SEED SYSTEMS GROUP

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

AGRA Growing Africa's Agriculture

The ROCKEFELLER FOUNDATION

STUDY REPORT ON EXISTING SEED SYSTEMS AND THEIR POTENTIAL FOR IMPROVEMENT IN GUINEA

Ibrahima Diallo
National consultant

October 2019

ABBREVIATIONS

AFD: French Development Agency
ACTION: Global Alliance for Resiliency Initiatives
ANASA: National Agency of Agricultural Statistics and Food Security
ANPROCA: National Agency for Agricultural Promotion and Agricultural Council
AfDB: African Development Bank
WB: World Bank
IDB: Islamic Development Bank
BI: Boutiques Inputs
ECOWAS: Economic Community of West African States
CNS: National Seed Committee
ARC: Agricultural Research Center
CILSS: Permanent Inter-State Committee Fight against Drought in the Sahel and West Africa
DNA: National Department of Agriculture
FAO: UN Agency for Food and Agriculture
HTF: Support Fund Sector Seed
HLI: High labor-intensive work
IRAG: Agricultural Research Institute of Guinea
ISAV / F: Higher Institute of Agronomy and Veterinary '' Valery Giscard D'Estaing '' Faranah
LOA: Agricultural Orientation Law
MA: Ministry of Agriculture
MDG: Millennium Development
ODD: Sustainable Development Goals
OAPI: African Intellectual Property Organization
OP: Peasant Organizations
NHP: National Seed Policy
PASAL: Project to Support Food Security
NADP: National Agricultural Development Policy
PNIASAN: National Agricultural Investment Plan and the Food and Nutrition Security
FCPN: Food Crisis Prevention Network
PREGEC: Prevention and Management of Food Crises
PNDES: National Economic and Social Development Plan
CAADP: Comprehensive Program of Agricultural Development in Africa
WFP: World Food Program
PATAg: Support Project for the Transformation of Agriculture Guinea
NRDS II National Strategy for Rice Development
SNRAH: National Agricultural Research System, livestock and fisheries
ICT: Information and Communication Technologies
WAAPP / WAAPP West African Agricultural Productivity Program / Program
Agricultural Productivity in West Africa

Contents

ABBREVIATIONS 3

1. Introduction and Background 5

at. Farming Systems 6

b. Current and recent agricultural development initiatives 12

vs. Development prospects for agriculture 13

2. Farming Systems 14

at. Levels of current production of food crops, yields and trends 15

b. Description of the main agro-ecological zones and farming systems 16

vs. Current status of agricultural extension activities, public and private 29

d. adoption of improved seed level, Culture 29

e. Level of use of fertilizers and organic manure to increase yields by crop 30

f. General description of the marketing system of excess production of staple crops 31

g. Trends in the development of industries and sales channels for staple crops 31

3. National Agricultural Research System 32

at. public institutes and universities actively engaged in plant breeding 32

b. Current situation of recent or ongoing varietal selection by species 32

vs. State of the art of seed research institutions to public vocation 35

d. Recent collaborations or underway with the private sector and farmers' organizations seed supply material 36

e. current situation of seed production license agreements by third entities 36

4. State of the art for the provision and supply of seeds 36

5. National Strategic Plan of the seed sector 43

6. Summary and Conclusions 48

at. Current state of access to improved seeds among small farmers 48

b. Contribution and governmental support for the improvement of seed systems 49

vs. Prospects and opportunities for the improvement of seed systems 52

d. recommendations 52

e. Impacts and benefits of a better smallholder access to improved seeds 53

NOTES 54

1. Introduction and Background

Agriculture is the mainstay of the economy of Guinea, employs 80% of the Guinean population and is the main source of income for 57% of rural. The number of farms is high and reached the figure of 840,454. Each farm is live on average 8 people including 5 assets. Smallholding dominates; 64% of farms are smaller than2 ha and only 4% stretch over 7 ha. In general, it is poorly equipped farms in which the work is performed mainly by family labor using rudimentary instruments. The proportion of women working in the agricultural sector is slightly higher than that of men: 50.7% against 49.3%.

Guinea is a country full of vast natural resources which gives it sufficient growth potential to get out of poverty. These resources both abundant and varied are a major asset for economic diversification

Despite this immense potential, the economic performance of Guinea are currently insufficient to ensure sustainable reduction of poverty as presented in the Millennium Development Goals (MDGs).

Agricultural growth is mainly driven by the increase in cultivated areas that increase at an average rate of about 3% per year (3.2% in 2010). Yields have changed very little in recent years and remain well below their potential to make this sector the main engine of development of Guinea. Indeed, weak agricultural growth is mainly attributed to the productivity of the rural sector. Despite efforts in the rural sector for twenty years, the practices remain relatively unchanged. The promotion of new technical routes, control of water and land surfaces remain very localized. Only 2.3% of the plots benefit from phytosanitary treatments, less than 8% of sown areas receive improved seeds and an average of 7 kg of fertilizer used per hectare per year. The absence of functional rural credit system prevents the modernization of equipment and the use of inputs.

However, there are solutions to Guinea to reverse this trend, the number of which, the use of quality seed that is determining the most important of which agricultural production potential efficacy of other agricultural inputs depends. The adapted quality seeds are needed to meet the requirements of various agro-climatic conditions and intensive cropping systems. The sustained increase in production and productivity depends to a large extent, the development of new improved varieties and an efficient and dynamic system of supply of quality seeds to farmers.

Reasonable and concerted support of the Guinean seed system would be an opportunity to grab when we know that food and nutritional security depends to a large extent an actual accessibility to all producers of the varieties available in adequate quantity and quality.

To promote the use of quality seeds (or certified) in favor of sustainable agriculture and marketing, production and promotion of in situ seed becomes a must.

The inventory of the entire sub-sector seed company revealed that it faces one hand, constraints plaguing the entire agricultural sector and also in various specific obstacles and constraints related to the nature of the seed sub-sector. Indeed, despite some achievements (improved varieties, various infrastructure, existence of a formal private sector), the national seed sector is currently characterized by a malfunction of its main links to: (i) varietal selection, retention and the renewal of the available plant material; (Ii) regular supply of the die pre-basic seed and / or base; (Iii) the

production of certified seed or commercial in sufficient quantity and quality; (Iv) the quality control of seeds produced and marketed; (V) packaging and storage of the seed produced; (Vi) marketing and distribution; (Vii) promoting the production and use of quality certified seeds; (Viii) the organization of an inter-actors of the sector.

a. Farming Systems

In Guinea, agricultural production systems vary across regions, ecologies and cultures.

In Guinea from 2009 to 2010, local rice varieties are heavily used by rice farmers in Guinea, but also much more practiced in Coteau / Tea / Mountain with 45.2% of rice farmers, followed by Lower Depths unirrigated 35.5 % and floodplains 11.5% of Lower Depths irrigated with 3.4%, with 3.4% of mangroves and lowland irrigated with 0.9% (PRESAO, 2011a).

Generally the system of seed production of all agricultural species is based on the general principles of filiation, consistency varietal characteristics obtained by a conservative selection system corresponding to the species. In this seed multiplication part passes through four successive stages resulting in four categories of seeds namely strain seed (or parent material), pre-basic seed, basic seed and certified seed.

The categorization of agricultural seed and the conditions of production and marketing of the four categories will be specified by the laws and regulations relating to seed activities and in line with those in force in ECOWAS. However, the Government may, after consulting the CNS and exceptionally, permit the marketing of seed of certain species in other categories. These must, however, meet the minimum conditions and standards set by related texts (NSP, 2014).

Description of rice production systems

- *The upland rice*

The traditional upland rice also called dry rice, is by far the most common, accounting for about 65% of areas. Indeed, it is found on hillsides, slash and burn forests after clearing. Cultivation operations are in hand. There is no fertilizer. Yields vary between 500 and 900 kg / ha depending on the natural fertility and regularity of rainfall. The short cycle varieties (90 -110 days) are the most commonly used.

With the dissemination of improved rice varieties, there is real prospects of development of this system with yields of the order of 1 to 2 t / ha. In forest area, the surpluses generated by the system are responsible for the establishment of a local industry that supplies the capital Conakry net rice through Tanéné market - Aviation.

As such, there is the emergence of several associations and unions, the most important are the Union of steamers groups and collector of Gouecké (N'Zérékoré) and the Union of rice women vendors of Sinko (Beyla).

- *The lowland rice*

It has the characteristic of being practiced in the depths of the valleys, instead of privileged passage of rain water. In some cases, the water potential is under control because of the development of

reserves and distribution system (canals, pumps). In other cases, the rice farmer makes just trust the rain and floods that accompany it. It represents 9% of the rice production in the country.
The lowlands are found everywhere in Guinea. We meet them in the northwest areas of the Forest Guinea (Kissidougou, Gueckedou, Macenta West). generally distinguished:

- ***Rice lowland traditional*** : This type of rice cultivation is practiced in the shallows temporary waterlogging. It is emphasized on summary clearing without flattening or water control.

- ***Rice cultivation of inland valleys*** : The development of slums is a major component of the National Rural Infrastructure Program PNIR (PRESAO, 2011).

This system represents 10% of the rice area. The yields are between 1.5 and 2.5 t / ha. Forest Guinea has the largest extent in slums compared to other natural regions. According to the National Directorate of Rural Engineering, the overall potential shallows for the area would be about 121 760 hectares of which only 5% are managed. rice crop systems lowland improve through the use of inputs and improved varieties especially in the regions of Faranah and Forest Guinea. Also, the rice-fish farming is being developed in forest areas with the support of AFD and is being extended in Lower Guinea with WAAPP project (NRDS II, 2019).

- *The plain rice*

This system is especially prevalent in Upper Guinea and in the prefectures of Gaoual and Koundara (Middle Guinea). It represents 9% of the areas and yields vary between 0.5 tonnes and 2 tonnes / ha depending flooding of rivers and their tributaries. The area of plains convertible is estimated at about 120 000 ha (80 000 ha in Upper Guinea).

It depends on climatic factors (deficiency or excess rainfall, arrival or flood withdrawal). The implementation of agricultural development projects funded by the State and the financial and technical partners such as the ADB, WB, IDB, etc ...) has allowed producers to better organize and improve their production and the quality of rice (NRDS II, 2019).

Depending on the topography, and the level of the water layer can be distinguished:

- Rice collected the plains (floating rice). It concerns the more or less fertile valleys and rivers or creeks that are flooded following heavy rainfall.
- The traditional rice large alluvial plains (deep immersion rice). It is practiced in inland basins and low alluvial plains bordering the Niger River and its major tributaries (Tinkisso, Mafour, Niandan Milo Sankarani).
- Rice cultivation of large alluvial plains appointed: it occurs in developed areas summarily (without flattening or total water control). The amenities on the plains are to control flood recession, preparing soil by supporting the engine and input supply. The contribution of plain rice is 19% of the total rice production in the country (PASAL 2001).

- *Mangrove rice*

Currently, mangrove rice represents 16% of the rice area and yields are between 1.5 and 3.5 t / ha. Over 50% of production volumes are marketed.

The natural fertility of these areas can be stable if the sea water, rich in silt, is admitted in the dry season plots and good rainfall in the rainy season to dissolve the salt in the soil.

The development of this system of rice was mainly supported by the State and the AFD for more than 30 years of management actions, development, processing and marketing of rice (NRDS II, 2019).

Mangrove rice, with 8% of the national rice production, is practiced on land situated near the coast and inland estuaries and occurs exclusively in Guinea Maritime (PASAL, 2001b). In traditional rice, people have a development technique of their land of installing nurseries around houses and bedding in lockers separated by dikes or on ridges (Boffa Boke) is flat (Forécariah , Coyah).
In the dry season, the lockers are intentionally flooded with salt water for the dual purpose of preventing weed and avoid excess acidity in the dry soil containing sulfur compounds. Desalination is done with the accumulation of rainwater which is then drained (at transplanting) through the bunds. After transplanting (10-20 strands per bundle), the rainwater is stored in lockers until maturity rice. The yields of these rice fields are often random (1 to 1.5 t / ha) due to the fragility of bunds tides, inadequate drainage and rainfall (PASAL 2001).

Processors and traders

Supports for processing and marketing have enabled the emergence of several groups of steamers and female unions and slip with appropriate equipment (improved steamers, husking). Note the creation of the Union Bora Male, a powerful Union specializes in marketing that led to Bora Male label rice (NRDS II, 2019).

Culture fonio

In West Africa, traditional cereals are the staple diet of human populations. They participate paramount to the food security of the poorest and most isolated. Among these traditional cereals, fonio (Digitaria exilis Stapf) is considered the oldest because its primary domestication dates from 5000 BC. JC (Purseglove, 1985). The fonio cultivation area stretches from Senegal to Lake Chad but especially in Guinea that fonio is produced especially in the mountainous regions of Futa Jalon (Portères 1976).

The area of cultivation extension fonio is located in West Africa, from Senegal to Chad and Benue, on one hand, and the Sahel region on the edge of the rain forest on the other. In Guinea, it covers extensively all plateaus and slopes of the Fouta and joins this way the growing areas of Guinea-Bissau. Kissien countries and throughout Upper Guinea in the Malinke people, this is a very practiced cultivation. Also, Guinea contains Does the most important resources from the perspective of diversity of plant fonio equipment; she finds herself in the Fouta Djallon Highlands where Diallonké

mestizo populations and Fulani cultivate fonio lot and at the upper basins of the Senegal and Niger rivers where Malinke and Kissi populations are dominant. At the turn of the geographical core,

According to FAO (Food and Agriculture Organization of the United Nations), fonio production in 2013 was close to 600,000 tons for a harvested area of about 720,000 ha with a slightly higher average yield 830 kg / ha. But in many areas that yield varies from 500 kg / ha to 900 kg / ha and may even reach more than 1 t / ha. The Guinea remains the largest producer which ensures, alone, over 70% of world production. Fonio is grown in the four natural regions of the country but particularly in Middle Guinea in the mountainous areas of Fouta Djalon. On farms, the cultivation of fonio is second after rice and occupies between 14 and 17% of cultivated areas.

As has long been a largely self-consumed culture, fonio is still too often seen as a marginal cereal by Guinea's agriculture and is rarely taken into account in public policy. But today, fonio is both a food crop and a cash crop. Nowadays, this cereal knows indeed renewed interest in urban areas because of its culinary and nutritional qualities and its dietary benefits (Cruz et al, 2011) even though the vast majority of consumers in preparing that occasionally (Konkobo-Yameogo et al. 2004). In rural areas, fonio still often plays the role of culture solder entering a strategy against seasonal food insecurity (Vall et al., 2011, Ouedraogo et al., 2015).

maize farming:

The zones and farming systems

The average Guinea is the largest maize growing area of Guinea, with 48% of sown corn. The areas south and north Guinean savannah experienced in recent years an increase in corn acreage.

