



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



REPORT ON ANGOLA SEED SYSTEMS

Angola-Huambo

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Abbreviations and Acronyms

- **ADESPOV:** Development Association and Social Context of Vulnerable Populations
- **ADRA:** Action for Rural Development and the Environment
- **CEAT:** International Center for Tropical Agriculture
- **CIMMYT:** Improvement International Center Maiz y Trigo
- **CNRF:** Plant Genetic Resource Center
- **CODESPA:** Spanish NGO
- **DNAGRI:** National Agricultural Directorate
- **CPLP:** Countries of the Community of Portuguese Speaking
- **EAE:** Agriculture Exploration Company
- **EAF:** Family Farming Exploration
- **EDAs:** Development of Agricultural Stations
- **EEA:** Agricultural Experimental Station
- **FAA:** Angolan Armed Forces
- **EP:** Public company
- **FAO:** United Nations Fund for Food and Agriculture
- **GEPROC:** Office of Studies, Projects and Consulting Lda.
- **IDA:** Agrarian Development Institute
- **IFAD:** International Fund for Agricultural Development
- **IIA:** Institute of Agricultural Research
- **LDA:** Limited
- **MINAGRIF:** Ministry of Agriculture and Forestry
- **MOSAP:** Project Development and Commercialization of Family Agriculture
- **MSC-CONSAN** - Facilitation Mechanism for Civil Society Participation in the Council of Food and Nutrition Security
- **NGO:** Non-governmental organization
- **NGOs:** Non-Governmental Organizations
- **PEDR:** Extension and Rural Development Program
- **PIN:** People In Need
- **SA:** Anonymous society
- **SADC:** Development Community of Southern African Countries
- **SARL:** Limited Company Limited Liability
- **SENSE:** National Seed Service
- **UJES:** University José Eduardo do Santos
- **UNACA:** Union of Peasants of Angola
- **UTAIP:** Technical Unit to Support Private Investment

EXECUTIVE SUMMARY

This report is within the scope of a study done on seeds in Angola, held by the Company Seed Systems Group, with particular emphasis on the grains (maize, bean and soybean) and roots and tubers (cassava, sweet potato), and presents the following components:

- **COMPONENTE 1. INTRODUCTION - begins with the background** where are presented preliminary information of this report, aspects relating to agricultural production system with greater penchant integration between family agriculture and business; current and recent initiatives for agricultural development and the scope (scope) for the development of agriculture.
- **COMPONENT 2. LITERATURE REVIEW:** It begins with the theoretical basis regarding the following aspects to consider:
 - a) **Crop Production Systems-** is a subcomponent that mirrors the current levels of production cultures; description of the main agroecologies the country and its farming systems; situation of agricultural extension activities; Adoption level of crop varieties; levels of use of fertilizers and soil conditioners; general description of the current system over the marketing of production of staple crops and trends in developing markets.
 - b) **Status seed supply** - it is sub-component, has a sense of the history relativamente information on crop improvement and seed supply to the country and other very important issues on the seeds.
 - c) **national agricultural research system** - this item is a sub-component with information about the description of public institutes and universities engaged in the creation of cultures; the nature of the recent crop improvement activities or in progress, culture, the capacity level of the institutions (scientific personnel and infrastructure), are detailed in this component.

d) national policy framework seeds - aspects linked to legislation regulating everything as it has to do with the seeds, are presented in this sub-component, namely (Law or documents, process for the official release of improved crop varieties, procedures for seed certification, current states of agencies regulatory etc.)

• **COMPONENT 3. SUMMARY AND CONCLUSIONS** - Taking into account the objectives of this narrative report, this item is presented in summary form and gesture of consolidation reports on:

- a) The current status of small farmers to access improved seeds;
- b) current state of government support; trends and opportunities for improvement in seed systems;
- c) Recommendations and likely impact of improved access to improved seeds by small farmers.

Keywords: Improved seeds, grains, tubers and roots.

I. INTRODUCTION.

1.1. BACKGROUND

(Ng, 2016)He says that the genetic potential of a cultivar is expressed in the crop through the optimum development of the seeds. The production requirements of modern agriculture require multiplication and rapid dissemination of effective and modern cultivars, coupled with the maintenance of the superior features of the same.

Seed multiplication, is through small amounts that generate volumes on a commercial scale, genetic potential losses may occur in this process. New improved cultivars only became agricultural inputs when its seeds are available to farmers and maintains its superior performance in the field, which usually does not happen in Angola. Moreover, the use of seed quality combined with improper handling practices may lead to reduction of gene expression and consequently grow, the failure of the culture.

1.1.1. rationale

Angola despite being a country with great potential for agricultural production, the family farm and the integration of corporate agriculture imposes on us, with a particular focus areas of the central highlands, namely: Huambo, Bié, Huíla, Kwanza-Sul and Malange.

according to the (Ministry of Agriculture and Forestry, 2018); has been little publicized the situation on the levels of production and multiplication, the stat seed supply, is of such importance because according to the ideas of(Pereira et al., 2018)The grains sector, Roots and Tubers educational activities are conducted search and exemplified extension by grains (wheat, rice, corn, coffee, soybeans, beans), roots (cassava, sweet potatoes, beets, carrots) and tubers (potato English, yams, taro, yacon) are indicated as being sinequâno condition that are necessary to enhance the sector of production and seed multiplication, which is why it justifies the submission of this report; taking into account the idea

to defend and relevance of this report, the following question arises presented as the scientific problem.

1.1.2. Scientific problem.

What contribution can propose a survey that results from a report on the study of indicators of varieties of corn seeds, beans, potatoes - sweet, cassava and yams in Angola?

1.1.3. Idea to defend.

A survey of the current levels of the indicators of the seeds in Angola grains, roots and tubers, can contribute to the dissemination and finding ways of solutions to enable and combine the use of high quality seeds with proper management practices that bring number of benefits including: increased production and productivity; more efficient use of fertilizers, irrigation and pesticides because most scientifically recommended uniformity.

1.2. OBJECTIVES:

1.2.1. Overall objectives

Evaluate the practical aspects of the production and multiplication of seeds in Angola with special emphasis grains (corn, soy and beans), roots and tubers (cassava, potatoes - sweet and yams).

1.2.2. specific objectives

1. Describe the background information of crop production systems
2. Considering the aspects related to the status system of seed supplies in Angola;
3. Evaluate the aspects related to the National Agricultural Research System;
4. Analyze the important aspects of the national policy framework of seeds

1.3. METHODOLOGY

During the accomplishment of this task was employed participatory approach methodology involving constructive opinions and aliciações with the various actors involved each to their level, namely: employees from different departments of the Ministry of Agriculture and Forestry, Ministry of Environment, other relevant ministries , provincial governments and municipal governments, the private sector (companies targeting the farm); civil society organization, national and international organizations not governmental, religious and traditional authorities. Details of the methodology are presented below in a systematic manner:

1.3.1. Literature review

The literature review was used in the extraction and compilation of data based on the existing general literature, provided by aforementioned entities among which are: Information and swings design MOSAP and MOSAP II; Sites and reports of similar institutions; Detailed analysis of the laws, policies and relevant national guidelines.

1.3.2. Field Visits

Held visits and meetings with some related institutions and some projects of commercial agriculture in different provinces and cities (Luanda, Cacuaco, Funda, Bengo, Quibala, Waku-Kungo, Caxito, Huambo, Caála, Chinguar and Huíla, Humpata) with the purpose of collecting information that is necessary to this report.

1.3.3. Consultations and discussions Interactive

several meetings were held with various actors and stakeholders, including government officials, private sector, NGOs and business associations, including:

- a) Research Institute Agronômica- IIA (National Program for Angola cereals);
(National Program for tubers and roots).
- b) IDA-Institute for Agricultural Development,
- c) National Agriculture and Livestock Directorate,

- d) Forest Development Institute,
- e) Ministry of the Environment,
- f) National Union of Peasants of Angola - UNACA
- g) Action for Rural Development and the Environment-ADRA,
- h) International NGO - World Vision (World Vision: Project Prorenda)
- i) Agriculture Associations Commercial
- j) Business Confederation of Angola, individual farms,
- k) Distributors of chemicals and seed suppliers.

A public consultation was held with religious and traditional authorities in order to contribute positively on aspects related to the seeds in Angola, particularly grain, tubers and roots, allowing generally develop and add useful information to the description of form clear and objective aspects that are presented in the following chapter.

II. LITERATURE REVIEW

2.1. System of agricultural production

data made public by the (Row cooperation network of agribusiness technologies and services, 2014) Show that the potential area for agricultural production system in Angola is around 5821 million hectares, of which it has grown only about 5.2 million hectares in the last five years, still representing a 6% increase , over the period from 2010 to 2015 and reinforced the growth trend of the sector. The production activity of the agricultural sector is realized through agricultural campaigns, implemented on family farms (EAF) and corporate farms (EAE).

The former are responsible for producing large share of Angola, and refers especially in upland farming methods scheme; since corporate farms perform the production process predominantly for irrigation.

The cultivation of beans (beans, corn and soybean) and from roots and tubers (cassava, sweet potatoes and yams) occupies an outstanding position among the agricultural activities in Angola, being the most prevalent in rural properties and its value production, hence once more the reason to emphasize the importance of this research.

2.2. Production System grain varieties

according to the (Office of Studies, Planning and Statistics, 2019) In its report of the results of the 2018/2019 crop year, the country purchased various quantities of inputs, in which is included a total of 6,845 tons. of various seeds and this universe, it purchased 5,469 ton. of corn; 623 ton. Bean and 5 ton. soybeans.

2.2.1. Corn varieties

Corn stands out as one of the major food crops in Angola. Its production is concentrated in the provinces of Kwanza-Sul, Huambo, Benguela and Bie, makes

up 40% of total agricultural production. About 90% of total production in Angola comes from small farmers.

Popularly Known varieties.

a) Corn Popcorn

Characteristics: hard grain generally consumed only after preparation.

ideal preparation: Popcorn salty or sweet.

Shape and color of the grain: Kid-shaped droplet and a yellowish orange



Image 1 - Popcorn Corn

b) Corn teeth (ZM 523 Y)

Characteristics: Grain firmly with hard edges. It is the most produced in the world and in Angola.

ideal preparation: Food for livestock and used to prepare starch, syrups and alcohol.

Shape and color of the grain: tooth shape, is shown in yellow or orange.



Image 2 - toothed Corn

c) Sweet corn

Characteristics: Grain sweet, soft and easy to digest.

ideal preparation: Pastries, creams, cakes, juices, pastries, breads, scones, chips, couscous, corn flakes, corn flour, cornmeal, tamales, cooked cob.

Shape and color of the grain: Rounded, flat, yellow.



Image 3 - Sweet corn

d) corn Mole

- **Characteristics:** Grain sweet, soft, smooth taste.
- **ideal preparation:** Hominy (typical of June festivities).
- **Shape and color of the grain:** Rounded and presents in white and yellow colors.



Image 4 - Corn Mole

e) White corn

- **Characteristics:** whitish grains. Harvested at the immature stage.
- **ideal preparation:** Hominy, savory recipes such as canjicada, grains and silage.
- **Shape and color of the grain:** White, deep, heavy and medium texture.

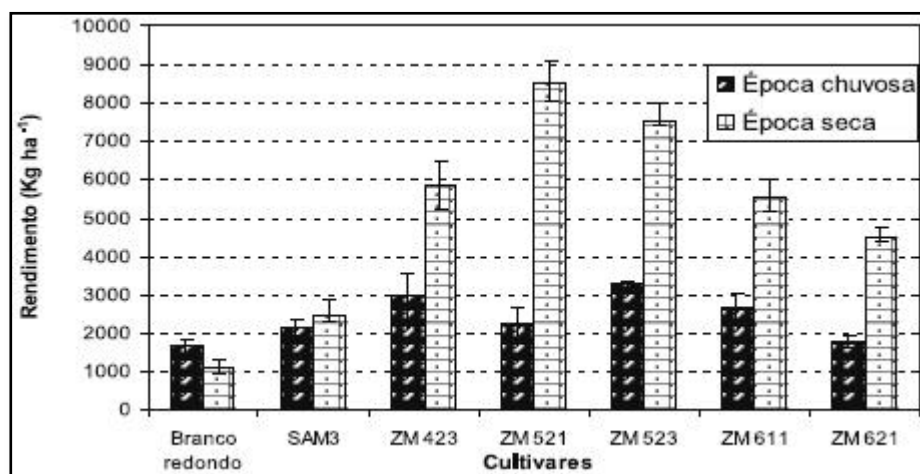


Image 5 - White Corn

Corn seed varieties:

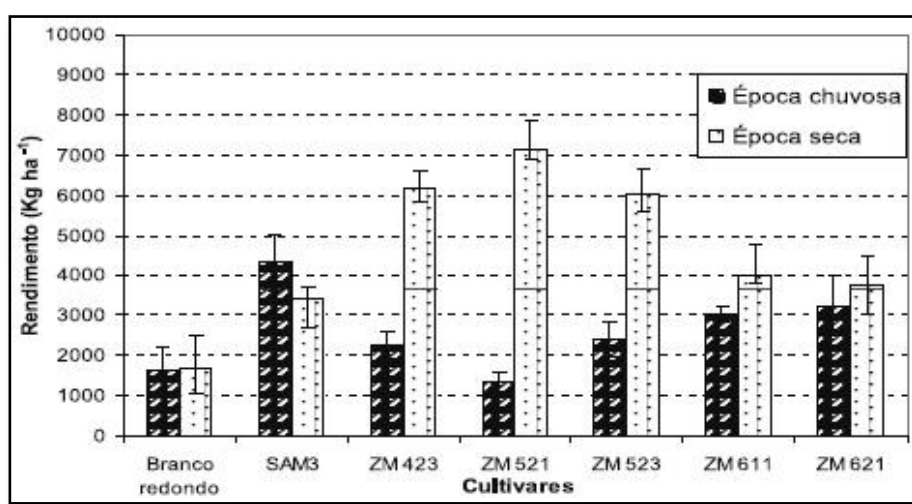
White round 'and' SAM3 '-' ZM423 ',' ZM521 ',' ZM523 ',' ZM611 ',' ZM621 '. All these varieties are imported, it is known that the country does not produce seeds, but there are corporate exploitation institutions engaged in seed multiplication.

According to information gathered by the Journal of Agricultural Sciences of Huambo, the graphs below show the behavior of the proceeds of each variety according to the location and time. Source of graph: (Henriques et al., 2010)

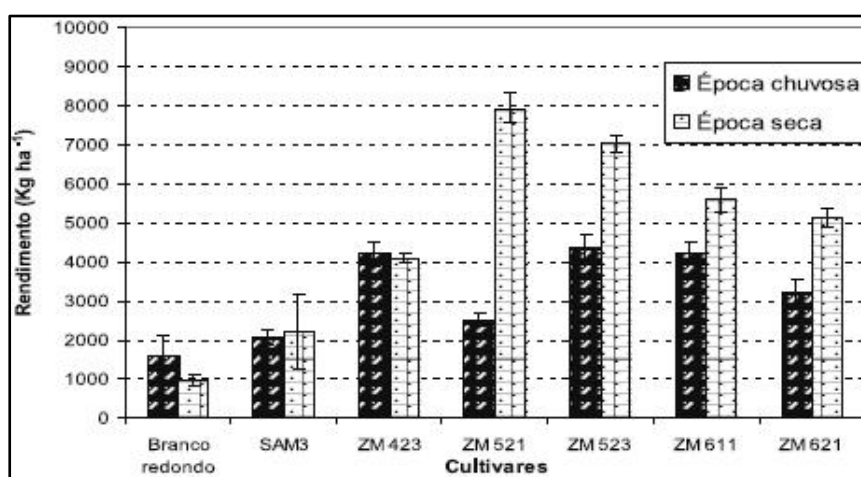


Graphic 1 - Income of seven varieties of corn in Bailundo

Data Source: Journal of Agricultural Sciences (Henriques et al., 2010)



Graphic 2 - Income of seven varieties of corn, drought in Chianga



Graphic 3 - Income seven maize cultivars in Calenga.

