

SEED SYSTEM SECURITY ASSESSMENT

CENTRAL AND EAST REGIONS

BURKINA FASO

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Typically site assessment teams are comprised of staff from different organizations and some working in different parts of the region or country as opposed to the same zone as the assessment. Due to the short notice of this assessment the teams were not mixed which introduced a constraint in action planning as enumerators tended to approach the assessment and key findings through the prism of the FASO project which they had been implementing in these sites during the past few years.

The perspective of many people interviewed across the sites is reflected in the assessment: men and women farmers, seed producers, government officials, agro-dealers, grain traders, and others. The data, interpretation of data, and key insights are drawn from these different seed system actors. We believe this assessment has identified clear opportunities for seed system investments and practical action in the short and medium-term.

A more detailed action planning, involving a cross section of seed sector specialists and focused on the key cross sites findings and recommendations, is warranted. This could be done by using the data from this assessment and building on the identified action areas to make them more detailed, time bound, and to specify the roles and responsibilities of the most important seed system actors for each of the priority action areas.

Acronyms

ANES-BF : Association nationale des entreprises semencières du Burkina Faso

ASIWA : Alliance pour une Industrie Semencière en Afrique de l'Ouest

CEDEAO : Communauté Économique des États de l'Afrique de l'Ouest

CNS : Comité National des Semences

COAfEV : Catalogue Ouest Africain des Espèces et Variétés Végétales

COASem : Comité Ouest Africain des Semences Végétales et Plants

CORAF : Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles

CPF : Confédération Paysanne du Burkina Faso

DGPV : Direction Générale des Productions Végétales

DHS : Distinction, Homogénéité et Stabilité

INERA : Institut de l'Environnement et de Recherches Agricoles

MAAH : Ministère de l'Agriculture et des Aménagements Hydrauliques

PDDAA : Programme Détaillé pour le Développement Agricole en Afrique

PME : Petite et Moyenne Entreprise

PSAO : Programme Semencier pour l'Afrique de l'Ouest

ROPPA : Réseau des Organisations Paysannes et des Producteurs de l'Afrique de l'Ouest

UEMOA : Union Économique et Monétaire de l'Afrique de l'Ouest

UNPS : Union des Producteurs Semenciers du Burkina Faso

USAID : Agence des États-Unis pour le développement international

WASP : West Africa Seed Programme

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EXECUTIVE SUMMARY

This report presents the results of a Seed System Security Assessment (SSSA) in three sites within the Center-North and East Regions of Burkina Faso. The sites included Tougouri department, Namentenga Province (Center – North Region); Thion department, Gnagna Province (East Region); and Bartiebogou department, Komandjari Province (East Region). The assessment took place in from mid-October through early November 2017.

The SSSA was conducted in these three provinces for three main reasons:

1. These provinces have been a focus of a food aid program (DFAP) funded by the US Agency for International Development / Office of Food for Peace since 2009. The SSSA can serve as a seed system review and reflection for this program and a range of other agricultural programs funded by other organizations in the same program area.
2. Seed systems are seen as a critical entry point for increasing agricultural productivity. CRS is planning for a new DFAP from 2018 in the same regions and wishes to get a better understanding of what seed system investments may be most warranted based on existing opportunities and the status of seed systems in these regions.
3. The assessment also built the seed assessment capacity of CRS partners. OCADES and TinTua staff were trained on the methodology, process, and tools in conducting seed system security assessments. At each site a participatory feedback session was carried out on the last day to highlight and discuss key issues. This was based on the household surveys, key informant interviews, and the perspective and insights from the enumerators. The SSSA in Burkina Faso was organized so that participants gained capacity in conducting seed system assessments and could be better prepared and training to replicate an SSSA in additional sites in Burkina Faso (for more on tools and methodology of SSSA please go to SeedSystem.org).

This report presents findings across the all three sites followed by summary recommendations based on the key cross site findings.

Cross Site Seed Findings

HH data

- No sign of seed insecurity in our target sites. HH didn't have trouble accessing seed.
- Plenty of access to new varieties.
- New varieties are mostly provided for free and few are bought from formal seed sources like agro-dealers or seed producers.
- HHs are primarily accessing seed from own saved stock followed by government and NGO's. Much less accessing seed from Agro-dealers, friends/family/neighbors, or local markets, except for a few cases (cowpea, peanuts).
- The government and projects provide an important source of seed as reported by households at all three sites of the assessment.

- Almost all HH have accessed seed aid in the last 5 years.
- A high percentage of HH received seed aid multiple times over the last 5 years.
- HHs apply organic amendments to their fields from diversified sources (but the women are not composting).
- A strong percentage of HHs apply (expensive) chemical fertilizers despite their limited means.
- HHs use seed treatment, primarily on cereals. It's a widely reported phenomenon that is used by a minority of farmers.
- Storage loss was not a major issue.

Agro-dealers

- Excluding vegetable seed, seed sales make up no more than 25% of their business (their business is not seed).
- Agro-dealers generally expressed interest in building their seed business.
- Agro-dealers are showing dynamism and innovation in their sales and marketing approach (agents, mobile money, collaboration with other agro-dealers).
- Their 2 main constraints are the late arrival of seed and a limited amount working capital/credit.
- Two additional constraints are permits/certification and the lack of distribution networks.
- Agro-dealers can now sell seed to government and NGOs.
- The market for the agro-dealers has become more favorable (legal changes since 2015).
- The number of agro-dealers is very limited.

Seed Producers

- Seed producers generally lack an entrepreneurial spirit.
- Seed producers are well organized into producer unions.
- Legal changes are underway to make the seed structure more business friendly and harmonized with regional laws (OHADA).
- Seed producers are orienting their production toward government and NGOs, but not toward farmers and agro-dealers.

- Production decisions are driven by government and the market is not functioning.
- There are multiple cases of supply and demand not meeting (2017: overproduction of sorghum by 30 tons in Komandjari, and underproduction of peanut and cowpea in Thion).
- Lots of cowpea fields are declassified because of insect attack during flowering period.
- The auxilier semencier provincial works closely with seed producer unions – he is the primary source of technical support for seed producers and he heavily influences the crops and varieties that are produced.
- Current seed law stipulations on minimum amount of land for seed production hinders women and vulnerable populations from becoming seed producers.
- Too much seed is being produced. There is no indication that the amount of seed being produced could be sold at its current price.

Local Market

- Very limited reported sourcing from local markets, except for cowpea, peanuts, and sesame.
- Multiples cases of farmers sourcing seed from local markets, and grain traders selling seed, but HH data indicates it is not a significant source (under exploited opportunity to leverage local grain markets for seed value chain development and for promoting access to new varieties).
- The sale of seed at the local market strengthens the vendor's customer base for grain.
- Seed sales at the local market are based on trust and accountability.
- Reported cultural reticence to buying seed in the local market

Government

- Government play a massive role in the seed system (production, distribution, pricing, legal framework).
- Government subsidies to seed producers is the foundation of seed producers' business.
- The structure and processes of government seed distribution are becoming more developed (compared to before), but variable results in targeting the vulnerable.
- Basic seed production continues to present a challenge in terms of providing quantity/quality/price despite significant improvements.
- INERA seed fairs are innovative and present an excellent opportunity.

- Many examples of a lack of basic seed for specific crops (cowpea) and specific varieties
- The collaboration between seed enterprises and seed producers does not exist.
- There is a lack coordination of seed activities at the communal level between government and NGOs

NGOs

- There is a lack coordination of seed activities at the communal level between government and NGOs.
- The amount of seed that NGOs provide to a given farmer is unnecessarily high, and it's potentially creating dependency.
- Large seed purchases from NGOs (appel d'offre) can destabilize the market.
- NGOs are an important source new varieties, innovations, and training for farmers.
- NGOs need to coordinate seed subsidies to avoid creating perverse competition among farmers.

Recommendations

The SSSA was conducted across three sites in Burkina Faso and covered 242 households. The recommendations are oriented to action areas which can help farmers to alleviate chronic stress and which can position the seed system to be more dynamic, responsive, and sustainable. Overall, the SSSA did not identify seed insecurity which would warrant an emergency response or "quick one-off" set of seed system activities. The seed security issues identified by the assessment were more chronic. They require a more integrated and coordinated approach, working with a breadth of actors from the public and private sector, and with a longer term perspective and emphasis.

The recommendations below are practical and feasible. Implementation of these broad action areas will lead to positive seed system changes within a four year time frame. This set of recommendations is applicable across the SSSA sites and are clustered into four themes: expand varietal diversity; diversify sources and means through which new varieties are accessed; innovate approaches to support entrepreneurial seed producers; and improve seed productivity through promoting seed dressing and composting.

A more detailed action planning, involving a cross section of seed sector specialists and focused on the key cross sites findings and recommendations, is warranted. This could be done by using the data from this assessment and building on the identified action areas to make them more detailed, time bound, and to specify the roles and responsibilities of the most important seed system actors for each of the priority action areas.

1. Expand Varietal Diversity

Overview

There is substantial scope to expand varietal diversity. The focus for new variety access should be placed on sorghum, millet, cowpea, rice, and sweet potato. Modern, farmer-acceptable, and market preferred crops and varieties have to continually feed into local production systems. This will help farmers be more resilient in terms of adapting to changes in temperature and rainfall, in some case boost and in other cases stabilize yields, and expand market possibilities through access to more crop and varietal germplasm options. Across sites, only new cowpea varieties have entered farming systems in a significant way over the past five years. Otherwise, varietal turn-over and varietal diversity as measured by what farmers consider to be 'new varieties' is weak.

The SSSA showed that over 87% of households (n=239) across all three sites had accessed a new variety in the past five years with an average of 1.9 new varieties reported per household. However, further analysis reveals that access to new varieties was limited in terms of crops, varieties per crop, and in terms of sources by which households accessed new varieties.

Across the three sites, the SSSA had 383 reports of new varieties during the past five years of which 78% of these reports were for only three crops: cow pea (134 reports), sorghum (105 reports), and rice (58 reports). Millet and maize, both of which were top five crops in terms of total seed planted during the most recent campaign of 2017 and projected planting in the 2018 campaign, accounted for only 12% of the reports of new varieties received during the past five years (30 report for maize and 16 reports for millet). There was a single report of a new sweet potato variety.