The different maize growing systems

tapades of crops benefit from regular garbage and spreading of organic fertilizer. This culture system is especially prevalent in Middle Guinea with the use of early varieties of corn. Corn is produced in pure culture or in association with taro.

of field crops are grown in the coastal zone and the Sudano-Guinean zone. For this type of culture is increased which is often practiced. In Upper Guinea (cotton belt), corn succeeds cotton, benefiting from the rear fertilization effect of the latter. This cultural practice is initiated and led by the CFDT (French Company for Textile Development) which operates on the ground.

The lowland crops are much practiced in Lower Guinea during the dry season, when farmers take advantage of residual moisture of the soil and micro-developments.

Associated crops are ubiquitous. The traditional varieties of maize (late maturity) are associated with upland rice in the coastal zone. Other associations are commonly used, including corn-peanut, corn, cowpea, maize and sorghum.

Irrigated crops, less common, are made in large farms that have the appropriate equipment for irrigation.

The growing seasons are highly variable. Maize yellow grains toothed horny and is the most common and responds to the taste of the peasants.

The cultivated varieties

- Perta: synthetic variety, cultivated almost throughout the country. It is early maturing (90 days), grain yellow horny with a yield potential of 3500 kg / ha.
- Kilissi 113: yellow grain variety horny with a 95-day cycle; its yield potential of 5000 kg / ha; it is grown in low and middle Guinea.
- Kilissi 5: variety with white grain, intermediate cycle (105 days), grown in Middle Guinea where white maize is often used in the feast of food preparation. Its potential yield is 5,000 kg / ha.
- Diansangué: locals intermediate maturity (110 days), with a yield potential of 2500 kg / ha, mainly cultivated in Fouta Jalon.
- Langan: Late local (the 15 days), also grown in Fouta Jalon with identical performance to the previous.
- Kaabè binyé: Local variety with particularly long cycle (1 to 30 days), yield 1500 kg / ha; it is often associated with upland rice in Lower Guinea.
- Sataba: cultivated in Upper Guinea, local variety of late maturity (140 days) giving a yield almost identical to the previous.
- K9101: selected population, it is grown on Plateau and Lower Depths with a 100-day cycle. The potential yield of 4 tons / ha.

The use of corn

Maize is one of the main staples of the population average and the high Guinea. Revenue from corn are largely local varieties; corn undergoes several transformations on the traditional plan with fairly similar processes from one area to another.

- **The green corn**

• The grilled corn: fresh cobs are déspathés and arranged on the grids supported by a charcoal stove. Ears and grilled consumed directly.

• The boiled corn: corn defeated their husks are boiled or steamed; while cooking we add salt. They are eaten in the same way as grilled corn. Corn Ball: fresh ears stripped of their husks are shelled, fresh beans are crushed with a pestle. the product added sugar which is then wrapped in corn husks and steamed.

- **Grain corn**

Traditional foods prepared from dry maize grain are obtained after processing thereof into flour. For this meal, the corn kernels are soaked a few hours earlier in water and shelled by pounding and winnowed. The corn head sounds is pounded in a mortar, flour is sifted through a fine mesh screen.

The main dishes made from flour are described below.

•Ndapa: the more or less fine flour mixed with a certain amount of grits is placed in the pot containing boiling water on the fire.

With a wooden pallet, kneaded by adding salt until a moderately stiff dough. It is eaten with peanut sauce to the fish or meat.

• Te: was prepared in the same manner as the previous, with the difference that here we use the flour only.

• M'bhadju (or fat corn): the coarse flour is mixed with the meat sauce in the pot placed on the fire. The ensemble is regularly stirred until the end of cooking.

• Corn Cake: corn flour is pulped after mixing with water; we add sugar and dumplings are fried in peanut oil or palm.

Mush: Corn flour is moistened years a calabash. The product is kneaded into tiny balls that will be placed in boiling water, sugar is added depending on demand. The whole is stirred during cooking. Corn, in this form, is used a lot in the month of Lent.

• Bread dough: corn dough is fried or cooked in a local construction furnace.

• Latyri (corn couscous): steamed cornmeal. A perforated bowl in several places is encased in a water-containing pot on the fire. Water vapor enters the bowl containing the flour through the holes more or less fine. The bowl is sealed so that no vapor exhaust is possible. The flour is stirred regularly until it becomes soft. The lathyri (couscous) is usually consumed with cow's milk.

The importance of corn products in Guinea

The importance of corn products tallest described is related to the eating habits of each zone (see table below).

products	Lower Guinea	middle Guinea	Upper Guinea	forest Guinea
grilled corn	+++	+	++	+++
boiled corn	+++	++	+++	+++
Ball corn	+	+++	++	
N'dapa	*+*	*+++*	*+*	
Teh	*+*	*+++*	*+++*	*++*
N'bhadju (or fatty maize)	*+++*	*+*		
Cake	+++	+++	++	++
porridge	+++	+++	+++	++
Bread dough	+	+	+	
Latyri	*++*	*+++*	*++*	*+*

+++ = very important ++ = average size = Small +

Corn is one of the main cereals grown in Guinea. it ranks 3rd after rice and fonio in terms of acreage. Maize production is insufficient while consumer needs are constantly increasing. The average Guinea is the largest maize growing area of the country. The most common cropping systems are intercropping and pure cultures of corn around the boxes. The local and improved varieties of corn are grown. The soil and climatic constraints, biotic, socio-economic and technical limit corn yield. Important actions of research and development are engaged in finding solutions to these constraints. Corn in Guinea is used in several forms. Green, it is eaten grilled or boiled. Corn grain into flour gives several recipes: tô, lathyri, slurry. The importance of these products varies from one area to another. The horny or yellow maize is the most requested by consumers.

Potato :

The cultivation of the potato is expanding in Guinea, especially in Fouta Jalon, in the north of the country. Local production covers domestic needs and refuels the sub regional market, developing a business around this product.

According to the Agricultural Research Institute of Guinea (IRAG), the country annually produces just over 20,000 tons of potato. Half of the production is consumed in large Guinean towns, mainly in Conakry, the capital, while the other half is exported to other countries in western Africa.

The Timbi Madina region offers a vast plain of approximately 30,000 hectares and the shallows for the development of the culture of the potato.
Moussa Para Diallo, President of the Farmers Federation of Fouta Jalon, says the Pita prefecture accounts for one-over 60 percent of total production, with an average yield ranging from 15 to 20 tonnes per hectare.

However, other parts of the country, west and south, trying, with mixed results, to follow the example of the Fouta Djallon in the culture of apple terre.Le group Timbi Madina uses the Nicola variety which keeps more easily. "This variety of potato also has a good yield of 17-18 tons per hectare. In November and December 2012, the yield of their crop was 17 tons per hectare.

The potato kilogram is currently sold between 10,000 and 12,000 Guinean francs.

The sale of the majority of this production has allowed us to gain nearly 300 million FG (about 44,000 dollars) at the end of 2012, "said Bah, saying that" the success of the potato terminated the rural exodus of young people and contributed to the emancipation of women who now have small income through trade in this product.

Apple Guinean land is prized by consumers Guinean and foreign. "It can be cooked in a variety of ways and the taste is very significant," says Saran Camara who runs a restaurant in Conakry.Le development of large-scale potato began in the late 1980s, studies conducted to identify the best export sectors, followed by the creation of the agricultural development Project Timbi Madina.

b. Current and recent agricultural development initiatives

Current agricultural development initiatives include continued distribution of regulatory documents on seeds

A special protection system will be set up to develop an insurance stakeholders value chains Agricultural, particularly the most vulnerable. In this context, ongoing initiatives such as the Global

Alliance for Initiatives Resilience (ACT), Social Nets Program will be strengthened by the NADP, while encouraging additional initiatives.

The PNIASAN is fully in operationalizing the mechanisms, instruments and initiatives validated by ECOWAS, CILSS and their partners and to which Guinea has subscribed. Activities focus on the active involvement of sectoral ministries in National Food Security and Nutrition Council (CNSAN) and the sessions of the Harmonized Framework for analysis and identification of risk areas and populations in food insecurity in the Sahel and in West Africa West (CH) within the standby cycle Food Crisis Prevention Network (FCPN) And the Regional device for prevention and management of food crises (PREGEC).

c. Development prospects for agriculture

The vision of the NADP is to make Guinea an emerging agricultural power in 2025 where farmers and other entrepreneurs create, manage and develop their business in different chains Agricultural values, in a logic of sustainable development. It is based consideration of gender disparities and capacity between different groups of actors, but also the specific sub-sectoral and territorial. This vision is part of a dynamic of sustainable progress and resilient, adjusting to vision Guinea in 2040, the Economic National Development Plan and Social (PNDES), agricultural policy of ECOWAS (ECOWAP), the Comprehensive Program Development of e African Agriculture (CAADP) and the Sustainable Development Goals (SDGs).

Perfectly consistent with the Agricultural Orientation Law (LOA) which enshrines the right to food security for all, the National Agricultural Development Policy (NADP) aims to promote a modern agricultural sector, sustainable and competitive, based on efficiency and efficiency of family farms and Agricultural Promotion of Agricultural enterprises with the involvement of the private sector.

More specifically, the NADP is (i) job creation and the reduction of rural exodus, (ii) improving the environment and living conditions in rural areas, (iii) improving producer incomes (iv) increasing forest cover and herbaceous, (v) restoring and preserving biodiversity, (vi) control and mobilization of surface water and groundwater resources, (vii) protect farms agricultural against agricultural risks, (viii) the protection of farms agricultural production against the unsustainable practices or contrary to the rules of national, subregional and structuring of agricultural profession, (ix) the improvement of product quality agricultural,(X) of exportable goods production and the conquest of foreign markets and (xi) the use of rural land for Agricultural purposes in harmony with other uses

For the main food of plant origin, needs coverage by useful production in 2020 and 2025 appear in the table below.

Table 2: Coverage of commodity food needs of plant origin

	2020			*2025*		
Product	Consumption Annual per person. (Kg)	annual available per person. (Kg)	Coverage	Consumption Annual per person. (Kg)	annual available per person. (Kg)	Coverage
White rice	125	127.9	102.4%	125	203.7	162.9%
But	25	56.6	226.5%	25	78.9	315.6%
Tomato / onion / okra	60	41.2	68.7%	60	72.9	121.6%
Cassava	50	95.8	191.5%	50	151.0	302.0%

source: Estimates Matrix PNIASAN, 2017

With the implementation of the actions in the PNIASAN, consumption needs coverage rates will be globally widely covered and will generate large surpluses for the food industry, for animal feed and for export . Indeed :

- The rice consumption needs coverage (on a basis of 125 kg of rice blancpar person per year) will increase from 85.7% in 2015 to 162.9% in 2025. This improvement strengthens food sovereignty for foodstuff which has taken over the years increasingly important in the food habits of people, especially in urban centers. Combined with a continuous improvement of the quality of production as provided for in the NADP, rice production will also improve the trade balance;
- the coverage rate of corn consumption needs will increase from 193% in 2015 to 315% in 2025. This significant increase available is the result of increasing productivity and reducing post-harvest losses will increase from 15 to 8 % in 2025. the surplus will be used for other purposes such as the production of feed for animals, food industry and exported to the countries of the subregion, particularly those in the Sahel where demand is sustained;
- the major vegetable coverage (tomato, okra and onion) from 53% in 2015 to 121% in 2025 (on a basis of 60 kg per person per year with a loss rate after 30% crop) consequently strengthening food sovereignty for this priority sectors. This improvement in market gardening needs coverage will help reduce seasonal import and supply the small processing units and recycling of garden produce; and
- the rate of coverage of cassava consumption needs pass 153% in 2015 to 302% in 2025, thereby release more surplus production for export and the agro-industrial sector.

These theoretical projections clearly reinforces the vision of the NADP to the Agriculture sector Guinean an important driver of the national economy.

2. Farming Systems

There are two systems of production and marketing: (i) the informal or traditional system (family and community systems) mainly based on a self seed supply by mass selection through trade and deals as gifts or barter between neighbors or in the informal market. (Ii) the formal system that enjoys incentives and support from the state encouraged and strengthened to better meet national and regional needs. It is market-oriented and developed by public and / or private. This system is based on scientific research including variety selection, seed control laboratory and experimentation.

Generally the system of seed production of all agricultural species is based on the general principles of filiation, consistency varietal characteristics obtained by a conservative selection system corresponding to the species. In this context seed multiplication through four successive stages leading to four categories of seeds including: strain seed (or parent material), pre-basic seed, basic seed and certified seed (MA, 2013).

a. Levels of current production of food crops, yields and trends

Rice has a predominant place in production systems, bringing more than 60% of the national cereal production as shown in Table 2 below which shows that increasing yields very little advanced and is largely dependent on the increase in acreage.

In terms of the potential crop yield, see catalog of different species and plant varieties for agricultural use in the appendices.