2.2.2. Varieties Bean

In recent years, the cultures of kidney beans, cowpeas, peanuts and soybeans are produced not only by traditional farming practices, but some modern practices oriented to the market. Yields have been driven by the fact that prices in the Angolan market become more attractive, which naturally increases its production, a fact which leads us to present the data in some bean varieties most common and inserted in the Angolan crop production system classified into groups.

1. Butter Group Varieties

- a) **Bago pea**(Cream), round shape, better known as butter;
- b) **cebo**,(Cream, elongated shape); very common in the southern region;
- c) **Canary**(Yellow, round shape), better known as butter, in dealing jointly by the market;
- d) **Lead**, green or blue whiting, elongated shape, more commonly known by calembé beans. The level of the region is framed as butter, but according to the IIA has specific group.



Image 6 - Group Butter Beans

2. Groups of veined

- a) **variety Carioca**(Color striped in black), short elongated shape, carioca common name;

- b) **variety Catarina**(Striped brown color), elongated shape, common name calopato;
- c) **Variety Partridge Eye**, Variety extinction by Ila referenced, very grown in northern Bie (Andulo and Nharea), very popular;
- d) **Variety Fernando**, (Common name sicola, striped yellow) elongated shape;
- e) **Variety coined expected**, Name internationalized pinto beans, cream with brown stripes;
- f) **variety Calima**, Elongated, striped red color
- g) **Lead**, green or blue whiting, elongated shape, more commonly known by calembé beans. The level of the region is framed as butter, but according to the IIA has specific group.



Image 7 - Bean group of rifled

OBS. Calima beans and black beans were introduced by CEAT - International Tropical Agricultural Center (Headquarters Colombia, Africa, Malawa)

3. Group of white beans

- a) **catiolo variety or white kid** (White color) in the light extinction, very cultivated in Bailundo central plateau;
- b) **variety Fidalga**, Grado white, thick elongated shape, color white.

In addition to the varieties mentioned, the research shows that in Angola there are others among them are:

- **Cowpeas:** The "Cowpea" (*Vigna unguiculata*) was commonly known as "Cafreal beans" (Mozambique), but currently most used name is "Cowpea" in Mozambique and "cowpea" in Angola.
- **Congo beans:** also called "pigeon peas" or "Angola beans".

2.2.3. Soybean Varieties

Soybean (*Glycine max*), also known as soybean and bean-Chinese, is a plant that belongs to famíliaFabaceae. It is used in food (in the form of soy oil, soy milk, soy protein, soy beans, etc.) and animal (in the preparation of feed). The word "soy" comes from Japanese shoyu. The plant is native to China and Japan. It is a rich grain in proteins. Among the minerals present the most are: potassium, calcium, magnesium, phosphorus, copper and zinc. It source of some B vitamins such as riboflavin and niacin as well as vitamin C (ascorbic acid). But is low in vitamin A and contains no vitamin D and B12.

Soybeans, has several varieties, but the famous but cultivated and is the format of soybeans round and color yellow. There are two other versions which are also known and provide health benefits (edamame and black soybeans).

Varieties, but common:

- **Variety** IPRO RK8115 and RK8317 IPRO
- **Main features**
 - a) Indeterminate growth habit
 - b) planting opening
 - c) High yield potential with stability
 - d) Wide geographic adaptation

Are great options to choose from for Angolan farmers, both the family farm as the corporate exploitation substantially for those looking for high yields. Since the Intact technology, it has excellent stability, and a production ceiling high in

response to the investment. Your indeterminate growth habit brings a competitive differential when subjected to adverse climatic conditions in relation to its main competitors in the same cycle.

2.3. System production of varieties of roots and tubers.

2.3.1. Variety of Cassava

Cassava is a shrub belonging to the order Malpighiales, Euphorbiaceae family, genus and species *Manihot Manihot* Grantz. It is the only among the 98 known species of the Euphorbiaceae family, grown for food. According to Carvalho (2005), the ancestor of the cassava plant's natural gallery of vegetation associated with rivers of amazon, Brazil. The introduction of cassava in Angola, took place between the sixteenth and seventeenth centuries, making - one of the major food crops of much of the population. The production of cassava knew no major development until 1975, to be considered until then a practiced subsistence culture mainly of poor peasants and without resources.

Currently Angola, cassava has been a key element to food security, since it is the about 40 base food to 50% of the population just after corn, being simultaneously a cash crop for many rural families, thus contributing to the resolution of the vast socio-economic problems of families, related to education, health and welfare.

In the case of Angola, cassava as a crop in expansion and despite remaining a long time in the soil, between 14 to 24 months, it has a multitude of uses and can be framed in a sustainable management scheme with a view to improving the efficiency of systems production.

existing varieties in Angola.

- Verdinha (TMS30162)
- Taiwan (TMS00326)
- Vermouth / Early in Angola



Image 8. Cassava variety of Formosa

It is noted that the row of roots and tubers, the household sector is largely dominant in Angola, compared to the business sector, representing 92% of the production volume and the cropping system is by cuttings, as shown in picture 9.



Image 9. Farmer with cassava cuttings to plant.

2.3.2. Sweet Potato Variety

According (Pereira et al., 2018) the Sweet Potato, has the scientific name *Ipomoea batatas*, is the family: *convolvulaceae*, originally from America the hot regions of South America's roots, large and fleshy, provide food. The sweet potatoes are often confused with yams, but they belong to another family and grow mostly in the tropics.

The sweet potatoes can be yellow or white. Generally in Angola, it is grown mainly varieties: lush, meadows, holy amaro, chapel, holy - Sofia pindorama. The sweet potato is an important source of energy and vitamins A and C, is grown from roots placed in moist soil, warm and sandy greenhouse seed producers or four weeks before planting time.

Main varieties:

You have the following potato varieties - sweet:

With white flesh, yellow, pink, purple and orange.

Content to be complemented by the IIA - Department of Roots and Tubers.



Image 11 - Ladies selling sweet potatoes



Image 10 Sweet Potatoes Red



Image 12. Variety of red and white sweet potato

2.3.3. variety Yam

Yam has the scientific name *Dioscorea* spp, is a species adapted to local conditions and eating habits of the different regions of Africa and particularly in Angola generally found in Exploration Farmers gardens family and the varieties best known are: the yam-white, yam-brave, the yam-cicada, yam-of-China (also called yam-yam) and taro-taro. The yam is sometimes confused with the yam, but the two are distinct tubers (Ng, 2016).

It should be noted that although the yam part in the diet of many families in Angola, there is little availability of bibliographic about this variety.



Image 14. white yam



Image 13. Yam - taro

2.4. current and recent initiatives for agricultural development.

(P 2018) States that Angola is one of the countries with the greatest potential for development in Africa, including the development of a modern and competitive agriculture rooted in its climate conditions, soils, water resources, biological resources, geographical location and sources of electrical power, associated tradition and the ability of their populations to adapt to an agriculture for the market, among others. However, this potential can not be developed by a large number of constraints.

According to FAO data for citizens (P 2018) show that Angola has a potential agricultural area of about 58 million hectares, of which more than 10% covered by forest, the country currently uses just over 5 million hectares in agriculture.

Since over 95% of this area approximately are occupied by seven major food crops: Maize (37%), manioc (24%), beans (17%), peanuts (7%), sorghum (4%), potato -doce (4%) and potatoes (2.5%). It is known that about 95% of the cultivated area is divided by family farms and only 5% for holding the business type.

The family farm, plays a leading role in agricultural production: over 95% of roots and tubers, pulses and oilseeds and vegetable, 74% of cereal and 41% of vegetables. However, this dualistic view is not static, as it is believed to be in

training in the medium term, a kind of middle class "of farmers who will bring a new dynamic to the Angolan agriculture.

The yield of main crops are low in terms average for the African continent, but this can be an excellent opportunity for private investment in a certain perspective, especially in the supply of development initiatives that will provide the extension and technical assistance services, seeds and planting material quality, fertilizers and plant protection.

short (P 2018) points as strengths of current and recent initiatives for the development of agriculture in the country and the opportunities it offers among several the following:

- a) Plenty of agricultural land;
- b) Potential of a family farm that gradually binds to the market and should be seen as an important component of the agri - business;
- c) Emergence of a private sector business with an open mind to technological innovations;
- d) Existence of labor-work young;
- e) significant increase in agricultural schools of secondary and higher level in the past 15 years;
- f) potential increase in domestic demand for agricultural products;
- g) Political stability and social cohesion;
- h) regional integration of Angola in SADC;
- i) Potential of the neighboring markets;
- j) Openness to foreign investment and gradual improvement of the business environment;
- k) Presence of the major players in the international agricultural financing, such as the World Bank, European Union, African Development Bank,
- l) International Development Fund Agrarian, with a current portfolio of financing next projects of \$ 300 million;
- m) Recent transport infrastructure rehabilitation (roads and railways).

Still (P 2018) It says that there are constraints that must be seen as particular business opportunities:

- a) Weak knowledge of the most productive agricultural techniques;

- b) Weak institutional development and human capital;
- c) Poor training and underutilization of technical staff;
- d) Reduced ability of marketing and production flow;
- e) Lack of financial resources for the effective use of resources;
- f) Weak capacity planning and management of agricultural entrepreneurs;
- g) Poor service supply inputs;
- h) Lack of reliable statistical information;
- i) **Lack of technical assistance and scientific research;**
- j) Low productivity of land and labor.

In terms of current and recent initiatives for agricultural development, it here to remember that the Angolan agriculture is going through a difficult time, but you can say that it is a blank sheet where all can write, that is, there are plenty do, including processing various constraints into business opportunities and we also added there is great weakness as statistical information, there is little information in terms of numbers when it comes to seeds in Angola.

2.5. Scope (scope) for the development of agriculture

According (Silveira, 2012), Agriculture has always been important in the national economy. Markets become increasingly uncertain and dynamic, with a growing complexity of farming. In the scenario that makes up the rural areas comes an actor with great economic and social importance: the family farmer.

Therefore, the scope (scope) for development in Angola is family farming because it is a strategic sector for the maintenance and recovery of employment, income redistribution, to guarantee food sovereignty of the country and the construction of the development sustainable. For that family farming can remain in this increasingly competitive market we need to create alternative ways of work and survival. Rural diversification / agricultural could be one of these forms, as it may reduce the risk of having only one activity as the main source of income and family maintenance.

So that farmers can diversify their production and develop sustainable production systems, taking advantage of niches and market demand for differentiated products, we need guidance, determination of institutional domes (government or its research structures, technical assistance and rural extension) and a shift in consciousness and behavior of technicians and developers.

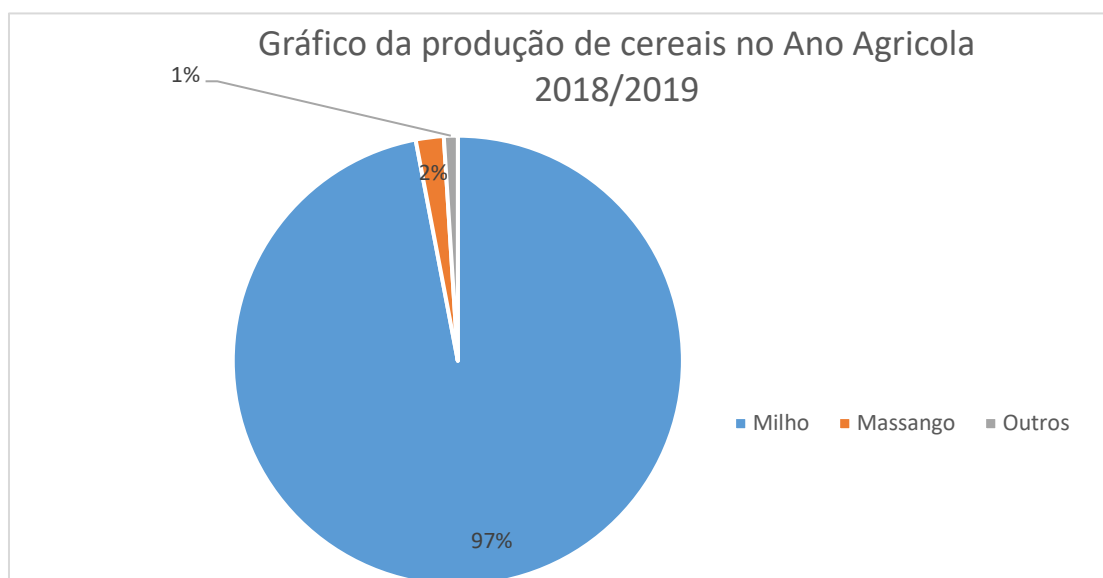
-System III CROP PRODUCTION.

3.1. Current levels of crop production of the main staple food, average crop yields and trends, by culture.

The Ministry of Agriculture and Forestry, through the (Office of Studies, Planning and Statistics, 2019), Presented a report of the results of the agricultural season 2018/2019 with the following crop production levels:

a) Cereals:

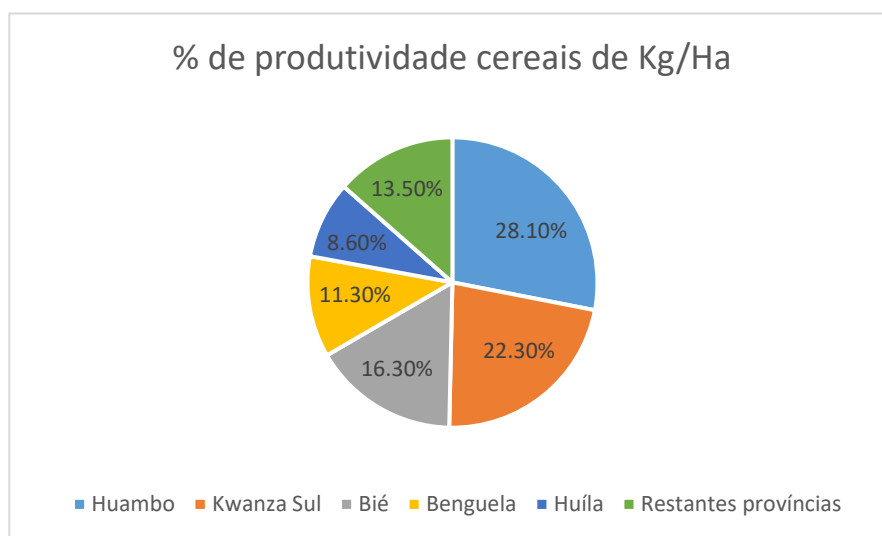
In agricultural year 2018/2019, they were cultured more than 3 million hectares of cereals, a variation of + 0.1% from the previous corresponding period. In the year in question, we proceeded to harvest 92% of the sown area. In the North, Central and South production of cereals was 2 million and 900 thousand tons, an increase of + 0.9% over the period 2017/2018. In row cereal corn crop is the dominant, representing 97.1% of all grains produced, and this segment, the household sector is 81% of the production volume.



Graphic 4. Corn, dominant culture of cereals

It is noteworthy that the corn crop is dominant both in the EAF as EAE in the national territory level.

