establishments producing fruit and oil palm seedlings must meet the following conditions:

- Have a disease-free woodlot for fruit plants or an oil palm seed field for oil palm plants or a contract for the delivery of base;
- Have a nursery, easily accessible allowing the minimum production of 5,000 plants annually with a quadrennial rotation, for the production of fruit plants with bare root;

	<ul style="list-style-type: none"> - Have shelters allowing the production of a minimum of 1000 fruit plants or oil palm plants in bags or pots; - Have the facilities and equipment necessary for the production, maintenance, health protection and preparation of plants; - Have adequate facilities for the conservation of seeds, grafts and cuttings
Place of deposit / withdrawal	Direction of Regulation and Quality Control / MINADER And Regional Delegations of MINADER
Reference text	Law No. 2001/014 of 23 July 2001 relating to the seed activity and its implementing texts

Activity 3: Manufacture, formulation and packaging of approved sanitary products

Required authorization	Certificate of manufacture, formulation and packaging of approved sanitary products
Prerequisite	<ol style="list-style-type: none"> 1. To employ a technician or a technical sales agent of seeds and plants at all times; 2. Have a storage room isolated from any store that may contain seeds for other purposes or products that may alter the quality of the seeds; 3. Obtain from one or more foreign suppliers registered by the competent authority of the exporting country; 4. Provide at the point of entry for each seed batch candidate for import, in addition to the import authorization issued by the Ministry of Commerce, the following documents: <ul style="list-style-type: none"> - the phytosanitary certificate issued by the competent authority of the exporting country, - the Orange bulletin issued by the competent authority of Cameroon, - the import permit issued by the competent authority of Cameroon, - Imported seed treatment products must comply with Cameroon seed and phytosanitary regulations.
Place of deposit / withdrawal	Courrier central du Ministère chargé de l’Agriculture

Activity 4: Seed marketing

Required authorization	Seed marketing certificate
<p>Pre-requisite</p>	<p>Any establishment wishing to engage in the marketing of seeds must meet the following conditions:</p> <ol style="list-style-type: none"> 1. Employ a technician or a technical sales agent for seeds and plants on a permanent basis; 2. Have an equipped and appropriate point of sale for the seed trade; 3. Have a storage room isolated from any store that may contain seeds intended for other purposes or products that may alter the quality of the seeds; 4. Have a gauge for the conservation of bare root market garden plants; <p>Any establishment wishing to engage in the retail marketing of seeds must meet the following conditions</p> <ol style="list-style-type: none"> 1. Employ a technician or technical sales agent for inputs on a permanent basis; 2. Have an equipped and appropriate point of sale for the trade of seeds, plants and other agricultural inputs only; 3. Have a storage room isolated from any store that may contain seeds intended for other purposes or products that may alter the quality of the seeds.
<p>Place of deposit / withdrawal</p>	<p>Secretariat of the National Pesticide Approval Commission in triplicate against receipt, located next to the ETOUG EBE disabled rehabilitation center</p>
<p>Reference text</p>	<p>Joint Order No. 380 / MINADER / MINCOMMERCE of August 7, 2006 setting specifications for the production, import and marketing of seeds</p>

i. Access by private seed companies to basic seed

Currently, basic seeds in Cameroon are produced by research institutes (IRAD, IITA), some seed farms of MINADER, for some specific crops (Cocoa), SODECOTON or cotton, SEMRI and UNVDA for rice. These basic seeds are made available to seed producers, seed producer groups or cooperatives through direct purchases from these institutes or through donations from MINADER or various projects (PAP-MVQ/MINADER, SAPEP, PIDMA...) or NGOs. For now, no private seed company is buying basic seeds from research institutes.