Table 3: Evolution of the production of some priority crops in Guinea

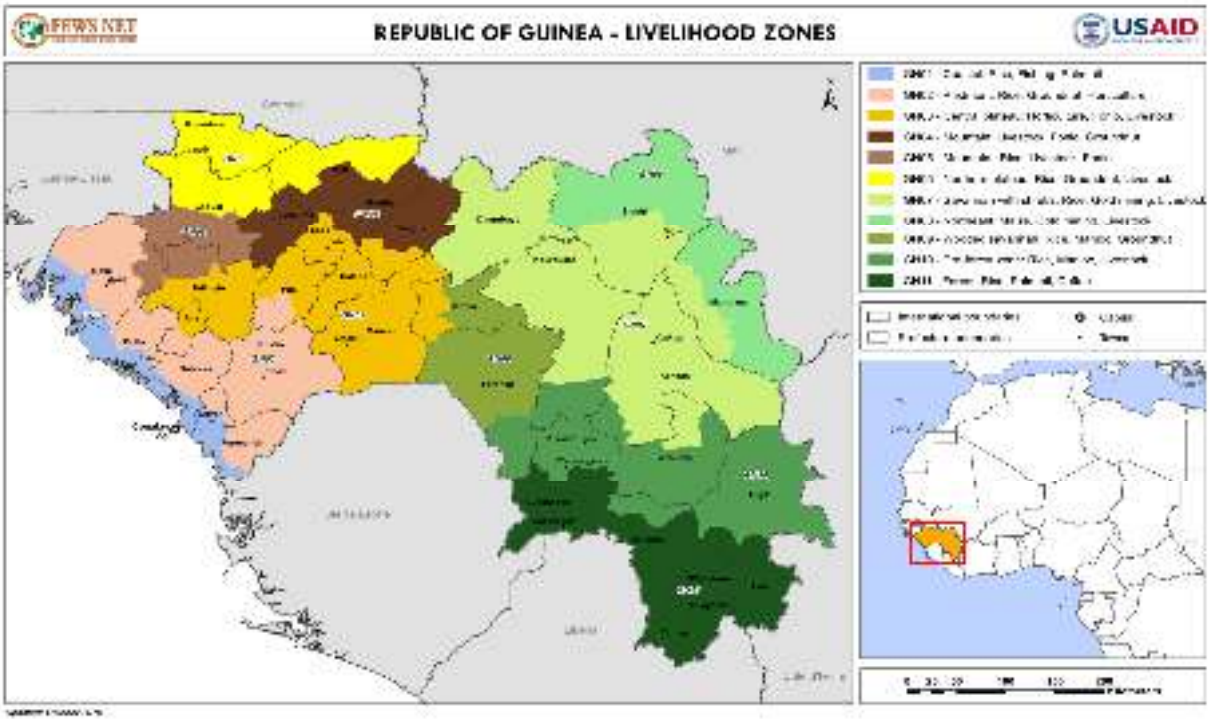
Cultures	variables	2009/2010 (Estimation)	2010/2011 (Estimate)	2011/2012 (Observation)	2012/2013 (Estimation)	2013/2014 (Estimation)	2014/2015 (Observation)	2015/2016 (Estimation)	2016/2017 (Estimation)	2017/2018 (Estimate)	2018/2019 (Estimation)
Rice	Area (ha)	1594783	1597752	1630123	1650371	1670872	1690869	1706138	1738994	1805878	1859767
	Yield (t / ha)	*1.01*	*1.01*	*1.10*	*1.12*	*1.15*	*1.17*	*1.20*	*1.25*	*1.22*	*1.26*
	Production in dry paddy (t)	1610731	1613730	1793135	1852262	1913338	1970515	2047365	2173742	2197907	2339747
But	Area (ha)	467025	486784	489035	512 836	537795	566780	581847	588874	605397	611474
	Yield (t / ha)	*1.20*	*1.20*	*1.25*	*1.25*	*1.25*	*1.23*	*1.25*	*1.3*	*1.35*	*1.34*
	Production in dry grain (t)	560 430	584141	611294	641045	672244	698462	727308	765536	817286	818544
fonio	Area (ha)	474025	499308	531168	557674	585504	602187	602153	606 264	610387	614538
	Yield (t / ha)	*0.77*	*0.77*	*0.77*	*0.77*	*0.77*	*0.79*	*0.79*	*0.80*	*0.80*	*0.83*
	Production in dry paddy (t)	364 999	384467	408999	429409	450 838	473334	475701	478079	488309	508 525
Peanut	Area (ha)	400131	442 775	470372	477156	484037	535378	612313	669624	732234	785737
	Yield (t / ha)	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.79*	*0.80*	*0.90*	*0.95*	*0.98*
	Product ° dry shell (t)	300098	332081	352779	357 867	363028	421703	489 850	569010	695622	770105
Cassava	Area (ha)	130936	136 184	141731	148349	155 277	180 365	190 475	202 149	218 965	237183
	Yield (t / ha)	*7.80*	*7.80*	*7.85*	*7.85*	*7.85*	*7.91*	*7.91*	*7.95*	*8.00*	*7.99*
	Production costs (t)	1021300	1062233	1112585	1164542	1218925	1426625	1506659	1607082	1751719	1895396

source: ER Division / ANASA

This description of the different rice systems comes from the results of the survey ANASA report.

b. Description of the main agro-ecological zones and farming systems

Guinea has eleven (11) agro-ecological zones or areas of livelihood including:



- **Zone Livelihood 1 Coastline: Rice, Fishing, Palm oil**

The resources in this area are large and varied: from the sea fish and mangrove wood to the fertile lands and forest products. Economic activity in the coastal zone is active and attracts many immigrants from the hinterland. The city of Conakry adds a high demand for agricultural and marine products, as well as labor-time. The high density of the rural population limits the land available to poor households who happen to only cover half of their needs for basic food with their crops and therefore must engage in various economic activities and jobs to ensure their means of existence.

This area covers the entire coastline, from north to south. It includes the western parts of the prefectures of Boke, Boffa, Dubréka, Forécariah and Coyah. She shares a small border south with Sierra Leone and to the north with Guinea-Bissau. The rainy season is uni-modal and lasts from May to October. Rainfall varies from 2000 to 3000 mm / year, the highest in the country. It identifies the fertile soils with hydromorphic lithosols inclusions. The seaside is covered with mangrove forests over long stretches of the coast.

The main activities of livelihoods are agricultural (mangrove rice and oil palm), artisanal fishing, salt mining, the exploitation of forest products and trade. The population density is highly variable in the area (15-70hbts / km2 but reached 1200-7000hbts / km2 in Conakry and its surrounding). The density is generally considered very high compared to the national

average. The average cultivated area per household is 1 hectare, but the gap between land possession of affluent households and poor households is large enough. The pressure of immigrants from other parts of the country who wish to settle here has led to a situation where the rich earn a significant income from the rental of land on annual contracts.

Rice is the staple food of the majority of households. Harvests allow poor households to cover six months of their basic food needs (in November), while in wealthier households own production can cover all their food needs. Poor households buy food, mainly rice, especially between May and October, and they have access to non-timber forest products between March and June to supplement their diet. The poor also consume some tubers. Fish is an important supplement in the diet of all the inhabitants of the area, but the meat is not affordable, in principle, for the affluent. The poor tend to consume bonga, fish at the lowest price.

Among poor households, the main sources of income is the sale of their agricultural production, fisheries, labor (in rice fields, in fishing, etc.), self-employment (including production coal), the sale of harvested products and the sale of livestock (poultry and small ruminants). They also sell sea salt. As for the affluent, their incomes are derived primarily from the sale of agricultural production (food crops and palm oil), followed by the sale of seafood, livestock sales, trade and various services.

The processing of fresh fish smoked is usually an activity haves and commercialization of this product at the national level provides significant revenue. However, some poor households practice this small-scale activity. For smokers women use mangrove wood shavings. The high combustibility of this type of wood makes it useful for cooking in general. In addition, mangrove wood is used for scaffolding in the construction, which increases the commercial value of this natural resource.

The breeding is practiced by all households and is semi-extensive type. Poor households raise poultry and small ruminants, while affluent raise larger herds of small ruminants and cattle.

The main hazards are listed every year the attacks of hairy caterpillars, advanced sea / reduction of mangrove areas, epizootic and hostile cultures.

- **Area livelihoods 2 Piedmont: Rice, Peanut, Horticulture:**

With rice producing and horticultural products, the area is well positioned to meet market demand of the dense coastal population and especially the city of Conakry. Nevertheless among poor households is a tendency to depend more on the sale of their labor because they only have access to relatively small areas of land and possess few cattle.

This area shares borders with Guinea-Bissau in its northern part and with Sierra Leone in its southern part. Made of high areas and plains, with a combination of forest, gallery forest and

grassland, the Piedmont area has a uni-modal rainfall (May to October) which varies between 2000 and 2500mm per year. The soil, sandy clay type are relatively fertile. Demography is rather dense (15-100hbts / km2 depending on the location), but not as dense as in the littoral zone (zone 1).

The main activities of livelihood in the area are agriculture, livestock and horticulture (market gardening and arboriculture). Some areas of surrounding 0,25-0,5ha are grown by poor households, amounting to an average of 5ha for the wealthiest households. The production system varies depending on the economic status of the household in poor households mainly include hand tools while in the richest households are the tools such as animal traction, tillers and pumps dominate.

rice cultivation dominates local agriculture; cassava and fonio are important staples; Groundnut is the major cash crop and horticultural production is dominated by mangoes. The cultivation of pineapple, papaya and banana and citrus are important also in the center and south of the zone. Livestock is type transhumance and livestock consists of cattle are owned by wealthier households, and small ruminants (sheep and goats) found in most households (poor and rich).

Better-off households account for most of their food from own production (local rice, cassava and fonio), but they also buy food on the market in order to diversify their diet. As against the poor households are barely able to cover five months of consumption based on their own production, and the rest of the time they buy imported rice and eat wild foods. Poor households spend therefore an important part of their income on food for several months, and they are very susceptible to price increases of basic commodities. Markets Sikhourou and Kindia, and that of Conakry in Zone 1 provide an important outlet for the area.

The main sources of income of households in the area depend on the status of the household. Better-off households derive their income primarily from the sale of their own production (rice and peanuts), sale of livestock and service delivery (tillers of rental and animal traction). Poor households depend on the sale of labor, including migration to Boke (gardening work) and in neighboring countries. They also earn income from the sale of fruit picking and wood and coal.

Poor households sell a significant part of their agricultural production to cover certain non-food needs. Sometimes they sell their own rice harvest in order to buy a larger quantity of imported rice is cheaper. The social support system is highly developed. This consists of groups of neighbors that go around the fields of a member to another in exchange for one (or two) meals a day. The non-skilled labor demand is triggered after the buddy system.

The main hazards of the area are the climatic disturbance and bushfires that occasionally destroying fruit plantations. In addition, every year there are vinegar flies attacks (Drosophila) that lead to the cutting of fruit trees to make charcoal.

- **Area livelihoods 3 Central Plateau: Breeding, Fonio, Horticulture:**

Specializing in farming and market gardening, the area benefits from its strategic position to meet the demand of Conakry market for its products. In addition, mining employees' wages, although immigrants, boosts local trade for the benefit of the villagers.

This area of high plains and grasslands rather temperate, receives between 1500-2000 mm of rain per year. The soils relatively fertile, are sandy, clayey and silty clay. The population density is average, allowing a relatively large prey density.

The area is rich in bauxite and other minerals. The mines in this area are industrial companies and they do not offer a great outlet for the local workforce. However the strength of purchasing power and demand for mining inhabiting the area is an advantage for local trade.

Plowing the land was done mainly by hand with a minority of cultivated land with animal traction. If a major constraint for poor households is lack of oxen for plowing, the very steep topography often prevents animal traction (and more mechanical traction). The vast majority of households have animals as a form of savings. Small ruminants are the most common among the different types of animals owned by households despite plague attacks during recent years; However, the possession of cattle is concentrated in the wealthiest households (which have large herds in mountainous areas) while poultry ownership is higher among poor households. Cattle in the area also caters well Conakry as the country's main cattle market (Dogomet) from which the animals are sent to Sierra Leone and Liberia. The area, especially the southern part, serves as a seasonal grazing source for migratory herds from neighboring areas.

This area specializes in vegetable production, especially the cultivation of the potato, which is a main source of supply for the domestic market. There is also the production of sweet potatoes, and tomatoes and eggplant are also common. These crops are higher between the months of February and March. The orange, mango, banana and avocado are the main fruit grown, and they are harvested from January to June These products are grouped in the markets of Doune (Mamou) and Timbi Madina (especially potatoes) for distribution to Conakry mainly, but also to the interior (Kankan). The main gathered products (including the peak of the harvest is between March and April) include Alere and koussa.

These are the wealthier households that have access to resources and capital necessary to store and transport food crop as well as horticultural products, and those who control the marketing of these products both wholesale (in Conakry) that in detail. As a result, it is common to see most expensive price in production zones markets (retail markets), as the main destination market for these products in Conakry. This means that the haves (wholesalers) are taking advantage of prices of production or purchase (prices paid to small producers) very low.

The demand for labor is concentrated in urban centers in Labé, Timbimadina (Pita) and Mamou mainly for domestic work and labor market gardener from December to April / May. It is mostly women who are involved in vegetable workforce; a significant proportion of the

labor male labor migrates to Senegal and Gambia. The intensification of picking and research work is the main strategy for adapting to shocks.

- **Area livelihoods 4 Mountain: Breeding, Fonio, Peanut:**

Heavily populated, with rugged terrain and relatively infertile soils, livestock ranks first in the creation of wealth in the area. But households also can maintain a non-negligible agricultural production, including good production fonio and peanuts, and even rice in the thick soil of the high mountains.

The mountainous zone, called the Fouta, receives 1200-1500 mm of rain per year, which supports a shrub savannah with gallery forests. The soils are lateritic and poor enough; However, this area has the highest rural population densities in the country (70-150hbts / km2). The temperature is also lower throughout Guinea, regularly reaching minimum of 8 ° C especially from December to February.

This area specializes in breeding, especially cattle among the wealthiest households and poultry in poor households. Almost all households have at least a core of goats and sheep for sale at significant expense, especially during welding, the school year and during Muslim holidays. The rearing system is generally sedentary but extensive. The main livestock markets are Matakaou and Thianguel Bori (middle market) and Labe / Conakry (concluding contracts).

Given the extensive but local farming system, agricultural lands are almost all closed, with the haves and mesh in wood poor. Generally poor households have access to less than one hectare of land (often much less) and the wealthiest up to 4 ha, typically in community lands. Additional land may be available for rental, but the need fencing poses a major constraint to the expansion of crops. The wealthy buy agricultural inputs, but in this area the rice is grown without fertilizer because of the long period of fallow. View topography, mechanization and even animal traction is hard on most of the land; the majority of agricultural work is manual. The recommended fallow period is four to seven years,

The main crops are rice hill, fonio (production zone par excellence) and peanuts, often in rotation rice-fonio peanut followed by 4-7 years of fallow. Cassava can be grown in place of rice in some localities. Maize, though less important in the basic diet in relation to zone 6 to the north is planted near homes. Some maize is harvested "green" in August / September to alleviate weld. In addition, artisanal honey collection for sale is as important in the area (to Diaoubhé Senegal, to be sold under the name Senegalese) and gardening (products following the trade route: market local - Konah - Labe - Conakry). Labe is also collection market for peanuts which is partly exported to Senegal.

Poor households are reported to be larger than wealthier households, but the difference tends to be compared to a greater number of young addicts rather than a large number of able-bodied. However, it is interesting to note that the terms of the hand work of exchange against imported rice are quite unfavorable, about 3 kg / day worked or slightly less.

The main constraints for the poor households' access to food (especially rice imported) during welding include:

The informal food credit which is not common in the area.

The cost of fences and long periods of fallow Recommended prevent the expansion of cultivated land.

The mismanagement of stocks and income related to low literacy rates.