For sorghum, community interviews and discussions with key informants (seed producers, district authorities) revealed that Kapelga was almost exclusively the new sorghum variety produced and accessed by farmers across all three sites. Sariaso 11 was also noted as being produced by a few seed producers. Both are earlier maturing varieties. Sariaso 11 was released by INERA in 1996. Kapelga was released by INERA in 1999. There are 23 sorghum varieties in the Burkina Faso seed catalogue as of 2017.

For rice, key informants revealed that FKR 19 (flood plain, released in 1986) and FKR 45 N (rain fed, released in 2006) were the dominant new rice varieties produced and accessed by farmers across all three sites. These are 7 rice varieties in the Burkina Faso seed catalogue as of 2017.

For cow peas, key informants revealed that Komkalle, Nafi, and Tilligre were widely produced and the three sites. Several cow pea seed producers acknowledged growing all three varieties. These varieties were released in 2012 and are highly tolerant to thrips and short cycle (60-75 days). There are 12 cow pea varieties in the Burkina Faso seed catalogue as of 2017.

For millet, key informants revealed two varieties were being promoted as new varieties in the assessment areas: Misari 2 (85 days) and IKMV8201 (80 days). None of the seed producers interviewed were producing millet seed. Misari 2 was released in 2009 and IKMV2801 was released in 1986. There are 7 millet varieties in the Burkina Faso seed catalogue as of 2017.

Problem: New varieties are limited in terms of both crop and varietal diversity.

Seed System Goal: Increase the diversity of improved locally adapted germplasm.

Tasks	Actions	
	1-2 seasons	+ 3-4 seasons
Identify available catalogued germplasm of sorghum, millet, cowpea, rice, and sweet potato which meet the desired varietal characteristics of farmers in target intervention zones.	Work closely with INERA and identify three candidate varieties per crop per intervention zone.	Continually identify potential germplasm through collaboration with INERA and INERA research partners (Universities / CGIAR) involved in plant breeding for these crops.
For sorghum and millet, identify land races whose attributes meet the desired characteristics of farmers in target intervention zones.	Identify material from both formal breeding and local genetic sources and introduce land races from areas of similar agro-ecologies. Conduct in community adaptability trials directly with farmer by providing very small quantities (50-100 grams per variety) and up to three varieties per farmer.	Link seed producers and agro-dealers with the results from adaptability trials so that they better under farmer demand for the different sorghum and millet varieties.
For cow pea, focus on exposing communities to the performance of the varieties released since 2010.	Conduct PVS for all varieties in a community site with one trial per village covered by program intervention.	Link seed producers and agro-dealers with the results from adaptability trials so that they better under farmer demand for the different cowpea varieties.
For rice, identify three irrigated and three rain fed varieties	Conduct PVS for rain fed and irrigated varieties; one PVS for irrigated rice per BAS FOND throughout the program intervention areas and two PVS for rain fed per per commune.	Link agro-dealers with the results from adaptability trials so that they better understand demand for rice varieties.
For sweet potato, identify at least 2 orange fleshed and 3 white flesh varieties.	Identify up to 12 farmers per commune with access to irrigation to manage a PVS plot.	Provide technical training and support to small scale sweet potato vine multipliers.

2. Diversify the Sources and Means by which New Varieties are Accessed

Overview

There is substantial scope to expand the sources and means through which new varieties are accessed. The focus on sources should be placed on seed producers, local grain traders, and agro-dealers. These three sources were not important source of new varieties – accounting for under 10% of all reported sources (372 citations of new sources were noted in the SSSA). The focus on new means through which new varieties are accessed should be aimed towards the innovative use of vouchers and partially subsidized coupons.

Across the three sites, the SSSA had 372 reports of sources of new varieties during the past five years of which 81% were NGO's/FAO (169 reports) and Government (135 reports). Friends, family, and neighbors accounted for 13% (47 reports) while local markets, ago-dealers, and seed producers combined accounted for 6% (21 reports) of the reported sources of new varieties during the past five years.

Across the three sites, the SSSA had 231 reports for means by which new varieties were accessed during the past five years of which 48% (112 reports) were by direct distribution, 25% (58 reports) gifts from friends and neighbors, and 23% was from either direct purchase (31 reports) or vouchers (23 reports).

It is excellent that the government and NGO's are such an important source of new varieties. However, farmers will have more options through promoting existing but under used sources for new varieties and in some cases establishing new channels by which farmers access new varieties. Some other seed sourcing channels which can be used to promote new variety access include seed producers, local grain traders, and agro-dealers. Each of these sources could benefit from access to technical training and support in marketing and in packaging seed in small packets.

By law, seed producers are currently not allowed to sell seed to individual farmers. Change in seed regulation is necessary to enable seed producers to sell directly to individual farmers. Alternatively, seed producers can be encouraged to partner with agro-dealers and sales agent working in local markets to sell certified seed. The number of agro-dealers in all three of the sites was quite limited. In the course of the SSSA in Bartiebogou we identified only three agro-dealers.

While seed producers and agro-dealers could serve as sources to access new varieties, seed dealers or agents working in local markets could also be a key new sourcing option if they could establish a legal / regulatory right to sell certified seed. These agents could operate on a commission basis where-by they hold a seed inventory during planting season on behalf of a seed producer or agro-dealer. In return for holding the inventory at free of charge, they charge a commission (30-50%) on the value of each transaction and maintain records of all sales.

Problem: New varieties are made available to farmers through limited sources and mostly by gift or free distribution.

Seed System Goal: Expand the sources and use innovative means through which farmers access new varieties.

Tasks	Actions	
	1-2 seasons	+ 3-4 seasons
Broaden sale venues for new varieties to stimulate the creation of a broader customer base. Expand the sources and innovative means through which new varieties are accessed.	Link under-utilized seed sources (seed producers, local grain traders, agro-dealers) with PVS results in the commune. Invite them to open field days, provided summary data sheets on varieties and performance, provide contacts information for certified and basic seed producers. Where possible, variety testing trials and demonstration in close proximity to where sales are taking place.	Farmer focused, VERY small packs sales (50-100 grams) with very small quantities (requiring small inventory) can be done across a range of venues where farmers buy seed. Small pack seed would all be certified and the models aimed to expand sources by farmer customers access high quality seed.
Support Seed Producers to identify new sales outlets and to carry a wider variety of crops as they will be under more pressure to find markets beyond the government and NGO's.	Work with seed inspectorate and seed producers to help them sell seed directly to farmers. Link seed producers with PVS / variety assessment trials. Train seed producers in seed marketing.	Help seed producers to carry a wider variety of crop. Work with seed inspectorate and producers to identify innovative ways by which producers can increase diversity of seed production and still certify production.
Support Local Grain Traders as sources of new germplasm and certified seed and help them improve quality of seed they put on offer. Seed/grain traders can have a large positive impact in helping to farmers to access new varieties.	Identify seed/grain traders in main markets that are willing to maintain a small inventory of certified seed. Link local grain traders with PVS / variety assessment trials. Train seed/grain traders on better storage techniques.	Support traders to learn about new variety identification, attributes and management. Strengthen local market channels that all farmers use on a regular basis to access as source of new germplasm.
Support Agro-Dealers to be more prominent sources of new germplasm and certified seed. Help agro-dealers to become be better integrated with seed producers, variety assessment trials, and seed business development services	Link agro-dealers with PVS / variety assessment trials. Advocate that seed aid programs use voucher and coupons re-imbursed through agro-dealers. Train and support agro-dealers to maintain documentation on seed and other agricultural inputsales. Encourage agro-dealers to use small packs.	Identify and facilitate credit facilities with banks and agricultural loan programs.

Tasks	Actions	
	1-2 seasons	+ 3-4 seasons
(credit, sales & marketing, packaging).	<p>Provide credit to agro-dealers so that they can maintain an inventory of seed during planting season.</p> <p>Transport and inventory credit to encourage agro-dealers to sell certified seed closer to farmer, such as at weekly markets during planting season.</p>	

3. Innovate Approaches to Support Entrepreneurial Seed Producers

Overview

The network of seed producers and seed producer union is well organized across all three of the assessment sites and reflect the significant investment and policy focus from the Burkina Faso government since 2006. This has led to a big increase in area of seed production, wider range of varieties, and the total quantity of seed produced. However, the system is predicated in significant levels of subsidies and is not market oriented. Nearly all seed producers interviewed noted that their business is dependent on selling to the government. Seed unions reported selling certified seed in large lot tenders to NGO's supported by USAID funding. Discussions with seed producers and seed unions across all of the sites revealed that the government prices and even the NGO price at which certified seed is purchased is typically sold at a 200-800% mark up from grain prices. The level of subsidy encourages certified seed production but also results in seed surplus. For example, the Komandjari Seed Union reported a 30 metric tons surplus of certified sorghum seed in both 2016 and 2017. The high rates of subsidies does not encourage entrepreneurial spirit or market orientation from seed producers as they focus almost exclusively on selling to the government. At the same time, certified seed standards are strict, with a minimum of 3 HA of land required for a certified seed producer, which is a barrier to entry for many potential seed producers.

Change is underway in Burkina Faso and discussions with two seed unions revealed that de-regulation of seed law is expected. Changes to the seed law in 2016 allowed for seed enterprises and agro-dealers to compete with seed producers in bidding on government seed contacts and moving seed from one province to another. This means that agro-dealers and seed enterprises can act as seed traders, buying certified seed in one part of the country and selling it in another. This trend of de-regulation is expected to continue. As of late 2017, seed unions reports that legal changes are under way to harmonize regional seed laws (OHADA) which will make it feasible for seed producers in Burkina to sell into neighbouring countries and vice-versa.

Problem: Certified Seed Producers in Burkina Faso are not entrepreneurial and are not well equipped to adapt to more de-regulated and competitive seed market.

Seed System Goal: Support the development of a network of entrepreneurial market oriented certified seed producers less dependent on government and NGO contracts for their survival.

Tasks	Actions	
	1-2 seasons	+ 3-4 seasons
Develop and launch a “direct seed marketing” program to help seed producers sell seed directly to farmers.	<p>Work with government authorities to test and learn from pilot direct seed marketing program where seed producers sell directly to farmers through organized seed markets and registered seed dealers / agro-dealers.</p> <p>Stimulate organized seed markets through introducing market subsidies (vouchers) to encourage more buyers and sellers to participate.</p>	Identify and address seed policy and seed regulatory issues which make it difficult for seed producers to sell directly to farmers or to local registered seed dealers and agro-dealers.
Establish an information platform for seed producers to access up to date information on availability of basic seed; certified seed prices in different locations; and relevant seed policy impacting seed producers.	<p>Create an open access information platform managed centrally with technical support from economists and IT specialists.</p> <p>Make user interface simple and oriented to seed producers (accessible via mobile phone messaging).</p>	Transfer management of information platform to an independent commission made up of seed producers, INERA, and seed inspectorate.
Identify and facilitate access to credit (working capital loans for seed producers)	Identify and facilitate credit facilities with local banks and agricultural loan programs.	

