



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



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**Issoufou Salami**  
**National Consultant**

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## Table of content

I.	INTRODUCTION AND BACKGROUND .....	5
A.	AGRICULTURAL PRODUCTION SYSTEMS .....	5
B.	CURRENT AND RECENT AGRICULTURAL DEVELOPMENT INITIATIVES .....	6
C.	SCOPE FOR THE DEVELOPMENT OF AGRICULTURE .....	6
II.	CROP PRODUCTION SYSTEMS.....	7
A.	CURRENT CROP PRODUCTION LEVELS OF MAJOR STAPLE FOOD CROPS, AVERAGE CROP YIELDS, AND TRENDS, BY CROP 7	7
B.	DESCRIPTION OF THE COUNTRY'S MAIN AGRO-ECOLOGIES AND THEIR CROPPING SYSTEMS.....	7
C.	CURRENT STATUS OF AGRICULTURAL EXTENSION ACTIVITIES .....	11
D.	LEVEL OF ADOPTION OF IMPROVED CROP VARIETIES, BY CROP.....	12
E.	LEVEL OF UTILIZATION OF FERTILIZER AND MANURES TO INCREASE CROP YIELDS, BY CROP.....	13
F.	GENERAL DESCRIPTION OF THE CURRENT SYSTEM FOR MARKETING SURPLUS PRODUCTION OF STAPLE CROPS .....	13
G.	TRENDS IN DEVELOPMENT OF MARKETS FOR STAPLE FOOD CROPS .....	13
III.	NATIONAL AGRICULTURAL RESEARCH SYSTEM .....	13
A.	DESCRIPTION OF THE PUBLIC INSTITUTES AND UNIVERSITIES ACTIVELY ENGAGED IN CROP BREEDING .....	14
B.	NATURE OF RECENT OR ONGOING CROP IMPROVEMENT ACTIVITIES, BY CROP .....	14
C.	LEVEL OF CAPACITY OF PUBLIC CROP BREEDING INSTITUTIONS.....	15
D.	RECENT OR ONGOING COLLABORATIONS WITH PUBLIC INSTITUTIONS, FARMER-BASED ORGANIZATIONS, AND PRIVATE SECTOR IN SEED SUPPLY .....	17
E.	CURRENT STATUS OF CROP VARIETY LICENSING ARRANGEMENTS FOR PRODUCTION OF SEED BY THIRD PARTY ENTITIES.....	18
IV.	STATUS OF SEED SUPPLY.....	19
A.	HISTORY OF CROP BREEDING AND SEED SUPPLY IN THE COUNTRY .....	19
B.	RECENT AND ONGOING ACTIVITIES AIMED AT RELEASE OF IMPROVED CROP VARIETIES, BY CROP.....	20
C.	RECENT AND ONGOING ACTIVITIES AIMED AT INCREASING SUPPLY OF IMPROVED SEED.....	21
D.	CURRENT OPTIONS FOR SMALLHOLDER TO ACCESS IMPROVED SEED .....	21
E.	NUMBER OF PRIVATE SEED COMPANIES OPERATING IN THE COUNTRY AND THEIR ESTIMATED ANNUAL SUPPLY .....	21
F.	OTHER NON-GOVERNMENTAL AND FARMER-BASED ORGANIZATIONS ACTIVE IN SEED PRODUCTION AND SUPPLY ..	23
G.	FACILITIES AND EQUIPMENT AVAILABLE FOR SEED PROCESSING AND PACKAGING IN THE COUNTRY .....	24
H.	TONNAGES OF SEED CERTIFIED AND MARKETED IN THE PAST FIVE YEARS, BY CROP (IN METRIC TONS) .....	24
I.	NUMBER OF AGRO-DEALERS CURRENTLY IN OPERATION, BY REGION .....	25
J.	LEVEL OF IMPORTATION OF CERTIFIED SEED FROM NEIGHBORING COUNTRIES, BY CROP.....	25
K.	SUMMARY OF PROSPECTS FOR IMPROVING SEED SUPPLY .....	26
V.	NATIONAL SEED POLICY FRAMEWORK .....	26
A.	DOCUMENTS WHICH CONTROL THE PRODUCTION AND SUPPLY OF SEED.....	26
B.	PROCESS FOR THE OFFICIAL RELEASE OF IMPROVED CROP VARIETIES .....	27
C.	PROCEDURES FOR SEED CERTIFICATION.....	28
D.	CURRENT STATUS OF THE REGULATORY AGENCIES IN CHARGE OF SEED CERTIFICATION .....	28
E.	CURRENT STATUS OF BASIC (FOUNDATION) SEED SUPPLY .....	29

F.	PROCEDURES FOR PRODUCTION AND SUPPLY OF BASIC (FOUNDATION) SEED .....	29
VI.	SUMMARY AND CONCLUSIONS .....	30
A.	CURRENT STATUS OF ACCESS TO IMPROVED SEED AMONG SMALLHOLDER FARMERS .....	30
B.	CURRENT STATUS OF GOVERNMENT SUPPORT FOR IMPROVING SEED SYSTEMS .....	30
C.	TRENDS AND OPPORTUNITIES FOR SEED SYSTEMS IMPROVEMENTS .....	31
D.	RECOMMENDATIONS .....	32
E.	LIKELY IMPACT FROM THE IMPROVEMENT OF ACCESS TO IMPROVED SEED BY SMALLHOLDER FARMERS .....	32

## I. Introduction and Background

The present document is a feasibility study for the development of public-private seed delivery systems in Niger. It has been commissioned by the Seed System Group (SSG). The paper has been researched and written by Issoufou SALAMI and Laouali Mahamane NASSER, respectively agronomist and plant breeder from the Institut National de la Recherche Agronomique du Niger (INRAN) and Liman Souley ABDULKARIM, a seed scientist working at ICRISATS Sadoré - Niamey, Niger.

### a. Agricultural production systems

Niger is a landlocked country of 1,267,000 square kilometers located in West African region. There are two predominant agricultural systems: crop production mainly under rainfed conditions and animal husbandry. Rain fed crop production is practiced on less than one third of the area in the Southern part of the country. It is often a mixed agricultural system where crop production is associated with intensive animal rearing. Extensive animal production is mostly observed in the Northern part of the country where crop production is limited due to low rainfall except under irrigation around the oasis. This system of extensive animal husbandry is severely affected by a progressive extension of cultivated areas northward. It was recorded that between 70,000 and 80,000 ha of new areas are devoted to new crop production at the expense of animal production and forest preservation each year

Crop production under irrigation is also widely practiced in the country in areas where drainage and underground water can be mobilized. The development of irrigation schemes these recent years led to a significant increase in irrigated lands HCI-3N (2012).

Fishery, although very scanty and rudimentary, is practiced along the Niger River Basin (550 km long), in Lake Chad and also in some permanent and semi-permanent water pounds scattered all over the country mostly in the Southern part of the country.

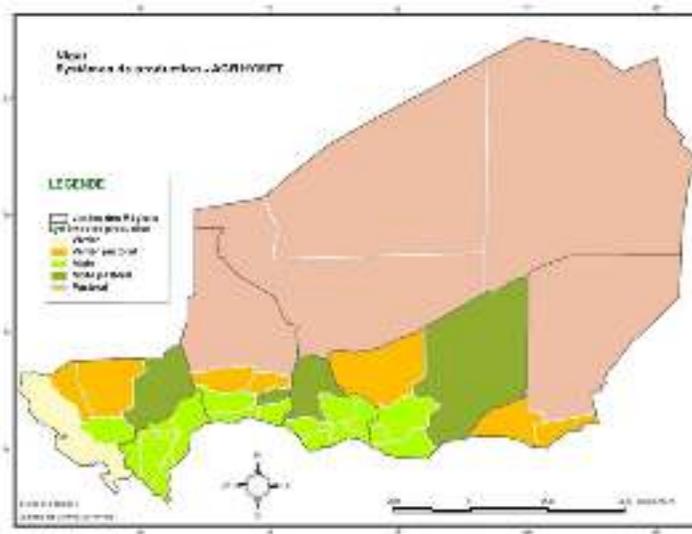


Figure 1: spatial distribution of agricultural production systems in Niger (AGRHYMET Regional Center, AP3A Project)

## **b. Current and recent agricultural development initiatives**

Since 2012, the new national policy for food security and sustainable agricultural development adopted by the government of Niger was the “3N Initiative” (In french les **NigériensNourrissent les Nigériens** meaning the Nigeriens feed the Nigeriens). It represents agricultural strategic plan that is being implemented by the current administration elected in 2011. The main objective of the “Initiative” is to strengthen the national production capacity and improve the resilience of the population against food crisis and disaster. It was then designed to contribute to the achievement of the Millennium Development Goals (MDG) and later on to play a central role in Sustainable Development Goals (SGD).