School canteens (WFP) are widespread. With the global price crisis in 2008, WFP has made some food distributions in the area. In 2010 FAO distributed agricultural inputs.

- **Area livelihoods 5 Mountain: Rice, Livestock, Fonio**

Zone 5 located west of Zone 4 and is relatively similar to zone 4 in terms of distribution of wealth and seasonal calendars and consumption. This area is relatively isolated and has the peculiarity that rice is the most important source of income and that cattle took second place. Bamboo in this area is both a source of income as a raw material for handicrafts. In this area there is a communal practice regarding labor country. They exist two common systems: the main system is the gathering of households to provide their labor to neighbors and relatives. In this case the groups can amount to 50-60 people working together in a single field; Owner offers to a group or two meals for the working day. The second system applies in particular to the crop where the worker receives the tenth unit harvested (the dime - eg a bale of rice) as payment.

The importance of agriculture in this subarea and the weakness of the local availability of forage that, unlike in zone 4, there is an annual transhumance of much cattle to the area 2, December / January to May, especially to Boke.

This area has an important place in the cattle trade nationally. The Koumbia market used to supply Boke, Conakry and Labé.

Also in this area, there has been rain delays (2nd decade of June) that cause the delay planting. Annual rainfall varies between 800 - 1500 mm / year.

The main income generating activities in the area are agriculture (rice, fonio, groundnuts, maize, millet / sorghum ...), livestock, handicrafts, trade is more or less developed, ...

Women are very active in the processing and marketing of groundnuts, livestock trade, extends to Sangarédi and Boke.

- **6 of existence, means north Plateau area: Rice, Peanut, Breeding**

This border area in the foothills of the areas 4 and 5 products much corn, but harder rice (because of skeletal soils) and vegetables (due to the lack of wetlands against season). Poor households rely heavily on the sale of their labor either locally or outside the area. This is an area comparatively poor.

The North Plateau differs from zones 4 and 5 mountainous southern especially by the rapid descent altitude of 1200 m in the mountains 400 m in the sandy plains of North Plateau. The vegetation type savanna shrub to tree on glazes, hills, tea and armor. The rainfall is the lowest in the country. But the area receives between 1000-1200 mm / year, especially between June to October, making it possible rainfed agriculture dominated by rice and corn, also accompanied by the cultivation of millet, sorghum and cassava. The soils are less fertile than in other regions of Guinea; average population density. In fact, this area is similar to the neighboring area of Senegal.

The main income generating activities in the area are agriculture (rice hills, plains, fonio, millet / sorghum / maize, groundnuts, cassava) and trade (among the wealthy). Rice production is only possible with fertilizer use. In fact, this area is known for its high production of maize and for picking Dixinn (or "monkey bread", the baobab fruit). These products are assembled in Labé or sometimes directly exported to Senegal. In addition, sandy soils are conducive to the cultivation of palmyra, where the extraction of wine palmyra and manufacture of mats and baskets. The sale of labor-poor households, especially during the harvest seems to be higher than in neighboring areas to the south. Most households, even those poor, have a core of small ruminants, and cattle among the haves and poultry among the poor, which constitutes a source of savings for major expenditures (ceremonies and festivals, education, health, food during welding, construction). Women are active in the market as vendors rice and groundnuts; livestock trade is occupied by men (their cattle trade extends to Gaoual).

This area is considered to be poorer than the south because there is no significant opportunities for growing vegetables during the dry season. In addition, growing corn is a variety of rather long cycle that harvest in September - a month longer compared to most early varieties in the nearby mountains of the zone 4 or 5. This makes the welding in this area is longer than in other areas.

The workforce in this area sometimes moves in zone 4 or 5 or even Labe to participate in dry season gardening. She returned in August for harvesting corn (paid in kind) to alleviate the weld. The farther exodus is mainly in Guinea-Bissau and Senegal, and also in the Gambia.

- **Zone 7 means of existence, Savannah shrub: Rice, Gold Panning, Breeding**

The sparse population of this large area has large areas of land cultivable, with moderately fertile soil in the vast alluvial plains and lowlands, where among others the production at least self-sufficient in rice as the main staple . However gold mining attracts young people villages (as well as thousands of immigrant workers) to the point that the rural labor has become

expensive, pushing the haves to mechanise production and to invest more in gold panning them- same.

The area lies to the east of the country and covers all sub-prefectures of Kouroussa except that of Douako south, the prefecture of Kankan and the sub-prefecture of north Komodou Prefecture Kérouané. This is the least rugged area of the country, dominated by vast plains on hardened glaze, interrupted by shoals and rivers. The course of the Niger River starts in part in the area. The chain of Niandan north and east of the area separates it from the zone 8 neighbor. The soil infertile generally consist mainly of ferrisols fersiallitic and soils. The vegetation is dominated by bush savannah and woody fallow. The rainy season lasts from May to October and the average annual rainfall varies between 1500 and 2000mm. The population density is modest with 10-20hbts / km2.

Agriculture and livestock are the main activities of livelihood for the majority of households. The area cultivated by households are the largest of all livelihood zones: the average field size is 2 ha with operator-off between 10 and 30 ha. Agricultural production is dominated by the cultivation of rice, cassava, maize and fonio; but in the northern Corn consumption area is more pronounced than elsewhere. However, there was a bit of yam cultivation in the southern area (Tinti-Oulen and Missamana). Rice production, important in this area is mainly for sale, and to enjoy the good prices for their rice the poor consume primarily cassava, maize and fonio. Market gardening is an activity practiced throughout the year by women from poor households, but it is growing during the dry season. Sales of vegetable production provides income to them. Orchards cashew (cashew nut) held by the wealthy also offer job opportunities to poor households during the harvest period and contribute, with gold panning, setting young people in the area which initially went in the forest area south in the dry season to work on the coffee plantations, palm trees, etc. and the exploitation of timber. Orchards cashew (cashew nut) held by the wealthy also offer job opportunities to poor households during the harvest period and contribute, with gold panning, setting young people in the area which initially went in the forest area south in the dry season to work on the coffee plantations, palm trees, etc. and the exploitation of timber. Orchards cashew (cashew nut) held by the wealthy also offer job opportunities to poor households during the harvest period and contribute, with gold panning, setting young people in the area which initially went in the forest area south in the dry season to work on the coffee plantations, palm trees, etc. and the exploitation of timber.

Livestock is sedentary type and consists essentially of poultry and small ruminants in poor households. Besides poultry, sales of small animals is generally used to meet expenses of the ceremonies. The poor have sometimes a pair of oxen while wealthier households raise cattle, sheep and goats in larger numbers.

The wealthy consume primarily rice, followed by cassava, fonio and corn. They buy a part of the production of the poor harvest to constitute trade or strengthen their food stocks stocks (the poor are forced to sell their crops to cover immediate needs including repayment of

loans). The poor cover their crops with six months of their low nutritional requirements and depend on the particular market between March and August, while the rich produce enough to make most of their needs and sell the surplus. For households poor welding begins in July and ends in September with the arrival of early crops in the same month.

Poor households derive their income from the sale of agricultural products, hand mining work, the sale of wild foods, timber, coal and poultry. Fishing is practiced by poor households in parts of the area, concentrated mainly along rivers, but the activity is not very rependue. Hunting and bushmeat sale is another activity that provides income to poor households. As for the affluent, the sale of crops, livestock and trade are the main sources of income.

Panning for gold is the third largest source of income for local households and attracts labor from all regions of Guinea, Mali and Burkina Faso. Artisanal gold mining is a key feature of this area and the neighboring region 8. The workforce consists essentially of the members of the poor households in the area all year round with a peak that runs from December to April, but many young people from the region 9 and other parts of the country job search particularly during the dry season. Women in poor households are also engaged in this activity through the washing of aggregates. The activity was modernized with the introduction of metal detectors, provided by wealthy owners,

This significant labor attraction creates a large demand for consumer goods of basic foods, offering good business opportunities for producers in the area. The area is also stocked with rice, plantain, cassava, yam, potato, taro and palm oil from zones 9, 10 and 11. The gains of gold panning (when significant) also allow investment in agriculture. However, the attraction of labor by mines as a constraint to agriculture has more trouble finding cheap labor. We are witnessing the use of increasingly higher mineral fertilizers, herbicides and tillage mechanized or animal traction. To prevent accidents and direct labor to agriculture,

The coping strategies of households facing economic shortages include the intensification of dry season crops, selling wood and coal, labor, increased consumption of wild foods and borrowing.

- **Area livelihood 8, Northeast: Corn, Gold Panning, Breeding**

The big difference between this area and the neighboring area 6 is the heavy reliance on corn instead of rice - and corn surplus which supplies the domestic market. In addition to the long border with Mali offers the advantage of cross-border trade which concerns not only agricultural products but also cattle and poultry. Regarding agricultural conditions and characteristics of the gold mining sector, comments on the zone 7 above also apply to this area.

The area covers all prefectures of Dinguiraye, Siguiri and Mandiana. With the exception of the north of Siguiri and Dinguiraye, the area is also one of the least hilly country, where live buttes, plateaus north, plains and lowlands. Glazes indurated cover much of Siguiri and Mandiana.

The soils are generally less fertile and essentially composed of ferrisols in high areas and waterlogged soils in the shallows. The vegetation is dominated by the shrubby savannah trees associated with wood and mosaics fallow forests. The rainy season lasts from May to September and rainfall varies between 1000 and 1500 mm / year. The population density is 6-15hbts / km2 in the north and south of the area and 16-30hbts / km2 in the center of the area, so in general relatively low.

Agriculture and livestock are the main activities of livelihood for the majority of households. The average field size is 2-3 ha haves operator 10-20 ha; ie that nationally the area cultivated by households are relatively large. Agricultural production is dominated by maize with millet / sorghum and rice in second place. Harvests allow poor households to cover six months of their basic food needs; so they depend on the market from March to August, while wealthier households produce most of their needs and sell the surplus. Poor households tend to raise and sell goats and poultry, while wealthier households raise cattle, sheep and goats aillant higher effective.

Poor households derive their income from the sale of agricultural products, the hand of mining work, the sale of wild foods, timber, coal, poultry and small ruminants. As for the affluent, the sale of crops, livestock and trade are the main sources of income. As in Zone 7 orchards cashew (cashew nut) held by the wealthy also offer job opportunities to poor households.

Yet as in zone 8, rice production is mainly for sale: priority consume poor households corn followed by millet / sorghum. Wealthier households consume corn priority followed by rice and also millet / sorghum, the vast majority comes from their own production. Gardening, practiced especially during the dry season, for women who grow average area of 0.1-0.25 ha. The sale of production gives them substantial income. The wealthy are buying a part of the food production for the poor harvest to constitute trade or strengthen their food stocks stocks.

As in zone 8 neighbor, gold mining is an important source of income for local households (third) and attracts labor from all regions of Guinea, Mali and Burkina Faso. Artisanal mining of gold mining is a main feature of the area, where we find exactly the same inputs and the same effects on agricultural production in zone 7 - see above.

This area is also the old producing zone par excellence of cotton whose production has been in decline for more than a decade. Between 1990 and 2012, it is estimated that the number of households engaged in cultivation of cotton rose 40,000 to about 5,000.

Livestock farming is semi-extensive type, essentially consisting of poultry, small ruminants and donkeys among the poor. Besides poultry, sales of small animals is generally used to meet expenses of the ceremonies.

Household coping strategies against failures (rare enough) agricultural production or other economic misfortunes include the intensification of dry season crops, labor, the sale of wood and coal, increased consumption picking products and / or least favorite foods and borrowing.

- **Area livelihoods 9, Savanna: Rice, Livestock, Corn**

Area crisscross rivers, ecological transition between forest region in the south and the region of savannah plains - and gold mining - to the north, it is self-sufficient in food, rather than supplying foodstuffs to the national market. The account area with a rich peanut production as a cash crop and a good production of cassava used to relieve welding in poor households at the time of the year when their grain stocks and to buy means exhausted.

The area is in the center and east of the country and covers the entire prefecture of Dabola, Faranah that with the exception of the sub-prefecture of Kobikoro, sub-prefectures north of Kissidougou, sub-prefectures center, east and west Kérouané, sub-prefectures in the north and south of Beyla and Kankan Kouroussa. Except Faranah or the relief is weakly corrugated dotted pronounced ridges, outside the terrain is rough with small received shallows. The dominant soils are lateritic to Dabola and Faranah vertisols to Kérouané and ferrisols associated with fersiallitic soils. The vegetation is wooded shrubby savannah associated with woody fallow. The rainy season lasts from May to October and the average annual rainfall varies between 1500 and 2500mm.

Agriculture is mainly rainfed farming is with the main activities of livelihood for the majority of households. However, near the sites of gold mining in zones 7 and 8 allows many assets of poor households to get there by dry season to sell their labor. Agricultural production is dominated by the cultivation of rice, groundnuts, cassava, maize and fonio. The area is the heart of the groundnut basin (Dabola, Faranah North West Kouroussa south Dinguiraye and Mamou) and are home to a peanut oil extraction plant which is being refurbished after years of non-operation . (Close to Faranah it was in the time a cassava processing factory.)

All categories of households consume primarily rice and cassava, followed by maize and fonio with a preference for fonio in affluent. The affluent produce the majority of their needs in basic food while the poor own production covers six months of consumption in September. Livestock farming is semi-extensive type, consisting essentially of poultry, goats and sheep among the poor (in smaller workforce), while among the rich are also added cattle, counting higher effective for all types of animals. At harvest time, between October and December, when poor households sell part of their production to meet other expenses, the wealthy are buying these products to constitute trade or strengthen their food stocks stocks.

Poor households derive their income from the sale of agricultural products, mining workforce by visiting the zones 7 and 8 in the dry season (Siguiri, Dinguiraye, Mandiana), sale of firewood and charcoal , the sale of poultry and sale of wild foods. The poorly paid agricultural labor is declining in the area for the benefit of gold panning. Hunting and fishing are practiced by poor

households in parts of the area and provide some income. As for the affluent, the sale of crops, livestock and trade are their main sources of income.

The Dogomet cattle market, the largest in the country and the Marela west of the area, near the area 3 greatly refuel Sierra Leone and neighboring Liberia.

The weld in this zone begins in June and ends in August and is for the poor to the depletion of stocks of rice and eating more cassava in all its forms. Even with the depletion of the reserves, access to food on the market is not a major constraint for arranged.

The adaptation of households to economic shocks strategies include dry season crops, over selling firewood and coal, labor and increased picking products consumption.

- **Area livelihoods 10, Pre-forest: Rice, Corn, Breeding**

In this area the profitability of mineral extraction tends to diminish efforts to work in the fields of household and makes part of the rural population highly dependent on the market to ensure food security.