VI. SUMMARY AND CONCLUSIONS

VI.1. Current status of access to improved seed among smallholder farmers

Cameroon's agricultural sector is dominated by smallholder farmers. These households mainly produce for subsistence and use little external input. The level of access to improved seed is very low. Farmers usually use seeds retained from the harvest of last season's crops. This situation is probably due to the low purchasing power of farmers and the limited awareness of the importance of using improved varieties. The non-awareness of the importance of using improved varieties can be due to the absence of the extension activities service in their area as a results of the inefficacy of the extension system.

Another reason for the use on unimproved varieties can be the lack of availability of improved seeds in the rural area where most of these smallholder farmers are located.

However, some smallholder's farmers use improved varieties, usually those who belong to farmers' groups such as cooperatives or who have received seeds from relatives, from NGOs, Projects or through Government free distributions. More often, the seeds received are of improved varieties developed or introduced by IRAD and IITA and produced by these institutes.

VI.2. Current status of government support for improving seed systems

The public sector has a definite contribution to promote seed development. Through the Department of Quality Regulation and Control of Agricultural Inputs and Products of the Ministry of Agriculture and Rural Development, the State ensures the regulation of seed and plant quarantine as well as the selection of various seed species.

The promotion of agricultural activities must be supported by an efficient and dynamic seed sector. In spite of the political will always expressed by government authorities through texts and declarations to promote the development of the seed sector in order to support national food

security policies, this will be gradually manifesting itself through concrete actions in the field. The seed sector is therefore developing and organizing gradually due to the attention given by the government and some donors (FAO, EU) to this sector these days. However some major structural and organizational constraints remain among which:

- The weak capacity of seed sector actors;
- The lack of a coherent extension and promotion program on the use of quality seeds;
- Low involvement of the private sector in the seed sector;
- Lack of an efficient and stable financing and credit system to develop and support the seed sector;
- Lack of effective and accessible information system on the seed sector.

MINADER's Decision N° 01024 of April 18, 2019, identifies the following twelve sectors as priorities: Cocoa, Coffee (Arabica and Robusta), Cotton, Maize, Rice, Sorghum/Millet, Cassava, Potato, Plantain Banana, Oil Palm, Cashew and Pineapple.

The production objectives assigned to each of these commodity chains are mentioned in "The Challenges of Agriculture 2020-2030".

In order to achieve these objectives, the government has several strategic documents, some of which are currently being validated, namely

- The National Plan for the Development of Agricultural Seeds 2020 - 2025 (PNDSA)
- The National Development Strategy for Structural Transformation and Inclusive Development 2020 - 2030 (NDS)
- The National Agricultural Investment Plan 2020 2030 (PNIA)

Other actions taken by the government to improve the seed sector are:

- Ongoing reform of the National Seed Fund to enable it to carry out efficiently its activities.
- Liberalisation of seed production and marketing (marketing of seeds by private economic operators: seed multiplication farmers' groups, seed production cooperatives, seed production and marketing multinationals).
- Support of seed producers and cooperatives; in this vein, with the aim of improving the accessibility of quality seeds to farmers, the government of Cameroon through its Ministry of Agriculture and Rural Development (MINADER) has requested financial and technical support from the Food and Agriculture Organization of the United Nations (FAO) through a project entitled "Support for institutional and technical capacity building of the seed sub-

sector in Cameroon". This project aims at strengthening the capacities of public and private actors of the seed sub-sector in the maize, rice and sorghum sectors. Thus, from 7 to 10 June 2020, a joint mission of FAO and MINADER teams supervised the distribution of agricultural inputs to farmers' organisations in the East, West, Adamawa and Far North regions.

- Regular meeting of CONSOV
- Publication of the national seed catalogue
- Validation of various RTO
- Validation of the National Seed Plan
- Capacity building of more seed inspectors
- Financially supporting IRAD for seed production.

VI.3. Trends and opportunities for seed systems improvement

The seed system of Cameroon is gradually undergoing some positive changes following government actions toward the improvement of the seed sectors. The liberalization of seed production and marketing involves the marketing of seeds by private economic operators (seed multiplication farmers' groups, seed production cooperatives, seed production and marketing multinationals). The seed law, followed by all the regulation documents enacted define the framework for the intervention of each actor in the seed sector and encourages the emergence of public-private partnerships.