The first phase of the “Initiative 3N” was implemented from 2011-2015. It included an intermediate irrigation emergency program for 2011/2012. This first phase was successful in that the Objective 1 of the MDG (which is to reduce by half the number people suffering from hunger) was achieved in 2012. The annual increment of GDP for the agriculture sub-sector is around 9% implying a very good performance of the rural sector during this period.

The second phase was planned for implementation from 2016 to 2021. The main objective was to achieve “Zero hunger” by the year 2021. It is expected that the poverty level at the rural area will drop from 45% in 2015 to 31% in 2021. The main focus of the 3N Initiative during the second phase was the development of Agricultural Research, the increase and diversification of agricultural production, the development of Rural and Urban markets for agricultural products, the improvement of the resilience of rural populations to climate change and natural hazards, and the Improvement of food and nutritional security.

The second phase of the 3N Initiative defines the key priority areas for investment as well as the necessary institutional reforms to achieve the different objectives. To boost the national crop production the following institutional reforms are being implemented:

- The creation of the executive Secretary of the National Agricultural Research Council to assist the government in designing and implementing policies on agricultural research. The Council developed a medium and long term strategy on Research, Training and Innovation for the Agricultural Sector,
- A seed policy document following the implementation of the West African regional seed regulation. A National Seed Council is set up to help government in the identification and implementation of seed value chain development activities.
- The establishment of a National Agricultural Extension System that functions as a network of public institutions and private organizations for a better implementation of agricultural extension activities. An Agricultural Extension Agency is also planned for a better coordination of all extension activities in the country.

## **c. Scope for the development of agriculture**

The agricultural is one of the key attracting sectors of Niger’s economy. It contributes to more than 40% to the country's total GDP and provides between 15 to 20% of the country's export earnings. It employs more than 80% of the active population. It comprises two principal components i.e. crop production and livestock which are a major source of income, economy growth and poverty alleviation in the country.

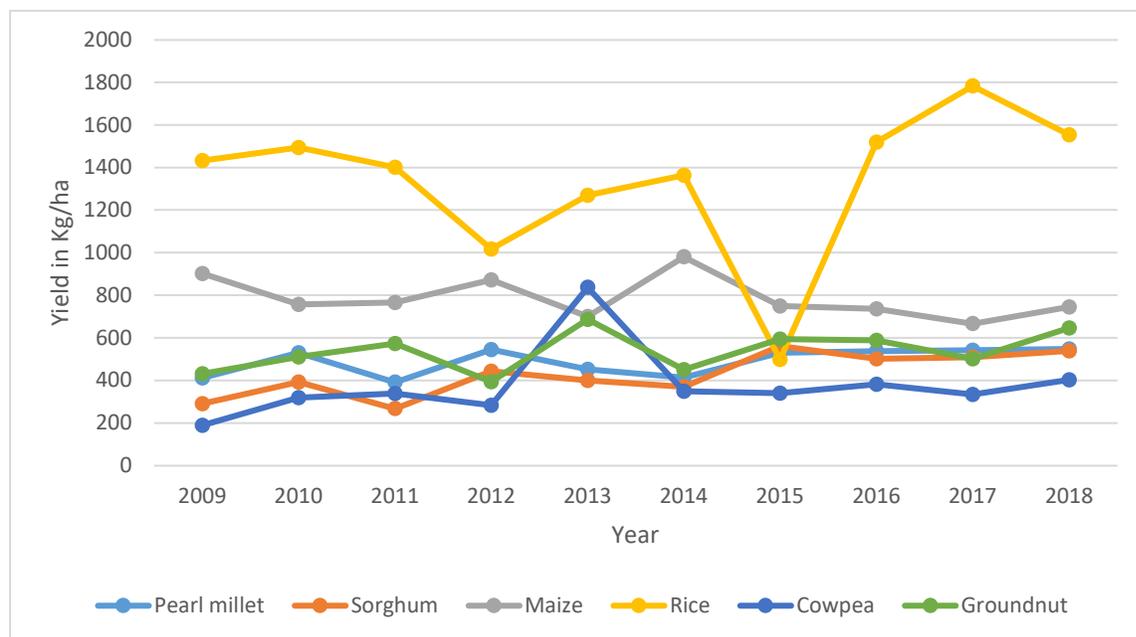
Rainfed agriculture predominantly conducted in the southern part of the country occupies around 16 million hectares while additional areas with irrigation potential are estimated at 270.000 to 300.000 hectares out of which more than 100.000 are under irrigation schemes.

The development of large scale and small scale irrigation schemes led to a significant increase in crop production under irrigation in all the regions of the country. This allowed reducing the risk related to rainfed crop production that frequently is challenged by drought. Crop Production Systems

**a. Current crop production levels of major staple food crops, average crop yields, and trends, by crop**

Pearl millet, Cowpea, Sorghum, and rice are the major food crops produced in Niger. Cowpea is used for dual purpose i.e food and cash crop, it plays a significant role in food security. The production of maize is limited to some areas where the agro-climatic conditions are favorable.

For all crops, the trend in yields and production over years is very irregular. The yield and production fluctuations are mainly due to the irregularities of rainfall distribution. The following figure shows the trend of yield for the major rainfed crops.



**Figure 2: evolution of grain yield for major rainfed crops produced in Niger from 2009 to 2018**

**b. Description of the country’s main agro-ecologies and their cropping systems**

Agricultural and pastoral activities are carried out in five distinct major agro-ecological zones namely:

- (i) The desert area in extreme north with merely no rainfall.



Out of these major Agro-ecological zones, 28 macro-zones are identified which are then grouped in 13 cropping systems with the following characteristics:

	Cropping system 1	Cropping system 2	Cropping system 3	Cropping system 4	Cropping system 5	Cropping system 6	Cropping system 7	Cropping system 8	Cropping system 9	Cropping system 10	Cropping system 11	Cropping system 12	Cropping system 13
Characteristics	Lake Chad Komadougou	Cuvettes MainéSoroa	Eastern Plateaux	Goulbises	Ader-DoutchiMaggia-Tarka	Sand Dunes	Dallols	Plateaus	Rivers and tributaries	Pastoral Nord	Oasis	Parc W	Peri-urbain
Localization	Eastern Niger basin (N'Guigmi and Diffa departments)	South-West of Mainé and South-East of Gouré department	South and South-center (Diffa, Zinder, south east Maradi regions)	South-Center (Maradi region)	Maggia and Tarka valleys (Tahoua, Madaoua, Konni, Keita and Bouza departments)	Center (Tahoua, North Dosso and Tillabéry regions)	South east (Niamey, Boboye, Gaya and Doutchi departments)	South west (Dosso and Tillabéry regions)	West (Dosso, Tillabéry regions et Niamey district)	North Diffa, North Zinder, North Tillabéry and South Agadez	Agadez	South-West of the Country (Tapoa)	Around cities
Approximate area	0,37Mha	0,01Mha	2,5 à 7,5Mha	0,2Mha	0,2Mha	18Mha	0,5Mha	2,5Mha	0,91Mha	350 000 km2		3 500 km2	1 000 à 1 500 km2
Climate and annual total rainfall	North Sahelian 250 - 300 mm/yea	Dry Sahelian 300 - 350 mm/ye	Sahelian 300 - 600 mm/year	Sahelian in the North and sahelo	Sub-Sahelian 350 - 450 mm/year	Sahelian 300 - 450 mm/year	Sahelian in the North and sahelo-sudania	Sahélian à l'ouest et soudano-	Sahelian au nord-ouest et sahélo-soudanien au	Sahélo-saharien 100 à 300 mm/an	Saheliano-saharien	Soudanien 600 à 800 mm/year	