The area consists of plains, lowlands, hills and mountains with tree vegetation. This Pre-forest area shares borders to the east with the Ivory Coast and west with Sierra Leone. This position offers him a high potential for trade with them.

Annual rainfall varies between 1500 and 2000 mm rainfall from May to October. Cultivated land is sandy clay type and are relatively fertile. The cultivated areas vary between 0,5ha for poor households and 2ha for affluent households. The main activities of livelihood are agriculture, livestock, gold panning and crafts. Agriculture is mainly rainfed and releases an annual surplus of food crops, following a manual production system for poor households and hitched and driven for affluent households. Breeding is extensive with a herd of small ruminants (and poultry) and cattle among affluent households only. Crafting is an activity practiced mainly by women throughout the year.

Panning for gold plays an important role in the lives of area households. In addition to the guaranteed demand for labor it provides to poor, artisanal gold mining is the main source of income for wealthier households that use and sell gold. But the workforce is made up of foreigners from neighboring areas and other countries. The wealthy are also involved in the artisanal diamond mining places in the area and the timber trade, while hiring labor of the poor.

The market is a food safety factor in that zone. Despite the surplus character of the area, poor households buy food (imported rice, cassava and corn) on a five-month period (March to July) and benefit payments in kind during the harvest period. The nature of the weld can explain spending relatively large poor households in the diet. Wealthier households eat their own production and often supply on the market for livestock products like milk and meat.

Markets Beyla Sinko and regulate the marketing of food products, these markets supply Conakry, rice and corn.

The most common hazards in the area are the climatic disturbance and livestock diseases.

- **Area livelihoods 11 Forest: rice, palm oil, coffee**

In addition to forest resources this area has conditions especially conducive to agricultural production - high rainfall, fertile soil - including cash perennial crops. The area is comparatively wealthy - but there are still many poor households can not live only from their land and must depend inter alia on the extraction of palm oil and the sale of their labor .

Characterized by lowlands, plains, hills and mountains, the Forest area is the combination of the dense forest and woodland. The area shares borders to the east with the Ivory Coast, to the west with Sierra Leone and South with Liberia. Apart from wood and game resources, there are iron deposits.

The average annual rainfall varies between 2000 and 2500mm (April to October). Vertisols, very fertile soils recognized wetlands are prevalent there with inclusions of brown soil all too fertile and some ferruginous and lateritic soils. The plot size for the wealthiest households is about 1ha and 0.4H for poor households. The main activities of livelihood are farming, fish farming, livestock and trade.

This area two types of agriculture: rainfed and irrigated. Food crops are mainly based on the production of rice, maize, cassava and groundnuts. The cash crops are also grown in the area, they act in coffee cultivation, cocoa, cola, palm oil and rubber. This diversity of cultures mark a production area par excellence where major cross-border exchange.

Wealthy households feed mostly on their own production (rice, cassava, banana etc). They also buy food in order to diversify their diet, unlike the poor who have to buy basic food during the months not covered by crops.

Wealthy households derive their income from not only the sale and trade of food products and annuity but also from the sale of animals and trade of palm oil. Livestock is dominated by the pig, with some nuclei of sheep and goats. As for poor households most of their income is derived from the extraction of palm oil, of labor in logging and sale of food products and cash.

The market Nzerekore ensures exchanges of cash crops such as coffee and rubber with neighboring countries and European countries (France) while the Lola refuels Conakry in local rice and other food crops (maize, groundnut ...).

The most common hazards in the area remain the climatic disturbance and livestock diseases.

c. Current status of agricultural extension activities, public and private

The National Agency for Rural and Agricultural Promotion Council (ANPROCA) is a public institution with admiring nature with legal personality and enjoying administrative autonomy, and financial management.
Its mission is to develop, implement, and evaluate national agricultural development policy in rural promotion and agricultural advice, providing ongoing technical and economic advice to Agricultural operators to improve the production and productivity in agriculture.
Currently, the Agency's activities include:

- Training of farmers / producers and technicians;
- Advisory support to farmers / producers on good agricultural practices;
- Support for the organization and operation of the OPA;
- Installing demonstration plots and field schools;
- Support for rural women in primary processing and preservation of agricultural products;
- Travel Organization of studies on e-extension or electronic dissemination and use of ICTs tools in agriculture;
- Support for the implementation of the extension of electronic platform (e-extension) in Guinea and use of ICTs tools in the agricultural council;
- Support for the distribution of agricultural inputs (seeds, fertilizers);
- Monitoring and evaluation of activities.

d. adoption of improved seed level, Culture

Most of the seeds used are locally sourced through the samples in previous crops.

Only potato seeds, onion and certain other vegetables are imported from France, Israel and Senegal by the Federation of Fouta Djallon Farmers and some private importers.

The use of uncatalogued varieties are still dominant (57%) for cereal crops on the national and lower level in some areas. By cons, improved varieties account for about 40%.

Local varieties are more dominant in rice farms, although it is difficult to pin down an actual statistical areas set value of these local varieties and improved.

More than a hundred local varieties are encountered in the production areas, which differentiate them from the growing cycle, agro ecological zones of production, the ability to withstand stress, floods and enemies. The produced rice varieties can be structured according to the ecosystems or ecotypes.

e. Level of use of fertilizers and organic manure to increase yields by crop

Fertilizer use vary from 65 to 97% since 2011 until now by producers not to mention that most of them do not use little or no either because their limited financial means or reasons agroecological (mangroves), while the national need is about 100 000 tonnes.

The adoption rate of fertilizer varies depending on the year and the lowest rate was recorded in crop year 2012 - 2013 75% with an average of five years of 86%. It should be noted that this rate is not complete from the moment we do not have the statistics on the number of agricultural population using fertilizers. Therefore, it is difficult to determine the standard used per hectare which was 7 kg / ha on the national level (not nearly enough).

The crop year 2016 - 2017 recorded the largest amount in terms of public support.

For the practice of organic fertilizer and fertilizer adoption rate, the statistics are little or not known (lack of national statistics in terms of using organic fertilizer).

One of the major constraints of the Guinean agriculture is its low use of agricultural inputs (fertilizers, pesticides, improved seeds)

This finding is justified by the results revealed by the evaluation of seed systems for which 44.0% of farmers do not use any type of fertilizer, 38.8% use organic manure and 17.2% chemical fertilizer.

Organic manure is much used by producers of Lower Guinea and Middle Guinea as the other two regions which is certainly related to the practice of market gardening in every season in the first two regions (very demanding crops materials organic) and ease of access of producers to the foals in Lower Guinea and cow dung in Middle Guinea.

Table 4: fertilizer types used by producers

Natural regions	Types of manure			**Total**
	Any	manure	chemical fertilizer	
Lower Guinea	35.2%	56.8%	8.0%	100.0%
Forest Guinea	73.6%	14.4%	12.0%	100.0%
Upper Guinea	45.6%	11.2%	43.2%	100.0%
middle Guinea	21.6%	72.8%	5.6%	100.0%
GUINEA	44.0%	38.8%	17.2%	100.0%

Source: MLDOUMBOUYA, 2014

With the exception of the prefecture of Mamou, organic fertilizer is widely used in all other prefectures in the region (Middle Guinea) which is likely due to the common practice of market gardening system that uses only demanding crops organic fertilizer such as tomato, watermelon, eggplant, etc.

The low cost and ease of access to this type of manure in this locality could also contributed to its widespread use in the production area.

Conclusion; producers illiterate majority have little information on the issues and methods of use of chemical fertilizers which is the basis of admittedly low level of use of this type of fertilizer on farms.

Almost half of the producers of various natural areas does not use manure on their farms which is probably the basis of the poor performance of currently registered crops in areas of production.

The lack of funding for some producers further limits the use of chemical fertilizers in farms although they are essential to obtaining a good yield.

f. General description of the marketing system of excess production of staple crops

Currently, no study is going in the direction of excess valuation of commodities.

g. Trends in the development of industries and sales channels for staple crops

In recent years, the Government's objective is to make Guinea an agricultural power where farms and other entrepreneurs create, manage and develop their business in different agricultural value chains, in a logic of sustainable development.

To achieve this goal, the Guinean government has developed the National Plan for Agricultural Investment and Food and Nutrition Security (PNIASAN) and the National Agriculture Development Plan (NADP).

Based on these plans the Guinean State accompanied by technical and financial partners have invested enormous resources to improve productivity and the production of agricultural sectors through the facilities, facilitation of access to agricultural inputs qualities, coaching , infrastructure construction improved access, storage, preservation, processing, mechanization of production, harvest and post-harvest to move from subsistence agriculture to agribusiness.

A particular emphasis was placed on certain priority sectors because they significantly contribute, but to varying degrees, to agricultural growth and food and nutrition security of Guinean, while generating additional income to small farmers and primarily to producers.

As part of improving productivity, it will bring the yields of major crops at levels of the best performing African country, so to lead to lower production costs, while improving quality and get competitiveness gains.

Corn, cashew, cotton, palm oil, coffee and cocoa contribute significantly to the growth of the national economy. Some of these channels are channels for locomotives Development Initiatives Farm where they are more developed and are potential sources of growth for rural communities.

Fonio, millet and sorghum, yams and cassava are involved in the diversification of the national agriculture, guarantee food and nutrition security and justify the support to bring development to support the sides of streams receiving investments more significant.

The agricultural sector experienced a substantial improvement in recent years, the sown areas are clearly increasing and yields improved slightly.

Despite investments mentioned above, Guinea is still unable to meet the demand of its population quality and quantity to satisfy the dietary needs.

3. National Agricultural Research System

a. public institutes and universities actively engaged in plant breeding

Public Institutes and universities actively engaged in plant breeding are:

- **The Institute of Agricultural Research of Guinea (IRAG)**specializing in the creation, maintenance and adaptation of plant varieties and
- **Higher Agronomic and Veterinary Institute '' Valery Giscard D'Estaing '' Faranah (ISAV / F)**which is responsible for:
  - provide initial and ongoing training in the agricultural sector executives
  - participate in the development and promotion of research in the agricultural sector and the acquisition of appropriate technology
  - to contribute to rural development in the country in general and the settlement area in particular
  - by ensuring the production, support research and development activities
  - participate in the development and promotion of cultural, sporting and socio-educational youth
  - to develop exchanges and cooperation
  - varietal adaptation.

b. Current situation of recent or ongoing varietal selection by species

IRAG, despite the difficulties encountered in recent years mainly due to the discontinuity of funding, tangible results have been obtained in terms of selection and breeding.

In terms of technical procedures to improve the productivity of species and varieties created and selected IRAG implemented technical routes (i) generation, (ii) crop protection, (iii) animal health and (iv) post-harvest technologies.

In terms of conservation of plant genetic resources for the maintenance of the national genetic heritage and the preservation of biodiversity, IRAG set up an incorporated germplasm base living collections (in situ) and non-living laboratory. The living collections consist of species, varieties, clones and accessions.

At Foulaya, there are 63 species variety of citrus, 72 mango varieties, 186 accessions and varieties of cashew, pineapple 4 varieties, 25 varieties of bananas and plantains, avocado 40 varieties and 91 varieties of cassava. At Koba, there are 260 varieties of rice in the collection. The Bordo station has 80 rice varieties plain, 40 upland rice, 34 yam, 104 cassava, 9 cottonseed, peanut 12, 14 cowpea, 4 bean, soya 2, 2 wandzou and 48 ecotypes of corn, 4 millet, sorghum 72. In Sérédou station, an ethnobotanical study identified 90 different uses specimens of fertile herbarium; 400 dry specimens scanned, dried specimens 800 entered into the database RIHA SERG; 189 new plant species have been identified; 207 rare plant species

and / or endemic have been introduced and retained in the herbarium of SERG IRAG. This station also features live collections consist of clones 5 and 88 hybrids Robusta coffee, 3 hybrids selected cola, 4 hybrid cocoa, 7 Hevea clones 110 and legume plant species. The Kilissi station has a collection of 143 varieties of rice lowland and hillside 3 rice varieties; 60 peanut varieties, 130 of beans and corn 13. The Bareng station supports a rich vegetable crops collection of 3 varieties of eggplant, pepper 34, 7 okra, 2 amaranth, 6 shallot, 2 cucumber; 68 varieties of cassava, forages 6. This station also features live collections consist of clones 5 and 88 hybrids Robusta coffee, 3 hybrids selected cola, 4 hybrid cocoa, 7 Hevea clones 110 and legume plant species. The Kilissi station has a collection of 143 varieties of rice lowland and hillside 3 rice varieties; 60 peanut varieties, 130 of beans and corn 13. The Bareng station supports a rich vegetable crops collection of 3 varieties of eggplant, pepper 34, 7 okra, 2 amaranth, 6 shallot, 2 cucumber; 68 varieties of cassava, forages 6. This station also features live collections consist of clones 5 and 88 hybrids Robusta coffee, 3 hybrids selected cola, 4 hybrid cocoa, 7 Hevea clones 110 and legume plant species. The Kilissi station has a collection of 143 varieties of rice lowland and hillside 3 rice varieties; 60 peanut varieties, 130 of beans and corn 13. The Bareng station supports a rich vegetable crops collection of 3 varieties of eggplant, pepper 34, 7 okra, 2 amaranth, 6 shallot, 2 cucumber; 68 varieties of cassava, forages 6. The Kilissi station has a collection of 143 varieties of rice lowland and hillside 3 rice varieties; 60 peanut varieties, 130 of beans and corn 13. The Bareng station supports a rich vegetable crops collection of 3 varieties of eggplant, pepper 34, 7 okra, 2 amaranth, 6 shallot, 2 cucumber; 68 varieties of cassava, forages 6. The Kilissi station has a collection of 143 varieties of rice lowland and hillside 3 rice varieties; 60 peanut varieties, 130 of beans and corn 13. The Bareng station supports a rich vegetable crops collection of 3 varieties of eggplant, pepper 34, 7 okra, 2 amaranth, 6 shallot, 2 cucumber; 68 varieties of cassava, forages 6.

IRAG to disseminate its research results, mobilizes different communication channels depending on the target audience (producers, technical, scientific and general public) through: PVS demonstration plot, field schools, open house, Sheets technical, posters, scientific Symposium, scientific Article, participatory videos and documentaries, rural and community radios, TV, Internet etc.

constraints

IRAG faces many structural constraints, scientific, technical and financial that limit performance. The lack of medium and long-term planning is one of the constraints that do not allow IRAG to list its activities in duration.