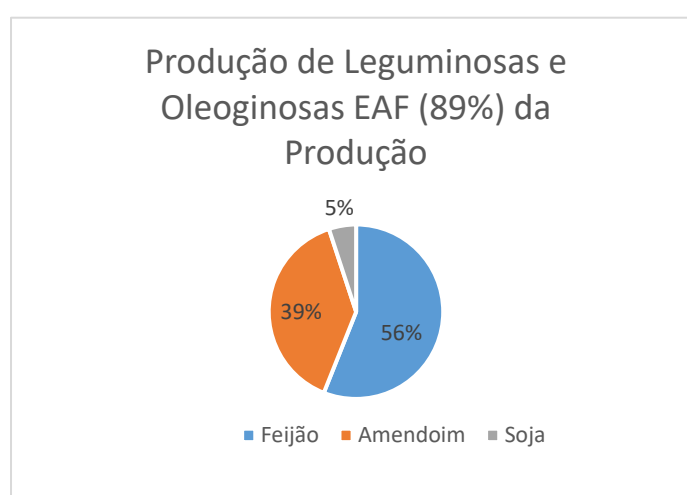
The central region contributes over 80% of total production, the top five provinces are: Huambo, Kwanza-Sul, Bie, Benguela and Huila and together contribute to 86, 5% of cereal production.



Graphic 5. Productivity cereals, kg / ha per provinces

b) Oilseeds and Pulses

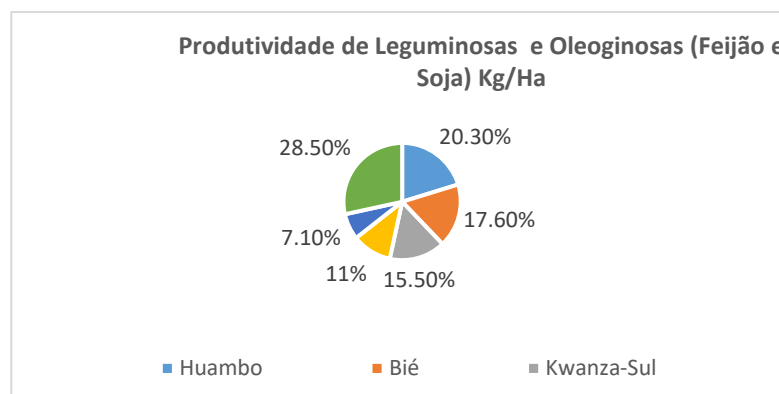
In the agricultural year 2018/2019 were planted more than one million hectares, an amount equal to the previous period and it was possible to harvest 96% of this area. In the year in question were produced approximately 575,000 tons of legumes and oilseeds which represents a slight increase on the order of $\pm 0.7\%$ over the same period. Beans are dominant in this production with 56% while soybean is only 6%, it is also worth mentioning that the focus for the business sector should face the soybean crop.



Graphic 6. Cultura the dominant beans in the production of pulses - EAF

The Central region contributed 64.6%, the North with 29.4% and the South with 6%. In this row the family farming sector is dominant and accounts for about 89%

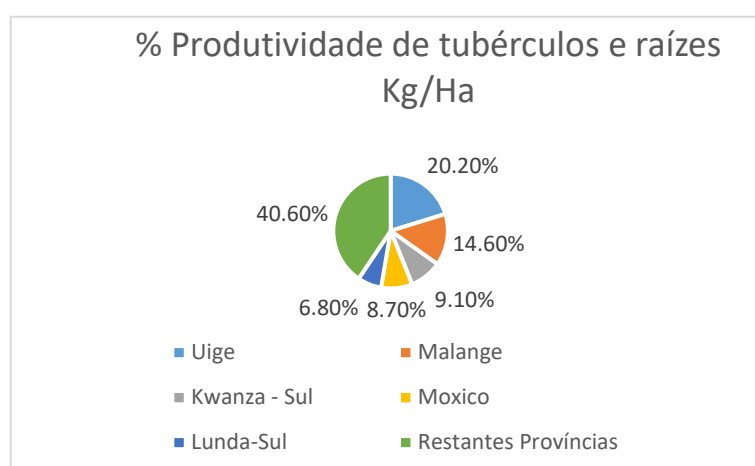
of the national production. The top five provinces are: Huambo, Bié, Kwanza Sul, Uíge and Malanje and the graph below shows the percentage per hectare productivity.



Graphic 7. Production of pulses and oilseeds by Provinces

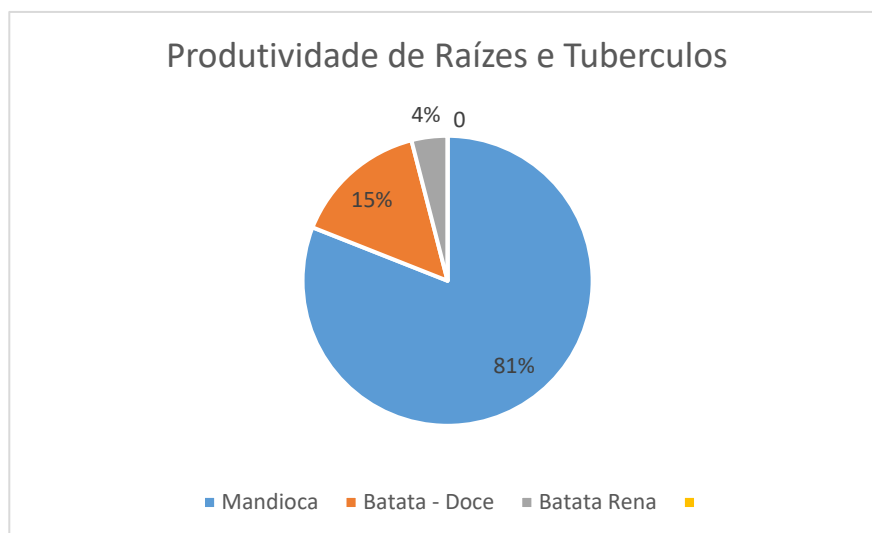
c) Tubers and roots

During the Agricultural year 2018/2019, they were grown approximately one million two hundred thousand hectares, the variation is 0.1% over the same period and harvest was 78% of the total sown area. was collected 11,135,827 tons, an increase of 2.4%. The northern region contributed 66.2%, the Center with 29% and the South with 4.7%. The EAF is dominant with around 92% against 8% of EAE. The top five provinces are Uíge, Malange, Kwanza - Sul, Moxico and Lunda-Sul, with 59% of all production.



Graphic 8. Production of tubers and roots by Provinces

It is noted that the row of roots and tubers, cassava stands out as being the dominant culture in 81% of the whole production, followed by 15% -doce potato and beat with 4% reindeer, data are not available on the culture of yam reason why it does not mention the current levels of production of that culture.



Graphic 9. Cassava dominant culture

Having regard to the theme and the objectives of this report, we present the results of the 2018/2019 agricultural campaign indicators, these crops compared to current production levels, average incomes and trends in culture.

Tables 1,2 and 3 below show a summary of data on crops of corn, beans, soybeans, cassava and sweet potatoes, and lacks information about the yam culture.

	National - EAF	Area sown hectare				Harvested area in hectare				Productivity in kg / ha			
		Campaign 2017 2018	Campaign 2018 2019	change%	Absolute change	Campaign 2017 2018	Campaign 2018 2019	Variation %	Variation absolute	Campaign 2017 2018	Campaign 2018 2019	change %	Absolute change
grains	Corn	2417073	2419644	0.09	2,500	2293573	2312363	0.82	18,790	980	986	0.59	6
	Bean	6.14.918	6.14.847	-0.01	-71	602 529	598 091	-0.74	-4.438	476	482	1.25	6
	Soy	24,135	24,477	1.42	342	23,858	24,278	1.76	420	1058	1,040	-1.71	-18
roots and tubers	Manioc	903 599	904 244	0.07	645	641 447	664 607	3.61	23,160	12,725	12,668	-0.44	-56
	Sweet potato	165 319	165 380	0.04	61	159.922	156.729	-2.00	-3.193	9663	9797	1:39	1.34
	Yam												

Table 1. Results of agricultural production per hectare indicators EAF

	National - EAE	Area sown hectare				Harvested area in hectare				Productivity in kg / ha			
		Campaign 2017 2018	Campaign 2018 2019	change %	Absolute change	Campaign 2017 2018	Campaign 2018 2019	Variation %	Variation absolute	Campaign 2017 2018	Campaign 2018 2019	change %	Absolute change
grains	Corn	222.462	223.047	0.26	585	205.662	198.815	-3.33	-6.847	2,501	2,709	8.31	208
	Bean	57.607	57.990	0.66	383	54.152	53.883	-0.50	-269	684	701	2.51	17
	Soy	11.743	11,775	0.27	32	11.361	11.651	2.55	290	882	1,038	17.75	156
roots and tubers	Manioc	40,554	41.084	1.31	530	32.539	33.039	1.54	500	17.462	17.583	0.69	121
	Sweet potato	12.505	12,892	3.09	387	11.917	12.028	0.93	111	11.983	12.023	0.34	40
	Yam												

Table 2. Results of the indicators of agricultural production per hectare EAE

	National - EAF and EAE	Area sown hectare				Harvested area in hectare				Productivity in kg / ha			
		Campaign 2017 2018	Campaign 2018 2019	change %	Absolute change	Campaign 2017 2018	Campaign 2018 2019	Variation %	Variation absolute	Campaign 2017 2018	Campaign 2018 2019	change %	Absolute change
grains	Corn	2639.535	2642.691	0.12	3156	2499.235	2511.178	0.48	11,943	1,105	1,122	1.54	17
	Bean	672.525	672.837	0.05	312	656.681	651.974	-0.72	-4.707	493	500	1.40	7
	Soy	35,878	36,252	1.04	374	35,219	35,929	2.02	710	1,001	1,040	3.82	38
roots and tubers	Manioc	944 153	945 328	0.12	1,175	673 986	697.646	3.51	23.660	12,954	12,901	-0.40	-52
	Sweet potato	177 824	178 272	0.25	448	171 839	168.757	-1.79	-3.082	9824	9,956	1.35	132
	Yam												

Table 3.Indicadores Agricultural Production per hectare - EA F & EAE

3.2. Description of the main agroecologies the country and its culture systems.

The agro-ecological approach proposes profound changes in the systems and forms of production. On the basis of this change is the philosophy of producing in accordance with the laws and the dynamics governing ecosystems - a production in favor of nature.

It is proposed therefore, new ways of appropriation of natural resources, which should materialize into consistent strategies and technologies with the philosophy basis.

3.2.1. Major agro-ecological zones

In Angola there are three main agro-ecological zones corresponding to the main climatic and geographical characteristics of the country: the north, with a humid climate; the semi-arid south; and the Central Plateau, with a sub-humid climate, which is the transition zone between the wet and dry north south.

In the strictest sense, agro - ecology can be seen as an approach to agriculture that is based on the dynamics of nature. In this context and in accordance with (FAO, 2017) in relation to agro-ecological zone of Angola and their farming systems must take into account the following aspects:

- **latest Climatological aspects:**

According to the information gathered in the Ministry of Agriculture and Forestry report on Agricultural Campaign 2018/2019 (Office of Studies, Planning and Statistics, 2019), Tell us that the projections made for the reporting period, suggest that the impact of climate change will become more severe in the coming decades. The most pronounced manifestations of climate change will be:

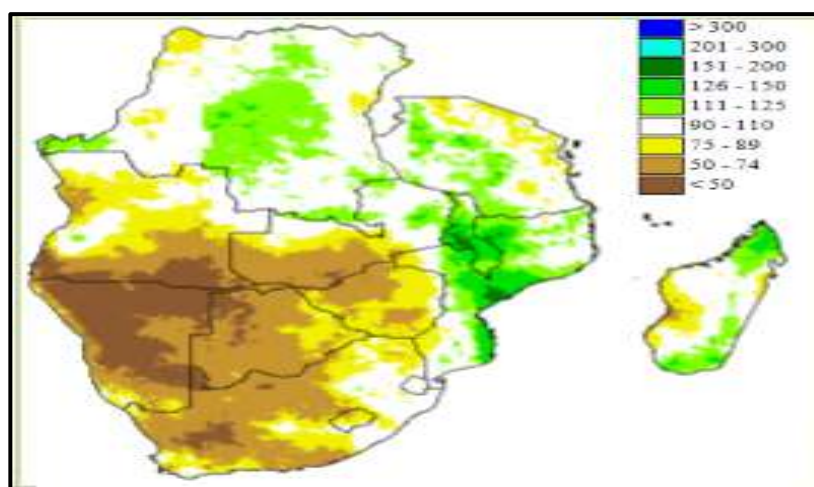
- a) Increase in temperature, leading to an increase in the heat stress and decrease the crop yield;
- b) Changes in precipitation patterns: rainfall events increasingly erratic high intensity, leading to floods and more frequent droughts;

- c) Late start of the rainy season; and
- d) Anticipated reduction of crops, thus reducing the growth period of crops.

The current variability and extreme events across the region are increasingly evident. The behavior of rainfall is changing, with deviations in the start date and end station and the station for greater variability, including increased episodes of high rainfall and drought and heat waves. The maize and other cereals are especially prone to the effects of climate change. A warmer region will have a significant reduction in yield of these crops.

▪ Impact of Drought

In Angola, most crops is practiced during the rainy season from November to April. The drought affected large Southern and Eastern Country Center during the rainy season of 2018/2019 as shown in the figure below. In most Southern Angola, rains started late and were in general and irregulares, resulting in the reduction of cultivated areas in poor germination and crop wilted.

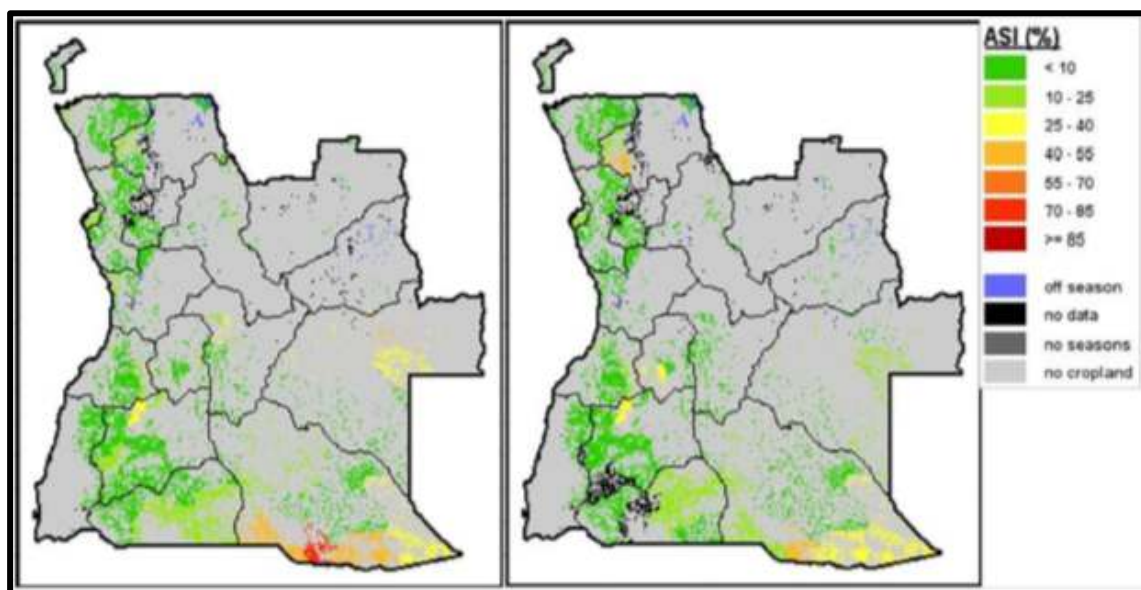


Graphic 10. Ouct 2018 - Mar 2019 - Average% Rain

Source: (Office of Studies, Planning and Statistics, 2019)

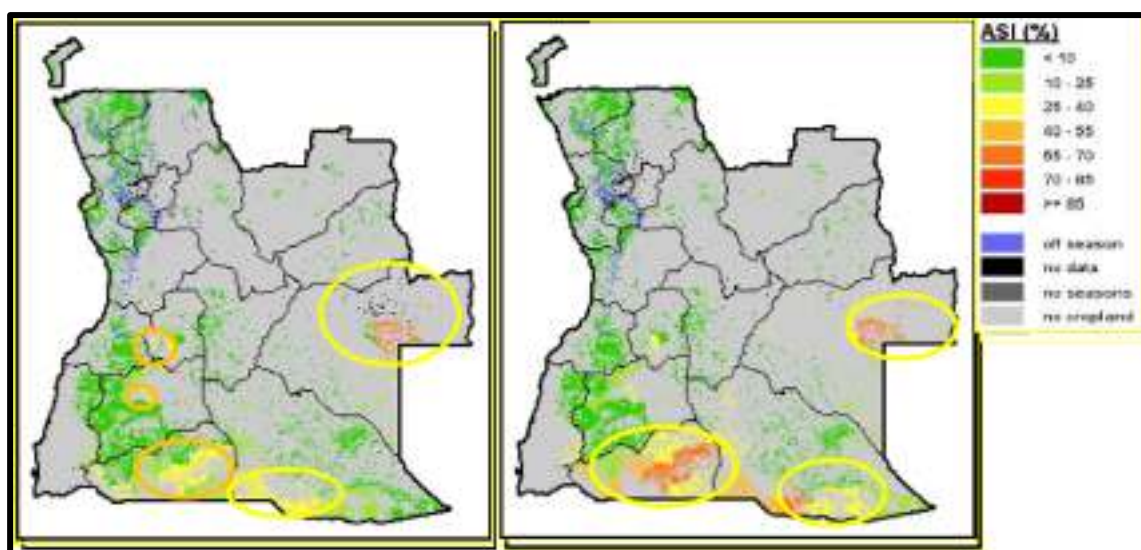
According to the information gathered in the report MINAGRIF (Office of Studies, Planning and Statistics, 2019) On the 2018/2019 agricultural campaign, stated that until January this year indicated a state of alert for the southern Bié province, north of Huila, to the northern part Cuangar in Cuando-Cubango and moderate situations in some locations (see : Figure 11).