4. Improve Seed Productivity by Promoting Seed Dressing and Composting

Overview

Chemical and organic fertilizer as well as the use of seed dressing can raise overall seed productivity in terms of seed use (lower the use of seed due to higher germination rates and greater plant vigour and increased the yield from each seed planted).

Seed dressing was added as a question to the survey after completing the first site of Togouri. The rationale for its inclusion was the recognition that it is a growing practice throughout the Sahel. Not surprisingly, nearly 2/3 of household’s surveyed indicated that they used seed dressing in the previous season. Farmers indicated that without seed dressing they often must reseed between a quarter and a half of their fields. Seed dressing is gaining importance because it reduces the need for replanting, which exacerbates the labor constraint at a critical labor period in the agricultural season (once farmers finish planting all of their fields, they immediately return to the first field to begin weeding). Seed dressing also contributes to the resilience of farmers because it enables them to take advantage of the first rains, rather than

replanting up to half of their field 10 days after the first rains, once they can surmise where germination did not occur.

Seed Dressing, particularly Apron Star, increases resilience to drought and reduces labor during the critical period when the labor is especially constraining. CRS trainings should focus messaging on the labor and resilience benefits of seed dressing when promoting its adoption. Demonstration plots should include a plot that demonstrates the results of Apron Star combined with reduced fertilizer expenditure (reflecting the real-life decisions farmers must make). CRS should also engage farmers in discussions about selling their labor after the first rain in order to buy Apron Star, which can reduce overall labor and result in earlier yields, due to higher germination rates and reduced replanting. This can be a hard sell because cultural practices dictate that a farmer should sow his own fields at the critical timing, thus demonstration plots should include a plot that shows the results of planting 5 days late with Apron Star.

Despite prolific use of manure, focus groups with female farmers revealed that they are not composting. Composting is an excellent way of improving the efficacy of organic soil amendments. The main barrier to composting for West African farmers is most often labor. Watering the pits at frequent intervals and transporting the compost to the fields make composting very laborious. Nevertheless, female farmers are in a unique position to reduce the labor necessary for composting by (1) digging a cubic meter compost pit near or in their concession, (2) including kitchen scraps, ash, and other household detritus in their pits, and (3) watering the pits with wastewater from their daily washing duties (dishes, children, and clothes). CRS experience in other West African Countries has shown that once women experience the efficacy of compost pits in or near their concessions, they become champions of the practice.

CRS should promote the benefits of composting (in piles or pits) via demonstrations of its efficacy. Pits are less labor in the long run because a farmer only digs the hole once and they make more efficient use of the water, which is a repeated cause for labor. However, if the upfront labor of digging a hole dissuades adoption, piles make a good intermediary step in the adoption of composting.

Problem: Tried and proven methods to increase seed productivity are not widely practiced.

Seed System Goal: Maximize the productivity of seed through seed dressing and organic manure.

Tasks	Actions	
	1-2 seasons	+ 3-4 seasons
Increase use of seed dressing to help farmers be more resilient to drought and improve seed productivity (raise germination, plant vigour, and reduce need to re-seed).	Demonstration plots with and without use of seed dressing (ApronStar). Credit support to agro-dealers and village level boutiques to encourage them to carry seed dressing	Lead farmers (one per village) serve as seed dressing distributor linked to an agro-dealer in exchange for managing a seed dressing demonstration plot.

Tasks	Actions	
	1-2 seasons	+ 3-4 seasons
	<p>products (Apron Star) at start of planting season.</p> <p>Selective use of voucher / coupons to encourage farmers to try seed dressing.</p>	
Increase use of composting to increase availability and use of organic fertilizer and improve seed productivity.	<p>Demonstration pits and training on pits construction, compost management, and compost application.</p> <p>Selective use of “composting rewards” for farmers following best composting practices.</p> <p>Selective use of labor vouchers to facilitate movement of compost to fields during periods of critical labor shortage.</p>	<p>Village managed labor credit fund / labor vouchers enables for sustainable mechanism to overcome labor constraint to composting.</p> <p>The village labor credit fund for agriculture works with the Village Development Committee and establishes a governing structure and by-laws.</p>
Improve understanding of adoption / best practices for both seed dressing and composting.	Baseline study of adopters and non- adopters and key behavior traits of each group.	Mid-term study to track progress for both use of seed dressing and composting: adopters and non-adopters and behavior trait of each group.

I. INTRODUCTION

Rationale for Seed System Security Assessment (SSSA)

This report presents the results of a Seed System Security Assessment (SSSA) in three sites within the Center-North and East Regions of Burkina Faso. The sites included Tougouri department, Namentenga Province (Center – North Region); Thion department, Gnagna Province (East Region); and Bartiebogou department, Komandjari Province (East Region)

These provinces have been a focus of a food aid program (DFAP) funded by the US Agency for International Development / Office of Food for Peace since 2009. The SSSA can serve as a seed system review and reflection for this program and a range of other agricultural programs funded by other organizations in the same program area.

Seed systems are seen as a critical entry point for increasing agricultural productivity. CRS is planning for a new DFAP from 2018 in the same regions and wishes to get a better understanding of what seed system investments may be most warranted based on existing opportunities and the status of seed systems in these regions.

The assessment also built the seed assessment capacity of CRS partners. OCADES and TinTua staff were trained on the methodology, process, and tools in conducting seed system security assessments. At each site a participatory feedback session was carried out on the last day to highlight and discuss key issues. This was based on the household surveys, key informant interviews, and the perspective and insights from the enumerators. The SSSA in Burkina Faso was organized so that participants gained capacity in conducting seed system assessments and could be better prepared and training to replicate an SSSA in additional sites in Burkina Faso (for more on tools and methodology of SSSA please go to SeedSystem.org).

Report Structure

The report presents the results of the SSSA in Center-North and East Regions of Burkina Faso in October 2017. It presents the findings of the seed system assessment across three sites.

Chapter II introduces the SSSA methodology, methods used in the October 2017 assessment, and describes the three sites of the assessment.

Chapter III provides a summary background to Burkina Faso Seed Systems including a summary of major developments over the past ten years.

Chapter IV presents the main field findings of the HH survey.

Chapter V presents the recommendations across sites.

II. BACKGROUND TO SEED SYSTEM SECURITY ASSESSMENT (SSSA)

The Concept of Seed Security

Farm families are seed secure when they have access to seed (and other planting material) of adequate quantity, acceptable quality, and in time for planting. Seed security is best framed within the broader context of food and livelihood security. Helping farmers to obtain the planting materials they need enables them to produce for their own consumption and sale.

Achieving seed security is quite different from attaining food security, despite their obvious links. One can have enough seed to sow a plot but lack sufficient food to eat, for example during the 'hungry season' prior to harvest. Conversely, a household can have adequate food but lack access to appropriate seed for planting. Despite these important differences between food security and seed security, determinations of seed security are normally based, implicitly or explicitly, on food security assessments. This results from a lack of appreciation and understanding of seed security issues.

The Dimensions of Seed Security: a Framework

The concept of seed security embodies several fundamental aspects. Differentiating among these is crucial for promoting those features that foster seed security as well as for anticipating the ways in which such security might be threatened. Table 2.1 outlines the fundamental elements of seed security: seed has to be available, farmers need to have the means to access it, and the seed quality must be sufficient to promote good production.

Table 2.1: Seed security framework, basic elements

Parameter	Seed Security
<i>Availability</i>	Sufficient quantity of seed of adapted crops is within reasonable proximity and in time for critical sowing periods.
<i>Access</i>	People have adequate income or other resources to purchase or barter for appropriate seeds.
<i>Quality</i>	Seed is of acceptable quality: <ul style="list-style-type: none"> • 'healthy' (physical, physiological and sanitary quality) • adapted and farmer-acceptable varieties

Source: Remington *et al.* 2002.

Availability is defined narrowly as whether a sufficient quantity of seed of target crops is present within reasonable proximity (spatial availability) and in time for critical sowing periods (temporal availability). It is essentially a geographically based parameter, and so is independent of the socioeconomic status of farmers.

Seed **access** is a parameter specific to farmers or communities. It largely depends upon the assets of the farmer or household in question: whether they have the cash (financial capital) or social networks (social capital) to purchase or barter for seed.

Seed **quality** includes two broad aspects: seed quality *per se*, and variety quality. Seed quality consists of physical, physiological and sanitary attributes (such as germination rate and the absence or presence of disease, stones, sand, broken seed or weeds). *Variety quality* consists of genetic attributes, such as plant type, duration of growth cycle, seed color and shape, and palatability.

In situations of stress, it is rare to have constraints in all three seed security features at the same time. The challenge is to identify the real problem and then to target actions that alleviate well-defined problem.

Seed System Security Assessment

The SSSA reviews the functioning of the seed systems farmers use and looks at the different sources through which they access seed. It asks whether seed of adequate quality is available and whether farmers can access it. The SSSA also promotes strategic thinking about how the seed system functions by maintaining a focus on farmers, what their practices have been in terms of seed sourcing, and what their strategy will be in the next season in terms of seed sourcing.

Methods Used

The themes and methods used in the Burkina Faso SSSA are shown in Table 2.2. They include a range of qualitative and quantitative methods and draw on a variety of seed stakeholders but with a focus on farmers. The sample sizes was relatively large for a rapid assessment on relatively short notice: 242 individual farmer interviews, 8 trader interviews, 8 seed producers interviews, 4 agro-dealer interviewers, and focus group discussions at each site, and key informant interviews.