	Cropping system 1	Cropping system 2	Cropping system 3	Cropping system 4	Cropping system 5	Cropping system 6	Cropping system 7	Cropping system 8	Cropping system 9	Cropping system 10	Cropping system 11	Cropping system 12	Cropping system 13
	r	ar		- sudanian in the South 300 - 600 mm/year			n in the South 300 - 600 mm/year	Sahelian sud	sud				
<b>Soils</b>	Hydromorphic to pseudogley	Sub arid brown to red vertisols	tropical Ferruginous	Heavy soils to gley with alluvial intake	Brown red of plateaus and gley of valley	Poorly evolved soils and light	Hydromorphic tropical ferruginous, natronated by location	Ferruginous on plateau, sandy to the north and loamy to the south	Hydromorphic pseudogley and vertisols	Light sandy and sandy-loamy	Light sandy	Tropical Ferruginous	Varying soils

### **c. Current status of agricultural extension activities**

The history of agricultural extension in Niger shows a predominance of public service from 1960 to 1998. From 1998 which coincides with the end of the World Bank Funded project "Project for the Reinforcement of the Agricultural Support Services", the government reduced its support to extension services and activities. Other actors progressively overtook the government public extension services with however, a poorly coordinated agricultural extension activities.

From the diagnosis conducted in 2006, the following extension systems were identified: the public system, the system operated by professional farmers' organizations, the system managed by the private service providers, the system operated by the private veterinary service providers, the system operated by NGOs and Projects.

#### **▪ Level of capacity of public extension system**

The public agricultural extension activities are under the responsibilities of two (02) ministries: the Ministry in charge of Agriculture and Livestock, and the Ministry in charge of forestry and environment management. Each of the ministries is responsible for the diffusion of new technologies developed by research in their specific areas. They operate at the central level through national directions, represented at different levels (regions, departments and districts). A survey conducted in 2016 shows that the overall staff of the ministries concerned by agricultural extension activities, working at regional and district level is around 3,000 agents. Only 750 of them are estimated to be working as extension agents directly in contact with producers. According to the same study one extension agent works with 3000 to 6000 farmers to address all agricultural issues. Also, there is no training program for these extension agents by the government except through some projects where there are intervening. This mostly restricts the extension activities to the dissemination of old and already known technologies and agricultural practices.

More over the insufficiency of financial resource and logistic negatively impacted the execution of daily extension activities.

Another public extension service on rice production and vegetable crop production was provided by ONAHA (National Office for Agricultural Irrigation Schemes). It is operating in around 70 irrigation schemes along the Niger River Basin and other irrigated parts of the country. The system integrates farmers' organizations at certain level (mostly in rice irrigation schemes) but it is poorly coordinated.

#### **▪ Level of activity by non-governmental and private sector entities in agricultural extension**

The current trend in agricultural extension activities in Niger consists of extension services provided by private and non-government entities including NGOs, farmers associations, and projects. Currently, different extension services providers exist:

A lot NGOs and farmers based organization have created network of extension agents. The most illustrative case of private extension service provider is RECA "Réseau des Chambres d'Agriculture". It supports farmers through technical guidance and counsel on crop production, trainings sessions on agribusiness, management of farm activities, marketing of agriculture products, etc.

Other private entities providing extension services to farmers are the so called “Groupement Service Conseil- GSC” and the “Centre de Prestation des Services” but most of the time they are operating under contract with projects and other NGOs what limits the services they are providing.

An important drawback of the agricultural extension systems in the country is the lack of proper coordination of their activities. For instance more than one service provider can operate in the same area and on the same topic. This situation led to the proposition of a new strategy on Agricultural Extension in the country. An independent agency is planned to operate for a better coordination of all extensions services (public and private) in the country.

#### **d. Level of adoption of improved crop varieties, by crop**

There is no official record of level of adoption of improved varieties by crops. But it was estimated that around 10% of the area devoted to major crops production are covered with seeds of improved varieties released by INRAN, ICRISAT or introduced from other research institutions. It is believed that this low usage of seeds of improved varieties is explained by a poor sensitization of farmers on their advantages, a poor coverage of rural areas by the seed distribution network and inadequate seed promotion activities and seed marketing strategies deployed by the private seed operators.

Most of the varieties used by farmers for legume crops (groundnut and cowpea) and rice are improved varieties originated from research institutions (INRAN, ICRISAT, IITA, AfricaRice and other NARS). However, the quality of the seeds used is sometimes not guaranteed because of the existence of informal seed distribution systems (seed saving, free distribution of seeds, seed production with no quality control etc).

For pearl millet, HKP variety developed by INRAN in 1978 remains the most popular improved variety adopted by farmers mostly because of its earliness, wide adaptation and its promotion by the government, NGOs and projects involved in the free distribution of seeds. Other OPVs (Zatib and P3Kollo from INRAN, SOSSAT C88 from ICRISAT) are being grown to a lesser extent by farmers. ICRISAT millet breeding program is promoting six newly released OPVs (See section IV paragraph b) to increase their adoption by farmers. INRAN and ICRISAT millet programs are also currently working toward the promotion of millet hybrid varieties. Their dissemination is however hindered by the downy mildew as most CMS germplasm sources used in the development of these new millet hybrids seemed to be susceptible to the pathogen races in the country.

There is a wide range of farmer's preferences for sorghum varieties with regards to cooking qualities, endosperm color, stalk height, maturity cycles that probably explain the use of local varieties by a large number of sorghum growers in the country. Many sorghum varieties of dwarf types to medium stalk size with high grain yield potential are available but not widely adopted by farmers due to a low demand from sorghum grain processors.

Maize production in Niger is restricted to some areas where rainfall is important or irrigation facilities are available. The most popular variety currently grown by farmers is an old yellow OPV P3Kollo due to lack of new improved varieties released by INRAN for long time. The recent resume of INRAN maize breeding program led to the release of a single cross hybrid which is currently promoted to farmers growers in the country. Many other early and extra early maturing varieties (single crosses, top crosses, synthetics etc.) are in the development and release process at INRAN.

There is limited breeding and seed dissemination activities for vegetables by the research institutions in the country. Vegetables growers are therefore using whatever variety of their choice either produced locally or introduced by private operators.

**e. Level of utilization of fertilizer and manures to increase crop yields, by crop**

The level of fertilizer use is very low compared to that at regional level. In 2016, it was estimated to be covering 3% of the area cultivated. The largest quantity of fertilizer is used on irrigated crops such as rice and vegetables crops. The level of fertilizer used on rainfed crops is still very low. The rainfall distribution limits the use of fertilizer in some areas because of the risk associated with the application of fertilizers in areas where drought can occur at any time.

**f. General description of the current system for marketing surplus production of staple crops**

The bulk of production of surplus is marketed directly by farmers in local markets. At harvest, the produce prices are relatively low and large quantities are bought by middlemen who often store them and resell at high prices during shortage period. In some cases the produce are exported in neighboring countries reducing drastically the national stock.

To overcome this situation (lower prices at harvest and export of produce), the government of Niger developed a national strategy aiming at buying directly from local producers (avoiding the middlemen) large quantities of grains that are stored in the national grain reserve. This also concerns all other partners supporting food security initiatives such as the World Food Program, the Food and Agricultural Organization.

The information system on market of major staple food (Système d'Information sur les Marchés Agricoles – SIMA) provides valuable information on the prices all over the country, this helps in the marketing of the produce.

Another mechanism for marketing surplus of staple crops produce is the creation of markets named “marchés de demi-gros” (a type of Medium Wholesale Markets) in rural areas where farmers can directly sell their produce without dealing with middlemen.

**g. Trends in development of markets for staple food crops**

One of the programs of the “Initiative 3N” which is the national policy with regard to agriculture is to improve the supply of agriculture food products to urban and rural markets. A lot of demand creation activities are developed to increase the commercialization of agricultural staple foods. The recent development in agricultural produce processing by medium scale processor is also one of the major achievements of the “Initiative 3N”. These resulted to an increase development of the markets for these produce.