The weakness of human resources is the main constraint is characterized by:

- The researcher insufficient staff and administrative and accounting manager;
- The aging workforce;
- The difficulty in recruiting, training and insertion of young researchers (for example, since 2010, 75 graduates recruitment files remained without following the Ministry of Public Service.)

- The weak representation of women;
- The lack of expertise in the fields of biotechnology, economics, sociology, mechanization and hydrology, the administrative and financial management.

Scientifically, we note:

- Low utilization of research results, resulting in a reduced number of scientific publications and communications;
- Low participation of researchers in scientific meetings (seminars, workshops, conferences)
- Low mobilization of research funds subregional and competitive international.

In terms of infrastructure and equipment included:

- Advanced obsolescence and degradation of built infrastructure;
- The deterioration of the pumping stations;
- lack of drinking water at stations Koba, Bareng and Faranah;
- The lack of reliable structures threshing, drying and storage of basic seed;
- Dilapidated and inadequate equipment;
- The narrowness of the headquarters of the General Directorate;
- Lack of internet access in offices and stations;
- Insufficient displacement means (cars and motorcycles).

In agricultural areas, it should be noted:

- Degradation advanced developed areas;
- Mastering Difficulty water and weed;
- The poor state of access roads to the experimental plots;
- The illegal occupation of plots;
- The lack of secure areas;
- The destruction by wild fires, by excessive cutting of timber and artisanal mining, plots, collections, forests and streams.

In terms of financial resources:

- Current funding show a major effort of the Government of Guinea. However, these amounts are modest in relation to research needs, staff recruitment, training of researchers and accounting managers, rehabilitation and / or construction of infrastructure and equipment. Funding should also take into account the need for communication and dissemination of research results which are many and little known.

- Also, delays in mobilizing grants are a disruptive factor research programming. Agriculture is by definition very often dependent locality science seasons, delays in the provision of financial resources affect the mobilization of researchers and technicians in their activities and the quality of deliverables.

partner institutions

For the coordination of agricultural research activities in Guinea, SNRAH was set up in June 2006. In addition to IRAG, this system includes other research institutions (CNSHB, Pasteur Institute of Guinea and Research Institute extension of the cane-rats in Guinea environmental research Institute Bossou scientific station of Mount Nimba, study and environmental research Center) and higher education institutions (universities in Conakry, Kankan, Nzérékoré, institutes Faranah and Mamou Dalaba).

Farmers' organizations, technical departments of the ministries of the rural sector, agricultural projects and NGOs are the main implementing partners of IRAG. They participate in the implementation of the mid farmer experiments. They are also broadcast players in search results. They initiate and also finance the operations of research and development conducted by IRAG.

Internationally, a partnership between IRAG and CIRAD, IRD, AFRICA RICE, CORAF, IITA, WAAPP / WAAPP 1C. This partnership is embodied in the joint implementation of research projects, the training of young researchers Guineans abroad and hosting foreign trainees in Guinea.

In terms of the case of rice, there are a variety of fragrant rice experimental phase for agricultural research station in Kindia Kilissi.

c. State of the art of seed research institutions to public vocation

Table 5: scientific staff

No.	**Staff**	**Effective**
1	researchers	65
2	Support staff	26
3	contract staff	25
Total		**116**

Table 6: infrastructures

Natural regions	**Stations of Agricultural Extension**	**Research Programs**
Lower Guinea	**Foulaya**	1. Agricultural Systems Program, Territory Management and Savings dies
		2. Program fruits (mango, pineapple, banana, citrus and various fruit)
		3. Food Technology Program

		4. Biodiversity Program and Conservation
	Kilissi	1. Rice program
	KOBA	
middle Guinea	**Bareng**	1. Fonio program 2. Maraîchères Crops Program and Potato 3. Animal Production Program and farming systems 4. Soil fertility program and sustainable ecosystem management
Upper Guinea	**BORDO**	1. Cotton Program and energy plants 2. Program other cereals (maize, sorghum and millet) 3. Program peanut and other legumes 4. Plants Program roots and tubers
	FARANAH	
Forest Guinea	**Sérédou**	1. perennials Program (oil palm, rubber, coffee, cola, cocoa, and cocoa) 2. Forestry and Agroforestry

d. Recent collaborations or underway with the private sector and farmers' organizations seed supply material

IRAG had links with the World Bank through the WAAPP / WAAPP as part of the rehabilitation of infrastructure to enhance the capacity of IRAG mainly for rice research (field, laboratory, means of transport and office facilities), mainly Kilissi, Bareng, Foulaya and Bordo.

However, some ad hoc initiatives authorized for joint activities with Africa Rice in the field of rice policy, field research and seed emergency operations were implemented. Thus, agricultural research projects were subsidized, mainly around issues related to the increase in rice productivity, while an analysis of the rice sector in Guinea was initiated and carried out.

e. current situation of seed production license agreements by third entities

There is no licensing agreement to IRAG but production approvals, import, export, distribution and marketing of seeds are issued by the National Directorate of Agriculture after filling conditions required for this purpose.

4. State of the art for the provision and supply of seeds

a. History of Plant Breeding and provision of seeds countries

The selection and breeding are the main achievements of IRAG. In terms of breeding, we have the CK series with 24 varieties of irrigated rice which aired 8, 16 upland rice varieties including 4 broadcast; for corn, the K series with 13 varieties 7 disseminated; and peanut, AK series with 11 varieties including 4 broadcast. In addition to breeding, IRAG introduced and selected species and varieties of rice, cassava, maize, groundnut, yam, horticultural crops, cotton, coffee, rubber, to cocoa, which are adapted to local conditions of production and broadcast-farm.

Since 2011, here is the situation of state support for pre-seed and foundation by the various agricultural research stations under IRAG through projects and programs.

Table 7: Location Seedling production and seed base- pre-basic (tons)

Cultures / Categories	**Year of production in tonnes**	

Upland rice / Down Back / plain								**Websites: Bordo, Sérédou, Kilissi and Bareng**
	2011	2012	2013	2014	2015	2016	2017	Main varieties multiplied
Pre-base	5	5	6	6	10	12	15	CK801, CK21, CK90, CK211, CK73, M6, NERICA4, NL19
Based	100	100	150	110	200	225	250	
irrigated rice	**tonnes**							Websites: Bordo, Sérédou, Kilissi Koba and Bareng
	2011	2012	2013	2014	2015	2016	2017	Main varieties multiplied
Pre-base	0.5	0.5	1	1	1	1	1	CK801, CK21, CK90, CK211, CK43, M6, NL19
Based	10	10	30	20	30	35	40	
But	**tonnes**							Websites: Bordo, Breng and Kilissi
	2011	2012	2013	2014	2015	2016	2017	Main varieties multiplied
Pre-base	0.5	0.5	1	1	1	1	1	K5, K9101, DMR ESRY
Based	15	15	20	30	30	35	40	
Peanut	**tonnes**							Websites: Bordo and Kilissi
	2011	2012	2013	2014	2015	2016	2017	Main varieties multiplied
Pre-base	0.2	0.2	0.3	1	1	1	1	AK10, AK11, AK12, AK13, AK14
Based	2	2	4	5	8	9	10	
Cassava	**Number: thousands of cuttings**							Websites: Bordo, Sérédou and Bareng
	2011	2012	2013	2014	2015	2016	2017	Main varieties multiplied
Pre-base	2	2	3	5	5	8	10	Tokoumbo Package 92 0581, TME 60142
Based	20	20	40	60	60	70	80	
horticultural seeds	**in kilograms**							Websites: Bareng and Foulaya
	2011	2012	2013	2014	2015	2016	2017	Main varieties multiplied
Pre-base	0.5	0.5	1	2	2	3	4	Tomato, Onion, Aubergine, Pepper, Okra, Watermelon, cabbage
Based	30	30	60	90	90	100	120	
certified								
Potato	**Tons**							Website: CRA Bareng
	2011	2012	2013	2014	2015	2016	2017	Main varieties multiplied
Based	0.5	0.5	0.5	0.5	0.5	1	1.5	Nicola Spunta, Arnova, Arizona Desiree etc.
certified	4	4	4	5	5	8	10	
fonio	**in kilogram**							Website: CRA Bareng
	2011	2012	2013	2014	2015	2016	2017	Main varieties multiplied
Based	500	500	500	600	600	700	800	Varieties: Niathia, Oar, Konso
coffee tree	**In plants in Thousands**							Website: CRA Sérédou
	2011	2012	2013	2014	2015	2016	2017	Coffee plants
coffee tree	5000	10000	10000	20000	20000	75000	100000	

cacao	**In plants in Thousands**							Website: CRA Sérédou
	2011	2012	2013	2014	2015	2016	2017	Plants cocoa
cacao	5000	10000	10000	20000	20000	75000	100000	
Oil palm tree	**In plants in Thousands**							Website: CRA Sérédou
	2011	2012	2013	2014	2015	2016	2017	Oil palm seedlings
Oil palm tree	5000	10000	10000	30000	30000	35000	35000	
Citrus	**In plants in Thousands**							Sites: CRA Foulaya, Bareng
	2011	2012	2013	2014	2015	2016	2017	Plants Citrus Valencia Lemon
Citrus	10000	10000	10000	25000	25000	30000	30000	orange tree
Source: IRAG / Collaborative Council Internal / Synthesis Division Chief Production June 2018								

Table 8: Brief Summary of some innovations / agricultural technologies produced in Guinea

Department of guardianship / institution	component	Description of innovation / technology
Agriculture Ministry MHESR IRAG + + UJNK	crops	1. Plant breeding: development of varieties of rice, corn, tomato, peanut production adapted to the different agro-ecologies of the country, resilient and accessible to socioeconomic conditions of farmers. **Some rice varieties:** • CK 43 variety: Medium-cycle generating station 93 days 4 t / ha and 2.4 t / ha in the middle peasant; adapted crop lowlands and the coastal plains • varieties of lowlands and plains: CK 21, 70 and 801 • CK varieties serial CK 30, 31, 34, 41, 43 and 44 resistant to iron toxicity 2. mineral and organic fertilizers to improve yields and stabilize farmers; tests were conducted on rice lowlands, mangroves, flood plains and hillsides. 3. Fruit: Many varieties of the major fruit species were studied with the aim to select the most promising in terms of adaptation, disease tolerance (yellow Sigatoka disease, gummosis to phytophthora, etc.), enemies (insects polyphagous , disease vectors, etc.), technical routes and marketing. Some adoptions involve introductions and bananas (large dwarf, FHIA, etc.) and citrus (navel varieties Timbo, Valencia late, Tahiti lime, etc.), widely distributed in the middle peasant. 4. Crop protection: identification of insects subservient to food crops, study on fruit flies (species identification, population dynamics, alternative hosts), nematode identification.

		5. Agroecological zoning of the four natural regions indicating the soil of agricultural vocations; characterization of production systems by setting the dominant typologies. 6. Protection and conservation of plant genetic resources (germplasm) in situ and ex situ living collections in laboratories. 7. Food Technology: • Valuation of handicrafts manufacturing tomato puree, mango jam or orange, powdered ginger or slices of dried mango. • Development and technical-economic assessment of the mixer palm oil • Scientific publications: • Progression of Sigatoka citrus in Guinea (Journal Fruits, 2001, Vol. 56, 37-43) • Towards a fight against Sigatoka citrus in Guinea (Journal Fruits, 2003, vol. 58, 329-344) • Influence of the duration of fluid restriction on the production of the Tahiti lime (Citrus aurantifolia Christm. Swing) in Guinea (Journal Fruits, 2002, Vol. 57, 273-284). • Valuation by obtaining yam fufu using solar drying in Kankan resulting obtaining dried chips and yam powder paving the way for a varied diet based yam (Acts of Workshop "Potential of cassava in West Africa" - Abidjan, 4-7 June 2007)

b. Recent and ongoing activities aimed at the diffusion of improved varieties by crop

With the World Bank through the WAAPP / WAAP the ANPROCA conducted outreach activities of a number of species to support the production of quality vegetable seeds. Support focused on the production of rice seed (CK 90, CK 801 and NERICA19) of maize seed (Wari and Hope) and Soya which distributed 99.3 tons. These activities were carried out in all four (4) Natural regions of the country (Lower Guinea, Middle Guinea, Upper Guinea and Forest Guinea).

c. Recent and ongoing to increase the seed capital of the country

In order to encourage traders to invest in seed activities, incentives such as tax exemptions, privileges to import and export financing loans to subsidized interest rates, repatriation guarantee profits can be applied by the state until the investment is part of the priority areas of economic development.

In addition, the state will provide support and coordination of promotional efforts at both the public and private sectors by organizing marketing campaigns in addition to the extension and the proper training of farmers.

In order to accelerate the distribution of newly created varieties and promote them, certified seed kits are provided to farmers by the state either gratuitously or subsidized. In addition,

the exchange transactions between farmers and seed producers are encouraged to accelerate the popularization of these new varieties.

To ensure better dissemination of information on seeds from different stakeholders, a national information network will be set up with the support of development partners.

The state has the responsibility to conduct pilot operations for the development of the agricultural sector in general and the sub-sector in particular seed. The state ensures the production of seeds needed for these operations as well as those for the contract with the Emergency Assistance seed operators of the private sector to help them develop their financial and technical capacities to to organize and become full operators of the subsector.

Also, the state encourages investments in the areas of processing and the food industry to create profitable outlets for surplus agricultural products generated as a result of the use of improved seeds and technologies that accompany them.

Finally, to facilitate access to the various rural agricultural inputs (including quality seeds), the state encourages the establishment and expansion of a distribution network performance of these inputs.

d. Current options for small farmers to access improved and certified seed

Existing Options for small farmers to access improved and certified seed shall grant or offer free seed to farmers for a start.

Encouraging the private sector to focus on the sector through regular consultations to accelerate the withdrawal of the state. The availability of resources and capacity building of seed producers.

e. Number of private seed companies operating in the country and an annual quantitative estimate of their seed production

There is still no seed companies operating in the country, but producer associations, groups or cooperatives and individual producers, sometimes made into a federation.

f. nongovernmental organizations and peasant organizations involved in the production and supply of seeds

Table 9: List of some seed structures

No.	**Region**	**Structure**	**crops grown**	**Production capacity annual**
1	Lower Guinea	Seed Cooperative Koba	Rice	50 tons
2		Union of seed producers Kindia	Rice	140 tons
3	Forest Guinea	agricultural cooperative Boussedou (COABOU)	Oil palm tree	15 ha (8 to 10 tons system)
4	middle Guinea	Union of Coffee Producers	Coffee	
5	Upper Guinea	Unions Federation of Rice Producers / Upper Guinea (FUPRORIZ / HG)	Rice	

g. existing infrastructure for processing and packaging of seeds

We note the existence of four operational centers of production and seed packaging (Koba Kilissi Bordo and Guéckédou) whose production capacity ranges from 500 to 700 tons of improved seeds and the treatment between 800 and 1,000 tons of seeds each (CPCS K, 2014). For agro ecological diversity reasons of Guinea, centers outside the rice have a certain specificity of speculation and varieties.