1st ten days of January 2019	2nd ten days of January 2019
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Graphic 11. water stress index

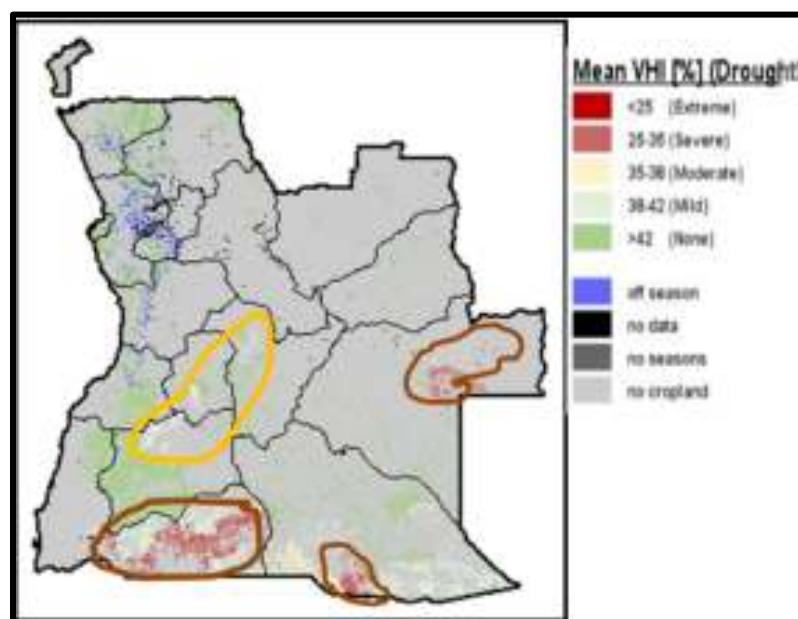
The above reported table, recorded a worsening of water stress in the months of February and March 2019, having covered the southern Huambo district, north of Huila, eastern Moxico province, a generalized irradiation in the provinces of Cunene and southern Kuando Kubango, with ratios equal to or greater than 30% (See: Figure 12).



Graphic 12. Water stress index in February and March 2019

Because of these phenomena, caused the extreme droughts and severe in the provinces of Cunene, Kuando Kubango and Moxico and parts of moderate drought in the provinces of Bié, Huambo and Huila parts.

The drought also affected the supply of water for agricultural and livestock use. The southern region of Angola received on average less than 75% of rainfall in the period October 2018 to March 2019, by which time most farmers realize their agricultural activity (see: Chart 13). Is situation just happened by anthropic action due to inappropriate practices of agro-ecology implemented by farmers.



Graphic 13. Intensity Dry Mar 2019

Good agro-ecology practices in family farming in Angola

According to a dossier of (CPLP 2016) in Angola civil society is organized in a network to promote the sustainable development of agriculture through good practices. Some organizations such as UNACA are rehearsing these practices (organic fertilization with green straw or dried, composted or direct application of animal manure, agro-forestry practices and crop rotation) with the associations and cooperatives of farmers.

The first experiments of combination of traditional knowledge and new agro-ecological practices were tested in Huambo province, in an area located in the central part of the country, where soils are unproductive due to the overuse of chemical fertilizers. In this area without the application of fertilizer is difficult to harvest something. To remedy this problem, UNACA, after participating in the exchange on "Public policies and sustainable agricultural production systems in CPLP", organized by Civil Society Participation Facilitation Mechanism Regional Council for Food Security and Nutrition of the CPLP (MSC CONSAN), matured

reflection on their agro-ecology program and began an awareness campaign circle of its members (farmers) on the need for soil conservation.

The first experiments were started in Huambo Province. Followed by the provinces of Kwanza Sul and Bié, where lectures and training seminars for farmers of some cooperatives are being animated. Members are discovering the benefits of organic fertilizers and learn the techniques of their application in practical class in experimental fields prepared for the purpose.

3.3. Current situation of agricultural extension activities.

according to the (Portal of the Government of Angola), Agrarian activity in the country decreased much after independence in 1975 as a result of the war. This situation mainly affected the peasant sector which was forced in many provinces to leave their home areas to focus on areas offering security conditions in general on the outskirts of the centers.

The end of hostilities in 2002, allowed the restoration of movement of persons and goods, allowing a very significant part of the displaced could return to their areas of origin and restart their productive activity. Increased food security, improvement of living conditions of the population and the reduction of external dependence, included the various guidelines of the Government and are now embodied in the Strategy to Combat Poverty and relative to rural areas, through the rehabilitation of production capacity land of the farmers through the Agricultural Rural Extension Program as key to reducing unemployment, to increase domestic production and the restoration of commercial circuits.

Initially the extension of activity in Angola has led in many cases to the intervention to bring the peasants to act in accordance with the drawn agricultural policy for the country with the adoption of "modern methods of production" or for the promotion of certain subordinated culture commercial interests of big

companies. This situation is currently far from the desired due to the reasons described in the following item.

3.3.1. capacity level of the public extension system

Formerly in Angola rural extension interventions were carried out by religious missions and later by organisms that pursued the development of a particular culture: cereals in the central highlands for Grains Export Board (later the Institute of Angola cereals) and other regions by Agriculture and Forestry services, but only from the end of the 60s that arises Rural Extension Mission.(Portal of the Government of Angola).

Currently the Agrarian Development Institute (IDA) is the body tutored by the Ministry of Agriculture and Forestry (MINAGRIF), able to ensure the promotion, coordination and implementation of policies and strategies outlined in the development the agricultural and rural extension.

The IDA is a public institution with responsibilities to reflect the actions for the rehabilitation and development of rural communities. In order to fulfill this role, the IDA has promoted the development of an Extension and Rural Development Program (PEDR), which serves as dean instrument for its restructuring and to guide its activities over the next five years. For all purposes hired Studies GEPROC-Office, Projects and Consulting Lda., A company that produced the (PEDR) and according to the statistics(Portal of the Government of Angola)on the IDA's establishment plan has a structure in which senior technicians are located generally at the level of the Directorate General and Provincial departments making (74%). Those of ordinary skill correspond to 26% of the total personnel, are distributed by the central structure and provincial departments (42%) and the DAEs.

Analyzing the percentages show that the capacity level of the public extension system Angola (IDA) notes the existence of a large number of management tables corresponding to 45% of the total staff (partly as a result of personnel reclassification with basic training), which is not a favorable indicator for an

institution should develop a technical and service framework for the development of agricultural extension in Angola.

3.3.2. Level of activities by non-governmental organizations and the private sector in agricultural extension.

The support that has been given to peasant production and rural extension activities in recent years by the state administration structures has been less than impressive.

Likewise the support provided at the level of partners, international community, civil society organizations and NGOs has been primarily directed towards emergency measures.

Non-governmental organizations that have implemented the extension activities with a sense of intervention are: CODESPA, ADRA, ADESPOV, WORLD VISION AND PIN (People in Need) and projects MOSAP I and MOSAP II, in the provinces of Huambo, Benguela, Malange, Huíla, Kwanza - Sul and Bié. It is noteworthy that 90% of the activities of these NGOs are more focused on emergency situations, actions and support initiatives the agricultural extension activities are still very weak by NGOs and companies service providers, this indicator shows that urgent need intervention and capacity building of institutions and related actors in order to change the picture and remove existing weaknesses without losing sight of the enhancement of the private business sector.

3.4. level adoption of improved crop varieties for crop.

The adoption of improved seed varieties, fits under the Rural Extension Development Program (PEDR) and aims to encourage men of the field to increase production to reduce hunger. Second(Vemba, 2016)EAF in the sector the level of adoption of improved varieties, is basically very weak, likewise is not felt in EAE sector to the extent that 92% agriculture in Angola is more focused on EAF. Small Angolan farmers face many difficulties due to lack of access to technical training and financing lines for the acquisition of improved varieties,

making it very difficult to improve the processes of agricultural production and to invest in activities to increase the cultivated area as well as the profitability.

Some initiatives have been taken I end by the Ministry of Agriculture and Forestry through the acquisition of improved varieties in the neighboring Republic of Zambia and Morocco. But the reality of rural areas in the adoption of these varieties is still very weak due to lack of funding.

3.5. Level of use of fertilizers and fertilizer to increase crop yields per crop.

The level of use of chemical fertilizers, is registered in most of central and southern provinces, where farmers have a tradition of using this production factor, especially in maize, beans and soybeans.

The insufficient supply in these regions caused that part of the last campaign of fertilizers appear in the informal market and inter provincial trade, with increased prices and reduced ability to purchase the peasants.

Currently there are in the different provinces some actions of Provincial Governments on the basis of funds provided by the State to support peasant production, including the purchase and distribution of seeds, tools and fertilizers, working cattle and plows (Huambo, Bie and Huila) . The volume of these means is small and its distribution is being made under the coordination of the Provincial Agriculture and Forestry Offices and usually directly by Municipal Administrators. Also in some provinces the provincial governments are promoting with funds from its budget mechanized preparation of "cultural blocks" for some peasant communities.

The EDAs appear in secundarizadas rule or sometimes away from these interventions. These reports show that the level of use of the rural peasant is conditioned with the free distribution of fertilizers by the state and undermining the level of income and entrepreneurial initiative.

3.6. overview of the current system of marketing of staple crop production surpluses.

According to some investigations made very recently, it was found:

Establishments Licensed Internal Rally	
Wholesale trade	3371
Retail sale	27,687
Provision of market services	4410
precarious commerce stores	8140
Market	168
Trade shows	12
TOTAL	43,788

Table 4. Establishment of licensed domestic trade

The table above shows that the commercial network and the provision of market services in Angola is estimated at forty-three thousand seven hundred eighty-eight establishments. And of this number 39,378 are retail outlets and have a partnership with family farmers and aggregation of corporate exploitation agriculture.

Production and Corn Marketing, beans, soybeans, cassava, potatoes - sweet and yams (grains, roots and tubers are also marketed its derivatives) in rural assignments and large shopping centers of Angola is a reality, although there is still a node constraints, ensures income for family farmers and business.

Currently Executive Angolan, is implementing a school feeding program, which aims to buy products from family farms and rural family entrepreneur or their organizations (cooperatives and association of farmers), giving priority to land reform policies, modes makes and motivated them more attractive for the production of grains, roots and tubers.

The Angolan Armed Forces (FAA) will also acquire domestic production of goods, which can help to leverage and encourage agriculture Angolan corporate exploitation judging by the large volume of goods that the FAA can acquire. Having recourse to goods produced by Angolan companies, this will make these productive units can remain on the market, not at risk of going bankrupt.

It should also be noted that the sistema of field goods trade, it has the component of the project MOSAP in the provinces of Huambo, Bie and Malange, Agriculture Project for Farmers Family Oriented to the market The available evidence showed that the Community mines grown through 109 sub mechanization led to approximately 30 to 50% over production, generally sold in local markets. Typically, members of the group stated that the net profit from the sale of the product was partially shared among members and partly reinvested in the mining community to the next harvest.

Principal Crops that can be commercialized:

With a diverse climate, Angola provides opportunities for commercial farming of a wide variety of tropical and subtropical crops, including: cassava, yams, sisal, corn, beans, wood, soy, rice, tobacco, bananas, citrus and other tropical fruits etc.

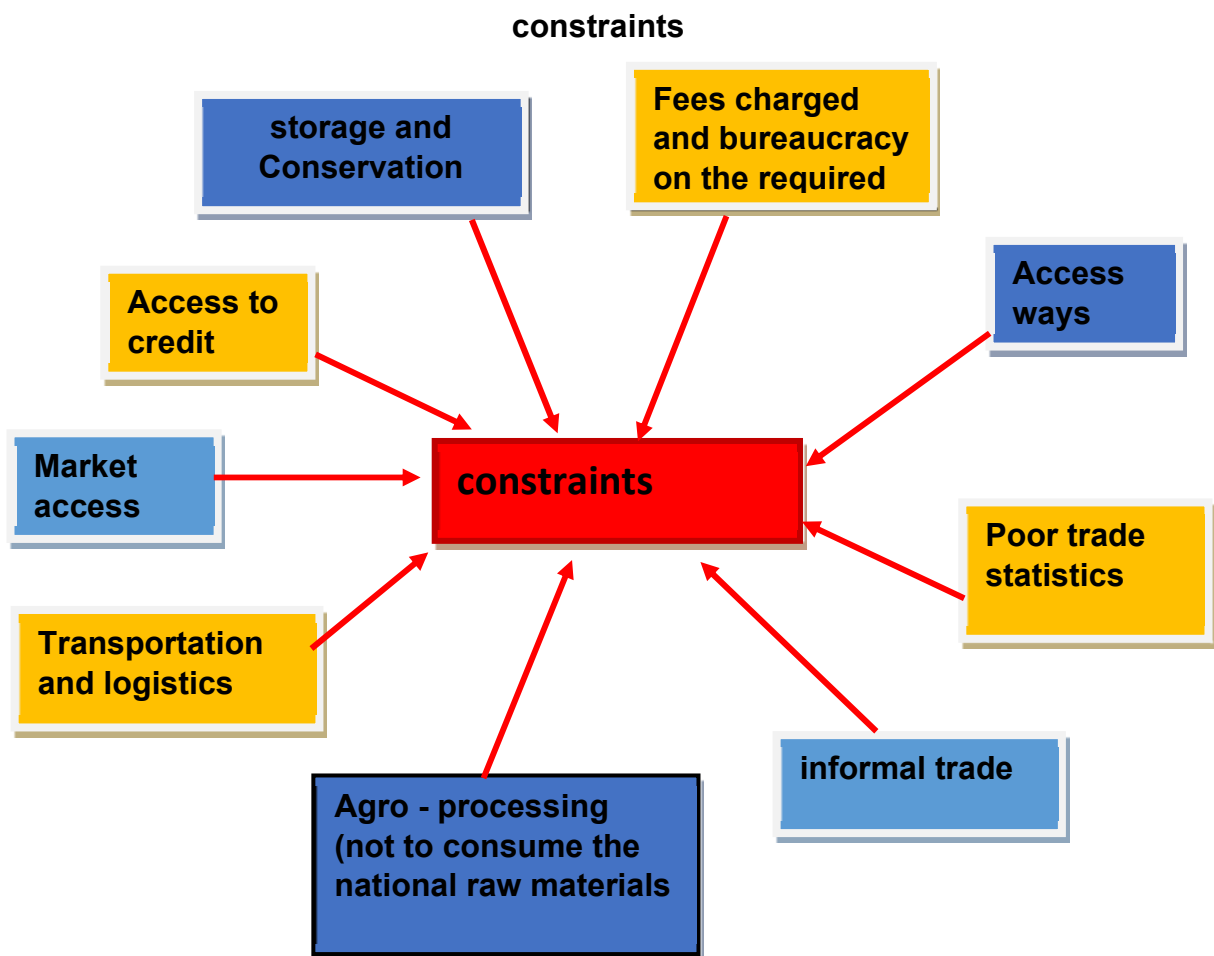
In short the Marketing is essential to agricultural development for several reasons:

- It promotes surplus areas to deficit flows, thereby improving overall food security;
- It generates income for farmers who can then buy inputs and increase yields;
- It helps to find outlets for marketable products thereby avoiding overproduction crises, etc. Despite this, there are several constraints that hinder the marketing activities of producers, which ends up not being a good indicator for the country.

constraints:

- **Access ways:** Is a major constraint to the extent that hinders the flow of products for drainage.