Table 2.2: Investigative methods used in the SSSA Burkina Faso, October 2017

Type of Investigation	Commentary
Background information collection	Project reports, regional and country specific documents, power point presentation from CRS on Burkina Faso Seed Systems
Government data	Agriculture and seed production and distribution data/demographic data
Key informant interviews	Seed Producers (selling only certified seed) Agro-dealers Government /project personnel
Focus group discussions (FGD)	Separate community and women FGD in most sites. Trends in agricultural, variety use, and seed sourcing strategies. Key crops and seed constraints/opportunities .
Farmer interview s (N=242)	Seed sources /Input use/ Access to new varieties/ seed aid.
Agro-dealers (N=4)	Seed market development, key constraints & opportunities.
Seed Producers (N=8)	Crop and variety production decisions, key constraints & opportunities, major buyers, perspective on future.

Seed/grain market traders (N=6)	To what extent and under what conditions are grain markets a source of seed? Seed/grain market movements.
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Household sample

The overwhelming focus of this SSSA was quantitative household interviews. The rationale for focusing on a relatively large HH sample size was because there were very few experienced seed system staff involved in the SSSA relative to the number of sites (3) and so the strategic decision was to focus local staff resources on HH surveys. Most, not all, of the qualitative investigations (seed producers, agro-dealers, traders) were conducted by CRS staff and the lead consultant.

Households were largely chosen without bias. Within each site, approximately half the households were located in larger more densely populated villages and half in more dispersed villages. Enumerators were instructed to fan out in diverse directions from a central location point in each village and to interview every 3rd or 4th household (depending on density of household in the village) and to conduct the interviews at the household. However, in two instances during the SSSA in Burkina Faso, enumerators were found to be calling targeted household to a central location where interviews were conducted. This was strongly discouraged and the enumerators and their team leaders were instructed that this can lead to a bias in terms of the HH head or representative who could be available to leave the household to convene in a central location. The enumerators and their organizations (OCADES / Tintua) were well known within the sites of the assessment.

Of the 243 HH interviewed, nearly 30% were noted as “displaced” while 86% were adult headed. The 30% ISD figure was due to a misunderstanding of the term “IDP” (internally displaced person) which was translated as ‘have you moved to a new location’. The reported IDP rate was close to 65% for female and 6% for males which reflects the cultural practice at all sites of women moving to their husbands village.

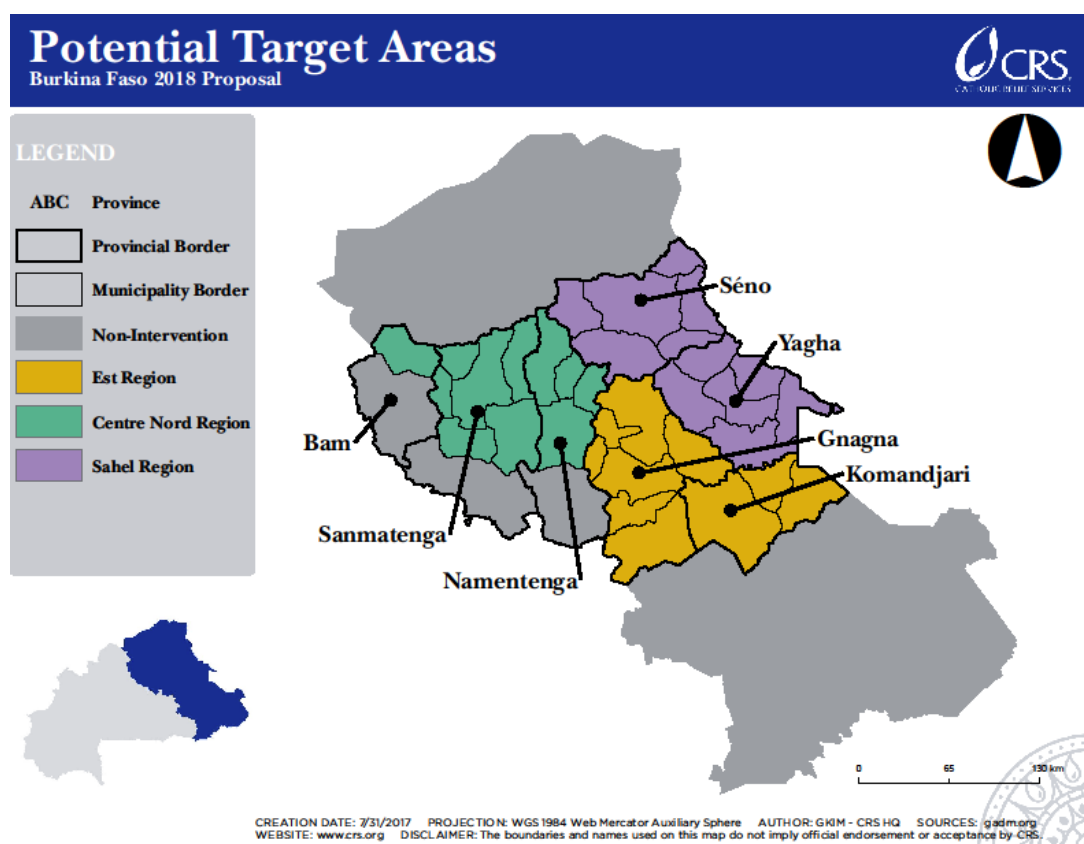
Table 2.3: SSSA Burkina Faso, household (HH) sample characteristics (N =243)

Feature	Description	% Sample		
Type of HH	Adult-headed	86.3		
	Grandparent-headed	5.3		
	Child-headed	8.4		
Resident status	Resident	69.7		
	IDPs	30.3		
Gender of HH head*	Male	58.3		
	Female	41.7		
Area cultivated (ha)	< 0.5	1.7		
	0.5-1.0	69.2		
	>1.0- 2.0	13.5		
	>2.0	15.6		
Household size	Average	Standard deviation	Minimum	Maximum
	10.6	5.4	3	37
Age of HH Head	44.0	13.2	5	92

Site Choice

CRS Burkina Faso made the site decisions. Assessment sites were chosen to link the assessment findings and recommendation with the projected target areas to be covered by a DFAP. At the time of the assessment, DFAP target areas had not been announced. The three assessment sites represented CRS Burkina Faso's best assessment in October 2017 of DFAP target areas which could be safely accessed for an in-depth field based assessment.

Figure 2.1. Geographic location sites in Center-North and East Regions of Burkina Faso for SSSA October 2017



A summary of the basic site parameters appears as Table 2.5 below. These were elicited from a launch meeting of staff from OCADES and TinTua working in these provinces. Given that the SSSA team sketched basic characteristics as unusually similar, the report and analyses have clustered the sites in terms of the key findings and recommendations.

Table 2.4: Select descriptive parameters of sites chosen for SSSA

Site	Tougouri	Thion	Bartiebogou
Agro-ecology	Pluviometrie moyenne de 700mm/an; sol sableux, sol hydromorphe, les lithosols; commune localisée entre les meridians 00°42' et 00°18', de longitude Ouest et les paralleles 12°59'11" et 13°26'58" de latitude Nord. Existence de 2 grands barages a Tougouri ville et Nioudougou.	Pluviométrique annuelle entre 500 et 650 mm, réparti sur 40 à 50 jours de pluie. La végétation est de type savane arbustive dominée par des épineux (Acacia nilotica, Acacia seyal, Acacia senegal, Balanites egyptiaca, Zizyphus mauritiana). Deux types de sols: les sols légers sablonneux ou gravillonnaires qui sont peu fertiles et les sols profonds plus ou moins argileux. Il y a un petit barrage a Thion ville.	Zone sub-sahélienne. Végétation arbustive Pluviométrie 400 à 600mm. Mauvaise repartition des pluies dans le temps et dans l'espace. Sols argilo-sablonneux. la moyenne des cinq dernieres annees est de 781 mm d'eau. Un fort potentiel de terres cultivables
Irrigated /rainfed		Présence de cultures irriguées (principalement le riz) dans la partie aval du barrage de Thion et des cultures maraichères irriguées en saison sèche (oignon, aubergine, chou, tomate) à l'aide des puits maraichers et des eaux du barrage.	
Principal Crops	Mil, sorgho, le riz.	Sorghum, millet, l'arachide, le riz, le niébé et le maïs.	Sorghum, millet, maïs, niébé, vouandzou
Emerging crops	Patates douces, arachides, Niébé, le maïs, le Sesame, le voazou	le riz et le niébé et le sesame	Maïs, riz, sésame et niébé
Infrastructure -roads - telephone - marches	1 route nationale et 2 routes departementales de mauvaises état. Une trentaine de bas fonds aménages autour de 300 hectares. Presence des reseaux telephoniques. Un marches tous les trois jours la cheflieu (Tougouri) de la commune.	Les infrastructures routiées sont passable et la couverture téléphonique est assez bonne. La presence de la service administrative et technique a Thion. Deux marchés animent le trafic commercial dans la commune notamment Diaka et Thion. Un grand marche de betaille a Diaka.	Routes impraticables surtout en saison pluvieuse. Un seul réseau téléphonique couvre la zone avec souvent des interruptions pouvant atteindre une semaine. Existence d'un marché hebdomadaire à caractère régional situe a 7km de bartiebougou (Haba).
Security risks	les petits banditisme a le bracement mais depuis la structure auto-defence (2016) ces incidents a diminue.	Le risque sécuritaire est moyen.	Réduction/disparition du braquage grâce à l'avènement des structures d'auto-défense

Environmental risks	sites miniere, leur pailage tradionel avec fertilisation de cyare (same as other two sites) Les inondation, les vents violents, les checheresses	Le risque environnementale (désertification) est élevé. La dégradation environnementale causée par l'exploitation artisanale de l'or. En 2016, il y avait des inondations et ca se passe souvent	Dégradation progressive des ressources naturelles (terres, eaux, forêt à cause de la pratique de l'orpillage, changement climatques, mauvaise pratique agro sylvo pastorales
Vulnerable	Les personnes agees, les femmes, les personnes vivants avec un hadicape, les orphelins, les enfants de 0 a 5 ans.	Les femmes, les personnes âgées et les jeunes, les handicapés, les veuves, les villages avec tendances d'etre inondee.	Les ménages démunies , les femmes et les personnes âgées
Other salient characteristics	Zone d'elevage par excellence, Plusieurs differentes ethnies, les mossis, les peulhs, et les gourmantches.	Le mouvement des personnes actives (la jeunesse) vers les sites aurifères. Les Mossi, les Gourmantches, et les Peulhs.	Ethnies: Principalement les Gourmantches suivi par les peulhs et les mossis. Zone pastorale à forte potentiel ; Grande dispersion des concessions à l'intérieure d'un même village, Forte vulnérabilité de la population, Faible revenu des ménages, faible niveau d' analphabétisation, pésanteurs socio-culturels, population féminine très travailleuse ,Population peu réceptive aux changements, zone à potentiel minier, forte cohésion sociale et ethnique.