Cameroon's strategic position in relation to other CEMAC countries in the field of seed production presents a potential market. Awareness-raising by MINADER, projects and NGOs on the importance of using quality seed increases producer interest and subsequently the use of seeds of improved varieties. In Cameroon, several organizations are interested in the seed issue and bring various supports to the actors of the seed sector.

It should be noted however that the lack of local source of improved vegetable seeds, while being a handicap for producers, is also a market opportunity for seed producers.

VI.4. Recommendations for improving seed supply and adoption

Improving the seed system of Cameroon has many implications on both food security and economic development. To achieve this goal, greater collaboration between partners involved in the seed sector is required to increase the production of seed and its availability at the reach of smallholder farmers at affordable prices. Collaboration will also facilitate the tracking of seed

movements in the country, while assuring seed quality. In addition, it is very important to support the research development among institutions involved in agricultural production.

More specifically :

1. To support implementation of the national seed plan. This plan is almost validated and each actor will have to act (Financially, technically...) at his own level for a good implementation of this seed plan in order to produce quality seeds in quantity and quality.
2. To strengthen the infrastructural, human and financial capacities of IRAD. IRAD's research budget should be increased and personnel be given practical training on seed production and seed systems development. Recently recruited researchers should be trained as plant breeders or seed specialists, with an emphasis on vegetable breeding. There is no current breeding program on vegetable and most seeds of vegetables used in Cameroon imported, for this reason they are very expensive and not easily accessible to farmers;
3. To strengthen the capacities of the Directorate in charge of seed certification (DRCQ). This can be done by:
 - a. increasing the staff in the official services in charge of seed control and certification

The number of control and certification agents which is currently 58 for all the 10 regions and 20 at the directorate level should be increase to at least 100 for all the 10 regions in order to satisfy the need in term of seed certification. These agents should not be based only at the regional levels but also deployed to Divisions at least.

- b. built the capacity of this staff by organising regular trainings;

The control and certification agents which are designated among MINADER staff (with at least the level of agricultural technician for controllers and Engineer in agriculture/MSc for inspectors) more often were not trained before in seed control and certification, as such training does not exist anywhere in the academic curriculum in Cameroon. It is therefore necessary to regularly organise capacity building workshops for them. This capacity building is also important with the regular renewal of control and certification agents due to the retirement of old ones and regular release of

new crop varieties. This can be done through regular training workshops on both technical and regulatory aspects.

- c. equip the agents in charge of seed control and certification in terms of inspection kits, and transportation means which will allow them to reach the seed production plots wherever they are;
4. The National Seed Fund should be made more effective in supporting the seed sector. Seed certification for instance is an activity subsidized by the state through the National Seed Funds. However, this body have difficulties in supporting efficiently the minimum of three controls required per seed production plot, thus the need of looking for additional funding for this Body.
5. To improve the capacities of cooperatives in seed production techniques and commercialization in order to allow them to produce quality seeds for farmers; For instance, most seed producers have difficulties in processing their seeds, especially those in rural areas, the creation of more seed processing centers in close proximity of seed producers or reinforce the existing ones will allow seed producers with insufficient equipment to process their seeds and improve the quality. Another alternative is to support the small seed producers with small equipment. Manufacturers involved in production of local equipment both for seed production, processing and packaging in the country should thus be encouraged and promoted;
6. To facilitate access to agricultural credit by seed producers and cooperatives.
7. To encourage creation of private seed companies which operate close to farmers; this can be done by creating a conducting environment to the private sector (government subsidies, reduction of taxes, ...). These seed companies could use some of the small seed producers as out growers.
8. To support the regular update and the diffusion of national seed catalogue to inform the producers on improved varieties available that are suitable to their environments and meet their preferences; one way can be done be the online publication of the catalogue;
9. To encourage the establishment of consultative platforms IRAD/MINADER/OP/seed companies by crop for a better sharing of information;