**II. National Agricultural Research System**

#### **a. Description of the public institutes and universities actively engaged in crop breeding**

In Niger the public institutions having potential capacities to run crop breeding programs are INRAN and the Public Universities (University Abdou Moumouni of Niamey UAM, University Dan DickoDankoulodo of Maradi UDDM, University of Diffa,, and University of Tahoua)

The public Universities are under the ministry of higher education, research and technology. UAM was the first higher educational institution created in 1971. The agricultural research at UAM is done at the Faculty of Agronomy, Faculty of Sciences, and Institute of Radio Isotopes. The other Public Universities were recently created from 2008. The Public Universities are mostly involved in training most of the country's agricultural staff essentially extension agents with a B.Sc. and MSc levels and agricultural researchers with PhD levels in collaboration with other foreign universities. However, few of the faculty of agriculture's scientists in these Public Universities operate in the area of plant breeding for release of improved varieties or in the seed production.

INRAN under the ministry of agriculture remains the national agricultural research institution actively involved in the development, introduction and dissemination of improved varieties of the main crops grown in the country. Created by the government in 1975 following the heavy droughts of the early 1970s, INRAN replaced the French research institutions working on annual and perennial crops, oil crops, animal husbandry. INRAN's primary purpose is to contribute to the attainment of food security and rural development in Niger. The institute is a semi-autonomous public agency, its research focus includes crops breeding, agronomy, animal sciences, forestry, fisheries, and agro ecological and environmental issues. These activities are carried out at five regional agricultural research centers based in Niamey, Kollo, Maradi, Tahoua and recently Zinder. INRAN breeding programs received an important support from the Alliance for a green revolution in Africa (AGRA) that funded the training of INRAN young scientists in plant breeding and seed technology in different Universities of West African countries (Ghana, Burkina Faso).

#### **b. Nature of recent or ongoing crop improvement activities, by crop**

New varieties for the main crops are in the development process of INRAN breeding programs including:

##### **☐ Pearl millet breeding program:**

- On-farm evaluation of downy mildew tolerant/resistant hybrids;
- Recombination of inter local varieties crosses for the development of new composite varieties

##### **☐ Cowpea breeding program:**

- Advanced F4 generations for the development of cowpea lines combining earliness and tolerant to low soil phosphorus;

- Advanced F5 generations for the development of drought tolerant cowpea lines in development from crosses involving wild parents;

- Identification of dual purposes (grain and forage) promising genotypes among the advanced generations.

☒ **Sorghum breeding program:**

- Advanced F4 generations for the development of sorghum lines combining earliness, grain quality, yellow grain endosperm and mid height from crosses involving Kaoura collection.

☒ **Groundnut breeding program:**

- Evaluation for DUS and VCU information for registration of four new groundnut varieties including one (1) drought tolerant variety, one (1) early maturing variety and two (2) rosette resistant varieties.

☒ **Maize breeding program:**

- Crossing blocks for the development of early maturing yellow and white single crosses, top crosses and three way hybrids

- Evaluation for DUS and VCU information for registration of one synthetic early maturing yellow variety and one improved local yellow variety.

Under a new project called CSAT-Niger in collaboration with IITA and ICRISAT, the above INRAN breeding programs are currently evaluating advanced genotypes of pearl millet, cowpea, sorghum, and groundnut and maize hybrids for the identification of highly performing ones that could be recommended for release in the country.

A new project called Cowpea Square funded by the McKnight foundation is currently conducted by the University of Maradi in collaboration with INRAN and farmers organizations in order to develop dual purpose cowpea varieties combining forage production, high grain yield and other desirable features.

ICRISAT also through its Pearl millet breeding program is working at developing high yielding hybrid varieties. A single cross hybrid (ICMH 117111 or Alambana 111) is yet to be released. The yield potential is between 2.5 and 3 tonnes per hectare. At least 4 seed companies are already trying the variety in their field. Another Open Pollinated variety meant for production in sahelian zone is also about to be released (ICMV 167001).

Other hybrid varieties for different agro-ecology are on the pipeline and multi-location trials have started.

### **c. Level of capacity of public crop breeding institutions**

- **Scientific personnel**

In 2007, a report from Program for Africa's Seed Systems (PASS) of AGRA estimated to thirteen the number of plant breeders with M.Sc and Ph.D training in the country. Out of these, six worked for INRAN; six were university professors and one worked for ICRISAT. They were mostly involved with major cereals like millet and sorghum, and legume crops like cowpea and groundnut. There is an increase in plant breeders' number in the country with the training at the West African Center for Crop Improvement funded by AGRA and other donors and the enrollment by the Public Universities of scientists with conventional or molecular breeding background. The exhausted list of crop breeders present at the Public Institutions of Niger (INRAN and Public Universities) is currently not available but it is under establishment by the National Association of Plant breeders and Geneticists recently created in the country.

The plant breeders with MSc and PhD levels that are currently conducting plant breeding activities at INRAN are as follow:

- Millet breeding program: this program is run by two PhD plant breeders enrolled by INRAN who are assisted by MSc students supported by projects;
- Sorghum breeding program: this program is run by two PhD plant breeders and one PhD crop scientist enrolled by INRAN who are assisted by one PhD student of WACCI and MSc students supported by projects;
- Cowpea breeding program: this program is run by two PhD plant breeders enrolled by INRAN who are assisted by one PhD cowpea breeder under contract and MSc students supported by projects;
- Groundnut breeding program: this program is run by only one PhD plant breeder enrolled by INRAN who is assisted by a field technician;
- Maize breeding program: this program is run by one PhD plant breeder enrolled by INRAN who is assisted by three field technicians. Another INRAN scientist is currently enrolled in PhD plant breeding training in Nigeria and intended to work on maize.

#### – **Infrastructure**

The INRAN breeding programs have limited infrastructures. Two pathology laboratories accompanying breeding programs exist, one in Maradi and the other in Kollo but are not well equipped. There is one entomology laboratory working quite well but the activities conducted are mostly orientated on Integrated Pest Management. It is also important to note that INRAN has 2 seed laboratories for breeder and foundation seed quality control (seed germination, seed purity ....).

INRAN breeding programs lack appropriate breeding fields (nurseries with irrigation facilities), materials and equipment and greenhouses. They also lack well equipped central biotechnology and molecular breeding laboratory to support their activities.

This situation limit the breeding cycles for the development of new genotypes as the activity relays on the rains which distribution is often disturbed by drought.

**d. Recent or ongoing collaborations with public institutions, farmer-based organizations, and private sector in seed supply**

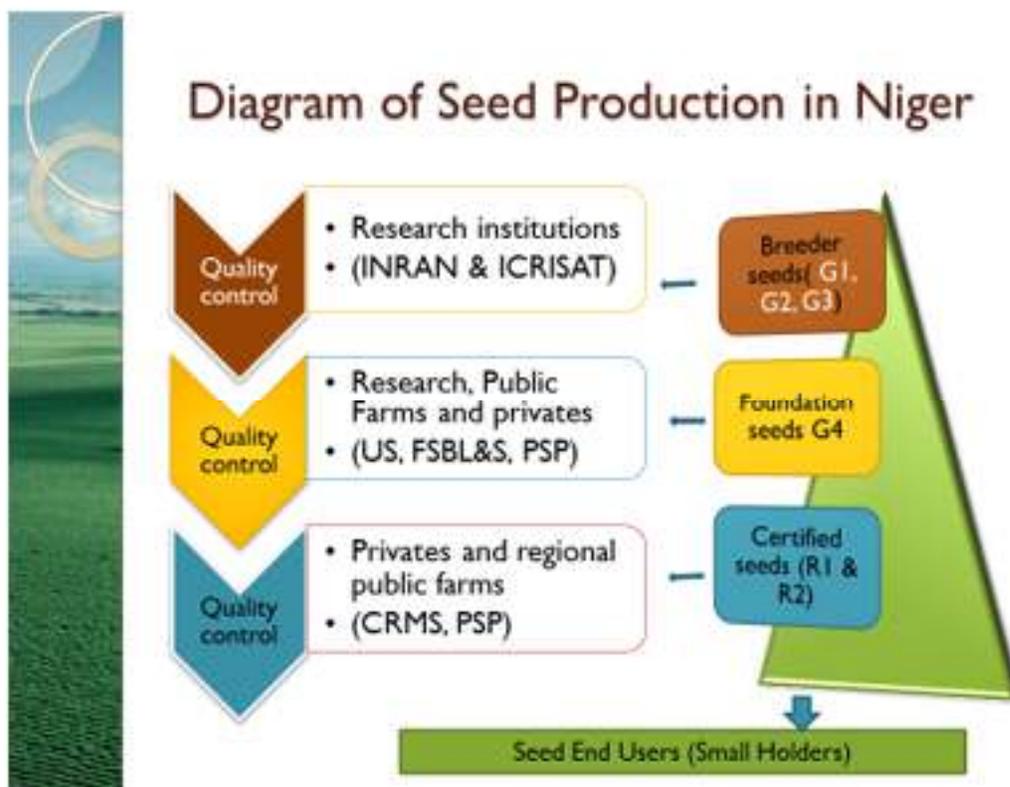
Despite the bottlenecks that limit efficiency and effectiveness of the components of the value chain in Niger Seed System, there is an important collaboration between these components particularly between public institutions, private seed companies, farmer-based seed producers and seed dealers. The following aspects of collaboration can be mentioned in the areas of seed production and seed commercialization:

**Seed production:** The national seed policy in Niger defines the role and responsibility of each key actor on seed production. According to this policy, seed production and distribution in the country are to be done basis on agreement between the different actors of the seed value chain.

Breeder and foundation seeds of major crops are mostly produced by the 2 research institutions (INRAN, ICRISAT) actively involved breeding activities. Foundation seeds are also produced by private seed companies on contract basis, under the supervision of the research institutions. For instance, in 2018, the FESA (a private seed company based in Maradi) produced in collaboration with INRAN and ICRISAT about 30 metric tons of foundation seeds of Pearl Millet, Cowpea, Groundnut, Maize and Sorghum (Annuaire, 2018). Similar collaboration exist between these institutions and others seed companies (AINOMA, HUSA'A, ALHERI). There are also some cases of collaboration on foundation seed production between ICRISAT and Farmers Organizations (case of Madda Ben of Falwel in Dosso region). This collaboration between research institutions and private seed producers aims at increasing the quantity of foundation required for the production of certified seeds supplied to smallholder farmers. It is also an avenue for building capacity of private seed producers on seed production techniques.

Certified seeds are produced by private seed companies and farmers organizations mostly under contracts with seed growers.

All seed categories (breeder, foundation and certified) are produced under the control of the official public seed control services (Direction du Contrôle et de la Certification des Semences, DCCS). Other public institutions collaborating with private seed producers are the extension services (Direction de la Vulgarisation et de Transfert de Technologie, Office National des Aménagements Hydro Agricole). They provide technical guidance and counseling to seed producers for a better organization of their seed production.



**Figure 4:** Seed production Diagram in Niger

**Seed Commercialization:** Breeder and foundation seeds are mainly supplied to seed companies, farmers groups' and individuals involved in production of foundation and certified seeds. The main constraint of supply of foundation seeds is the poor planning of the production due to inconsistency of demands by the private sector. This leads to unsold stock of seeds some years and shortage of supplies in other years.

The purpose of certified seed production is to supply to small holders farmers but the direct commercialization of seeds is disrupted by government and NGOs annual free seed distribution of seeds (emergency seed). Currently the most important challenge to certified seed producers is the lack of information on the real demand of seeds from small holders' farmers. The clear objective stated in the national agricultural policy of increasing the areas cropped with seeds of improved varieties to 20% each year, led to an increase in seed produced of major crops till 2014 (12,775 metric tons). This increase in seed production during this period was not supported by appropriate seed marketing mechanisms leading to a decrease in the seed production during the subsequent years (8,152 metric tons in 2015, 8,209 metric tons in 2016, 7,058 metric tons in 2017 and 9,417 metric tons in 2018).

**e. Current status of crop variety licensing arrangements for production of seed by third party entities**

- Licensing arrangement between AINOMA (Niger) with Advanta Ltd (India) for the production of maize and sorghum hybrid seeds
- Licensing arrangement between MANOMA S.A (Niger) with GERMICOPA (France) for the production of Irish potato seeds

### **III. Status of Seed Supply**

The agricultural research system of Niger is composed of public institutions and international agricultural research organizations under a recently created national council for agricultural research named Conseil National de la Recherche Agronomique (CNRA). The national council defines the national policy and national priorities for agronomic research and rural development in the country. The public institutions that primarily perform agricultural research in the country are the National Institute for Agronomic Research of Niger (INRAN) and the Directorate of Cattle Breeding Centers and Livestock Stations (CMB-SE). Other national higher-education agencies (Faculties of Agronomy, Faculties of Sciences, and Institute of Radio Isotopes) conduct agricultural R&D activities, all within the public Universities in the country (University of Niamey UAM, University of Maradi UDDM, and University of Diffa). INRAN accounts for nearly three-quarters of the country's total agricultural research staff. The other international and regional institutions operating agricultural research in the country include the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT Sahelian Center) and the Regional Research Center for Agriculture, Hydrology and Meteorology (AGRHYMET).

#### **a. History of crop breeding and seed supply in the country**

Niger's first agricultural research institutions were created in the 1920s and 1930s, and acted as satellites for activities undertaken by the French colonial government through its principal regional agricultural research station, located in Senegal. In 1960, the year of independence, the new Nigerien government created the National Agricultural Research Committee (CNRA) to set national agricultural research priorities and to propose financing levels. This committee still exists today, carrying out the same functions. In 1961, Niger signed a cooperation agreement with France allowing its former colonizer to continue managing and conducting agricultural research through its existing Nigerien agricultural and veterinary institutes.

In 1975, all agricultural research agencies in Niger were nationalized, and the National Agricultural Research Institute of Niger (INRAN) was created. INRAN, currently under the Ministry of Agricultural and Livestock, took over the activities of the five French institutes with permanent structures in Niger. From 1975 until 1984, French funding and personnel progressively withdrew from Niger. French expatriates were quickly replaced by U.S. counterparts, who remained until the mid-1990s, by which time a sizable national research contingent had been trained.

Modern crop breeding in Niger started in the sixties under the colonial French agricultural research institute named Institut de Recherches Agronomiques Tropicales (IRAT). With the creation of the national institution INRAN in 1975, national scientists and U.S. research collaborators took over the crop breeding activities with main focuses of major rainfed crops i.e. pearl millet, sorghum, cowpea and groundnut.

Early emphasis in breeding millet and sorghum was on the improvement of local varieties through the rogging of plants with undesirable features. Subsequent breeding strategies based on mass selection, recurrent methods and pedigree procedures led to the development of large number of OPVs for pearl millet and improved lines of sorghum, cowpea and groundnut. The list of main crop varieties developed up to 1985 were provided in the 2nd edition of INRAN varieties catalog published in 1987.

In early breeding strategies for the development of improved varieties particularly for sorghum, emphasis was given to the ones of dwarf and early maturing types. These two characteristics were suitable for Niger's arid climate. Improved varieties were promoted throughout the country with accompanying agronomic recommendations. Most of these, however, were for high-input, mono-cropped farming systems, which turned out to be highly inappropriate for the on-farm realities of Niger.

Alongside with the crop breeding conducted at INRAN, the institute introduced and disseminate large number of improved varieties developed by international CGIAR centers (IITA, ICRISAT, Africa Rice etc.) and from other research institutions of West African countries. The list of improved varieties currently released in the country is available in National Catalog of varieties and vegetal species edited in 2012.

In addition to crop breeding, INRAN particularly is the main national institution that performs seed production and some commercialization through the INRAN seed unit, a semi-autonomous entity created in 1998 to produce quality foundation seeds and support the emergence of a private seed sector.

Seed production and supply in the country has recently evolved on large scale basis with the event of emerging private seed companies. Five of them (Alheri, Husa'a, Halal, FESA, Gamonzen) received an important financial and technical support from the Alliance for a green revolution in Africa (AGRA) for their implementation and business development. Around twenty private seed companies are currently performing seed production and seed distribution in the country.