Seasonal Overview

Farmers in the three sites of the assessment have one major season from June to September. In between, some farmers in all sites have access to flood plains for off season production, mostly rice and vegetables. Table 2.6 gives an idea of the crops grown in these and the staggered dates of their sowings and harvests.

Table 2.5: Crop Calendar for Central-Nord and East Regions, Burkina Faso

Crop		Jan	feb	mar	apr	Ma	jun	Jul	aug	sep.	Oct	nov	dec.
1 Sorghum	Sowing							S	S				
	Harvest	H									H	H	H
2 Millet	Sowing							S	S				
	Harvest	H									H	H	H
3 Cowpea	Sowing						S	S					
	Harvest								H	H	H	H	
4 Rice	Sowing	S	S				S	S	S				S
	Harvest			H	H	H				H	H	H	
5 Maize	Sowing						S	S	S				
	Harvest									H	H	H	
6 Groundnut	Sowing						S	S					
	Harvest									H	H		
7 Sesame	Sowing							S					
	Harvest											H	H
8 Vouzou	Sowing						S	S					
	Harvest									H	H	H	

Of specific note were the patterns of crop performance around the period of the seed system security assessment. Communities assessed their harvest of key crops for the most recent season, June to September 2017, as well as for the two preceding seasons: June to September 2016 and June to September 2015. Across all three sites, farmers reported poor rains in July and August 2017 which negatively affected all crops but particularly maize and groundnut.

This assessment took place during a very stable period.

Table 2.8: Community assessments of crop performance over three past seasons

Main Crops	Current season : June – September 2017	Season before: June – September 2017	Season before June – September 2017
Bartiebougou			
Sorghum	Average	Good	Good
Millet	Average	Good	Good
Maize	Poor	Good	Good
Tougouri			
Sorghum	Average	Good	Good
Millet	Average	Good	Good
Cowpea	Average	Good	Good
Thion			
Sorghum	Average	Good	Good
Millet	Average	Good	Good
Groundnut	Average	Good	Good

Sorghum is the most important crops across all of the assessment sites in terms of total amount. Sorghum accounted for 45% of all seed planted in 2017 and was projected to account for 42% of all seed to be planted in 2018. The next most important crops as measured by seed planted in 2017 were groundnut, cowpea, and millet (see Tables 4.1 and 4.10).

III. SEED SYSTEMS IN BURKINA FASO: OVERVIEW

Smallholder farmers use multiple sources or channels for procuring seed. Maintaining a diversity of channels is critical for farmers to be resilient because at one time or another specific seed channels will fail or be severely restricted due to changes in government policy, the end of a seed project, or natural or manmade disasters. Farmer seed channels generally fall within formal and informal seed systems (with the latter also sometimes labeled as the local, traditional or farmer seed systems).

The formal seed system involves a chain of activities leading to the production, inspection, and certification of seed of released varieties. The process usually starts with plant breeding, includes multi-location trials to establish wide adaptability of distinct and uniform germplasm, and concludes with formal declaration of varietal release. Seed regulations aim to maintain varietal identity and purity and to guarantee physical, physiological and sanitary quality. Seed marketing typically takes place through officially recognized seed outlets, either commercially or by way of national agricultural research systems (Louwaars, 1994).

The informal system embraces most of the ways farmers themselves produce, disseminate and procure seed: directly from their own harvest; through gifts and barter among friends, neighbors and relatives; and through local grain markets or traders. Farmers' seed is generally selected from the harvests or grain stocks, rather than produced separately and local technical knowledge, standards guide informal seed system performance. Recent detailed analyses show that upwards of 90% of seed farmers sow comes from informal channels, although this varies by crop and region (McGuire and Sperling 2016).

Figure 3.1 shows schematically the components of the formal and informal seed systems and how they interact. The figure illustrates the multitude of potential seed sources and how they interrelate. The dark cylinders of commercial, government, and relief seed are often referred to as the 'formal seed system' because they typically follow a series of regulations which are codified in national seed law.

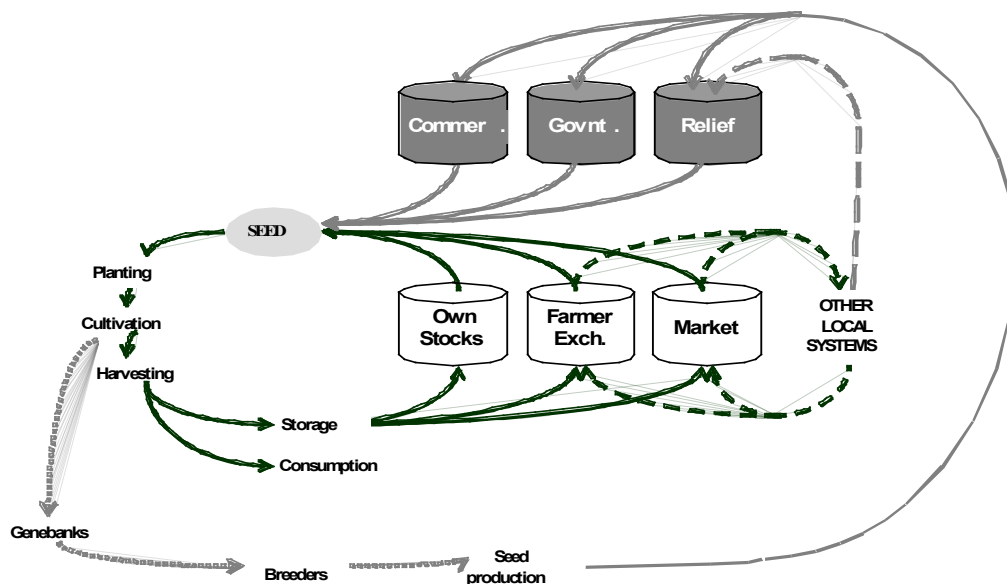


Figure 3.1: Channels through which Farmers Procure Seed. Own seed stocks, exchange with other farmers, and purchase through local grain markets constitute 'informal' channels, while commercial

seed companies, government or research outlets, relief supplies constitute formal channels. Adapted from Almekinders and Louwaars (1999).

The light cylinders of own exchange, farmer exchange, and local markets are often referred to as the 'informal seed system' because the rules and standards they follow are less formally codified and more often made up of traditional, and evolving, norms and practices. For example, farmers in Bartiebougou commune revealed during the SSSA community interview that sourcing seed from the market was not easily admitted because it was sign of vulnerability and low social capital but said that this was changing. Farmers who sourced seed from the local market did so discretely.

The Burkina Faso seed system has been strongly influenced by a tremendous level of commitment and support from the Burkina Faso government accompanied by NGOs and UN/FAO. Key changes in the Burkina Faso seed system over the past ten years are summarized in table 3.1.

Table 3.1: Key Changes in the Burkina Faso Seed System over 10 Years

Parameter	2007	2017	Effect on Agriculture and Seed
Seed Producers	Not well developed as a network and limited primarily to the West and Center West of the country. Crops were limited to mostly maize and rice. Not common for seed producers to be organized into groups or unions	Large number of seed producers, well organized, mostly work within unions, covering the entire country.	Representatives of seed producer organizations exist at regional, provincial, and department level. Big increase in area of seed production, wider range of varieties, big increase in quantity of seed produced.
Availability of Improved Varieties	Released varieties were not disseminated, pre-basic seed was not publicized.	A wide range of improved varieties. Since 2010, INERA seed fairs have greatly facilitated access to basic seed and new varieties of Depuis 2010. In the East Region, seed fairs were organized since 2014 by associations.	Seed system has been strengthened and it is more decentralized. Producers have better access to new varieties. However, several zones continue to have challenges in accessing new varieties.
Seed Policy	Before 2006, the seed law was not well defined. There was limited regulation on seed.	Seed law of 2006 established the National Seed Committee (CNS). The sector is now much more organized with heavy state subsidies since 2009. Seed certification has become much more rigorous and decentralized.	Big increase in the number of seed producers (UNPS, Entreprise semencier, ngo / projects). Sector is more supported by government and development partners. However, small seed producers are excluded and there is a distortion between the price paid by the government (high) and the market price. The link between farmers and seed producers is very weak. Subsidized seed is less expensive than grain sold in the market after harvest. Technical capacity and equipment of seed producers has greatly improved. Due to heavy subsidy of the state some seed producers are motivated to sell a lower quality of seed (switch grain for seed) and the government has responded by putting into place control measures like sealing seed stocks and more rigorous lab testing of warehoused stocks. Many complaints of late arrival of government seed.
Climate	Climate instability between and low rain in 2004. Locust invasion in 2005-2006.	Continued climatic instability with floods in 2009 and a general	More organized effort by research and development partners to identify short duration varieties adapted to local rainfall patterns. Government and development

		lowering of rainfall levels in other years.	partner support to buy seed from seed producers, distribute subsidized seed and fertilizer to farmers. Big effort to make available more farm tools (L'opération 100000 charrues et outils aratoires).
Politics	Politically stable but no strategy to support seed sector.	Political instability between 2014 and 2015 with popular uprising and change of government.	State and development partners not able to pay for the quantities of seed and fertilizer as planned. Late payment to seed producers. Late arrival of seed and fertilizer. Opening of new seed analysis laboratory (EST/FADA).

Source: SSSA Burkina Faso

In Burkina Faso, the seed laws have become more proscriptive since 2006 with three decrees and twelve specific set of seed laws covering many aspect of the seed system. The increase in seed law and regulation has been accompanied by a focus on promoting the availability and use of certified seed.

In the community meetings during the SSSA in Bartiebougou, the #2 ranked source for sorghum five years ago was the local market but for the 2017 season it was not among the top four sources referenced by the community. For cowpeas, the community interview indicated that the local market was the third ranked source for seed both last season and five years ago. For sesame, the community interview in Bartiebougou indicated that the local market was not listed as a main seed source for the 2017 season but was the second most important source five years ago. This reported trend of less reliance on local markets as a seed source over the past five years may reflect the high number of seed projects working in Bartiebougou and the tendency of farmers to not admit that they acquire seed from local markets as is often viewed as a sign of vulnerability and low social capital.