10. To strengthen the extension system for better supervision of producers and their sensitization/encouragement to the use of seeds of improved varieties through appropriate extension techniques. Since extension activities by NGOs and private actors are usually temporary, it will be important to put in place a permanent and sustainable extension systems. Thus, MINADER'S extension staff in decentralized services should improve its local supervision in seed activities, for this they should be trained and equipped with appropriate rolling stocks to easily access farmers who are mainly in rural areas.
11. To strengthen public-private partnerships in the seed sector by encouraging agreement between research institute and seed companies/cooperatives for production of basic seeds. This will would allow the research institute to focus on varieties development and pre-basic seeds. Research institute should also be encouraged to transfer the licenses of varieties developed to private seed companies in other to get royalties which will serve as return on investment in their breeding programs.
12. To increase the consideration of specific references in seed science and technology in agricultural education programmes. The Universities should think of setting up Master and PhD programs in Plant Breeding and Seed Technology in their institutions. Almost all the plant breeders in Cameroon were trained abroad. In the past, it was not possible to put in place a graduate program in the field of plant breeding because of the lack of qualified lecturers. With the increase observed in number of PhD in plant breeding in the country, these plant breeders can serve as lecturers and student supervisors in graduate and post-graduate programs in plant breeding if they are created.
13. To strengthen international collaborations in the seed sector.
14. To improve the monitoring of imported seeds. The DRCQ should follow up the production of imported seeds in order to be sure that all seeds imported and made available to farmers are really adapted to their environment.
15. Free distribution of seeds by the government and NGOs should be reduced in order to allow private seed companies to flourish. This distribution should be limited to emergency situations. In such situations, these seeds should be bought from private seed producers and these producers should be paid on time in order not to paralyse their activities.

VI.5. Likely impact from the improvement of access to improved seed by smallholder farmers

The use of good quality seed is a prerequisite for the satisfactory production of a good quality crop. Increased access to improved seeds among smallholder farmers will have a huge impact, not only at the household level, but also on the country's economy.

In fact, by using improved seeds, farmers will increase their productivity. This increase will improve their revenue and therefore their livelihood. At the national level, the use of improved seeds will increase the national agricultural production of various crops, thus reducing importations and currency losses. Moreover, with its strategic position in the CEMAC zone, Cameroon could see its exports increase, and a positive effect on the trade balance.

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APPENDICES

Appendice 1: Cooperatives in the southern zone involved in maize seeds production using basic seeds from IRAD during the 2019 campaign

Division	Seed producer	Varieties	Quantity (Tonne)
BAMBOUTOS	IC Forteresse GIC Forteresse	CHC 201	12
		CHC 203	12
	GIC P-VEGEL	SHABA	3
	GIC SEED CAM	CHC 201	19
	ATCHINDA THERESE MATCHINDA THERESE	CHC 201	1,5
		CHC 203	1,5
	GIC TATCHOUO	CHC 201	2
BOYO	Del&Fio;	ATP	3
BUI	Hard labour CIG,	CHC201 (KASSAI)	6
	Farmer Aid CIG,	CHC202 (ATP)	25
	Lavnggeh young farmers,	CHC202 (ATP)	15
	ultigreen investment CIG, Multigreen investment CIG,	CHC202 (ATP)	25
		CHC201 (KASSAI)	4
DJA ET LOBO	ABA'A François	CMS 8704	2,5
DJEREM	Scoop des Producteurs de Maïs (SAOUDI)	CMS 8501	75
DONGA MANTUNG	FAMAH MFG,	ATP	3
FAKO	Liysumver Farmers CIG	CMS 8704	13
	CITIZEN Building CIG	CMS 8704	5

