Cameroon

Country Snapshot

- Population- 26 million
- 23.1% Agricultural share to GDP
- 7.20 m ha Arable land
- 9.9% Undernourished population
- Age group p < 15 - 42.3%; 15-64 -54.7%; > 65 – 3%
- 60% Agricultural employment
- Climate Risk index- 97
- Global hunger index- 22.6

Figure 52: Country Snapshot - Cameroon

Nutrition Profile

- Poor nutritional habits in some parts of Cameroon has led to high prevalence of protein energy, malnutrition and micronutrient deficiency (vitamin A, C, E, iodine, iron, zinc etc.) especial-ly during infections with HIV/AIDS, tuberculosis and malaria
- However, data on micronutrient deficiency in Cameroon is very limited, except for public health relevant micronutrient (vitamin A, iron, iodine deficiency).

Food insecurity	Nutrition	Dietary diversity	Average per capita Fruits & Vegetable intake
• About 16% of population affected by food insecurityPoverty rate-37 % • Poverty rate-37.5 %	• < 5 stunting-31.7% • <5 Wasting- 5.2% • Anaemia in women of 15-49 years age -41.4 %	• 54% of energy source derived from cereals, roots and tubers representing low dietary diversity	• 307.5 and 293.3 g/day against recommended guidelines 200-250 g/day

Figure 53: Nutritional Profile - Cameroon

Crop Profile

The important food crops of Cameroon are plantains, cassava, maize, sorghum, and millet (Figure 54). While the main cash crops include cocoa, coffee, cotton, bananas, rubber, palm oil and peanuts. Currently, Cameroon is the fifth largest cocoa producer in the world (FAOSTAT, 2018). 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 in a "dry savanna" zone, 20% in "humid highland savanna" zone and 58% in "humid dense forest" zone, the remainder being in transition zones. 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, groundnut etc.), fruits, vegetables, spices, and medicinal plants. Although the main food items are generalized, there is a wide range on the choice of food items particularly the vegetables and spices. In Cameroon tradition, every ethnic group identifies itself with a range of foods and vegetable crops.

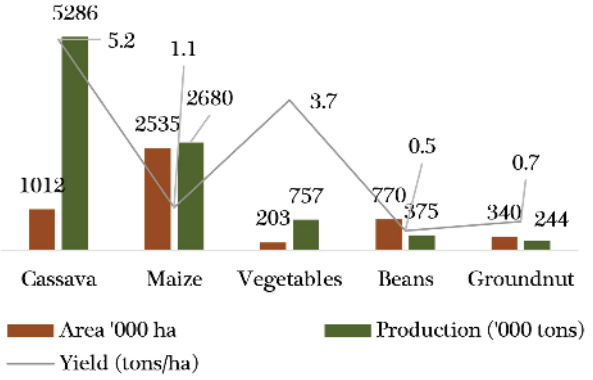

Figure 54: Crop Profile (2017) - Cameroon

Figure 55 depicts the yield trends of the key crops in Cameroon from 2008 to 2017. The figure indicates that the productivity of most of the major crops has remained stagnant with minor variations.

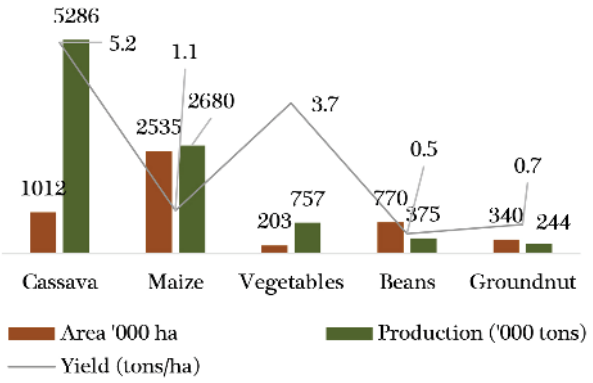

Figure 55: Yield Trends (tons/ha) - Cameroon

Based on the climatic conditions, the vegetation, soils and altitude, Cameroon has been divided into five agro-ecological zones (IRAD Cameroon, 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 Savanna 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 mm 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 mm 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 mm 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.