Formal Seed Systems in Burkina Faso:

Brief information is presented below on variety development and the organization of seed multiplication.

Variety development

Variety development is led by the Institut National pour l'Étude et la Recherche Agronomique (INERA). INERA has released a range of improved varieties which have been formally released and catalogued (see Table 3.2).

Among these the crops and varieties most promoted by the government throughout the country include for maize: SR21, Espoir, Barka ; for millet : IKMP-5, IKMV 8201 (2009 à 2011 in subsidized distribution), SOSAT et Missari (from 2012) ; for sorghum: kapelga and sariasso; for rice: FKR 45 N, FKR 19 and many Nerica varieties; for sesame : S42; and for cowpea: Komcallé, Nafi et Tilligré.

Table 3.2: Major Food Crops and Improved Varieties, Burkina Faso Seed Catalogue

Crop	Number of Varieties	Varieties
Sorghum	23	S29, Sariasso 03, Sariasso 04, Sariasso 05. Sariasso 01, Sariasso 02, Sariasso 06, Sariasso 07, Sariasso 08, Sariasso 09, Sariasso 10., B D F, Nongomsoba, Gnofing, Ouedzouré, ICSV 1049, Irat 204, Saouga IV, Makki, Kazoukwessé, Kanfiagui, Tioadi, Kalsaka
Millet	7	Ikmv 8201, IKMP-1, Zalla, SRM Dori, Irat P88, CIVT, Local Doumam
Maize	11	SR22, Maka, Maka SR, JFS, KPB, FBC 6, FBH 33, KEJ, KEB, IRAT 80

Groundnut	10	TS-32-1, CN 94c, TE 3, 59 426, RMP 12, RMP 91, KH 149 A, KH 241D, QH 243 C, 69101
Cowpea	12	KN1, Local Gorum, K VX 396, 396-4-4, K VX 396-4-5, K VX 396-4-5-2 D, K VX 61-1, K VX 309-6G, K VX 14-2, IAR-7, IT 81D, TVX 32-36, TN-78
Rice	7	44 18, 44 56, ITA 123, FKR-19, FKR 33, Irat 144
Sesame	3	38-1-7, S 42, 32-15
Soya	3	G-121, G-115, G-196

Source: Overview of Burkina Faso Seed System, Mr. Lamine Mohamed Ouedraogo, CRS Burkina Faso.

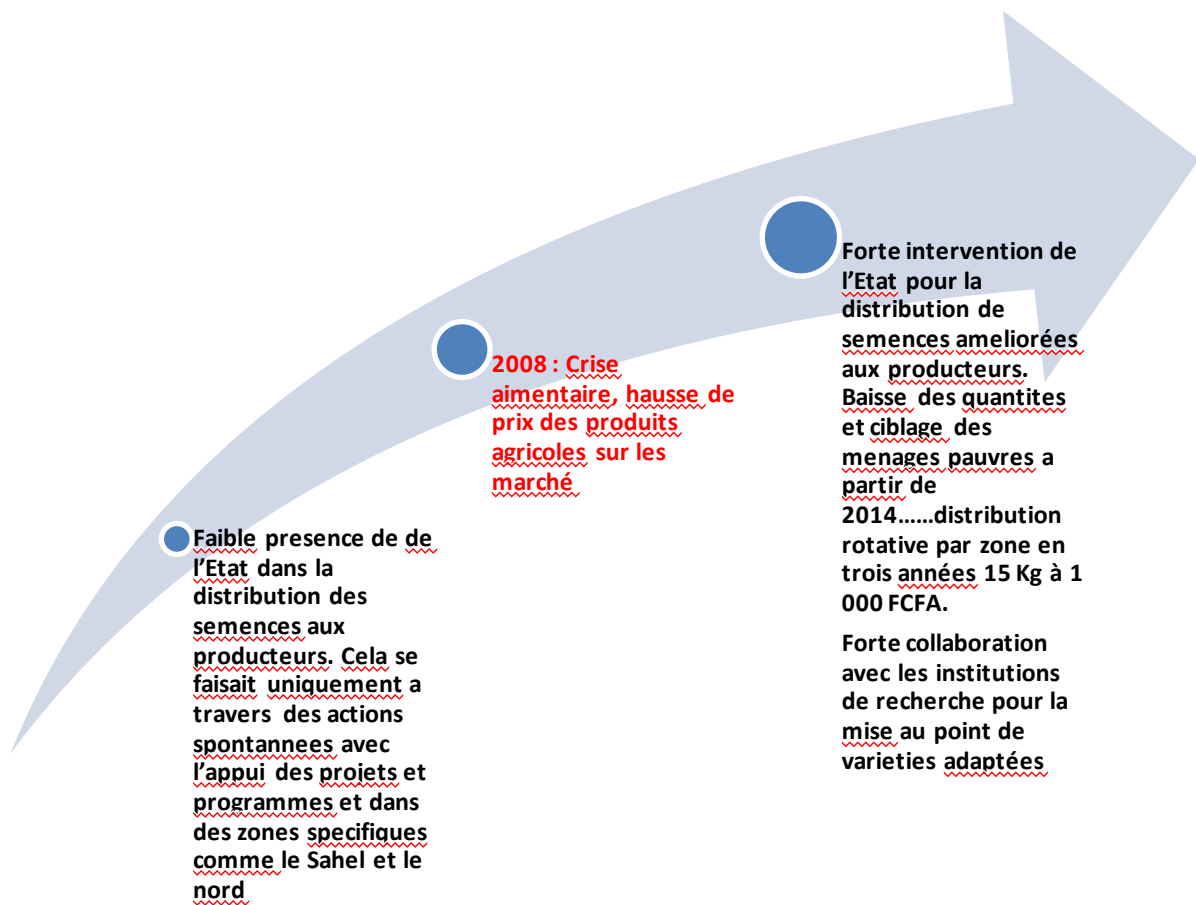
A sub-set of those varieties were being promoted in the regions of the Burkina SSSA, for East Region and specifically for Komandjari Province (see Table 3.3).

Table 3.3: Crops and varieties being promoted in Komandjari Province (East Region) Burkina Faso

Crop	Variety	Release Date	Characteristic
Sorghum	Kapelga	1999	Early maturing, introduced in the province since 2010.
	Sariaso 11	1996	Early maturing, introduced in the province since 2010.
Maize	Barca	2007	Drought tolerant, 80–85 days, introduced into province since 2013
	Wari	2007	Drought tolerant, 80-85 days, introduced into province since 2013
	FBC6	1999	Drought tolerant, 80-85 days, introduced into province since 2013
Rice	FKR 19	1986	Bas Fond, 90 days, introduced in province since 2009
	FKR45N	2006	Rain fed, 80 days, introduced into province since 2010
Millet	Misari 2	2009	Grey/cream, early maturing, 85 days, introduced into the province in 2013
	IKMV8201	1986	Grey, early maturing, 80 days
Niebe	Nafi	2012	70 days, Most tolerant of these three to thrips, introduced into the province since 2013
	Komcalle	2012	60 days, Highly tolerant to thrips, introduced into the province since 2013
	Tiigre	2012	65 days, Highly tolerant to thrips, introduced into the province since 2013
Sesame	S42	Not known	Early maturing, white. Most widely grown variety in the province.
Groundnut	QH243C	1984	Introduced into province from 2013.
Soya	G121	Not known	100-105 day cycle

Source: Komandjari, Provincial Director of Agriculture, DIIVA (Diffusion and Impact of Improved Varieties in Africa) Study 2010-2013

Figure 3.2: Increased Role of the Burkina Faso Government in the Seed System since 2008



Basic Seed Production (INERA)

INERA oversees all basic (foundation seed production). Basic seed is allocated primarily to certified seed producers (R1) which include individuals, groups, seed farms, and farmer associations. All R1 seed is inspected by the National Seed Service. The official basic foundation seed production figures for Burkina Faso were not acquired by the assessment team. Discussions with key informants (INERA, seed producers, seed unions, and large agro-dealers in Ougadougou) suggest that foundation seed production has improved dramatically over the past decade and the seed fair approach used by INERA to promote foundation seed access in a transparent manner is highly appreciated for being innovative and market oriented. Some key informants have indicated that foundation seed production does not match the certified seed produced and this has resulted in quality issues. Overall, the seed system actors in Burkina Faso interviewed as part of the assessment expressed great appreciation for how much foundation seed production has improved in terms of availability, ease of access, and quality over the past decade.

Certified Seed Production

During the SSSA, the team interviewed 8 seed producers and two seed producer union presidents. All of the seed producers were producing certified seed.

Two cowpea seed producers in Tougouri commune were interviewed. Both reported growing 2-3 varieties and both noted that the most important buyer over the course of the past four years was either the Tougouri agro-dealer or a commercial seed buyer and INERA was the third

most important seed buyer in terms of volume. In terms of price, one of the Tougouri commune cowpea seed producers noted that they sold to INERA at 1,000 CFA per kg in 2014, 2015, and 2016 while the second noted that they sold to INERA at 500 CFA per kg in 2014 and at 750 CFA per kg in 2017. The reported sales price for cowpea seed to the Tougouri agro-dealer was 500 CFA per kg in 2013 and 2016 while it was 750 CFA per kg in 2017. The reported sales price for cowpea seed to the commercial seed buyer was 700-750 CFA per kg in 2014, 2015, and 2016. Sales of cowpea sale to individual farmers was noted only once among these producers and it was reported to be about 5% of the total cowpea produced in 2013 at a price per KG of 600 CFA.

Seed producers interviewed in Bartiebougou were producing sesame and maize. The sesame producer had several years of experience and was quite entrepreneurial in finding buyers as he sold his production in five different markets over the past five years. This same producer sold slightly more than half his production to the government over the past three years. In each year the price to the government was at 1,500 CFA per kg in April while the price sold to traders in May was at 800 CFA per kg. The maize producer was also producing sesame but he has just starting out and 2017 was his first year of harvest so he awaits the 2018 market to see his buyers and prices.

The seed producers interviewed in Gayari town were the President and former President of the Komandjari Farmers Union. They are among the largest seed producers in Komandjari Province, with each reporting more than 20 HA of seed fields. The discussion was more focused on the union and the overall seed production and sales of the union in the Province. The union has 74 members of which 37 were active, producing seed, as of 2017. The main member advantage is to be able to sell seed to the government through the union. Certified R1 Seed Prices are set annually by the government after consultation with the seed unions. This usually occurs from mid-January to mid-February.