Seed production at the seed multiplication centers belong to the state. So activities continue at these centers under the control of state agents on a self-managed basis as the contribution of the state is limited to the payment of salaries of the agents responsible and a provision in case of availability of some equipment such as tractors and sorters. For this, the centers sell seed at subsidized prices fixed state FG 5000 kg of rice seeds and corn. These centers do not have their own areas for production management. They sign contracts with farmers around whom they distribute basic seed, cater to control buying up quantities produced at an agreed price in advance, condition and ultimately sell the seeds. These centers generally produce rice, corn, and peanuts.
The center of Kilissi contractualizes annually with 217 farmers including 53 women and could produce 300 tons in 2013 to 1 070 tonnes of seed in 2017.
The advantages of these production areas are summed up by the presence of different centers that include: the Agricultural Research Station (Koba Kilissi, Bareng, Bordo and Sérédou), the Centers for seed production and packaging (Koba Kilissi Bordo and Guéckédou), agricultural mechanization centers.

These facilities are now the pride of these areas for the promotion of intensive farming and marketing for food and nutrition security of the population.

These advantages are the result of government interventions in agricultural areas in full emergence. We note among others:

- The production and packaging center of Koba seed (Boffa): mangrove rice and plains;
- The production and packaging center Kilissi seed (Kindia): irrigated rice and rainfed groundnut and maize;
- The production and packaging center of Bordo seed (Kankan): Lowland rainfed rice and hillside maize;
- The production and packaging center Guéckédou seed rice lowland and hillside.

There are also extension centers of plant varieties managed by the National Agency for Rural Promotion and Agricultural Council which centers Banban (kindia) and Yatiya (Faranah).
The Bamban extension center which is a coaching center, dissemination and technology transfer is created in the framework of the Chinese cooperation in 1976 and has become seed producers through land availability 23 5 including 5 ha of irrigated low background. The center buys basic seed at the Kilissi station to produce R1 seeds of rice and corn. Through this activity and the extension of this center is self-managing. But here too the agents are paid by the government and seed prices this practice center does not really reflect the true seed production costs. This observation also applies to all state structures.

h. Quantity of certified seeds sold in the past five years, by crop

Regarding the marketing of seeds in the country, it is restricted to certified seed species and varieties. It should be emphasized here that the national catalog limit the marketing and use of varieties of agricultural plants to those with agronomic value and use for the country.

The categorization of agricultural seed and the conditions of production and marketing of the four categories specified by the legislation and regulations relating to seed activities and in line with those in force in ECOWAS.

With increasing urbanization and the development of the mining industry, demand for agricultural products out of production areas increases in both volume and diversity. This demand is partly satisfied by an informal private business sector but in producer prices that are too low to make them economically attractive food production. In production areas, the market sector is often faced with many logistical obstacles bidding transaction costs of agricultural production.

The marketing system is poorly structured. Trackers ply the weekly markets to procure agricultural products. They sell to wholesalers sowing and wholesalers who in turn distribute at the large zones of consumption and exports to some countries of the subregion.

Estimated production of certified seed by speculation Processed and distributed locally by seed centers

Rice :

Seed Producers centers	BORDO	Kilissi	KOBA	Guéckédou	TOTAL (T)	estimated production (T)
2012		324	150		474	**10157**
2013	577	152	105		834	**17871**
2014	500	216	55		771	**16521**
2015	842	823	41		1706	**36557**
2016	250	150	123	57	580	**12429**
2017	340	360	45	55	800	**17143**
2018	410	304	100	105	919	**19693**
TOTAL	**2919**	**2329**	**619**	**217**	**6084**	**130 371**

Corn and Soybeans

Year	But)	Production estimated (T)	Soybean (T)	estimated production (T)
2016-2017	1140	114 000		
2018 - 2019	354	35400	250	12500
Total	**1494**	**149 400**		**12500**

i. Number of small and medium businesses involved in agriculture / seed currently active, by region

In Guinea, there is not as such a private seed company working in seed production. Nevertheless, there are structured leading seed producers association, cooperative groupings or generally revolving around the production centers and seed packaging.

j. level of imports of certified seeds, by crop

For crop year 2017 - 2018, there were cooperation agreements between Guinea and some countries in the West African Sub-region (Burkina Faso and Benin) and the Center (Rwanda) in the provision of improved seed species corn, soybeans and coffee.

Table 9: Location seed imports by state

Year	Species	variety	Quantity (T)	Native country
2017	But	Hope	816	Burkina Faso
		Wari	354	
	Soy	white soy	250	Benign
	Coffee	Arabica	1	Rwanda

k. the seed sector improvement Prospects

Prospects for improvement of the seed sector are based on the implementation of the national seed policy which takes into account all aspects.

5. National Strategic Plan of the seed sector

a. Administrative formalities for seed production

The approach or passage for the production of certified seed is as follows:

- Annual R2 Controls, R1 and basic programming before production
- Creation or adaptation of varieties IRAG, full description of these varieties, registration and entry in the catalog of varieties selected
- production base by IRAG and confirmed after inspection and certification by DNA
- Awareness, information from all the players communicated by radio broadcast, rural radio, etc.
- Supply of certified bases to seed multipliers (large or small) framed by the seed centers or those supervised by responsible regional and prefectural but approved for that purpose in the production of R1.

- The quantities of seed produced at different levels is collected, drained to the nearest Center for seed processing and packaging, testing and certification and purchase by the state and third parties,
- Distribution to producers Level Group 2 for the production of R2 following the same control conditions.
- R2 seed produced are collected, drained centers, processed, packaged, analyzed and certified and then purchase or distribution to all intents and purposes (consumer products).
- All untracked field productions in various operations are compulsory processed, packaged and controlled a posteriori before marketing, distribution or use authorized by the National Director of Agriculture.

b. Administrative formalities for the registration of new varieties

After creation of the variety by IRAG, it ensures the quality or performance of the latter, it applied for registration in the national catalog of plant species and varieties. This requires the payment of registration fee and registration of the variety through multisite testing. It will then developed a validation report by a technical team which is no other than the National Seed Committee (CNS) following registration.

"Approval": Variety review process presented by the breeder or coach that can make the decision to enroll or not the national catalog of varieties on the basis of their performance, information on their description and test results in the field and in the laboratory.

c. Administrative formalities for certification of new varieties

The certification is the result of a quality control process to field installation, in growth, maturity, lots and seed stock to the store and in the laboratory, including the agronomic and technological value and purity varietal, and to ensure that seeds are presented in conformity with technical standards and regulations. It was after this that a seed quality control certificate is issued to this effect.

The official service what the DNA does not yet have a national laboratory seed control. It performs its tests at the Kilissi Center laboratory has been equipped with the support of FAO in developing national seed policy. This laboratory does not have a full hardware or specialized laboratory technician. This is the head of the center itself which performs tests on samples submitted including those from the production center he directs. Staff of the Division assigned to the regions, prefectures and towns are not all experienced in seed control in the field and in the laboratory.

The seed control despite its importance in the development of the seed industry is not fully operational for the following reasons:

- Low diffusion elaborate regulatory texts adopted and published in the Official Gazette of the Republic;

- The Division does not have enough qualified staff, equipment and logistics for control over the entire national territory;
- Control is done at the request of seed producers especially when a test certificate is required by the buyer and thereby the check is not performed in the laboratory.
- Pre basic seed and base produced at the research centers are all controlled by the Division;
- There is no capacity within the division for the control of plants and plant material;
- The seeds often imported through official channels are not controlled by the Division prior to their distribution to farmers;
- The utility control at the producer and seed operators is not well understood;
- The structures of true seed farm are not yet in place;
- The seeds produced from stocks and small producers in rural areas sometimes out of control system.

laboratory controls performed by the Division covers: physical purity, varietal purity, weight of 1000 seeds, germination, moisture content. As against the percentage of sick seeds and the seeds of weeds did not practice for lack of expertise and appropriate equipment. Once harvested seed and beaten, its varietal purity is often difficult to be determined also lack appropriate means and trained staff.

There is no national seed control laboratory yet. The laboratory currently acts is very narrow and leaking, there is no cold room or spacious closets to store samples. The calibration of certain measuring devices is not provided regularly. Some portable devices are required for analysis in the field, others are to increase the capacity of the national laboratory. Consumables such as labels, the germination blotter and some products such as tetrazolium to check seed viability or potassium nitrate (KNO 3) to break dormancy are also needed.

d. State of the art of agencies responsible for regulation and certification of new varieties

Table 10: Staff

No.	Structures and post	Numbers
1	central level	25
2	regional loaded	7
3	loaded prefectural	33
4	loaded communal	5
	Total	**70**

- Infrastructure

Infrastructure is represented by the production centers and seed packaging which are four in number which Koba (Boffa) Kilissi (Kindia) Bordo (Kankan) and Gueckedou. Each center contains a mini-lab with little or no including the Kilissi is currently functional only.

e. Inventory of basic seed

The production of basic seed is the responsibility of the research (IRAG) which statistics are detailed in (4 a).

f. Procedures for the production and supply of basic seed

The upside of seed production is the Institute has charge of ensuring the creation, maintenance and adaptation of introduced or produced varieties. In the stage production of basic seed after approval by its DNA testing and certification service provides complete control (installation, field, batches and laboratory).

The basic seed is sold or reassigned to seed production centers by contracting R1 and R2 seed through their networks or framed by others (leaders, large and small producers) but authorized; the centers are supported under control by regional and charged seed prefectural (whose role: the identification and supervision of seed producers, control of seed fields framed producers, the assessment of seed needs and stocks of seeds produced.

seed stocks produced after producers of information-awareness are drained at the fitness center closest to the sequence of operations (processing, packaging, labeling, sampling, testing and certification).

The crop declarations by each seed producer (regardless of the category to produce) is essential before any control operation and is especially recognized for cataloged varieties.

Any seed producer at any level whatsoever must back production information, introduction, marketing and storage at the National Department of Agriculture under the cover chain of command.

All available stocks of seeds (produced or introduced) are centralized at the Seeds Division as a database.

- Access by private seed companies to basic seed

The seed sector as a whole involves several actors from research (production base), the production of R1 in the centers through their leading seed producer networks, production of R2 in the centers through the network of multipliers seed leaders and that the major producers.

Approved seed companies and making crop declaration by campaign remain stakeholders of these provisions.

Producers seed multipliers (large or small) supervised by the prefectural seed loaded under supervision of regional and charged by reporting their culture network.

Production contracts at different levels attest seed production quality guarantees.

- Policies in place for the supply of basic seed by the private sector

The national seed policy puts much emphasis on private sector participation across the seed value chain including the privatization of production centers and seed packaging to private interest and / or recent graduates of agricultural schools and / or the faculty of Agriculture for operation for seed production purposes subject to compliance with a set of specifications or a partnership contract. Thus, the state wants to accelerate its withdrawal from these activities and will focus on its role of arbiter.

To ensure effective and regular supply of farmers quality seeds, increase demand for seeds, create and ensure a favorable socio-economic environment for private investment aimed at developing a national seed industry, the state will continue to play its sovereign role, through its various ministries, in the case that support agriculture.

As part of the implementation of this policy and aspects relating to the restructuring of the institutional environment and the disengagement policy, only the policy assignments, monitoring and control remain the purpose of interventions by the State. To do this, the development of the seed program will take account of the simultaneous development of the two sectors are interdependent namely the public sector and the private sector.

In addition, the implementation of the seed sub-sector development strategy, requires organizationally: (i) a broad regional decentralization of activities (experimentation, multiplication, distribution, control and extension); (Ii) the institutional environment restructuring and defining the role of professional bodies given the general direction of national economic policy. This restructuring will allow all stakeholders (public and private) working in perfect harmony and operate all components of the seed sector in a balance which can be achieve the objectives of this policy.

At point 7.2 of the national seed policy, it is devoted to the private sector this.

The private sector is involved in seed production, marketing and consulting support in close collaboration with other stakeholders. He will be allowed to conduct its own trade promotion in the field in compliance with the regulations.

It will support the following activities:

- seed production as well as basic seed or certified commercial seeds;
- conditioning and processing encompassing collection tasks, drying, cleaning, sorting, grading, sanitary treatment, bagging, labeling and seed storage;
- the marketing of seeds including import, export and distribution.

The private sector will also conduct research activities either directly or in partnership to create and select new performing varieties.

The groups, associations, federations of producers and other private operators provide seed multiplication and marketing by strengthening their operational capacities and incentives in taxation and credit. The role of groups and associations in the implementation of the development policy of the sub-seed sector should focus on:

- participation in the formulation and implementation of operational programs and investment programs;
- the contribution to the implementation of the strategic plan quality seed development;
- contribution to the implementation of the seed legislation;
- participation in training and support / advice of various stakeholders;
- participation in the consultation of stakeholders;
- participation in the operation of seed distribution networks;
- participation in the monitoring / evaluation of the implementation of the strategy of development of the seed sector.

Meanwhile, other structures (NGOs, companies, etc.) should help to encourage farmers to use improved seeds.

The State will ensure that the private sector and government agencies cooperate and work in the sense of a common purpose based on efficiency and profitability. Such cooperation must be manifested among others in the private sector contribution to training programs, regional meetings, national and international in the seed industry, and also in the exchange of information and free access to celle- this.

The establishment of a Fund to Support the Seed Sector (FASS) should be considered as essential accompanying measure to successfully end the grip of seed production and marketing activities by the private sector. In this regard, the State must exercise its regulatory functions to ensure the sustainability of the fund until the seed sub-sector is growing enough to contribute through any fees and other appropriate mechanisms. For now, this fund has been established but not functional because the texts of application of regulatory texts governing seeds and plants are not yet signed (pending signature files).

6. Summary and Conclusions

a. Current state of access to improved seeds among small farmers

In part 1.1 of PNIASAN, it is registered as the availability and access to quality seed is one of the major challenges to achieve the objectives set by the NADP. In this context, actions and mechanisms to be implemented to ensure permanent availability and accessibility of plant seeds, livestock, fisheries, forestry and wildlife high yield and resistant to climatic shocks are broken down for each sub-sector.

Nationally, producers of accessibility to improved seeds is still low despite the various support from the state.