	Nset Echat EfogCIG	CMS 8704	2
	BODFARD CIG	CMS 8704	15
	Leo La Bwea CIG	CHC 203	10
	SEDEV CIG	CHC 203	10
	ITONGOWA CIG	CMS 8704	5
	UNITY FARMERS CIG	CMS 8704	5
	GREEN WORLD CONSULT CIG	CMS 8704	10
	FAITHFULL WOMEN CIG	CHC 203	5
	Let Love Lead CIG	CMS 8704	10
HAUT-NKAM	GIC NGA'CA	CHC 201	2,5
KADEY	OOP CA PROMA COOP CA PROMA	CMS 8704	23
		CHC 201	1
		ATP	20
KOUNG-KHI	UGIC Fleur	Shaba	75
LEKIE	GICOBIL	CMS 8704	12
	RCDO PRCDO	CMS 8704	8
		CHH 101	0,5
	ASPHIC ONG	CMS 8704	4,4
	TABESS COOP	CMS 8704	35
	GIC CULTAO	CMS8704	1, 2
	GIC PRECONDECAM	CHC201	0,88
	COPALE COOP-CA	CMS 8704	6,5
GIC AGROPASTORAL	CMS 8704	3	
LOM ET DJEREM	COOP-CA/ Agri-Fomlo	CMS 8704	20
	COPAM COOPERATIVE	CMS 8704	2
MBAM ET	APRIMI GAPRIMI	CHH101	1,4

INOUBOU		CHH108	0,9
		CHC203	1,4
	IC EBA GIC EBA	CMS 8704	0,8
		CHH 101	1
MBAM ET KIM	OCOOP RACE SOCOOP RACE,	ATP	7
		CMS 8704	10
MBERE	Ets NAC	SHABA	2,5
MEFOU ET AFAMBA	GIC LA GRACE	PVA5YN6 (biofort)	14
	GIC PELAM,	CMS 8704	12
	SOCAPA	CMS 8704	12
MENCHUM	Ntein Moses	CHC 202 (ATP)	2
	Nkemasong Gabriel,	CHC 202 (ATP)	3
	CAMSEED,	CHC 202(ATP)	2
MENOUA	GIC AFA'ABON	CHC 202(ATP)	1
	IC FAM GIC FAM	CHC 201	3
		CHC 202(ATP)	2
MEZAM	ORDEP,	CHC 202(ATP)	3
	Aghani;	CHC 202(ATP)	4
	Intergrated MFG	CHC 202(ATP)	1
	Che Felix	CHC 202(ATP)	3
	Yamark Denis	CHC 202(ATP)	3
	ANAMED,	CHC 202(ATP)	15
MIFI	GIC AFUDIB	CHC 201	4
	KOAGNE RICHARD	CHC 201	4
	KENFACK Nicolas,	CHC 201	1
	OTSO Blaise FOTSO Blaise	CHC 201	4
		CHH 101	7

	FOPOU David	CHC 201	2
	KENFACK Nicolas	CHC 202	1,5
	FOTSO Blaise	CHC 202	4
	GIC AMEK-BA	CHC 201	3
	COCENOUN (MEKAMPTUE)	CHC 201	3
MOMO	ANDONGICHU	CHC202	3
MOUNGO	COOPRO DYCCAS	CMS 8704	12,5
	IC JAEM GIC JAEM	CMS 8704	4
		CMS 8501	2
	GIC LA FAMILLE	CMS 8704	12,5
	GIC GEC	CMS 8704	3
	GIC PROCAVIL	CMS 8704	12,5
	BOI-EXOTIC	CMS 8704	5
	GIC MAIN VERTE	CMS 8704	6
	ZOCK	CMS 8704	8
	Lobe manga	CMS 8704	1
	SOCOMASSA	CMS 8704	1
	GIC PROSEL	CMS 8704	5
MVILA	GIC LIFAKSIOBE,	CMS 8704	1,5
	PROTRACOPA-COOP-CA	CMS 8704	6,6
	EKOULOU Gervais MEKOULOU Gervais	CHC 201	2
		CMS 8704	0,125
		ATP	2
ABA Francois	CMS 8704	2	
NDE	MS SAR GMS SAR	CHC 203	6
		CHC 201	15
	GIC AEDINO	CHC 201	8
	GIC LE LAPINIER	CHC 201	1,5