- **Transportation and logistics:** There may even be access roads, however, the lack of transportation and logistics compete as one of the constraints that farmers face in marketing their products.
- **Storage and Conservation:** Many of the farmers are able to produce more find it difficult to storage and conservation, weakening the marketing of surpluses.
- **Agro - processing (not to consume the raw material):** due to the constraints mentioned above, the processing companies are not consuming the raw material, and as a result there is no drainage of products either for trade or for the agro-industry.
- **Access to credit:** Farmers mainly of family farms do not have access to credit and this hinders entrepreneurial initiatives for most small farmers
- **Market access:** Many of them do not have access to the market and its production have solid inhibited.
- **Fees charged and bureaucracy in the documents:** One of the major constraints have been imposed fees, fines levied and often for lack of documents and the red tape involved in acquiring them.
- **informal trade:** How badly a result, the marketing system of products and surpluses, has been dominated by the informal trade
- **Poor Trade statistics:** There is a lack of statistics is also one of the constraints for this report and the difficulties in terms of numbers concerning the quantities of grain, roots and tubers marketed either in family agriculture and for the agriculture



Graphic 14. Flowchart of Constraints in Marketing

3.7. Trend in the development of markets for discontinuous food crops.

Expectations of trends in the development of markets for staple food crops in Angola, are changing over time.

The market for food culture in Angola is booming to the extent that today the reasons and tubers are already marketed and consumed in the southern region of Angola (Cunene, Kuando - Kubango, Huíla and Namibe) was formerly a market of cereal foods the basis of millet and animal foods, the trend today and because of the drought and the drought plaguing the region, is to have a food culture based on consumption of tap-sweet, cassava,

yams, beans, corn and soybean aims to diversify the sources of macro and micronutrients.

The country's central region (Huambo, Benguela, Bié Kwanza Sul and some areas of Huila and Moxico), had the corn kernels, soybeans and beans as the main food crop discontinuous, however, the trend in the development of food crops other products such as roots and tubers, has been a reality, lacking just more motivation, more nutrition education.

The North and northeast of Angola (Cabinda, Uige, Malange, Zaire, Luanda, Kwanza -North, Moxico, Lunda North and South), the carbohydrates cassava, sweet potatoes and yams are seen as the main food crop. In the present context the trend in this market is modified by integration of cereals and oilseeds modes to provide a good combination and balanced diet with the development of food crops available in the region.

IV - STATUS OF SEED SUPPLY.

4.1. History on crop improvement and seed supply in the country.

Legend has it that the use of improved seed is one of the factors contributing to the achievement and the maintenance of food security in Angola.

As a result, the MINARIF in 2008, held a training, which benefited 21 agronomists of experimental stations of the Agronomic Research Institute, the National Seed Service, the National Institute of Angola cereals, the CNRF, Development Agrarian Institute, Institute national Coffee and the Faculty of Agricultural Sciences of Huambo province, the course was held at the Ministry of Science and Technology (former IASB) and the Experimental Station of the national Center of genetic resources, located in the area of Frescangol (Luanda), had the participation of five coaches (four improvers and biotechnology), the Brazilian company Embrapa. Participants learned techniques on the breeding of major food crops and biotechnology applications in seed breeding programs appropriate for farmers.

Seed sources and limitations facing the informal system.

Most farmers, particularly in the case of developing countries, its main source their own seeds and other mainly of the community, from social networks among farmers within and outside the community, informal markets and formal institutions (NGOs and institutions of State). The seeds of informal networks are a key element in the conservation of the diversity of local crops and are integrated into the identification of the rural communication network and the identification of farmers who use and cultivate local varieties (the operation of informal networks in rural communities is complex and not only depends on the ability of farmers, the management and exchange among farmers, but is the basis of security of families, (Oliveira, 2012)

The seed exchange among individuals and communities is as old as civilization. Exemplifies the indigenous cultures, who delivered seeds from one family to the other, as a wedding dowry. These customs associated with traditional habits are not only facts of the past still prevail in many regions including Angola, mainly families with agricultural tradition. The exchange of seeds among farmers with

relatives, neighbors, access from markets, are other elements besides contributing to the reintroduction of varieties in areas where they have been lost or unused, facilitate the distribution and dissemination of new varieties of seeds from informal sources, mostly within their own communities ((Lopes, 2015)

Local knowledge about useful features of exchanged varieties as well as its shortcomings, can also be considered as an important differential in situ conservation on-farm(Barros, 2008)

Traditional knowledge is dynamic and needs to be protected and respected, as are recommended in Articles 9.3 and 9.2 on the farmer's rights as defined in the International Treaty on genetic resources for food and agriculture(FAO, 2017). However, researchers have paid little attention and few studies are developed with these informal systems. The preference for seeds acquired informally by farmers due to various factors such as adaptation to specific environmental conditions, minimizing risks, culinary preferences and social factors such as religion and prestige, as well as market opportunities(Barros, 2008)

The formal system dominated by imports of the State and the Private Sector is expensive and is characterized by delays in the arrival of the seed and the acquisition of varieties not recommended by the National Seeds System. On the other hand, companies operating in the Angolan market, in general.

According (Portal of the Government of Angola), Companies like the Garden of Yoba in Huila province have given their contribution in the multiplication of seed corn and potatoes, under license from the National Seed Service (SENSE) .In Chaungo production facility, located at an altitude of 1370 meters and 500 hectares of arable land, placed in alluvial river valley Caculovar has clayey nature of the soil, of which 75 hectares of irrigated rotativos pivots 20 and with drop-by-drop irrigation (garden hose).

It multiplies corn seeds and potato seed under license from the National Seed Service (SENSE). According to information in 2017, the company in a public - private partnership with the Institute of Agricultural Research (IIA) initiated a program assisted by CIMMYT for propagating and maintaining parental (basic seed). This year, he added, began improvement work based on germplasm.

4.2. Recent and ongoing activities designed to release of improved varieties of crops.

Recent and ongoing activities release of improved varieties are those that have been shaped through the dissemination of the legislation in force in particular:

- Presidential Decree No. 7/05, of 11 August Seed Law;
- Presidential Decree No. 93/16 of May 09, Rules of the Seed Law;
- Executive Decree No. 386/17, of 17 August, Technical Regulation of Production and Seed Potato Certification;
- Executive Decree No. 387/17, of 17 August, Technical Regulation of Production and Horticultural Species Seed Certification;
- Executive Decree No. 388/17, of 17 August, Technical Regulation of Production and Cereal Seed Certification;
- Executive Decree No. 574/17 of 04 October, Production Technical Regulation and Pulses Seed Certification, oil and fiber;

- **4.3. Recent and ongoing activities to increase the supply of improved seeds.**

In Angola when it comes to certified seed, in general, it is the imported seed and in considerable quantities, for the improved seeds, the country has a variety of difficulties and to demystify this problem is in the following activities underway to increase supply:

- Creation of regional and active collections banks
- Identification and registration of seed producers
- Identification of seed production areas
- Establishment of credit lines for seed companies
- Concluding contracts with seed producers
- Production and supply of basic seed
- Promoting regional partnerships in the field of seeds
- Strengthening quality control seeds
- technical of training involved in seed production process
- Conducting inspections of seed units
- Conducting forums for dialogue with seed companies
- Installation of varieties of experimental fields
- certified seed production
- Mobilization and training of communities in the conservation of seeds
- Monitoring and evaluation

4.4. Current options for small farmers gain access to improved seeds

According to data from (World Bank - IDA, 2017), About 80% of the country's farmers are smallholders and face many difficulties to the extent that access to improved seeds options are very weak, including the lack of more efficient agricultural practices and new agricultural technology; poor access to extension services, as well as seeds and fertilizers; and scarce market information.

The MOSAP project has supported the beneficiaries with training and new technologies, improving their organizational and marketing skills, improving access to agricultural inputs and assistance services. At present, it has also supported a strengthening of farmer organizations and about 725 farmer field schools were established by the project.

The project was designed to fit the Strategy for Poverty Reduction (PRSP, acronym in English) of Angola, which highlighted rural development that focused on rural development with particular focus on food security and revitalizing the rural economy. Therefore, according to the (World Bank - IDA, 2017) About 50,000 small farmers have been helped to increase production of the main crops included in the project.

As a result, the average production of potatoes, corn, beans and cassava, grown in 90, 80, 40 and 17 percent, respectively.

To improve the results of MOSAP, to include more regions of Angola and more beneficiaries, a new agricultural project for smallholders was approved by the Board of the World Bank in July 2016 and started in the province of Bié in March. In addition to making the training of smallholders, Development and Agricultural Marketing Project for Smallholders (SADCP, acronym in English) to strengthen the Ministry of Agriculture's capacity in the areas of statistics, policy analysis, market information, irrigation development and agricultural extension.

Also become more weighted environmental considerations and agriculture adapted to climate, to include in project design, through soil conservation, integrated management of natural resources and the most efficient use of water.

4.5. Number of private seed companies operating in the country and the estimation of their annual supply.

In Angola there are two major companies with seed production initiatives and at the moment are aimed only at producing corn seeds, actions for the production and multiplication of seeds come at a time that there are many constraints, reason why we do not work for varieties of beans, cassava, sweet potatoes and yams and for reasons to be more practiced by AEF. The annual estimate of maize seed production is the one that appears in the table below:

COMPANY	CULTURE	VARIETY	ANNUAL ESTIMATE (Ton)	OBS
Kambondo	Corn	Hybrid corn	2800 / 400ha	NO DATA AVAILABLE
	Bean			
	Soy			
	Manioc			
	Sweet potato			
	Yam			
Gardens of Yoba Huila province Chibia of Municipalities and Humpata	Corn	Yellow	4400 T / 550Ha	NO DATA AVAILABLE
	Bean			
	Soy			
	Manioc			
	Sweet potato			
	Yam			

Table 5. estimated annual seed production

4.6. Other non-governmental organizations and based on farmers operating in the production and supply of seeds.

According (IFAD 2018) the Spanish NGO, Codespa under project called plateau seeds, has provided quality seeds to farmers from the provinces of Huambo and Bie, having built an enterprise, capable of storing more than 10 tons of products. The Codespa Spanish NGO has been a key partner in working with the provincial government of Huambo and Bié, in promoting national food security and production.

The impact of this project in some groups is positive and has invested in mines Community for the multiplication of seeds, which should be sold at better prices than production for food consumption. On the other hand, the remaining NGOs are facing situations of emergencies.

4.7. Facilities and equipment available for seed processing and packaging in the country.

The supply of the Angolan market with seeds has been a fact, and as a fundamental basis the developed production by farmers who still practice farming systems with hand use of family labor, production, including cassava, corn, beans, sweet potatoes.

The decades of hostilities in Angola devastated the country and destroyed its agricultural sector, which in the past was very strong and in much of the country, the war left the infrastructure and technical capabilities sites destroyed or in total disarray. Reports of systems and equipment for processing of seeds and packaging, is available only to Farm Kambondo and the Company Garden Yoba, which are producing hybrid corn seeds for distribution to the country's farmers, as part of a strategy that pursues the development of commercial agriculture and beans, soybeans, roots and tubers require facilities for processing

4.8. Quantity (tonnes) of certified seed and marketed in the last five years and by culture.

CULTURE	certified seed quantity (Tons)					Seed traded quantity (Tons)				
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
Corn										
Bean										
Rice										
Soy										
Potato										

Table 6. Certified seed and marketed

The above clearly reveals the weaknesses of public institutions (SENSE and IIA), concerning the treatment and data information. The table shows that not produced any informs showing numbers of quantities of certified seed and marketed in Angola.

There was a request of the data and the answer came without desired effect, and nothing contained in published online, the reason that presents a blank slate.

4.9 numbers agro - dealers presently in operation by region.

According to a report of (Row cooperation network of agribusiness technologies and services, 2014). In Angola, there are about 26 dealers operating in Angola, have their headquarters in the capital of Luanda country and branches in other cities of Angola, here utilities:

1. ACQUASOLO - Sociedade Comercial, Lda

- Name: Helena Garden
- Function: Director - Luanda 923 446 461

2. Agrochemical ANGOLA, SA

Name: Julio Correia
Function: Director - Luanda: 924 812 85

3. AGROMUNDO - Agricultural Advisory Ltd

- Name: Jesus Vizol
- Function: Commercial Director - Luanda: 924 564 009

4. AISHA TRADING - Comércio Geral, Lda

- Name: Zahed Isebhah
- Function: Director General - Luanda: 928 640 182

5. Angeja - Trade and Industry, Ltd.

- Name: Baltazar Manuel
- Function: Head shop - Luanda: 925 099 415

6. BARLWORLD EQUIPMENT ANGOLA, LDA

- Name: Rui Fernandes
- Function: Director of Expansion - Luanda: 923 407 485

7. Agrolândia Huambo

- Name: Sebastião Coelho:
- Managing Partner - Huambo: 924 002 083

8. AUTO GAS

- Name: Jorge Manuel Gouveia de Sousa
- Role: Owner - Huambo: 923 518 946

9. Campotec - Technical Assistance to Equipment Ltd

- Name: Susantha Silva
- Function: Director For Africa - Luanda: 00-244-222 395 021

10. Cimertex ANGOLA - Society of Machinery and Equipment, Ltd.

- Name: John Aveiro
- Function: Director General - Luanda: 923 736 786

11. ASCOTECNIA, LDA

- Name: Roberto Martin-Delgado Suarez
- Function: Manager - Luanda: 00-244-222 441 414

12. THIS GOOD - General Trade and Services,

- Name: Francisco Guido Alves
- Function: Director General - Luanda: 924 088 971

**13. DRAGO EQUIPMENT SERVICE DRAGAO, SA - Financial Consortium
Angola-China**

- Name: Gentil Viana
- Function: Administrator - Luanda: 912 501 623

14. FDCA - DEVELOPMENT OF ANGOLA COFFEE FUND

- Name: Carlos Gurgel
- Function: Technical Contacts Area and Award - 935 258 587
(Headquarters)

15. FERTIANGOLA, SA

- Name: Pedro Pimentel
- Function: Director General - Luanda - 927 907 729

16. Flop & COMMERCIAL SERVICES, LDA IDENTIFICATION

- Name: Paulo Manuel da Conceição
- Function: Director General

17. FRICALIS - Trade and Industry, Ltd.

- Name: Raul Saraiva de Almeida
- Function: Administrator - Luanda: 923 408 811

18. GROUP QUEEN CALDAS, LDA

- Name: Manuel Bernardino
- Function: Managing Partner - Luanda: 930 006 263

19. HUILIS - Irrigation Systems and Services, SARL

- Name: Antonio Marques Bicho
- Function: Technical Director and Commercial - Luanda: 923 373 856

20. Krasnaya, LDA IDENTIFICATION

- Name: Krasnaya Miura
- Role: Owner - Luanda: 923 622 771

21. LAUSSENA, LDA

- Name: Fernando Alexandre de Vasconcelos Costa
- Function: Managing Partner - Luanda: 912 504 662

22. MECANAGRO - Agricultural Mechanization Company, EP

- Name: Carlos Alberto Jaime Pinto
- Function: President Cons. Administration - Luanda: 912 502 883

23. NOVAGRO - Trade Products, Materials and Agricultural Equipment.

- Name: Samuel Jorge
- Function: Commercial Director: 912 204 696

24. AGRICULTURAL PRIMOR, LDA

- Name: Antonio Carlos Dias Fernandes Quarter
- Function: Managing Partner - Lubango: Telephone: 00-244-261 228 123

25. SEDIAC, SARL - Society for the Study and Agricultural Industrial and Commercial Development

- Name: Marcelina Campos
- Function: Responsible Commercial Area - Luanda: + 244-222393176

26. SIRIUS, SA

- Name: Denis Dravet
- Function: Director General - Luanda - + 244-222355853

4.10. import level of certified seed from neighboring countries, for culture.