The first stop for the union has been to sell to the government through the Province (see Table 3.4). Seed prices are best for government and NGO's and much less when selling to commercial dealers or farmers. For example, members of the Komandjari Seed Union reported selling maize seed to the government in 2017 at 2,350 CFA per kg and cowpea seed to NGO's at 1,500 CFA per kg. The same Union reported 2017 sorghum seed sales to the government at 350 CFA per KG and 800 CFA per kg to NGO's (see Table 3.5). The Union reported that unsold sorghum and maize seed was sold on local markets as grain at 160 CFA per kg.

Table 3.4: Certified Seed Production and Sales to Government: Komandjari Seed Union: 2014-2017

	2014		2015		2016		2017	
	Production (MT)	Gov't. Sales (MT)	Production (MT)	Gov't. Sales (MT)	Production (MT)	Gov't. Sales (MT)	Production (MT)	Gov't. Sales (MT)
Sorghum (Kapelga)	23.53	12.00	60.25	6.65	42.50	3.00	42.95	4.00
Sorghum (Sariasso 11)	0.00	0.00	0.00	0.00	14.60	1.00	0.00	0.00
Maize (Barka)	0.00	0.00	7.40	6.25	4.00	2.20	0.00	0.00
Maize (FBC6)	0.00	0.00	0.00	0.00	12.00	2.15	4.35	4.35
Sesame (S42)	0.00	0.00	3.05	0.25	2.40	1.00	0.60	0.60
Cowpea (Komcalle)	0.00	0.00	0.00	0.00	0.60	0.60	7.05	0.00
Groundnut (QH243C)	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.48

Source: Komandjari Provincial Director of Agriculture

Until 2016, only the union could supply the government but since 2017, “Enterprise Semenciere” also have right to sell to the government. This has created more competition as “Enterprise Semenciere” are more likely to buy and move seed from around the country. Seed unions also sell to NGO’s through public tenders (appel d’offre) on behalf of the union. Komandjari Seed Union applied for and won two public tenders in 2017, both for USAID project REGISE-ER. They were asked to supply cowpea as well but the union reported that did not have any.

Table 3.5: Volume and Value of Public Tenders of Komandjari Seed Union

	2016		2017	
	Volume (MT)	Value (CFA)	Volume (MT)	Value (CFA)
Sorghum (Kapelga)	7.30	5,841,600	8.71	6,970,400
Cowpea (Komcalle)	0.00	0	7.02	10,525,500

Source: Komandjari Seed Producers Union

Seed Unions and seed producers are entering a period of increased competition. They have benefitted greatly from market protection, high government prices paid for seed, and a high percentage of their seed sold to the government. Support to seed producers has been an anchor of government and development partner support for nearly a decade which has had positive results. However, changes in seed law will increase competition among seed producers. Also, development partners are committed to promoting an environment more conducive to market oriented agriculture input markets.

Large public tenders, such as those carried out by USAID funded REGISE-ER, can be damaging to the development of seed markets because they centralize buying and selling, curtail competition among individual seed producers, and encourage sticky or fixed pricing in agricultural input markets. Large seed tenders are politically popular but do not contribute to the development of market oriented seed input markets.

Nearly all of the seed producers interviewed were emphatic in stating that without a subsidy they would not produce R1 seed. Also, when asked under what conditions farmers would ‘regularly buy seed’, they said that some farmers would regularly buy seed if there was a subsidy. The current government subsidy on seed is about 80% when looking at the price they pay and the price at which government seed is sold. While the government seed subsidy program is limited in terms of volume, the high level of subsidy and questionable targeting (numerous reports of wealthy farmers accessing government subsidized seed) can create a circus like environment where farmers with means to buy seed hold off making buying commitments for in hopes of acquiring deeply discounted seed. This is not conducive to seed input market development.

New variety delivery systems (limited role of agro-dealers)

The results of the Burkina Faso SSSA showed more than 80% of farmers accessed new varieties within the last 5 years. Agro-dealers are likely to have a bright future in Burkina Faso if indeed the government and development partners are committed to agricultural input market development. During our discussions with agro-dealers in the Burkina SSSA we identified some very innovative practices which agro-dealers had undertaken to develop their seed business. Agro-dealer Hamado Sawadogo (see box below) provided a great testimony to how projects and agro-dealers can work collaboratively to introduce new varieties.

Mr Hamado Sawadogo

Tougouri Agro-Dealer since 2007



Box 1: The Agro-Dealer model for Introducing New Varieties

- Learn of new varieties by attending varietal demo field days organized by an NGO run project (FASO)
 - Listen to farmers and identify most interest varieties and make contact with seed producers.
-
- Make radio promotion to raise farmer awareness of the performance of new varieties and where they can find them (my shop!)
 - Package seed in small packets (1 kg for maize, cowpea, millet).

Agro-dealers currently have a very limited role as source of seed and inputs within the communes surveyed by the study. Agro-dealers accounted for less than 1% percentage of all seed sourced by households surveyed (n=242) during the most recent season. However, seed purchases accounted for 8% of all seed sourced for the most recent season. Nearly all seed purchased during the most recent season was from the local market. For the 2018, the same households project to source about 1% of seed from agro-dealers and project that seed purchases will account for 7% of all seed sourced. However, interviews with a half dozen agro-dealers serving the three communes of the study (Tougouri, Bartiebogou, Thion) revealed growth opportunities for agro-dealers, innovative actions they take to build their business, and some of the key business constraints and threats.

Mr Hamado Sawadogo has been operating as an agro-dealer in Tougouri town since 2007. He expanded his seed business over the past 5 years by participating in new variety demonstrations and then carrying the farmer preferred varieties during planting season. He has improved his capacity as an agro-dealer through several technical trainings facilitated by AGRODIA. He has also expanded his customer base through using local radio to raise profile. He has been innovative in accepting payment on mobile phone platforms and in delivering seed to distance villages in neighbouring communes using local transporters and paying them a small delivery commission. His biggest business concern for seed is late arrival of certified seed due to delays in issuing certificates. The emerging opportunity for Mr. Sawadogo is to expand to cover more villages through commission based agents. He estimate that more than 75% of his agricultural input sales are for fertilizer while seed is less than 25%. Cowpea is his biggest seed seller and he has sold four varieties.

Mr. Bernard Ouoba has operated as an agro-dealer in Gayari town since 2013. He worked as an agent for wholesalers and most of his revenues are from fertilizer and herbicide. In 2014, through sponsorship and training through IFDC he earned his license ('attestation') to sell pesticides & herbicides. In 2015, he received training on seed from USAID project holder REGISE-ER and from AGRODIA on input stock management (seed, fertilizer, pesticide). Over the past five years he has sold 5-7 metric tons of fertilizer annually while seed sales have ranged from 250-350 kilograms annually (nearly all cowpea). He indicated that his biggest constraint was lack of credit to purchase and store inputs and government subsidized agricultural inputs.

Mr. Dico started out as an agro-dealer for close to 15 years, early on it was fertilizer. Only since he started to work with the FASO project (2012) has he started to also sell seed. He is the largest Agro-Dealer in Komandjari and is the PICS Triple-Sac sole distributor for the province and he has three input agents in main markets of Komandjari. He has received a lot of training from AGRODIA and is very thankful for the support which was instrumental in him obtaining the necessary licenses to legally sell fertilizer and seed. In 2017 he sold 2.1 tons of seed of which 50% was rice seed. He also sold 10 metric tons of fertilizer. He noted that usually fertilizer accounts for at least 80% of his agricultural input sales. He sees a bright future in seed and fertilizer sales in the province and suggests that seed fairs for certified seed at communal level, like the basic seed fairs that INERA does, would be a good way to help promote seed sales. Late delivery of seed is a challenge which he hopes can be addressed. His big need is in working capital, 'If I can carry it, it will sell.'

Box 2: Government Input Subsidies Can Impact Agro-Dealers

The largest agro-dealer in Komandjari Province, Mr. Dico, sold 10 metric tons of fertilizer in 2017. He sold NPK and Urea at 19,000 per 50 KG sack. These sales were in all three communes of Komandjari, Bartibougou commune (the site of the SSSA), Gayeri, and Foutouri. In 2017, the government provided 13 metric tons of fertilizer for Bartiebougou Commune and another 9 metric tons in Foutouri and 30 metric tons in Gayeri. This fertilizer was sold at 12,000 per 50 KG sack or roughly 50% below the price of fertilizer sold by Mr. Dico.

Situation des engrais mis à la disposition des producteurs de la Komondjari par l'Etat Burkinabè													
Communes	Quantité de 2014 en Tonne (T)			Quantité de 2015 en Tonne (T)			Quantité de 2016 en Tonne (T)			Quantité de 2017 en Tonne (T)			Total en (T)
	NPK	Urée	DAP	NPK	Urée	DAP	NPK	Urée	DAP	NPK	Urée	DAP	
Gayeri	15	59	18.5	25	0	0	20	2	0	16	5	9	169.5
Bartiebougou	10.8	33	11.1	14	0	0	10	1	0	9	2	2	92.9
Foutouri	5.2	26	7.4	11	0	0	5	1	0	5	2	2	64.6
Total Komondjari	31	118	37	50	0	0	35	4	0	30	9	13	327

Source: District Agricultural Office, Komandjari Province

While it is not clear to what extent subsidized fertilizer sales crowd out commercial fertilizer sales in arid and semi-arid regions, studies in Kenya and Zambia show that subsidized fertilizer reduces the sales of unsubsidized fertilizer (see Xu et al 2009; Dorward et al. 2008). Fertilizer subsidies can build political support and can lead to increased fertilizer use and food production. However, these outcomes are not guaranteed and the subsidy programs can crowd out sales to commercial dealers and undermine a long term commitment to the development of viable commercial input delivery systems. In the commune of Tougouri, an NGO reported several cases of rice farmers who were advised to purchase inputs from an agro-dealer but delayed to do so because they were 'hoping' to procure seed and fertilizer at a subsidized rate from the government. As the season progressed, the farmers realized they could not acquire subsidized seed then went back to the agro-dealer who had already sold out of his stock. Possible solutions here include the development of credit programs to help smallholder farmers access to fertilizer; extension programs to support farmer productivity; agro-dealer training and credit programs for agro-dealers, and organization of farmers into groups to facilitate access to extension and credit services.