#### **b. Recent and ongoing activities aimed at release of improved crop varieties, by crop**

In 2018 the national variety release committee accepted for registration in the National Catalog of varieties and vegetal species fourteen (14) new varieties including:

- **six (6)** pearl millet OPVs ( from ICRISAT (Chakti, ICMV 167002, ICMV 167003, ICMV 167004 and ICMV 167005)
- **two (2)** sorghum single cross hybrids from INRAN (223A x 90SN1 and 223A x P9405)
- **one (1)** maize single cross hybrid from INRAN (NAGODE),
- **one (1)** sorghum hybrid (PAC 501) and one (1) three way maize hybrid (PAC 740) from Advanta Ltd which licenses their release and use to Ainoma Seed Co. in Niger and
- **four (4)** Irish potatoes varieties (Yona, Pamela, Daifla and Rosanna) from Germicopa France which licenses their release and use to Manoma SA Seed Co. in Niger.

### c. Recent and ongoing activities aimed at increasing supply of improved seed

As mentioned earlier, there is a good collaboration among seed value chain actors which is a guarantee for increasing the seed production in the country. But the main challenge remains the development of management and marketing strategies to improve the supply of seeds to small holders' farmers.

Recently a number of activities aimed at improving the supply of seeds have been initiated by both the public institution and the private sector:

- The Ministry of Agriculture adopted an action plan for the development of seed sub-sector. The main objective is to develop the seed subsector to reach a level of seed production and use of **19,943 metric** tons in 2020. The action plan clearly proposed the development of public-private partnership which will later lead to the accreditation of private entities to conduct seed quality control.
- Also to increase the production of seeds of major crops, the government incited a lot of Project to finance the production of foundation seeds. Projects like PASEC, SAPEP, PPAAO and even the national budget financed the production of breeder and foundation seeds by INRAN Seed Unit.
- The private seeds companies and other seed producers (farmers groups and private individuals) conducted a reform of the former Association of Private Seed Producers (Association des Producteurs Privés des Semences, APPSN) who changed to "Association Nigérienne des Opérateurs de Semences, ANOS". The objective of the reform is to bring all private seed producers and other seed private professionals under an umbrella and promote the production and supply of quality seeds for the benefit of end users.

### d. Current options for smallholder to access improved seed

The government is currently creating a multifunctional platform called "Maison du paysan" integrating a lot of services including inputs supply (seeds and other inputs) in all districts of Niger. Agro-dealers and other input shops can easily order seeds from the platform and distribute to farmers directly.

Other recent option is the introduction of E-voucher in distributing subsidized seeds. This help to avoid the distribution of counterfeit seeds and also allow the producers to directly choose the varieties they wish to grow.

### e. Number of private seed companies operating in the country and their estimated annual supply

Around twenty registered private seed companies are regularly operating in seed production in Niger. The volume of seeds their producing is fluctuating from year to year depending on the market

Entreprisesemencièrè	Volume of production 2018 (kg)
CIGABAN KARKARA	148,852
EAO	

<b>Entreprise semencière</b>	<b>Volume of production 2018 (kg)</b>
	350,854
Entreprise,Alfarey,Mazada	450,320
Entreprise,Alhéri,	139,100
Entreprise,Ambouta	938,280
Entreprise,Amintchi	23,000
Entreprise,Husa'a	483,623
entreprise,SAWKI	12,921
ETP,Adamou,Oumarou	47,690
Ferme,agricole,Moullou	5,800
FESA	206,220
FS,Gandou	145,220
FS,Mutashi,Da,Kammu	59,920
FS,Sadik	71,300
FSA	350,835
GAISA-SARL	227,100
Halal	64,740
Manoma,SA	1,140
Nagarta,Iri	104,900
SMS,IRI,NAGARI	60,425
TATACHE,IRI	342,415
<b>Grand Total</b>	<b>4,234,655</b>

**Source:** Annuaire de production de semences 2018/2019

**f. Other non-governmental and farmer-based organizations active in seed production and supply**

More than 45 farmer-based organizations are active in seed production and supply in Niger. See the table below.

<b>Farmers organization</b>	<b>Production 2018 ( in kg)</b>
ARI-Matter end Couseling	8,750
ChipkaKaWadata	3,519
Coop Ainoma	4,480
Coopérative FUSAHA	8,700
CoopérativeHadama	900
CPS-IRI	300
Goupementdalili	1,449
Goupementmanoma	1,000
groupementwafakay	560
HadinKanJama'a	23,000
Harey bane	10,000
JafaintarJuna	702
OP Amana	3,300
OP An-Niyya	6,092
OP Gagassiney	3,500
OP Godia	1,350
OP Hallassaye	7,016
OP HAREY BANE	800
OP Jinkaye	2,700
OP Liina	300
OP Modjeré	8,950
OP Naney	990
OP NIYYA	25,374
OP Raya Iri	400
OP SCOOP	351
OP Taimako	60
OP Taimako	2,290
OP Tchigaba	14,464
OP TchigabanGari	1,600
OP Tsintsiya	6,500
OP UPRODA	420
OP Wafakaye	9,864
OP Yotori Allah	11,523

<b>Farmers organization</b>	<b>Production 2018 ( in kg)</b>
OP ZUMUNTA	800
perimetreIrrigué	3,323
SCOOP Goursoumi	150
TaimakonJouna	150
Tun ga kai ni bongga	9,000
Union Adaltchi	300
Union Fahamey	3,750
Union MADDA BEN	109,850
Union Madeka	200
Union Raya IriMainagarta	40,050
Union SabonTsari	515
Union wafakaye	10,455
<b>Grand Total</b>	<b>349,747</b>

**Source:** Annuaire de production de semences 2018/2019

#### **g. Facilities and equipment available for seed processing and packaging in the country**

Facilities and equipment for seed processing can be grouped in two:

- Processing plants owned by government located in seed regional centers (created in 70's and 80's): 5 processing plants are now functioning: 1 in Iossa (Tillabéri region), 1 in Guéchémé (Dosso Region), 1 in Doukou-Doukou (Tahoua region), 1 in Kouroungoussaou (Maradi region) and 1 in AngoulGamdji (Zinder Region). INRAN also own 1 medium seed cleaner for breeder and foundation seed processing.
- Processing equipment owned by private seed companies are: 3 complete processing plants owned by Alheri S.A, Ainoma and Nagarta SARL. Husa'a and FESA also have a medium size seed cleaner each.

#### **h. Tonnages of seed certified and marketed in the past five years, by crop (in Metric tons)**

<b>Crop</b>	<b>2018</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>
<b>Pearl millet</b>	7268	5338	5679	5516	8372
<b>Sorghum</b>	492	483	403	390	1098
<b>Cowpea</b>	1198	832	1629	1894	2726
<b>Groundnut</b>	336	382	218	216	252
<b>Maize</b>	122	21	77	11	9
<b>Rice</b>	1	1.5	203	125	318
<b>Total</b>	<b>9417</b>	<b>7057.5</b>	<b>8209</b>	<b>8152</b>	<b>12775</b>

**Source:** Annales de disponibilité en semences de 2015 à 2019.

#### **i. Number of agro-dealers currently in operation, by region**

The concept of Agro-dealer is recent in Niger. Distribution of agricultural inputs have been achieved mostly through others farmers managed local “input shops”. “Input shops” were mostly developed by FAO funded project around 1999 and adopted by many other projects as the most efficient way for smallholder farmers to access inputs. It is even part and parcel of the national agricultural policy i.e “Initiative 3N”.

A large number of “Input shops” are established since, mostly by NGOs and other development projects. There is no current situation of the number of “Input shops” operating in the country. The last study conducted by then FAO “Input Project” in 2005 identified **288 inputs** shops all over the country. It is quite sure that the number of “Input shops” established so far has significantly increased but as for the number of those that are really functioning no record exist at present.

The distribution of inputs by private registered agro-dealers started very recently. Based on the public entity responsible for the registration of agro-dealers, we have three different groups of agro-dealers:

- Agro-dealers distributing phytosanitary chemicals registered by the General Direction for Plant Protection (Direction Générale de la Protection des Végétaux, DGPV)
- Agro-dealers distributing registered to market seeds by the General Direction of Agriculture (Direction Générale de l’Agriculture, DGA) through the DCCS
- Agro-dealers distributing fertilizer and equipment that are registered by the Central for the Supply of Inputs and Agricultural Equipment (Centrale d’approvisionnement des Intrants et Matériels Agricoles, CAIMA).