	TCHOUAYANG Claude	CHC 203	3
	YONGOUA	CHC 201	5
	COPSEMO	CHH 101	6
	IRAD Bangangté	CHC 202	20
NGOKETUNJIA	rupuh Agro- industrialfarming group,	CHC202 (ATP)	25
		SHABA	1
	Baba 1 maizefarmers union	CHC202 (ATP)	20
		KASSAI	2
	Muslem Women 674333953	CHC202	6
		KASSAI	6
	MBASAH MFG 652495475	CHC202 (ATP)	6
		KASSAI	6
Palace Green Rev,	ATP	9	
NOUN	GIC AVERTI	CHC 201	4
	AGRO ARIQUE	CHH 101	2,5
	IC AGROTAL GIC AGROTAL	CHC 201	1,5
		CMS 8704	0,8
	GIC AGROTAL	CHC 202	1
	IRAD Foubot	CMS 8704	1,2
	SEMVEG	CHC 201	2
	COPSEMO	CHH 101	3
	GIC AGROPO	CHC 201	0,5
NKAM	AFM	CMS 8704	3
VINA	GIC des Femmes OKO'O de Parmo	CMS 8704	0,1
	MAYO Françoise	Shaba	0,9
	Union So'o-Nougg	CMS 8704	2
		Shaba	2

	HAMADOU BINDOWO	CMS 8704	2
		Shaba	4
	GIC Femmes Capital Economique	Shaba	2
		CMS 8704	2
	LOUMNALA Gilbert	CMS 8704	4
	Scoop Simplifiée Producteurs de Maïs et semences	Shaba	7
	VIPRODED	Shaba	8
	Scoop des Agriculteurs de 2 ^{nde} Génération	CMS 2019	12,5
	Scoop des producteurs de maïs	CMS 8704	45
		CMS 8704	60
	SOCOMANGA	CMS 2019	80
		Shaba	150
		CMS 8704	60
	SOPROICAM	CMS 8704	300

Source: PIDMA, Journal of seed producers 2020

Appendice 2: Cooperatives in the northern zone involved in maize seeds production using basic seeds from IRAD during 2019 campaign

Division	Seed producer	Variétés	Quantity (Tonne)
Mayo Sava	SCOOP PROTOK	CMS 9015	15
		CMS 9015	5,2
	PROSEM	CMS 9015	2
	GASBROV LADE Emmanuel	CMS 9015	2,5
Mayo Kani	GIC GASPEN	CMS 9015	6
	Scoop Sylvo-Agropastoral de Mouda,	CMS 9015	3
	GIC GASPEN	CMS 8704	4,5
	UG POUIGO	CMS 9015	9,7
	Scoops Sylvo -Agropastoral de Mouda	CMS 9015	6,7
	SCOOP Djoumokoum-Aye	CMS 9015	20
		TZEE	8
		CMS 8806	3
EVDT		0,5	
Diamaré	GIC SOLDYBA	CMS 9015	2,8
	SCOOP-CA AGRIMOK ZIBI Medjewe	CMS 9015	31,5
	Ets PALNANG Ruben	CMS 9015	1,4
	SCOOPS NGAKAMA des Agro-éleveurs de Ziling	CMS 9015	4
	SCOOPS-NGAKAMA des Agro-éleveurs de Ziling, ABOLGO Pierre,	TZEE	3
	BOUBA Zeri	CMS 9015	5