Cameroon is the most important market in the Commission de la Cemac (CEMAC - Economic and Monetary Community of Central Africa) zone, accounting for nearly 50% of the GDP. Millet, sor-ghum, rice, yam, cassava, fruits (e.g. pineapple, papaya, and oranges), fresh vegetables and plantain are the staple food crops produced for both domestic consumption and exports to countries within the central African region.

Breeding, Variety Development and Release

The Institute of Agricultural Research for Development (IRAD) is a public agricultural research institute and oversees the development of new improved varieties for different crops, maintenance of these varieties and makes the seeds available to seed producers. They are also in charge of genetic resource conservation. 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. In addition, some state universities (University of Dschang, University of Yaoundé I, University of Buea, University of Bamenda, and the University of Maroua) have plant breeders in Department of Agriculture. However, there is no active breeding program and they usually rely on breeding programs of the research institutes for practical 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.

IRAD is also working with international research institutions in order to introduce improved varieties for testing for their adaptability and dissemination to farmers e.g. with IITA for maize and cassava, with CIP for potato, with CIAT/PABRA for common beans, Africa Rice for rice, with the Soybean Innovation Lab of University of Illinois for soybean, and with ICRISAT for Sorghum.

IRAD's major challenge remains the lack of human resources in the field of crop improvement and seed production. Despite the recent recruitment of several young researchers, their capacity in the field requires strengthening. The 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 48: Location of IRAD Research Center Structures and Their Potential Crops

N·	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 Mbalmayo	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.

IRAD's scientific staff consists of 347 Researchers and 72 technicians. More than 50% of this workforce consists of newly recruited researchers who are not yet specialized. Only 60 (17%) of researchers are PhD holders. 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 49 and 50 shows the number of personnel at IRAD and those engaged in crop improvement at IRAD.

Table 49: 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 50: 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

IRAD's infrastructure in all its operational structures is distributed all across the country. These are used for crop improvement and seed production among other activities. The most important ones 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; and
- One Lipid 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 rooms

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.

IRAD in 2017 has protected 17 varieties (Table 51) of different crops with the African Intellectual Property Organization (OAPI).

Table 51: IRAD Crop Varieties Protected at OAPI

CROP	Number of varieties protected	Name of varieties
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 Tables 52 and 53 shows the number of varieties in collection and disseminated on the main target crops of the national varietal selection. It has been observed that the seed sub-sector has a fairly rich genetic potential consisting of clones, varieties and hybrids, despite the very low uptake by farmers. This is a strength that provides ampt opportunity for seed system development.

Table 52: IRAD Varieties Available for Seed Prouction

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, NERICA 9, ORYLUX6, NERICA L60, NERICA 13,	All NERCA varieties were introduced from Africa Rice and evaluated in Cameroon
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 53: 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	Varity 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	Most of the 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.

Proposed Interventions

- Introduce improved rice, maize, sorghum varieties/hybrids and vegetable hybrids with focus on key traits. The aim will be to release 20-25 varieties/hybrids of key crops and vegetables in the country over a period of five years.
    - *Maize*: Maize hybrids with the yield potential of 3-4 times over current productivity will be sourced from private companies, IITA and CIMMYT.
    - *Rice*: Test improved hybrids and varieties from AfricaRice.
    - *Beans*: Varieties will be sourced from regional research centers in neighboring African countries and public and private sources in Asia.