Most of the time, these agro-dealers distribute and market all the agricultural inputs and some are registered by the 3 entities. Recently, many projects tried to create organizations of agro-dealers.

The agro-dealers registered by the DCCS to market seeds (in application of Joint order n° 214 MAG/EL/MF of November 11th 2016 on rules of accreditation for the commercialization of seed) are seed companies in most of the cases and other private entities. The registration of seed companies allow them to set up a network of agro-dealers (wholesalers and retailers) for the commercialization of seeds. For other, it is way to be able to supply seeds to NGOs seeking for seeds.

Only 38 seed dealers are registered so far, but a large number of wholesalers and retailers are operating under their umbrella.

#### **j. Level of importation of certified seed from neighboring countries, by crop**

There is no record on the importation of seeds of major crops from neighboring countries. It can be possible through informal means between villages located near borders but it may likely be uncertified seeds. Only vegetable seeds (Lettuce, tomato, onion ...) are imported from abroad by private inputs dealers like Agrimex, Sahelia, Technisem etc.

#### **k. Summary of prospects for improving seed supply**

- Ongoing breeding activities on Pearl millet, Sorghum, Cowpea, Groundnut, Maize and Rice constitute an opportunity for the release of new varieties with higher potential.
- The increasing number of seed producers (both private seed companies and farmer based-organizations) well distributed in the country is an opportunity in improving seed production level
- The seed processing capacities of the seed companies is improved
- The existing network of agro-dealers (both independent and linked to seed companies) can help in increasing access of agriculture inputs including quality seeds to small scale farmers.

#### **IV. National Seed Policy Framework**

##### **a. Documents which control the production and supply of seed**

The document that is central for the control, the production and supply of seeds in Niger is the Regulation C/REG.04/05/2008 on Harmonization of rules governing quality control, certification and marketing of plant seeds and seedlings in ECOWAS regions. Following the gazetting of the regulation on June 3<sup>rd</sup> 2013, a number of national implementation acts have been adopted in the country:

- **Law 2014-67 of Novembre 05th 2014 completing the regulation** (in french Loi 2014-67 du 05 novembre 2014 complétant le règlement C/REG.4/05/2008 portant harmonisation des règles régissant le contrôle de qualité, la certification et la commercialisation des semences végétales et plants l'espace CEDEAO)
- **Order n° 121/MAG/DGA of september 16th 2014 on Creation, attributions, organization and functioning of National Seed Council** (Arrêté n°121/MAG/DGA du 16 septembre 2014 portant création, attributions, organisation et fonctionnement du Comité National des Semences Végétales et Plants)
- **Order n°122/MAG/DGA of september 16th 2014 instituting the national catalog for cropspecies and varieties**(Arrêté n°122/MAG/DGA du 16 septembre 2014 instituant un catalogue national des espèces et variétés végétales)
- **Order 123/MAG/DGA of september 16th 2014 instituting administrative documents used in control and certification of seeds**(Arrêté n°123/MAG/DGA du 16 septembre 2014 instituant les documents administratifs dans le cadre du contrôle et de la certification des semences des espèces végétales et plants)
- **Order 124/MAG/DGA on adoption of technical documents of rules on seedquality control and certification** (Arrêté n°124/MAG/DGA du 16 septembre 2014 portant adoption des documents techniques annexes relatifs aux règles régissant le contrôle de qualité et la certification des semences des espèces végétales et plants)
- **Order 197/MAG/DGA of September 28th 2015, modifying the order 121/MAG/DGA on NationamSeed Council Creation** (Arrêté n°197/MAG/DGA du 28 sep. 2015 modifiant et complétant l'arrêté n°121/MAG/DGA du 16 septembre 2014 portant création, attributions, organisation et fonctionnement du Comité National des Semences Végétales et Plants)

- **Order n°074 MAG/EL/DGA of May 30th 2016 of seedinspectors nomination** (Arrêté n°074 MAG/EL/DGA du 30 mai 2016 portant nomination des inspecteurs semenciers)
- **Order n°186 MAG/EL/DGA of 24th October 2016 modifying and completing order 074 MAG/EL/DGA** (Arrêté n°186 MAG/EL/DGA du 24 Oct 2016 modifiant et complétant l'arrêté n°074 MAG/EL/DGA du 30 mai 2016 portant nomination des inspecteurs semenciers)
- **Joint order n° 214 MAG/EL/MF of november 11th 2016 on rules of accreditation for the commercialization of seed**(Arrêté conjoint 214 MAG/EL/MF du 11 novembre 2016 portant règles régissant l'obtention d'agrément sur la commercialisation des semences des espèces végétales et plants)
- **Joint order n°215 MAG/EL/MF of november 11th 2016 fixing taxes level and condition of payment and encashement in relation to the control, certification and commercialization of seeds,** (Arrêté conjoint 215 MAG/EL/MF du 11 novembre 2016 fixant les taux et les modalités d'acquittement et de perception des taxes et redevances dans le cadre du contrôle, de la certification et de la commercialisation des semences)
- **Order n° 125 of May 31th 2017 fixing the on admission for control to seedprofessionals**(Arrêté 125 du 31 mai 2017 portant conditions d'admission au contrôle des professionnels des semences)
- **Order 126of May 31th 2017 on institution and delivery of identification card for seedprofessionals** (Arrêté 126 du 31 mai 2017 portant institution et délivrance de la carte aux professionnels de semences)
- **Order 127of May 31th 2017 fixing the minimum and maximum areas and the deadlines of declarations :** Arrêté 127 du 31 mai 2017 fixant les superficies minima et maxima et les délais de déclaration des cultures,
- **Order 128of May 31th 2017 fixing the conditions for packaging, storage and transport of seeds**(Arrêté 128 du 31 mai 2017 fixant les conditions d'emballage, de stockage et de transport des semences)

#### **b. Process for the official release of improved crop varieties**

The national catalog has been instituted by order n° Order n°122/MAG/DGA of September 16th 2014 of the Ministry of agriculture. It should content all the crop varieties released in the country. The National Seed Council is in Charge of determining how the catalog should be organized and managed.

The process of variety release is governed by the ECOWAS-UEMOA-CILSS regional procedures that been adapted by the national seed council (but not yet acted).

During the process of variety release, the main steps can be retained:

- The Direction of Seed Control and Certification in french Direction de Contrôle et de Certification des Semences in short DCCS (which is the permanent secretary to the National Seed Council) receives demands from individuals or corporates duly registered. The demand should contain two years results of DUS and VCU tests conducted in the country by any mandated research stations (INRAN, ICRISAT, Faculties,) and also some other administrative documents,
- The DCCS check whether the demand is complete or not (it is called administrative checking). If the demand is complete the DCCS notifies to the National Seed Council who call for the meeting of the Variety Release Sub-Committee (CTHV).

- The CTHV examines technically the demand and decides to accept or reject the demand based on the results provided.
- Successful demands are sent to the National Seed Council who accepts to release the varieties and propose to the Ministry of Agriculture to sign an order stating all varieties released at a particular time.
- The national catalog is then updated. The variety released at national level is also admitted at regional level.

### **c. Procedures for seed certification**

The DCCS is the national body for quality control and certification. The procedures for quality control and certification follows that of the ECOWAS but adapted to the national context. The technical guidelines (**Order 124/MAG/DGA on adoption of technical documents of rules on seed quality control and certification**) is used during the certification process. There are 2 main steps leading to seed certification in Niger: Field inspection and laboratory control.

- **Field inspection:** It starts from the declaration of production by the seed producer till harvest. This consists of controlling the origin of seeds to be multiplied, the cropping history of the plots, the isolation requirements, the varietal purity in the field, the level of infection and infestation by diseases and pests, presence of harmful weeds, etc. This is conducted by field inspectors located at the district level. The results of field inspection are sent at the national level. After a successful field control and harvest, samples of seed lot are sent for laboratory analyses which is the second step.
- **Laboratory analyses:** it is conducted either at regional laboratories or at the national seed laboratory located in Niamey. The samples undergo the following tests: purity analysis, 100 or 1000 seeds weight, moisture content test, germination test. Varietal purity test at the laboratory is not yet conducted.