In Angola, according to the Ministry Of Foreign Affairs, (2010) classification of imported and exported goods is governed by the Customs Code and the Customs Tariff of Import and Export Rights.

(Decree-Law 04/12, published in the Official Gazette on 08.04.2012), but the research done, it was found the following information:

countries	CULTURE	Variety	Seed Quantity Imported (Tons)				
			2015	2016	2017	2018	2019
Zambia	Corn	ZM 523 Y	1100	-	5000	4000	-

Morocco	Corn	-	-	-	-	-	-
Brazil	Soy	-	-	-	-	-	-

Table 7. Certified seed imported from neighboring countries

4:11. Summary of prospects for improving seed supply.

The solution of the problem of seeds necessarily involves the creation of incentives to producers to facilitate their integration into the production process making this attractive sector to private investment.

In this context the MINAGRI after having tested various seeds and ensure its throughput production cost structures, implements measures aiming at large scale production and commercialization of high seed yield in order to increase the supply of terms seeds, reduction in import levels, generating more jobs, foreign exchange savings for the country, involving all stakeholders in the process (IFAD 2018).

V SYSTEM OF AGRICULTURAL RESEARCH NATIONAL

5.1. Description of public institutes and universities actively engaged in creating cultures.

Institutions and university actively engaged in the creation of research grain seed crops, roots and tubers are:

1. Guardianship agencies of the Ministry of Agriculture and Forestry Angola namely:

- a) Institute of Agricultural Research;
- b) Institute of Agrarian Development;

- c) National Institute of Cereals;
- d) National Seed Service;
- e) Central Laboratory;
- f) Fund for Support to Agricultural Development;

For more information about the functioning of institutions see Annex 1 - Statute of the Ministry of Agriculture Organic

2. Ministry of Higher Education Science and Technology and Innovation.

- a) **National Scientific Research Center;**
- b) **University José Eduardo Dos Santos UJES:** Faculty of Agricultural Sciences (Huambo):

5.2. Nature of the improvement activities of cultures recent or ongoing, for crops.

1. Institute of Agricultural Research;

- a) The IIA through Pulses Research National Program is carrying out the following crop improvement activities:
 - Implementation of a project of adaptation and selection of varieties of beans and ordinary beans macunde in the provinces of Huambo, Benguela, Bié, Kwanza Sul and Luanda.
 - Research and identification of six varieties that showed good adaptation to cultivation in different agro-ecological regions of the country.
 - Studies involving other cultures in order to minimize the impact of drought and ensure food production across the country.

- Testing of this nature are being made with cassava, sweet potato, corn.



Image 15. Trials in Chianga

the EEA

b) The IIA, through the Experimental Station Chianga in Huambo Province, has been developing activities of the following nature:

- Study Research seeds such as sweet potatoes, corn, cassava and subsequently distributed to farmers.
- Corn research study aims to find species tolerant to soil acidity in the Center region and as the sweet potato, the study aims to find varieties rich in vitamin A, C, B1, zinc and iron, to provide nutritious food.

The research also includes the impact of drought on agricultural these species, since the irregularity of rainfall has caused losses to farmers, jeopardizing food security.



Image 16. Soil improvement

2. Institute of Agrarian Development;

The IDA has developed the following activities:

- Preparation of an Extension and Rural Development Program (PEDR), which should serve as rector instrument for its restructuring and to guide their activities over the next five years
- Capacity building, skills and qualifications of the IDA staff, from the central level to the Agricultural Development Stations (EDAs), and participating farmers
- Distributing tons of maize seed, 30 beans in Huambo Province;
- Distribution of three thousand and 600 tons of fertilizer
- Provision of 2100 tons of compost (12/24), simple tons ammonium sulfate and five hundred tons of urea.
- Support for rural families through 135 agricultural cooperatives, 905 peasant association and 154 field schools for farmers.

3. National Institute of Cereals;

According to data made public the INC developed the following activities:

- Promotion, applied research, innovation and technological development of activities linked to production sectors of cereals, pulses, oilseeds, collection and analysis of grain samples, seeds and derivatives, soils, and the issuance of certificates of origin, quality, weight and plant .
- Preparation and securing the vulgarization of diagnostic tools and model resolution on technical assistance to the production of cereals and the like.

4. National Seed Service;

Second(Augusto Caetano da Silva, 2018); National SENSE director, his institution from various activities undertaken recently to improve cultures, there are the following:

- Import of corn seeds in the Republic of Zambia;
- The meeting to coordinate on production, availability and access of farmers to seeds in Angola.

That meeting aimed to create a space for sharing and exchange of knowledge, to improve dialogue between the various factors of the seed sector in the country, disseminate legislation on seeds, with a view to their application, and identify the factors restrict the availability and the access of farmers to the seed of good quality.

5. Central Laboratory;

- The Central Laboratory, have held control activities Food Quality, and there is low participation regarding the analysis or research on the seeds.

6. Fund for Support to Agricultural Development;

- One of the activities of the Support Fund for Agricultural Development (FADA), was the presentation of a proposal that defines the development of a national strategic plan for the sector's financing is prominent family farming and small-scale organization of agricultural cooperatives.
- The second activity was among others, listening to business owners about the main constraints they face in exercising their activity and formulate proposals with immediate impact to overcome them, follow the physical implementation of the projects of the reconstruction program and building infrastructure support structures to the productive sector.

7. Ministry of Higher Education Science and Technology and Innovation.

a) National Scientific Research Center;

The National Center for Scientific Research CNIC, is the following lines of research:

- Studies on the people of Angola;
- Food and nutrition security;
- bioactive principles;
- Diseases negligible;
- phytochemical studies.

Scientific studies in progress

- Experimental sunflower crops. Its adaptability to soil and oil yield;
- Study of fertility of soils Angola: subprojects: inorganic fertility evaluation of soils in Funda; Evaluation of organic matter in the deep soil; soil assessment deep affected by salts.

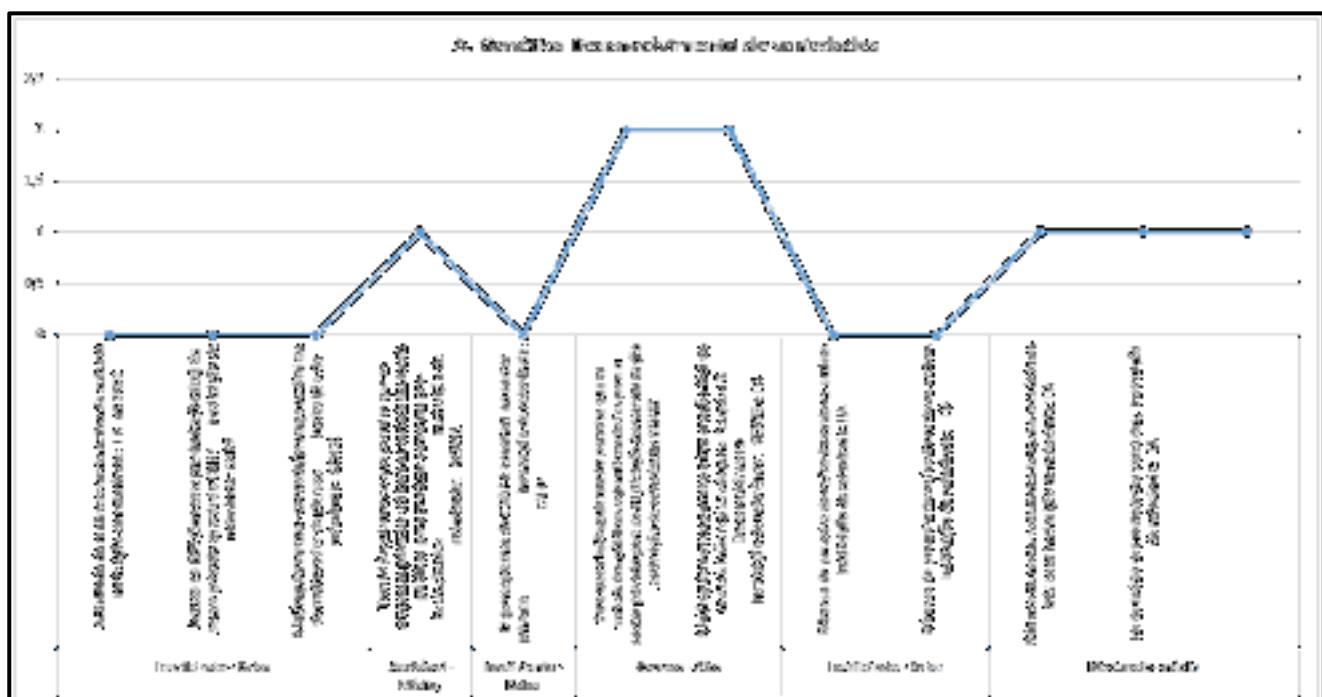
As for studies or activities on improving crop varieties studied in this report, the CNIC has not implemented recent activities so it is not a good indicator for the country.

8. University José Eduardo dos Santos

- Second (Henriques et al., 2010) the Faculty of Agricultural Sciences (FCA) in partnership with IIA and IDA reactivating actions on the seeds in Angola, in short have developed the following activities: Study for soil conditioning in a million, 461,000 and 128, 28 hectares of arable land.
- Studies and evaluation of the behavior of regional maize cultivars - 'White round' and 'SAM3' and imported - 'ZM423', 'ZM521', 'ZM523', 'ZM611', 'ZM621' as to its sensitivity to stalk borers and tang and the virus MSV (Maize Streak Virus). The tests were carried out at three sites of the Central Highlands of Angola in the dry season and the rainy season. In both seasons and the three sites, there were no infections MSV virus in regional cultivars; However, the disease incidence was imported albeit with low stringency.

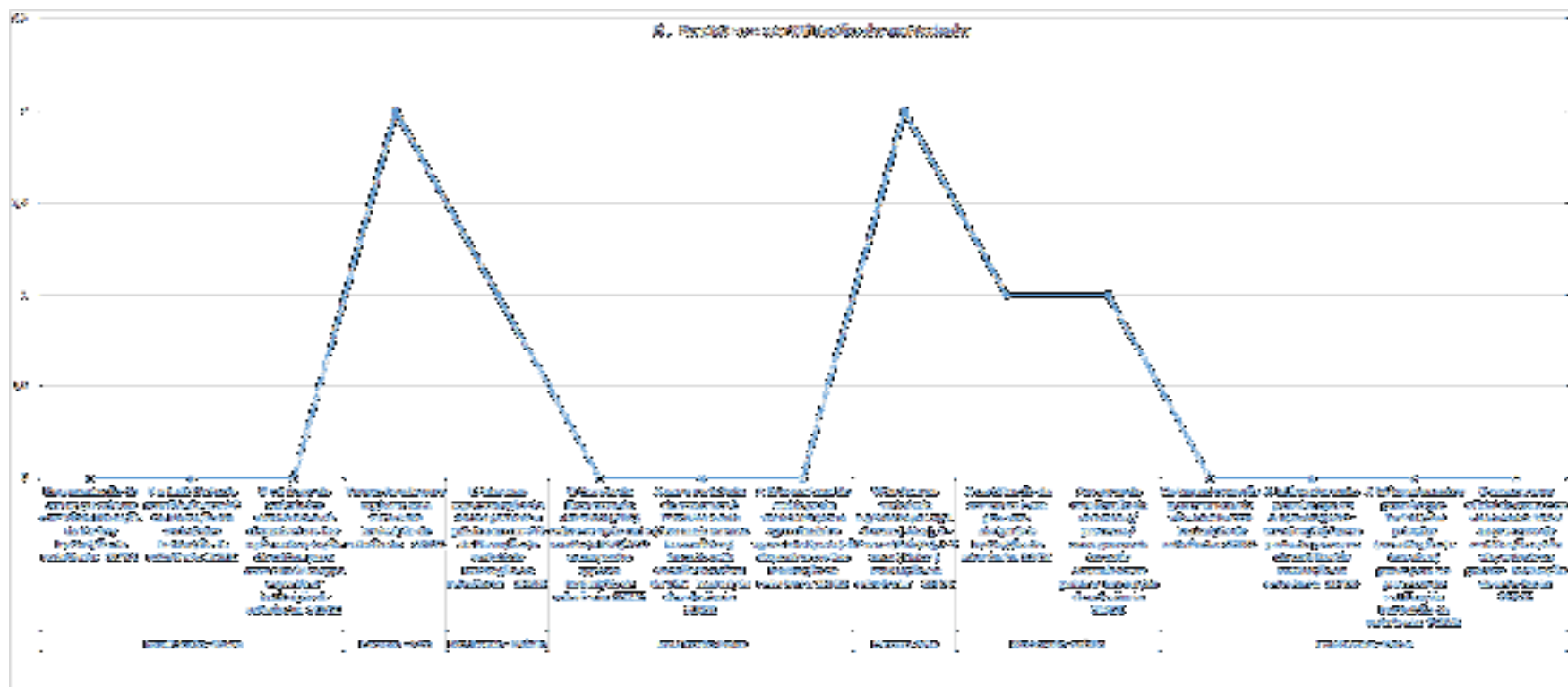
3. Level of capacity of public institutions to improve seed for culture.