- *True potato seed (TPS):* Capacity development will be undertaken in the private sector to produce TPS to develop virus-free planting material of local varieties in collaboration with Mahindra, PepsiCo (India), and local Angolan companies Novagrolider, Valagro and Vrelo.
- *Cassava*: Introduction of improved cassava varieties with preferred traits like (a) high yield; (b) high dry matter content; (c) medium branching type (d) resistance to cassava brown streak disease; (e) cassava mosaic disease resistant varieties; and (f) stay green leaves. Support of seed multiplication of planting sticks to private seed companies.
- *Vegetables*: Hybrids of okra and peppers will be introduced in collaboration with mid-sized global vegetable companies like East West, Advanta, Technisem, Sakata and the World Vegetable Centre. These hybrids will be validated with the help of private companies for commercialization.

- Enhancement of the R&D capacity of the private seed companies, including Grenier du Monde Rural (GMR), on hybrid development and hybrid vegetable production
- Building human resource capacity (breeding and seed production technology) within the country by providing support to 10 MS and two Ph.D fellowships via exchange programs at universities in Ghana, Kenya, Uganda, and RSA. MS and Ph.D breeders will be trained to work with breeding programs to introduce, evaluate, and select hybrids for maize, soybean, and vegetables.

Seed Systems

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. Figure 56 shows supply demand gap of certified seeds and Table 54 shows annual basic seeds produced by IRAD in Cameroon.

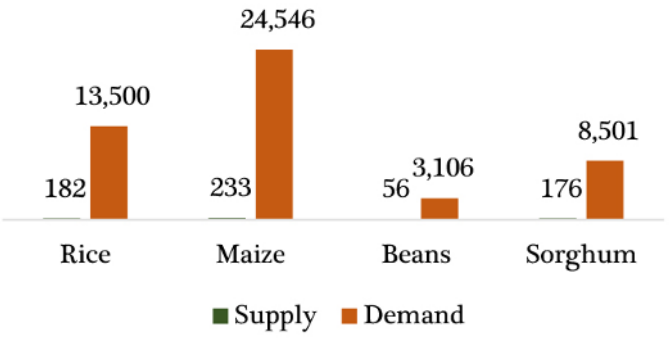

Figure 56 : Seed Supply Demand Gap (MT) - Cameroon

Table 54: 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

According to Access to Seeds Index, last updated April 2019, 13 seed companies are selling their seeds in Cameroon (Table 55). The seeds are mostly vegetable seeds. Only one of these seed companies, Semagri, is headquartered in the country and is planning to start local seed production activities in addition to the import. The others distribute seeds in Cameroon through local distributors.

Four vegetable seed companies have testing centers, three companies offer extension services, and two conduct breeding centers in the country. None of the companies in Cameroon have processing sites. Only Semagri is registered as a local company that partners with the Senegalese company Tropicasem. It is one of the few companies that conducts trials for vegetable seed varieties at its station in Douala. Semagri also 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 is 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 of vegetable seeds.

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 seed production. The quantities of vegetable seeds produced locally per year by GMR are:

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

Table 55: Private Seed Companies in Cameroon

Company	Range of crops		Company activities in the country					
	Field crops	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		✓	✓	✓	✓		✓	✓
Agroplants		✓					✓	
Farmers House		✓	✓				✓	
JACO			✓				✓	
Jardin des agriculteurs		✓	✓				✓	
Phytograines		✓	✓				✓	
Rhoticam			✓				✓	

The Table 56 shows the quantity of seeds officially imported into Cameroon in 2019-2020. IRAD, IITA and PRODERIP import small quantities of seeds for research purpose, all the other importers are doing it for commercial purpose.