According to surveys conducted by the DNA, the National Agricultural Statistics Service, the level of quality seed use is still very low (5.85%) (MA / DNA, 2010). But the source said, the use of the seed alone introduces a yield increase of nearly 40% according to FAO.

For the past five years,

Exceptionally, in the zone of Koba (Boffa), 74% of farmers use improved seeds according to a survey made by I. DIALLO in 2014.

b. Contribution and governmental support for the improvement of seed systems

Regarding the review of the policy and institutional framework, the NRDS II embodies certain objectives of Agenda 2030 United Nations system including those relating to the eradication of poverty, the fight against hunger and food insecurity, job creation and industrialization and modernization of agriculture.

Regionally, it is articulated with the objectives of ECOWAS rice initiative that would like all members of this organization achieve rice self-sufficiency by 2025.

On the national level, it strongly supports the objectives of food security and emergence declined respectively in PNIASAN and PNDES. At the sectoral level, it is part of the vision of the NADP consisting in laying the foundations of modern agriculture, intensive, diversified and resilient.

policy framework

In the strategies of economic and social development developed in Guinea, for over a quarter century, rice is considered one of the pillars of growth because of its importance in the national economy and food security of the population.

Recent political and strategic guidelines for development of rice are contained in two main documents: (i) the National Plan for Agricultural Investment and Food Security and Nutrition (PNIASAN 2018 to 2025 and (ii) the National Policy for Agricultural Development (NADP 2016-2025).

The Guinea has set in 2017 a second generation PNIASAN 2018-2025. This sector plan covers the Ministries of Agriculture, Livestock and Animal Production, Fisheries and Maritime Economy and the Environment, Water and Forest with the Ministry of Agriculture as a leader. The PNIASAN is implemented development strategy of the National Policy on Agricultural Development Vision 2025 (NADP 2016-2025). It is structured into five priority programs of which the first is the increase in productivity of major crops by improving Agricultural practices and modernization of infrastructure and productive facilities.

For rice, the objective is to increase production to 4.6 million tonnes in 2025. This will cover the rice requirements of the country and export to regional and international levels. For this strategy, based on crop intensification and modernization of farms in order to accelerate the rate of rice production.

Review of the institutional and organizational framework

The review of the institutional and organizational framework shows that many institutions have been set up to support the adverse effects of the withdrawal of the state in market aspects and beyond the effects of liberalization of the sector.

However it should be noted that although there is a good institutional network, the fact remains that the institutions are struggling to fulfill their missions because of their low

technical and financial capacity. Added to this is the strong burst structures in expenses for the implementation of the objectives related to the promotion of rice. Hence the need to set up a structure uniting all entities responsible for the implementation of the NRDS has a large budget like what is done in other countries in the sub- region.

To this end, the establishment of an implementation of the NRDS structure is an ideal framework in which all public and private stakeholders can meet and discuss the development and modernization of the rice sector in Guinea.

It will set up an office or agency to be responsible for:

- Strengthen the capacity of the inter of the rice sector;
- Organize consultation frameworks players in the rice sector and to monitor the proper functioning of said frames;
- Coordinate and monitor investments in infrastructure, especially regarding the rehabilitation of sites and rice irrigation schemes in connection with the services and relevant government agencies;
- Develop and implement a permanent mechanism to cover national needs for certified rice seeds of improved varieties, working closely with other departments and relevant government agencies;
- Facilitating land security process by the competent land administration landscaped rice sites and develop;
- To support the process of mechanization, agricultural research, farm advisory and extension of innovations;
- Promote the transformation and the establishment of local rice market, particularly through coordination and monitoring of investments in processing infrastructure, storage and rice products conservation;
- Make labeling and promotion of rice Guinea and the value of its by-products;
- Develop and manage a monitoring mechanism on the production, processing and putting the rice market locally and internationally, related services and competent public bodies;
- Set up and manage the national security stock;
- Develop a sustainable funding mechanism the industry and provide the necessary mechanisms for the regulation of the rice sector.

Youth employment, gender in the production, processing and trade in rice

Jobs in Guinea

The economic and social policy of Guinea remains marked in the last decade by the implementation of the Strategy Document for Poverty Reduction III (PRSP III). The job on the labor market in Guinea is very low and the unemployment rate is very high and close to 60% for the age group between 25 and 35 years. This phenomenon is observed in both urban and rural areas.

Faced with this problem of employment, the government has opted for the promotion of high intensity labor (HLI) activities in the implementation of public investment programs at local and decentralized level in order to create advantage of employment for young people.

To this end, growth centers were particularly targeted. agricultural service benefits, food processing, transportation, fisheries, tourism and ICT are all niche jobs to absorb the unemployed especially young people.
The main lines of the national youth employment policy are based on the achievement of full youth employment and contribution to the substantial reduction of poverty by offering young rural and urban aged 25 to 35 years, opportunities to skills training to improve their employability and productive employment and employees or self empowerment through youth access to credit through microfinance institutions.

Agriculture and employment in Guinea

The agricultural sector is the engine of the employability of youth, whereas it provides more jobs in Guinea (80% of the population earn their income in the rural sector). Climate change and the various crises that have occurred, such as the food crisis of 2008 has brought renewed attention from the state. Job creation schemes have been set up in the framework of agricultural projects and programs, they are:

- Presidential initiative for agricultural services which plans to create 140 jobs for the first time;
- The mills of the plant for processing rice;
- The creation of fertilizer marketing centers and plant protection products;
- The Support Program for the Transformation of Agriculture Guinea (PATAg) is a first response to this employment crisis. This program aims to assist 5,000 farmers, 1,000 young people and women, 100 seed companies, 100 associations and 20 unions of women's groups and youth;
- The consolidation and expansion of acquired in the sector which will create at least 600 000 jobs.

The State through national and international institutions, development programs and projects implemented a lot in improving the accessibility of producers to quality inputs. For example, the state has introduced new varieties of rice seeds, corn, soybeans, coffee and sesame and sometimes distribute free or subsidized producers.

Regarding fertilizers and agricultural tools (small or large), since 2011 to the present, the state subsidizes more than 50% to producers.

Board 11: Location of state support of agricultural inputs

Year	input	amount	comments
Fertilizer			
From 1984 to 2010		Less than 10,000 t annually	KR2 including fertilizers and private sector
2011/2012		20,000 T	all categories
2012/2013		20,000 T	all categories
2013/2014		14750 T	all categories
		1600 T	Moroccan Don
2015		16485 T	all categories
2016		22 600 T	all categories

2017 and 2018		100000 T	all categories
seeds			
From 1984 to 2006		Farmer Seed Production	
From 2007 to 2010		200 to 300 T of rice	pedigreed
2011		1482.753 rice T	pedigreed
2012		500 Rice T	pedigreed
2014		0.75 T	market garden seeds
		450 T	Rice seeds
2015		500 Rice T	
2016		500 Rice T	
2017-2018	CK21, CK801, KANDIYIN, NERICA4, CK90, ROCK5, RD15, MASSARAKA, NERICAs L19 + FKS 19 KAOLACK, FLOATING	1890 T (Rice)	pedigreed
	WARI Hope	1170 T (maize)	pedigreed
2018-2019	NL 4	300 Rice T	
	NL 19	125 Rice T	
	WARI	354 t of maize	
	local Production	1500 rice T	
	SOYBEAN WHITE	250 T Soy (renewed)	
	COFFEE ARABICA	1,755,308 Plants	

c. Prospects and opportunities for the improvement of seed systems

Guinea's seed industry has every opportunity for improvement for the availability of arable land readily available to producers, diverse ecologies (hillside, shallow, plains and mangroves) and the availability of varieties adapted to all ecologies.

d. recommendations

From the above, we recommend:

- The establishment of an input shops building plan (BI) supporting the training component and the funded component will be parallel adopted and implemented;
- The installation and equipping of a national reference laboratory for seed quality control;
- Strong private sector involvement in the chain of seed value;
- Strengthen the access of women and youth to inputs and services;
- Consider the roles, constraints and specific needs of women and youth in all stages of the design of future programs and refurbish approaches and mechanisms of intervention;
- Promote access for women and youth services provided by extension, by socio-professional organizations so that they can take ownership of new technologies of production, preservation, processing and marketing;
- Provide ongoing training of producers in the selection, production, management, preservation and marketing of seeds;

- Support the promotion of seed through women's access to national and international fairs, public radio and private television;
- Equip equipment producer groups and assist with tips geared towards the strengthening of financial autonomy;
- Promoting access to credit for producers;
- Encourage the initiation and monitoring of field schools at the level of farmers' organizations;
- Strengthen the capacity of POs in structuring and managing their organizations and advocacy with the authorities;
- Integrating the female literacy component in all training programs.
- Educate producers on the importance of the use of improved seeds and plants;
- Participate in the development of technical data and a manual on seed production systems;
- Provide research and extension services with adequate resources for the promotion and wide distribution of seeds of new high yielding varieties;
- Expand credit "adapted" at affordable rates to producers with simplified procedures;
- Ensure the promotion of peasant leaders for their specialization in the production and marketing of seeds than making a sideline of their food production;
- Ensuring the promotion of information on the seed;
- Ensure regular monitoring of seed in markets by state agents;
- Promoting inclusion of private sector in seed trade in accordance with the ECOWAS legislation taking into account the concern of implementing actors.

e. Impacts and benefits of a better smallholder access to improved seeds

A better smallholder access to improved seeds will improve their income and be professional in the field. This will also impact positively on food and nutrition security of poor households especially. In addition, this will allow them to improve their agricultural production and productivity, settling as increase their surface area for better production because, at home and in many countries the yield increase is mainly due to the increase in arable land . In short, this will strengthen our seed system in all its dimensions.

NOTES

Board 12: List of species and varieties cataloged in Guinea (updated and adopted)

No.	variety	Ecology	Rendt (T)	Height (cm)	vegetative cycle	Tolerance to drought	Disease resistance	Listing
species rice								
1	CK 73	Low background	5	115	120	2	5	B
2	CK 90	Irrigated Lowland Plain	6	125	120	3	5	B
3	CK 801	Irrigated Lowland Plain	5	115	105	3	3	B
4	CK 211	Lowland and Plains	3	100	110	3	5	VS
5	KATACO	MangroveBas bottom and Plain	5	147	137	1	5	VS
6	KINSAMPENA	MangroveBas bottom and Plain	5	125	140	2	5	VS
7	M6	Lowland and Plains	5.5	105	135	2	5	B
8	CQ 15	Mangrove Lowland	4	150	165	3	5	VS
9	KANDINYI	Lowland and Plains	3	105	120	2	3	VS
10	KAREA	Mangrove and Lowland Plain	107	107	120	1	5	VS
11	MASSARAKA	mangrove swamp Lowland and Plains	3	140	130	5	3	B
12	NANKIN 6	Lowland and irrigated Plaine	3	100	85	3	4	VS
13	RD 15	Mangrove and Plains	4	105	115	3	5	B
14	WONKIFONG	MangroveBas bottom and Plain	4	120	135	3	5	VS
15	Balanta	MangroveBas bottom and Plain	5	125	150	3	5	B
16	KABLACK	MangroveBas bottom and Plain	4	107	120	2	3	VS
17	NANKIN 11	MangroveBas bottom and Plain	3	115	90	2	5	VS
18	KHAO GAEWN	Submersion	4	150	175	5	2	VS
19	Gambiaka kokum	Lowland and Plains	4.5	135	145	145	4	VS
20	TAMBA KELE	Lowland and Plains	4	130	150	3	3	VS
21	CB 3	Hill	3.9	104	115	3	3	VS
22	Koundou	Coteau and Plains	3	126	125	4	7	VS

23	CK 26	Hill	4	115	100	3	5	VS
24	IDSA 6	Hill	4.5	120	110	7	5	B
25	SAMBANKONKON	Hill	3	156	110	3	7	VS
26	IAC 165 (N'DoniNaba)	Hill	4	105	95	2	5	VS
27	RED PASTE (PAATION)	Hill	3	124	125	2	3	VS
28	DISSI GBELI	Lower fondCoteau irrigated Plaine	2.5	107	125	2	5	B
29	CK 21	Shallow, irrigated plain Coteau	4	120	110	4	3	B
30	CK 43	Shallow, irrigated plain Coteau	4	110	85	2	3	B
species Mil								
31	KONOBALI	Plain	3	180	50		Sensitive	VS
32	ICMP 87,703	Plain	2.5	180	35		Sensitive	VS
species Corn								
33	BR 473	Plain	3-5	200-210	105 to 110	Tolerance	Tolerance	VS
34	CJK5	Plain	3.5 to 5.5	130 to 160	95 to 105	Tolerance	Tolerance	VS
35	K 9101	Lowland Plain	3-4	190 to 210	90 to 100	Tolerance	Tolerance	B
36	FOULAKABHE (DIANSENGUE)	Plain	2.5 to 4.5	210-230	95 to 105	Tolerance	Tolerance	VS
37	DMR ESR-Y	Plain	5	180 to 220	90		Resistant	B
38	Kolo Oulen	Plain	2.5 to 3	220 to 240	95-110	Tolerance	Sensitive	B
39	GSH-Q-4	Plain	6-8	210-230	115-130	Tolerance	Tolerance	B
species Cowpea								
40	IT07K 243-1-2	Plain			75	1	5	B
species Bean								
41	GLP 195	Plain, Lowland						B
Peanut species								
42	AK10	Plain non-flooded Lowland	3	40-50	90	medium	medium	B
43	AK11	Plain non-flooded Lowland	2	60 A80	85	medium	medium	B
44	AK13	Plain non-flooded Lowland	2.5		95			B
45	MARESSI	Plain non-flooded Lowland	2		90			VS
species Cassava								
46	TOKOUMBO	Plain non-flooded Lowland	30	150 to 200	8-12	Tolerant	2	B
47	98/0581 (Foulaya)	Plain non-flooded Lowland	25	150	12	Tolerant	2	VS
48	TME 419	Plain, not flooded Lowland	25	250	12	Tolerant	2	B
Tomato species								

49	KARAKOLY F1	Plain non-flooded Lowland	35		Medium		resistant	VS
50	CALINAGO F1	Plain non-flooded Lowland	25		Very early		resistant	VS
51	MONGAL F1	Plain not flooded lowlands	20		early		highly resistant	VS
52	ROMAVF techi	Plain non-flooded Lowland	25		veryearly		Sensitive	VS
Sorghum species								
53	84W848 (SIGUIRI KENDE)	Plain	4	Medium	45	tolerant	tolerant	B
54	KENDE- Oulen	Plain	3	High	45	tolerant	tolerant	VS