As regards the level of capacity of institutions regarding the improvement of crops, proceeded to the development of a script (Annex: 2), which resulted in 4 graphics that present themselves following:



Graphic 15. . capacity indicators of public institutions in the improvement of genetics, variety development

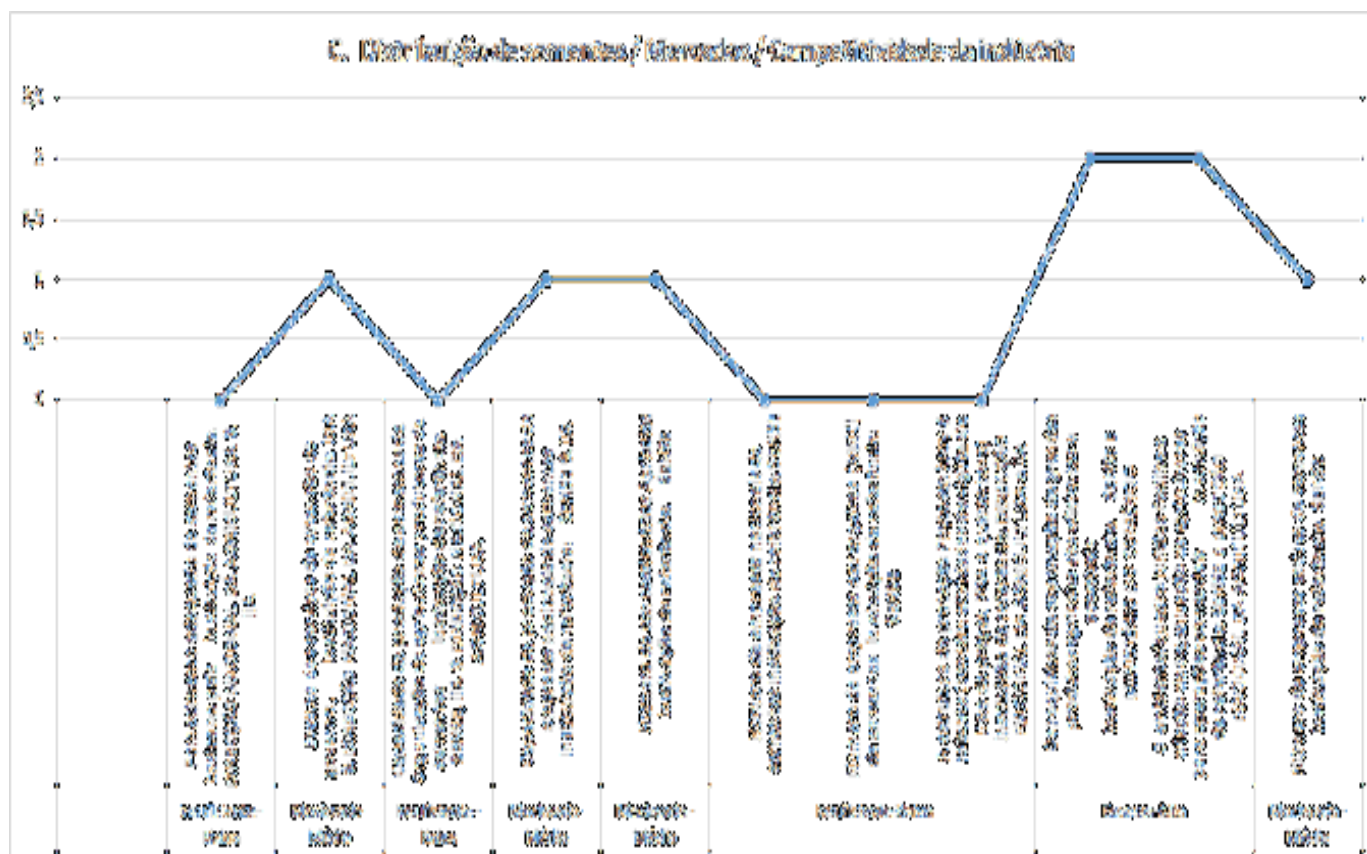
The chart No. 15 Shows that the SENSE and IIA, present in insufficient low-activity enhancement of active culture, has low CNRF inadequate access to EGS (pre-basic seed) and Germplasm. Already the IIA has low shortcomings with regard to the number of researchers / enhancers seeds. The SENSE is with shortcomings in relative aspect laws / regulations that protect the plant breeding rights.



Graphic 16. Indicators of Public Institutions capacity level in the Register and varieties Certification

Analyzing chart indicators No. 16 occurs due to the SENSE is the only institution Public, dedicated to the registration and certification of varieties and has shortcomings - low in the following aspects.

- Lack of representation in the sector of seed release committee; meeting periodicity of the variety release committee, is not a good indicator.
- Bad indicator regarding the catalog of updated varieties and their unavailability in online



Graphic 17. Indicators of the institutions in the distribution of seeds / Markets / Competitiveness of industry

The graphic No. 17, reflects the following reality:

- IIA and DNAGRI - failure - low in providing suitable seeds, which is not a good indicator for the weight that these institutions have.
- IIA, SENSE and DNAGRI- insufficiency-low in seed production capacity of the organization of farmers, seed producers are not a good indicator.
- SENSE: The number of company in this segment, it is presented as being insufficient, and the plant protection structure, eventually not be a good indicator for the SENSE and the National Agricultural Directorate.



Graphic 18. Indicators of capacity level of public institutions in the breeding range for culture. Regulatory Policies and seeds

Chart No. 18 shows exactly the IIA, the SENSE and the National Agriculture Directorate, acting as reference institutions in the adaptation of seed inspectors do not present a good indicator in mediated that on a scale from 0 to 2 the result was 0, implies that there is shortage of inspectors as well as their suitability for the improvement of seeds. The following table shows the IIA establishment plan, and there are no inspectors.

5.4.1. scientific staff (researchers) (IIA)

GENERAL STAFF MAP				
Group	Category	Man	Woman	Total
researchers	Senior researcher	2	0	2
	Principal investigator	2	1	3
	Auxiliary Researcher	15	1	16
	Research Assistant	6	2	8
	Research Intern	8	0	8
	Senior advisor	3	0	3
	first Advisor	1	0	1
technicians	Advisor	0	0	0
	Superior Chief Technical	2	0	2
Technical	Superior First Class coach	2	2	4
	Superior Technician Second Class	12	7	19
	Technician Third Class	0	2	2
	Technical East Main First Class	1	1	2
	Technical East Main Second Class	3	3	6
Average technical	Technical East Main Third Class	0	1	1
	Technical Middle First Class	7	1	8
	Technical East Second Class	14	4	18
	Technical East Third Class	15	10	25
administrative	Principal Administrative Officer	1	4	5
	First Officer	1	0	1
	second Officer	0	1	1
auxiliary	third Officer	4	1	5
	aspirant	1	3	4
	Driver Main Heavy	6	0	6
	Driver First Class Heavy	1	0	1

GENERAL STAFF MAP				
Group	Category	Man	Woman	Total
	Truck driver Second Class	1	0	1
	Principal Administrative Assistant	3	6	9
	Administrative Assistant First Class	2	0	2
	Administrative Assistant Second Class	0	1	1
	Auxiliary Home Cleaning	0	5	5
	Auxiliary Second Class Cleaning	0	2	2
charge	Qualified charge	56	3	59
	Charge Qualified First Class	21	3	23
	Qualified charge Second Class	30	3	33
	Charge Not Qualified	84	53	137
	No charge Qualified First Class	33	19	52
	No charge Qualified Second Class	23	11	34
Total		360	150	510

Table 8. Framework of the IIA staff

5.4.2. Infrastructure

The Institute of Agricultural Research (IIA) is a Public Institution for Scientific Research and Technological Development, nationwide, under the Ministry of Agriculture and Forestry, conducts applied research and adaptive and technological development aimed at increasing production and productivity, improve product quality. (IIA Site Agronomic Research Institute)



Image 17. Institute of Agronomic Research
Photo source: (IIA Site Agronomic Research Institute)

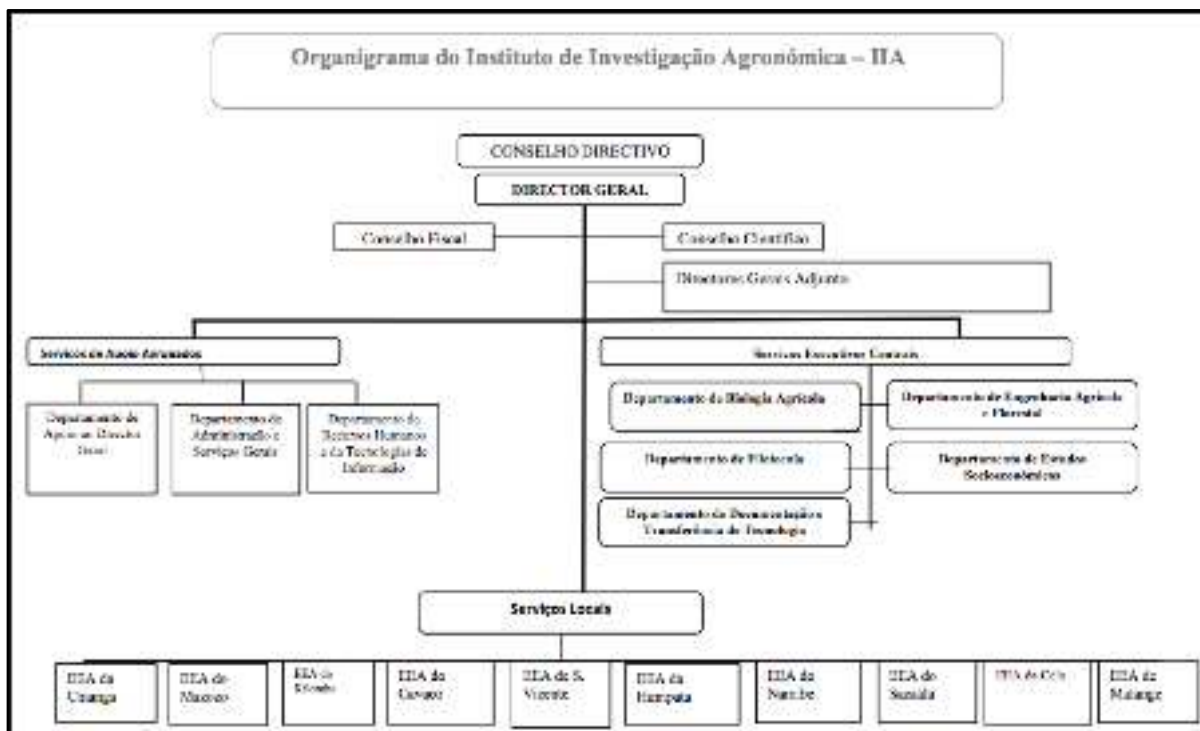


Image 18. Organization structure of the IIA

According to research done in (IIA Site Agronomic Research Institute), The institution controls including 4 research laboratories:

1 Analysis Laboratory of soils and plant nutrition

soil analysis laboratory and plants is a research unit and routine analysis belonging to the Institute of Agricultural Research, is located in the Agricultural

Experimental Station Chianga, Huambo Province. The laboratory consists of technicians and researchers able to carry out activities related to research, physical and chemical analysis of soils and analysis plants.



Image 19. Analysis Laboratory of Soil Science and Plant Nutrition

✓ Projects and activities

The research done, this is one that is operational and from various activities, we highlight the following:

- Providing service to pasture and forage legumes and programs.
- Installation and operation of BLOC DIGEST 4000638 for the determination of nitrogen and crude protein.
- Installation, calibration and operation of atomic absorption spectrophotometer PG-990.
- Installation of mapping and GIS rooms.
- Cooperation with the University of Hamburg (analysis Okavango project samples).
- Cooperation with the Polytechnic University of Valencia (training the laboratory).
- Project on soil correction methodology as a means to enhance the use of land in the Central Highlands.
- Project on the fertility of soils in pasture areas supported by the (IAEA) International Atomic Energy Agency).

2. Tissue Culture Laboratory

Does not work.

3 Laboratory of Plant Protection

This laboratory is designed for the following tasks:

- ✓ Phytopathology-1 (study of disease)
- ✓ Agricultural Entomology-2 (Study pests)
- ✓ 3- herblore

4. Post-Harvest Laboratory

- ✓ Does not work

Agricultural Experimental Stations:

The research done in (IIA Site Agronomic Research Institute)It was found that the IIA controls about 10 scattered experimental stations in some regions of the country including:

1st Experimental Agricultural Station of Cela

The EEA's Cell, located in hydro-agricultural perimeter of the medium farms Waco Kungo municipality of Cela. It is located at an altitude zone (1300m) with humid tropical climate characterized by alternating wet and dry seasons well defined, where the annual average temperature of 20.60 ° C, with average annual precipitation of 900-1000 mm.



Image 20. EEA Prison Cell

The EEA Cela, is dedicated to research and technological development, Forage Crops, legumes, cereals and fruit (pineapple). The same has offices, residences, infrastructure to install food science laboratory and experimental agricultural fields and a substation in the city of Sumbe.

Address: Farm 36. Waco-Kungo. Kwanza Sul

Contact: António João Zuke. Branch management

Email: azuke@yandex.ru

Tel: 922333370

2nd Experimental Agricultural Station of Chianga

The Agricultural Experimental Station (EEA) Chianga is one of the mainstays of research and testing of the Institute. Located 13 km from the city of Huambo, has an area of approximately 2,550 ha.

Its geographic location and agro-ecological conditions provide the ability season for corn, beans, vegetables, tropical fruits, potatoes, wheat, soybeans, forests and feed. It offers support infrastructure such as laboratories, experimental fields that provide research with certain scientific rigor.



Image 21. EEA Chianga

The EEA's Chianga according to (IIA Site Agronomic Research Institute) Provides soil analysis services, phytosanitary consultation, technical assistance to producers and production of basic seed and certified seedlings, among others.

Address: Chianga. CDATE Vilinga. Huambo

Contact Alberto Feliciano Pedro, Station Chief.

Email: albertopedro61@hotmail.com

Tel: 923870095

3rd Agricultural Experimental Station of Cavaco

The EEA's Cavaco, located in chip Valley and part of the green belt of Benguela province. It has a high potential agricultural soils due to its alluvial and rich water table that allows irrigation throughout the year. Lies in arid region with heat mega-average annual rainfall below 500 mm and an annual average temperature of 270 ° C.



Image 22. EEA do Cavaco - Benguela

Provides technical assistance to farmers and have available mango seedlings, banana and other fruit trees. The EEA's Cavaco have in your office structure and agricultural experimental fields. This station has a substation located in Upper Capaça, Cubal district, with administrative infrastructures and newly rehabilitated homes.

Address: Cavaco Valley. Kambagela. Benguela

Contact: Diassonama Cala

Email: diassonamadiassy@yahoo.om.br

Tel: 926971839

4th Experimental Agricultural Station of Humpata

The EEA Humpata, is located 22 km from the city of Lubango (Huila province) and 3 km from the axis of Lubango road - Namibe. The climate is temperate with rainy and dry season. Notes average minimum temperature of 11.0 ° C and 18.60 ° C maximum.



Image 23. EEA Humpata

According to what was found in (IIA Site Agronomic Research Institute)The EE Humpata is dedicated to research in the field of fruit growing in temperate regions and citrus on a large scale and small-scale cereal, produces seed pre - basic and basic. Recently rehabilitated the station has plants analysis laboratories, plant pathology, post-harvest, agricultural greenhouses, weather station, homes, offices and agricultural experimental fields.

Address: Humpata, km 22. Huíla

ContactSimon Jose Zacarias Tchicundi

Email: tchicundi@hotmail.com

Tel: 923468576

5th Experimental Agricultural Station Malanje

The Experimental Agricultural Station Malanje, located in Camibafo neighborhood in the Administrative area of the Municipality Headquarters of Malanje Province, between the coordinates 9 32' 06" South Latitude and 16 17' 45" Longitude East, has an area of 224.39 hectares of land. This station is located 6 km from the city of Malanje in the old forest polígono zone. The climate is humid tropical mesothermic and temperatures ranging from 20 ° C to 25 ° C Minimum Maximum. The station was created the Light of the Ministerial Order No. 6/02, is dedicated to the research and testing of cassava, beans, peanuts and fruit. It makes production plant material of cassava seedlings of fruit trees and forest plants.



Image 24.Aspecto Agricultural Experimental Station of Malanje

The station is dedicated to applied research, adaptive and participative, in agriculture. The introduction of modern knowledge and rational use of natural resources resulting from experimental studies, will allow settle hunger and poverty in the region and in the country.