The results from field inspection and laboratory analysis are used to certify seed lots produced. After certification, labels are affixed to each package.

To help the process of commercialization of seeds, a document named "annuaire de disponibilité des semences" is issued each year giving all details on seed produced, crops, varieties, location etc.

### **d. Current status of the regulatory agencies in charge of seed certification**

#### **– Active personnel**

The National Direction for Seed Control and Certification (Direction de Contrôle et de Certification de Semences, DCCS) is in charge of all aspects of seed regulation including seed certification. At the national level in Niamey, the permanent staff is composed of 8 active members. They are in charge of supervising a team of 77 sworn seed inspectors and lab technicians distributed all over the country (in regions, departments and districts).

The staff is relatively small with regard to the activities to be conducted. Also, the staff need capacity building in almost all areas.

– **Infrastructure**

The DCCS is endowed with a central seed laboratory in Niamey and 5 regional laboratories in Tillabéri, Dosso, Tahoua, Maradi and Zinder.

**e. Current status of basic (foundation) seed supply**

The foundation seeds are mostly supplied by INRAN seed unit which was created on June 16<sup>th</sup> 1998 with the following objectives:

- Improve breeder and foundation seed production for all major crops
- Contribute to a sustainable private industry in Niger

The supply of breeder and foundation seeds for the last 5 years is summarized on the following table (Production in Metric tons):

<b>Crop</b>	<b>2018</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>	<b>Total</b>
<b>Pearl millet</b>	16.065	15.87	12.10	32.53	26.25	102.815
<b>Sorghum</b>	6.224	4.62	3.63	10.35	7.87	32.694
<b>Rice</b>	1.013	0.90	0.78	1.75	1.69	6.133
<b>Maize</b>	0.526	1.57	1.46	0.36	3.173	7.089
<b>Cowpea</b>	8.905	5.27	4.58	5.74	9.58	34.075
<b>Groundnut</b>	3.133	2.30	2.00	8.11	4.34	19.883
<b>Total</b>	<b>35.866</b>	<b>30.53</b>	<b>24.55</b>	<b>58.84</b>	<b>52.903</b>	<b>202.689</b>

**Source:** INRAN Seed Unit, 2019

There is also a steady supply of Pearl millet breeder and foundation seed supply by ICRISAT Seed Unit.

**f. Procedures for production and supply of basic (foundation) seed**

Foundation seeds are produced by Research Institutes or any other institutions responsible for the release of varieties. However, a private company can produce foundation seeds under the supervision of the Institute. It is mostly done through contract between the Seed Company and the Institute. In some cases, Seed Company having technical capacity can access breeder seeds for the production of foundation seeds without contract.

– **Access by private seed companies to basic seed**

Any seed company can access foundation seeds produced by research Institutes at the beginning of the cropping season. The supply by the Institute is done according to the principle of “first come first serve”.

There is no planning of foundation seeds production based on the demand by seed companies. That is why the supply of foundation seeds is fluctuating.

– **Policies for supply of basic seed by private sector**

The seed regulation allows the production of basic seeds by the private sector. However, not all the seed companies have the technical capacities to produce basic seeds.

## **Summary and Conclusions**

### **a. Current status of access to improved seed among smallholder farmers**

Despite all existing opportunities (breeding programs, seed production entities, seed regulatory framework, distribution system) there is a limited access to improved seeds by smallholder farmers due to:

- Limited sensitization of farmers on the advantages of seeds of improved varieties
- Poor coverage of rural areas by seed distribution network
- Free distribution of seed of poor quality by the government and NGOs

There is however an improvement of seed distribution network by some private seed companies who are creating a large number of selling point in rural areas. For instance, the private seed company Aïnoma created 107 in 5 regions (Niamey, Tillaberi, Dosso, Tahoua and Maradi), FESA created 82 selling point in Maradi and Zinder, Alheri S.A has 46 selling points in Dosso, Tahoua and Tillaberi), Husa'awith 35 selling point in Dosso, Tahoua and Niamey and la Sahelienne Semences Halal seed with 35 selling points in Maradi, Zinder and Tahoua.

To further improve the access of smallholder farmers to high quality seeds the following suggestions can be made;

- Creation of more seed selling points in rural areas mostly in other regions not/less covered by the existing seed distribution network (Zinder, Diffa, Agadez)
- Incite private seeds producers and agro-leaders to develop efficient seed promotion and dissemination strategies
- Limit the free distribution of seeds to resource poor farmers in areas only when it is the appropriate solution to prevent food crisis

### **b. Current status of government support for improving seed systems**

The most significant support of the government is mainly through the public services:

- Variety development in public research institutions
- Production of breeder and foundation seeds to supply private seed companies
- Diffusion of improved varieties through public extension services
- Seed policy/regulation development and implementation

The government also invest important financial resources in the seed sub-sector. But the largest part of the investment is devoted to free seed distribution. Other aspects the seed value such research, quality control, are not appropriately supported. Also, seedprivate sectors (seed producers and distributors) although well-organized is almost overlooked by the government.

The government support for improving seed systems can be made more efficient if the following measures are taken:

- Establish a Seed Sector Support Fund(Fondsd’Appui au Secteur Semencier, FASS) managed by the National Seed Council in which both the public and private sector are represented
- Limit the role of public services (Ministry of Agriculture) to seed quality control and reduce its intervention in seed production and commercialization
- Backing the private sector (Producers and Agro-dealers) in increasing their production capacity and improve the seed distribution system in rural areas for the benefit of smallholder farmers.

### **c. Trends and opportunities for seed systems improvements**

Currently the following trends with regard to different aspects for seed systems improvements can be noted:

- Breeding programs:
  - an increase in the number of plant breeders for major crops (6 Mscand 2 PhDbreeders in 2010 against 4 Msc and 10 PhD breeders in 2019)
  - development and release of new varietiesincluding hybrids
- Seed production
  - An increasing number of seed companies operating in seed production (4 seed companies in 2010 to 21 seed companies in 2018)
  - Fluctuating level of breeder, foundation and certified seed production from 2014 to date
  - Increasing seed processing capacity developed by the private seed sector (from zero processing equipment owned by private seed companies to 3 complete processing plants and 2 medium size cleaning machine possessed by 5 different seed companies)
- Seed distribution
  - Emerging private distribution system which is progressively overtaking the old distribution system dominated by community managed “Input shops”
  - An increasing number of seed selling points (from less than 10 selling points in 2010 to 305 selling points established by 5 seed companies)
  - Limited seed promotion initiatives by the private sector
  - Continuation of free seed distribution by the government and NGOs which is disturbing the private seed business

- Seed utilization
  - Limited adoption of seeds of improved varieties by farmers due to low level of seed promotion
  - Increasing demand of seeds of specific varieties needed by increasing number of grain processors with small and medium processing capacities.

#### **d. Recommendations**

For an efficient public-private seed delivery system in Niger, the following recommendations can be addressed:

- **To the government**
  - Provide more financial support to national breeding institutions,
  - Provide equipment, logistics and training to the official quality control services
  - Implement appropriate seed policy measures to allow each actor to play his role in the seed value chain
  - Restrict the free seed distribution that can disturb the private seed business
  - facilitate the implementation of private seed producers associations
  - Establish the Seed Sector Support Fund
- **To the research institutions**
  - Adopt the demand-led breeding programs to develop more varieties to meet the end-users needs (farmers, processors, consumers)
  - Provide training to private seed producers in seed production technics and management
  - Increase the supply of breeder and foundation seeds to private seed producers
- **Quality control services**
  - Ensure appropriate supervision measures that can guarantee the quality of seeds produced and distributed to farmers
  - Provide training to private seed producers in seed regulation procedures
- **Private Seed Sector**
  - Follow the seed regulations to guarantee the quality of seeds supplied to farmers
  - Invest more in seed promotion and dissemination activities
  - Develop the private seed distribution network in rural areas to reach more smallholder farmers
  - Invest more in training staff in technical management
  - Develop their own seed marketing strategies that will focus on supplying the seeds produced directly to farmers

#### **e. Likely impact from the improvement of access to improved seed by smallholder farmers**

- Increase yield and major crops production in the country
- Improvement of food and nutritional security in the country
- Supply raw materials to processing industries.
- Improvement of farmers' incomes and welfare.

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