Table 56: 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 tons	France, Germany, Holland	DISEF Suarl GIG JEAN GROUPEMENT COOPERATIF AGRICOLE DU MBAM
Rice seed	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 vitro plants	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

Imports of seed for local production are generally done by private seed establishments (SEs) repre-senting 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 crops. The im-port 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 are not specialized. The seeds are imported in large quantities and the packaging is done locally and redistributed to the local points of sale that are knows as 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 consid-ered 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 players that buy basic seeds from research institute, multiply them and sell to the producers or NGOs. Seed Multipliers provide:
- The multiplication of basic and certified seeds and seedlings,
- Collection, conditioning and treatment of seeds and seedlings, and
- 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 57 below:

Table 57: 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 Nkoénvone Ferme d'Abong Mbang	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

Importers and Exporters oversee:

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

They mainly include 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

Table 58: Seed 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, soybean, palm trees	Adamawa (Ngaoundere)
SEMAGRI	Seed importation, seed production, commercialization, and capacity building of farmers	Tomatoes, onion, watermelon, cabbage, carrot, eggplant, cucumber	Littoral (Douala)
Grenier du monde rural (GMR)	Production and importation of seed and others agricultural inputs	Maize, Okra, green beans	West (Bafoussam)
FARMER'S HOUSE	Seed import	Maize hybrids	North West (Bamenda)

Seed processing and packaging activities are undertaken by seed producers. However, this step is also under the control of the seed certification services. Seed packaging in Cameroon is still approximate. Each seed producer chooses its own packaging based on the recommendations of Directorate for Regulation and Quality Control of Inputs and Agricultural Products (DRCQ).

In most cases, seed processing activities in Cameroon are carried out manually, however some equipment are available in the country (Table 59). Some small maize and bean shelling machines that are imported or locally manufactured are available in the market. Some forms of mechanical maize and bean 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 with the aim of increasing 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 with 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 seeds production farms and can be opened to cooperatives and seed producers when necessary. Table 59 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 bean shellers and two dryers. Sorting, grading of seeds, treatment and packaging are done manually.

Table 59: 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 chineese 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

Table 60: 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 61: 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 62: 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 63: 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	60,000
	92/0057	100,000
	Sub-Total	**160,000**
Centre	8034	750,000
	8061	250,000
	01/1797	100,000
	92/0326	1,150,000
	95/0109	1,010,000
	96/1414	550,000
	Biofortified (I070593)	100,000
	TME 693	260,000
	TME 419	580,000
	Sub-Total	**4,750,000**
Littoral	8034	980,000
	1070539	50,000
	92/0326	1,570,000
	95/0109	200,000
	96/1414	200,000
	Local	600,000
	TME/419	50,000
	Sub-Total	**3,600,000**
South	92/0326	2,000,000
	Sub-Total	**2,000,000**
TOTAL		**10,510,000**

Source: PIDMA journal of seed producers 2020

Table 64: Number of Agro-dealers by Regions Registered at DRCQ

Resgions	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 65: 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

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

- 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 head of service and the study engineers are national seed inspec-tors;
- The Head of seed analysis laboratory are seed analysts and laboratory technicians

At the Regional level, there is a Head Office (seed inspector) for seed control and certification, assisted by a seed inspector and two seed controllers. The DRCQ has a network of seed inspectors and controllers in the country's central and decentralized services. Controllers are mainly at agricultural technicians level while inspectors are agricultural engineers. Howev-er, 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 suf-ficient despite the efforts made by government through the National Seed Funds which is re-sponsible of financing this activity. The seed control and certification agents are general-ly based in MINADER regional offices and must be deployed in divisions and subdivisions.

Proposed Interventions

- Provide seed grant funding to four private seed companies (including GMR) to:.
    - Increase the capacity of quality seed production: aim to increase the quality seed production of existing varieties/hybrids and newly introduced ones by 23% of the current quality seed production
    - Expand the seed distribution network and their reach to farmers,
    - Increase production of hybrids seeds and capacity development
    - Strengthen business entrepreneurship skills of 80 personnel through professional training courses over a period of five years
- Capacity building of IRAD to produce basic/foundation seeds and build a public-private partnership to strengthen basic and foundation seed production
- Upgrade and establish seed processing infrastructure: installation of additional capacity of 2 tons/day in the country at private sector premises
- Agro-dealer development
    - Provide grants to 500 agro dealers in Cameroon to open new outlets, renovate or relocate shops, procure inventory supplies, and build cost-effective storage units
    - Capacity building of the agro dealers on aspects related to storage, quality control, and safe handling of products, and how to better manage micro-enterprises through courses on bookkeeping, cash management, inventory management, quality standards, customer relations, and compliance. All the 500 agro dealers will be trained on these modules over a period of five years.