	GIC ADJAGUIN de MOULOUM LOWAN Alioum	CMS 9015	1,8
	GIC Narral Astarou Yaouba	CMS 9015	1,8
	SCOOPS Aoudi BOUBAKARY Haman	CMS 9015	25
	SCOOPS MA SWA'A SHELIN Daniel MAFEWA	CMS 9015	5,5
	GIC Nga-Nga de GAZAWA DAGUIDAM Esther	CMS 9015	4
	GIC Assedjao DJIBRILA	CMS 9015	2
	GIC Agro-pastoral NDIKWA Jonas	CMS 9015	1,5
	Scoop Djoumoukoum Aye S/c ALIOUM Bello, Tél:	CMS 8704	0,9
	SCOOPS DJINIVOU NDJIDDA Yaya	CMS 9015	4
Mayo tsanaga	SCOOPS-HURFEDK LADA Ndanara	CMS 9015	3,5
	SCOOP-CA AGRIMOK ZIBI Medjewe	CMS 9015	6
	SCOOPS-HURFEDK LADA Ndanara	CMS 9015	35
Mayo Louti	HAROUNA TIZI	EVDT	1,5
	HAROUNA TIZI	CMS 9015	1
Faro	BEIDI Emmanuel	CMS 8501	10,5
		CMS 9015	10
	KOKAM Gilbert	CMS 9015	20

		CMS 8501	30
	MANA Ruben	CMS 8501	6
		CMS 9501	2
Bénoué	FOUMNA Amadou	CMS 9015	1
	COOP DE PRODUCTION DE SEMENCES	CMS 8704	1,5
	COOP DE PRODUCTION DE SEMENCES	CMS 8501	18
	GIC GASPEN	CMS 9015	1
		TZEE-W	1
	PAKAH Samuel	CMS 8501	3,5
	MEDJIRON Albert	CMS 8501	1,2
	AOUDI SANGUERE	CMS 8501	6
		CMS 9015	2,5
	GIC AGRENELAS	CMS 8501	3,5
		CMS 8704	2
	GIC LOUMLE	CMS 8704	4
	DOURKA Jean	CMS 9015	3
	GIC VATMAS	CMS 9015	3,9
		CMS 8501	2
	GIC SALAM	CMS 8501	3,9
		CMS 9015	1
DJEREM	Scoop des Producteurs de Maïs (SAOUDI)	CMS 8501	75
MBERE	Ets NAC	SHABA	2,5
VINA	GIC des Femmes OKO'O de Parmo	CMS 8704	0,1
	MAYO Françoise	Shaba	0,9
	Union So'o-Nougg	CMS 8704	2
		Shaba	2

	HAMADOU BINDOWO	CMS 8704	2
		Shaba	4
	GIC Femmes Capital Economique	Shaba	2
		CMS 8704	2
	LOUMNALA Gilbert	CMS 8704	4
	Scoop Simplifiée Producteurs de Maïs et semences	Shaba	7
	VIPRODED	Shaba	8
	Scoop des Agriculteurs de 2nde Génération	CMS 2019	12,5
	Scoop des producteurs de maïs	CMS 8704	45
		CMS 8704	60
	SOCOMANGA	CMS 2019	80
		Shaba	150
		CMS 8704	60
	SOPROICAM	CMS 8704	300
	TOTAL		1183,8

Source: PIDMA, Journal of seed producers 2020

Appendice 3: Cooperatives involved in certified cassava cuttings production using basic cassava cuttings from IRAD during the 2019 campaign in the southern zone (Central, South, East, Coastal and West)

Division	Seed producer	Variétés	Quantity (cutting)
BAMBOUTOS	PEYANI Rigobert	92/0326	60 000
		92/0057	100 000
HAUTE SANAGA	SOCOFESAE	92/0326	100 000
		TME 693	100 000
		Biofortifié (I070593)	100 000
		96/1414	100 000
HAUT NYONG	KELE KAYEM Mesmer	95/0109	100 000
	GIC PROSACA	8034	400 000
LEKIE	COPALE	8034	100 000
	CARITAS	96/1414	100 000
	CULTAO	TME419	150 000
	SOCOFESAE	96/1414	100 000
		95/0109	200 000
		92/0326	100 000
	DITRAMA	TME693	100 000
	SOCOAPACE	8034	100 000
		96/0326	150 000
		95/0109	150 000
		8061	250 000
96/0326		150 000	
	ESSAM ENONG	TME 419	200 000