The station has research infrastructures as three laboratories, namely soil, plants and fabrics and Seed Quality Culture. A classroom with a capacity of thirty students, an auditorium with a hundred places, eight dormitories with 16 beds, weather station and field trials.



Image 25. Soil and Plant Laboratory aspect EEA Malanje

For the conservation of different varieties of sweet potato and cassava, the station has developed propagation work of several varieties. Figure 3 presents itself a germplasm bank of sweet potato.



Image 26.Aspecto of sweet potato germplasm

Address: Forest Polygon. Control Old Malanje

ContactAlberto Goncalves Neto

Email: agneto6@hotmail.com

Tel: 934915414

6th Agricultural Experimental Station of S. Vicente

The station is located in S. Vicente, district of Cabinda. It has a humid subtropical climate with abundant rainfall, where the annual rainfall varies between 900 and 1200 mm. The activities of the station are turned over to the selection of genetic material, in order to form a gene bank for the evaluation of the major agronomic traits and phytopathogenic the corn crops, beans, groundnuts, cowpea, soybean, sunflower, pea congo (*Cajanus cajan*), cassava, sweet potato, yam and taro, in view of obtaining varieties resistant to diseases and pests of the region and hence high yields. It has laboratories of grounds, plant pathology, plant analysis,

greenhouses, weather station, farmland and offices,(IIA Site Agronomic Research Institute).

AddressS. Vincent. Cabinda

ContactFrancisco Puati

7th Agricultural Experimental Station of Mazozo

The EEA's Mazozo, is located in the municipality of Icolo and Bengo 60 km from the city of Luanda. It is characterized by low rainfall (about 400 to 500 mm year) irregular distribution. It has a source of water supply from the river Kwanza which is the Cauigia pond.



Image 27. EEA's Mazozo

This station is dedicated to the study of irrigation systems in fruit trees and food crops of short cycle tolerant to water stress and phytotechnical studies. Own tissue culture laboratory and analysis of plants, offices and fields of agricultural research.

Address: Mazozo. Icolo and Bengo, Catete, 60 km Luanda.

Contact: Paulo Moniz Mutunda

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Tel: 923501475

8th Agricultural Experimental Station of Namibe

The EEA Namibe, is located in southwest Angola, Namibe Province to 6 km of the city. It benefits from a hot desert climate, with an average temperature of 210 ° C and average annual rainfall of 61 mm.



Image 28. EEA Namibe

The station is dedicated to the cultivation in irrigated temperate fruit trees (vines, olive, peach, apple and pear trees) and tropical fruits, Forage Crops, cereals, legumes and vegetables. It has offices and farmland.(IIA Site Agronomic Research Institute).

Address Namibe Road - Lubango km. Moçamedes, Namibe

Chief of Station Adriano Muiocoto André

Email: Kulondoc@yahoo.com.br

Tel: 922878189

9th Agricultural Experimental Station of Quilombo

According to (IIA Site Agronomic Research Institute), The EEA Quilombo, is located in the province of Kwanza Norte, county Cazengo about 5 km from the city of Ndalatando. Falls within the humid tropical climate. Its various altitude of 500m to 1500m in relation to sea level, with an average temperature between 22 to 24 ° C.



Image 29. EEA Quilombo

The station retains an important botanical garden with natural and exotic plants, many endangered phase. It is dedicated to also to trial, multiplication and dissemination of knowledge about the cultures of roots and tubers, flowers and ornamental plants and forest plants.

As infrastructure has Phytopathology laboratory and plant analysis, herbal, greenhouses, weather station, homes, offices and agricultural experimental fields, (IIA Site Agronomic Research Institute).

Address: Botanical Garden. Ndalatando. Kwanza Norte

Contact: Domingos João Lambaiala

Email: joao.lambaila@yahoo.com.br

Tel: 923422947

Forestry Experimental Station Sacaála

Information found in (IIA Site Agronomic Research Institute) show that Sacaala Forestry Experiment Station (EEFS) is one of the research units of the Agronomic Research Institute (IIA) allocated to the Ministry of Agriculture and Forestry. IIA is the only station dedicated to the forest area. It is located in Huambo Province, between latitudes $12^{\circ} 06' - 12^{\circ} 12'S$ and Longitude $15^{\circ} 45' - 15^{\circ} 50' E$. It lies about 4 km east of Huambo with a area (which reduced in the last three decades) of 500 hectares. In the last three decades the area was in 3050, this reduction was due to the urbanization for the expansion of the city. The station is at an altitude between 1750 to 1830m, with precipitation of 1,380 mm and temperatures of $19^{\circ} C$ on average. It has a biome Zambeziaco and Miombo, ferralsols and humid temperate climate. Its creation dates back to the '60s, however,



Image 30. EAAF of Sacaala

Also according to the (IIA Site Agronomic Research Institute) The Sacaala station is designed to make forestry studies as:

- a) assessment of testing specific behavior;
- b) Comparison of plasticity of forest species;
- c) Selection of most interesting clones for seed production of good quality;
- d) Production of seedlings of forest species;
- e) Conduct studies in the field of beekeeping and fish farming.

The forest perimeter of Sacaala has environmental and safety functions to be the lung of the city of Huambo and at the same time serves as the airport Albano Machado buffer zone. In addition to these functions, it adds to economic function related to the generation of knowledge and technologies applicable under the rational use of forest resources for the development of the country.

As in the past, Sacaala Forest Experimental Station will continue to be the center for studies related to the evaluation of the adaptability of exotic species of economic importance, such as technology for wood and paper, beekeeping, forestry, fish farming, plant health and quarantine zone you have.

It owns farmland, sawmill, apiary, quarantine station, homes, offices and weather station completely destroyed by civil war.

Address: Sacaala. Huambo

Contact Óscar Morais

Email: oscarmorais2006@yahoo.com.br

Tel: 927162431

5.5. recent or ongoing collaborations with public institutions, farmer organizations and the private sector in the supply of seeds.

EDA is a state structure which operates in the rural areas, with the aim of helping the rural population, through educational activities, improve the methods and techniques of cultivation, raising the standard of living of rural families as well as the educational and social standards of living in the countryside.

IDA data indicate that, of the 77 Agricultural Development Stations, 11 are of Malanje, 09 of Kwanza Norte, equal number of Huambo and Huila, Benguela and Kwanza-Sul have seven, Uíge, five, Cabinda and Bengo with four, Bie three, Luanda, Namibe and Kuando - Kubango and Cunene have two has one.

5.6. current state of licensing arrangements of crop varieties for seed production by third parties

The current state of licensing arrangements of crop varieties for seed production by third parties in Angola, has an indicator not very good, because it is only performed, but with low shortcomings by SENSE, reason why there is no third parties.

SAW. TABLE OF NATIONAL SEEDS POLICY

6.1. Law or documents that control the production and supply of seeds

- Presidential Decree No. 7/05, of 11 August Seed Law;
- Presidential Decree No. 93/16 of May 09, Rules of the Seed Law;
- Executive Decree No. 386/17, of 17 August, Technical Regulation of Production and Seed Potato Certification;
- Executive Decree No. 387/17, of 17 August, Technical Regulation of Production and Horticultural Species Seed Certification;
- Executive Decree No. 388/17, of 17 August, Technical Regulation of Production and Cereal Seed Certification;
- Executive Decree No. 574/17 of 04 October, Production Technical Regulation and Pulses Seed Certification, oil and fiber

6.2. Process for the official release improved crop varieties.

See the Article 11, 12, 13, 14, 15, 16, 17^oe 18 of the current law.

6.3. Procedures for seed certification

- It is produced in blocks officially registered by the National Seed Service
 - It is produced by a seed productor registered with the respective certification blocks, be planted, grown and produced in accordance with current legislation;
 - Be inspected during cultivation;
 - Be analyzed in a laboratory in accordance with the requisites established and that the results meet the standards established internationally
- . See Exhibits 3 and 4. Gazette, Series I # 70 of 9 May 2016; Regulation of the Seed Law**

6.4. current status of regulatory agencies responsible for seed certification

See: APPENDIX 4.

6.4.1. Pessoal active

SENSE- active staff: 70 employees; 27 the upper level; 29 and 14 mid-level workers between skilled and unskilled

6.4.2. infra structure

- **Infrastructure**¹⁰ (Luanda, Huambo, Benguela, Bie, Malange, Kwanza-Sul, Namibe, Cunene, Huíla, Benguela and Lunda Norte)

6.5. current state of the supply of basic seed

agreeing with (Barros, 2008) the basic seed is the first generation of gene-seed, one that was obtained by the breeder. In order to better define the basic seed, you must first define the genetic seed.

Genetics is the mother seed, is the new range is the new creation, developed by the researcher and to be multiplied in the field by who created it, will give rise to basic seed. Still on genetic seed is important to emphasize that was obtained by the breeder's work and that often leads 8, 10 or more years to be created. This new strain was selected for its qualities as a plant, a seed, a root, or in some cases, a fabric obtained in the laboratory, where it was incorporated into a gene which will confer resistance against insect herbicide finally , adding a new technology. But all this was done, improved and multiplied, resulting in small amounts of seeds, ie grams of a few kilograms of seed genetics.

As a result the current state of supply of basic seed in Angola in accordance with the script and the indicators presented in Chart # 12, it can be said that it is not healthy, that is not a good indicator because the public institutions engaged this segment having low-shortcomings for this purpose.

6.6. Procedures for the production and supply of basic seed

(Good, et al., 2008) He explains that the technical procedures for seed production and genetic base class cultivars follow the guidance and monitoring of highly qualified professionals. The production fields are installed in places where the health aspect, the fertility of the soil and climate are favorable for the proper development of soybeans, corn and beans. In addition to the inoculation practices and fungicide seed treatment, moments before planting, and weed control, various inspections are performed during all stages of culture, for the control of pests, diseases and possible varietal blends. In the latter case, the removal of the mixtures is usually carried out in periods of pre-harvest, in an operation called "rouging" when it is possible to display characteristic of the variety, such as: plant height,

As the number of cultivars is high, the maintenance of genetic identity is highly dependent on the efficiency of cleaning the machinery, transport vehicles and processing equipment during the exchange to grow. For this type of cleaning is widely used compressed air. The constant washing machines can decrease your life. Another measure adopted to prevent varietal mixture is first spoon surround the fields, allocating the first bags for consumption

The basis for the seed volume of the decision-making supervised by cultivar that will be produced in two years are:

- a) the size forecasts and market share with the launch of cultivars that have added values of great interest to farmers;
- b) the ideal theoretical percent cultivars taking into account its cycle, and the technological level of the macro - region to be produced;
- c) the demand reported by the network of franchise and farmers.

This information is compiled and used to calculate the area and volume production fields seed in the previous classes. This exercise is rewarding in the sense that corrections in the initial plans can and are usually made at the regional level or to grow, but probably not impact the availability or leftover seeds in a given crop. error risks in the commercial sector can also be minimized by

adopting simple measures in planning, for example, no farming should represent more than 10% of the seed market.

These procedures are very far from the Angola reality, since according to results of the indicators on the procedures for the production and supply of basic seed, are not favorable in that the institutions involved have a low failure capacity level.

6.6.1. Access by private seed companies for basic seed

There is access by private companies, the most expensive seed, it is considered as a throttle for the agricultural activity due to high prices kilogram when it comes to farmers. So some Family Exploration Peasants have had access to basic seeds from some initiatives free of government that matters from outside the country.

This indicator shows that there is clearly a situation of competition between private operators and the state, which leads to private when they realize that the state needs or is struggling to complete the quota to one marketing year they raise prices, hurting those who do not receive state product, but that provide for commercial network.

6.6.2. supply of basic seeds by the private sector policies

supply policies seeds by the private sector, have been controlled and regulated by the rules and laws of the State through the Ministry of Agriculture. But it should be noted that due to the scope (scope) in Angola is 92% focused on family farming has been the state itself to import basic seed and distribute free of charge to small farmers.

. See Annex 3. Official Gazette, Series I # 70 of 9 May 2016; Seeds Regulation Act

VII. SUMMARY AND CONCLUSIONS

7.1. Current status of small farmers access to improved seeds

In this section, the aim is to ensure that the needs of small farmers are recognized and respected. But it was found clearly to the ground than the uncertainty of access to improved seeds by small farmers, discourages and deters them to increase their production, income and the surface to cultivate an indicator often described as shy. The Angolan government despite having made the free distribution of seeds, has not been enough for good coverage, there have been major constraints, especially for remote areas and difficult road access to free seed distribution has not resolved itself the problem shortages facing small farmers, another problem, Lack of micro schemes - credit are also very limited at present, and thus access to credit is very difficult for small farmers. Thus the current state of small farmers have access to improved seeds, are shown as a negative indicator.

7.2. current state of government support to improve seed systems (Sense).

According to the scarce resources allocated to the agricultural sector in the government budget in the order of 3.3%, the current capacity of the MINAGRIF is insufficient to carry out the tasks arising from the ambitious agricultural policy that these recommendations strongly advocate.

The SENSE should create an office for technical and legislative planning, with autonomous management in accordance with the results, which could devote all his attention to policy objectives and seed breeding regulations. This office should be interdepartmental, to deal with complex issues.

The IIA, SENSE and IDA, should be provided with the necessary resources to strengthen the extension network they operate, whether in infrastructure estruras as qualified human resources (Improvers / researchers) seeds. The current state of government support, has an insufficient-low indicator.

7.3. Trends and opportunities for improvement in seed systems.

- Promote training techniques to producers, proformas to check them entrepreneurial skills and resilience in this row;
- Reduce dependence on imports and ensure self-sufficiency in seed;
- Promote domestic production of improved seeds through the creation of partnerships between similar agencies in the public and private sectors, including specialist private partnerships between domestic and foreign producers, aimed at gradual reduction of imports;
- Grant credits to Economic Agents responsible for marketing and distribution of seeds;
- Grant credits to producers, with a view seeds Multipliers and Acondicionares increasing their production;
- Provide food security and promote integrated and sustainable development.

7.4. recommendations

- Reduction of seed imports;
- Access to improved varieties of seeds, resistance to climate change, pests and diseases and greater productivity.
- Increase in the areas of agricultural holdings;
- Encourage the production and subsequent use of improved seeds to small farmers.

7.5. likely impact of improved access to improved seeds by small farmers

The probable improved access to improved seeds by small farmers will have a positive impact to the extent that will allow:

1. Achieve self-sufficiency in corn, soy beans, cassava, sweet potatoes, yams.
2. improved seed fairs implementation, allowing trade between farmers and cooperation with similar institutions. The sellers are the seed companies and farmers have a surplus of seed multiplied. Sellers subsequently exchange the vouchers for cash. This solution promotes the local economy and create commercial ties that can be useful at a later stage for the sale of production. Regional experience in seed fairs is extremely valuable and should be replicated in Angola, possibly on the basis of lessons from field trips.
3. Seed storage practices at village level: Traditional storage of seeds that are still in working methods will be applied and played in places where it became apparent lack of knowledge in this area, either because they were lost or why not practiced storage.
4. It will also allow small farmers using improved local varieties: Clearly seeds imported are not adapted to local conditions of soil and climate or local habits of cultivation, or lack technical and financial capabilities to farmers to use inputs required for such varieties . Thus, local seeds can be more useful. Another advantage is that the local empirical selection methods are generally sufficient to significantly increase yields.
5. Better coordination among Small Farmers and MINAGRIF regarding the distribution of seeds: The coordinating role of the local MINAGRIF directions, will be fully taken into account in its ability to represent the authorities. They should also be provided with human or physical means to perform their normal functions, especially the extension. The lack of coordination with the Small Farmers often results in the lack of adaptation of appropriate seed policies to local conditions,

while the MINAGRF, should have information on soils and climate that could help avoid errors in this area.

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