- Strengthening of agro dealer network and association building

- Extension and knowledge dissemination
  - Enabling wider adoption of improved varieties through grants to NGOs for demos, small packs, etc
  - Promotion and introduction of ICT enabled infrastructure through various stakeholders to accelerate adoption of quality seeds
  - Professional trainings will be provided to over 900 extension professionals over a period of five years. Trainings will be provided on aspects related to farm demonstrations, farmer training through deployment of ICT tools

- Seed Policy and advocacy
  - Continued dialogue with public sector stakeholders for sensitization on national seed laws implementation and outreach methods to stakeholders, seed standards and regulations refinement, oversight of the seed delivery by national and international players, and harmonization of regional policy
  - Professional trainings will be provided to more than 60 seed inspectors on seed quality assessment and seed certification aspects

Facilitate quality seed production for the key crops to reach 5,000 tons covering an area of 10% under quality seeds (Figure 57) at the end of five-year period, and 16,696 tons covering 34% area at the end of 10 years.

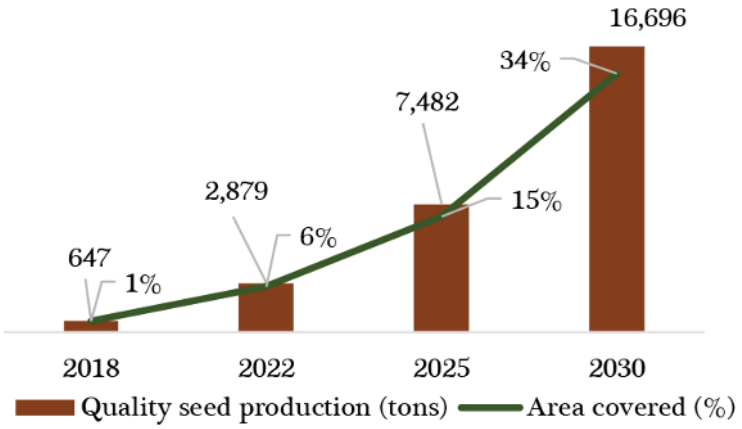

Figure 57: Projected Seed Quantity (MT) - Cameroon

Budget

Table 66: Cameroon Budget

Components	Amount (USD thousand)					
	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Component 1: Crop Variety Improvement						
NARS varietal Trials	90	90	90	90	90	**450**
Early generation seed production	36	36	30	21	12	**135**
MSc fellowships	175	105	70	-	-	**350**
PhD fellowships	150	150	-	-	-	**300**
Component 2: Seed Enterprise Development						
Grants for start-up seed companies	300	150	150	-	-	**600**
Multiplication support for vegetative crops	100	50	50	-	-	**200**
Hybrid seed production training	225	150	75	-	-	**450**
Professional trainings	75	45	30	-	-	**150**
Component 3: Agro-dealer Development						
Grants to agro-dealer development agencies	120	150	180	180	120	**750**
Capacity Development (Bookkeeping, information dissemination, inventory management etc.)	5	10	10	10	5	**40**
Component 4: Seed extension						
Grants to NGOs for demos, small packs, etc.	70	140	175	175	70	**630**
ICT, infrastructure and training support	25	50	75	75	25	**250**
Professional trainings	15	30	45	30	15	**135**
Component 5: Seed Policy and Advocacy						
Seed Policy and Advocacy (grantee and stakeholder meetings)	50	25	25	25	25	**150**
Professional trainings	15	15	15	-	-	**45**
Total	**1,451**	**1,196**	**1,020**	**606**	**362**	**4,635**