LOM ET DJEREM		95/0109	100 000
		96/1414	100 000
MBAM ET KIM	OPALE COPALE	95/019	150 000
		TME 693	60 000
		TME 419	30 000
		95/0109	60 000
		8034	350 000
MEFOU ET AFAMBA	GIC PELAM	95/0109	100 000
	GIC LA GRACE	8034	200 000
		92/0326	350 000
		95/0109	100 000
		TME 419	100 000
MEFOU ET AFAMBA	GIC ENTRE-NOUS	TME419	100 000
MEFOU ET AKONO	GIC APAC	95/1414	100 000
		TME419	100 000
	GIC PROSEC	TME419	100 000
	AGROSEP-COOP	01/1797	100 000
		92/0326	100 000
MOUNGO	GIC MAIN VERTE	92/0326	100 000
		Local	100 000
		96/14 14	100 000
	ETS MADREN	Local	200 000
	Labomote	92/0326	200 000
	Ferme semencière de Mbouroukou	92/0326	70 000
		8034	30 000

		TME/419	50 000
		1070539	50 000
NKAM	ETS MADREN	8034	350 000
		local	100 000
	SOCOPAACAM	8034	400 000
NYONG EKELLE	COOP-CA PROMA	95/0109	250 000
		92/0326	200 000
		96/1414	150 000
OCEAN	GIC GRACE DIVINE S/C EBALE Henriette T	92/0326	300 000
	GIC AGON FANG	92/0326	200 000
	GIC COUP DE CŒUR S/C MAPHOUNDOUR Benjamin,	92/0326	300 000
	ONANA BENDIE Sylvain,	92/0326	750 000
	MESSI AMOUGOU Pierre	92/0326	750 000
SANAGA MARITIME	GIC MAIN VERTE	92/0326	300 000
	BIBOG BILLONG	8034	100 000
		96/1414	100 000
		92/0326	200 000
		95/0109	200 000
		local	200 000
	KAMEGNI	92/0326	300 000
	GIC PROSEL	92/0326	100 000
		8034	100 000

Source: PIDMA, Journal of seed producers 2020

Appendice 4: Cooperatives involved in certified sorghum seed production using basic sorghum seed from IRAD during the 2019 campaign in the northern zone

Division	Seed producer	Variétés	Quantity (tonne)
Mayo Sava	La Maison du Paysan	S 35	35,6
	SCOOP PROTOK	S 35	42,3
	PROSEM	CS 54	8
	GIC KAOUTA BERDE	Zouaye	3,75
Mayo Kani	UG POUIGO	CS 54	3
	UG POUIGO	S 35	1
	Scoop Sylvo-Agropastoral de Mouda,	S 35	3,5
	SCOOP Djoumoukoum-Aye	S 35	9
	SCOOP Djoumoukoum-Aye	Zouaye	3
Mayo tsanaga	SCOOPS-HURFEDK LADA Ndanara,	Zouaye	10,2
	SCOOP-CA AGRIMOK ZIBI Medjewe	Zouaye	10,4
Diamaré	BOUBA Zeri	Zouaye	2,4
	BOUBA Zeri	S 35	0,8
	SCOOPS Aoudi	Zouaye	12,8
	SCOOPS MA SWA'A SHELIN	Zouaye	1,6
	SCOOPS MA SWA'A SHELIN	S 35	5,5
	GIC Assedjao	Zouaye	1,9
	GIC AGUI	Zouaye	2,2
	Scoop Djoumoukoum Aye S/c ALIOUM Bello	S 35	5
Mayo Louti	HAROUNA TIZI	S 35	4,5
Faro	KOKAM Gilbert	S 35	1,5
TOTAL			162,75

Source: PIDMA, Journal of seed producers 2020