For more reading:

Xu, Z., B. Burke, T. S. Jayne, and J. Govereh. 2009. "Do Input Subsidy Programs "Crowd In" or "Crowd Out" Commercial Market Development? Modeling Fertilizer Demand in a Two-Channel Marketing System." *Agricultural Economics* 40 (1): 79–94.

Dorward, A., E. Chirwa, V. Kelly, T. Jayne, R. Slater, and D. Boughton. 2008. "Evaluation of the 2006/7 Agricultural Input Supply Programme, Malawi." Final Report of the School of Oriental and African Studies, Wadonda Consult, Michigan State University, and Overseas Development Institute, undertaken for the Ministry of Agriculture and Food Security, Government of Malawi, Lilongwe.

Informal Seed Systems in Burkina Faso

Despite the significant government and development partners support to formal seed systems, farmer or more informal seed systems continue to dominate the Burkina Faso landscape. The Burkina Faso SSSA revealed that over 93% of seed sown by Burkina farmers during the last season (June to September 2017) comes from traditional channels like own stock; neighbor, family, and friends; and local market. The Burkina Faso SSSA shows that approximately 7% of seed sown by Burkina farmers during the last season (June to September 2017) comes from the government, NGO's or FAO, and agro-dealers (see Table 4.1). Results from the Burkina Faso SSSA indicate that the main channels for informal seed systems are own stocks, barter/gifts from friends, relatives, and neighbors, and lastly through local markets.

Seed/grain markets

'Seed/grain markets' refer to a diverse set of actors and institutions, from open-market traders to permanent village shops to long-distance truckers, who buy and sell crops for consumption and, potentially, for seed (Sperling and McGuire, 2010). To be clear, much that is sold in local markets is used for grain (for consumption, flour, brewing). However, there is a special subset of this grain which can potentially also be used for seed and which is actually sown. This is referred to as 'potential seed'.

Distinguishing seed from grain

Both farmers (buyers) and traders (sellers) use a range of strategies to access 'good' seed from the markets. For the buyer, he/she wants to maximize the possibility that the product bought will actually grow on farm. For the seller, he/she wants to tap into a lucrative seed market, one that may offer higher prices than for routine sales of food grain alone. There are a number of different practices that traders may use to distinguish seed from grain, in terms of how they source, manage, or present their wares.

Know also that traders report clear signals from buyers that such farmers are looking to find seed (not grain) from the local markets. Key among these: Farmers may: seek varieties that are not mixed; ask for a specific variety by name, look for batches that are free from waste (stones, dust) and where the grains are undamaged (full, not broken). Farmers may ask traders how the grains were stored-- or they may say explicitly: 'I am buying for seed'.

Box 3: Managing 'Potential' Seed

Local open markets serve as an important source for farmer seed. While these are, local markets are commonly referred to as 'grain' markets', farmers and traders regularly exercise considerable agency in managing and selecting among grain supplies to ensure that some can be used for planting material. These grain supplies that include adapted varieties and seed screened for select quality features can be termed 'potential seed' (Sperling and McGuire 2010).

Traders don't sell just anything

Traders employ numerous practices to support the quality of their seed. Among the most common:

- Seed is sought from specific regions known to provide sowing materials adapted to the local area.
- Traders seek specific varieties.
- Varieties are often kept separate.
- Recent harvests are kept separate from older ones.
- Broken, damaged, immature grains are often removed.
- Sand, pebbles, sticks, are removed.

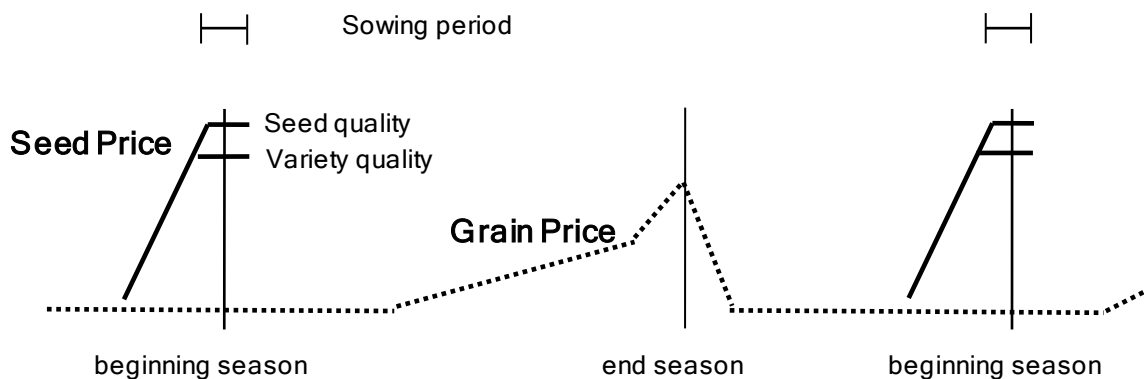
Farmers don't plant just anything

In assessing potential seed from markets, farmers may seek out specific varieties, even asking by name, and may look for unmixed stock. They also look for visible quality traits: Are the grains mature? Are they free from pest damage? Farmers may buy potential seed within a larger quantity of grain batch and sort for seed at home (removing broken grains, twigs, pebbles, sand).

Some farmers will indicate they are buying seed and seek the advice of the seed seller on varieties which may be best for sowing, i.e. which meet the needs profile of the buyer.

The relationship between seed seller and buyer is important. The most important asset for a successful traders (whether it be grain or seed) is their reputation. Word of mouth is still the most important promotion and marketing tool for most seed and grain traders.

Figure 3.4 Trends in crop and seed prices in local seed/grain markets through the season, showing seed price peaks at sowing time and grain price peaks before harvest. Seed price differential takes into account variety quality (for the most sought-after varieties), plus, sometimes, additional seed quality features (i.e. a price premium for well-sorted stocks).



Box 4: The Conservation and Promotion of Local Varieties is the Law

The national seed strategy references both the importance of improved varieties and certified seed and the protection and promotion of traditional varieties. However, seed production and promotion investments by the Burkina Faso government, donors, and NGO's have been primarily oriented towards improved varieties with less investment in characterizing, promoting, and protecting local varieties. Certified seed producers tend to specialize and focus on a limited number of crops and varieties. Institutional seed purchases and seed subsidy programs have focused on a handful of crops and varieties made available through certified seed producers.

This point is illustrated by looking at the crops and varieties carried by seed producers (producing only certified seed) interviewed in the course of the Burkina Faso SSSA.

Seed Producer	Years	Crops & Varieties
Namanebgzanga	Since 2013	Cowpea (Komkalle, Nafi, Tiligre),
Dabonsmnonre Village (5 farmers)	Since 2014	Cowpea (KVX-98 / KVX-97)
Thombiano Bahouba	2012, 2013, 2014, 2015, 2016, 2017	Sesame (S42)
Thombiano Limandikoa	Since 2009	Cowpea (Komkalle, Nafi, Tiligre), Sesame (S42), Maize (Barca, Wari) Sorghum (Kapelga, Sarioso 11)
Soampa Lompo	Since 2012	Cowpea (Komkalle, Nafi, Tiligre), Sesame (S42), Maize (Barca, Wari) Sorghum (Kapelga, Sarioso 11), Groundnut (QH243C)
Yameogo Rasmane	Since 2017	Maize (Barka), Sesame (S42)

Source: SSSA Burkina Faso, October 2017

Article 3 of the 2006 National Seed Law (010-AN/2006) notes that traditional varieties constitute part of the national heritage. Articles 13, 14, and 15 (section 2 of 010-AN/2006) outline the regulation of plant seeds.

Seed production capacity strengthening in Burkina Faso is focused on certified seed producers and varieties which are registered in the national seed catalogue. In order to maintain the dynamic nature of local varieties conservation efforts must be built on and integrated within the existing seed systems. There is an excellent opportunity to improve linkages between gene banks (ex-situ) and farming communities (in-situ) in Burkina Faso. Without these linkages, very few farmers will benefit from the characterization and preservation of local varieties in Burkina Faso. Better organized dissemination channels for traditional varieties will strengthen varietal diversity at farmer and community level.

Actions that can be taken to strengthen the access and availability of local varieties in Burkina Faso include: promoting the value of traditional varieties among farmers, farmer organizations, and local NGO's; implementing activities in seed programs which promote crop and varietal diversity; increasing cost efficient and replicable farmer participatory research to improve farmer access to better performing accessions (local varieties) of sorghum and millet; support INERA and CNS to better operationalize provisions of Burkina seed law aimed at characterizing, preserving, and promoting local germplasm; work with seed producers to identify seed market opportunities for local germplasm; introduce and promote better performing accessions through seed fairs and farmer field days; facilitate networking and information exchange on local varieties between researchers, NGO's, seed producers, and SNVACA (National Agricultural Extension System for Promoting, Supporting, and Advising technologies).

IV. FIELD FINDINGS: ACROSS SITES

The fieldwork for the SSSA took place in October 2017, just at or after harvest for many of the crops planted from the June – September 2017 season. The Burkina Faso SSSA focused on three sites: Tougouri, Bartiebougou, and Thion. The assessment was geared to serve as an analytic learning exercise to identify seed system issues which could be addressed in a forthcoming USAID/DFAP project. The SSSA has a secondary purpose to get an in-depth understanding among CRS staff and key CRS partners of the seed system in the region and what activities might be best undertaken to strengthen farmer seed security and make the seed system more sustainable and responsive to market oriented approaches over the coming three to five years (i.e. the length of the next project).

The assessment considered two major themes. It analysed the short-term, acute seed security situation, focusing on 2017 June - September season and the season 2018 June – September. Seed procurement strategies, quantities sown and crop profiles were all examined. In household interviews, the focus is on the three crops farmers consider most important. Crops which may systematically not be considered among the top three by farmers, but for example may be key for nutrition and income, are discussed during the community focus group discussion.

The second theme of the SSSA is to understand medium to long term trends. These include chronic issues impacting the seed system and seed security and emerging opportunities. Issues explored included: crop diversification; access to improved and farmer preferred varieties; access and use of fertilizer, chemicals, and other productivity enhancing technologies such as composting and use of seed dressing; and seed aid / seed subsidies.

This section presents field findings across three sites together as they seem sufficiently similar to be considered as one unit of analysis (see Table 2.4).

Acute Seed Security Findings: 2017 and 2018

Issues of seed security were scrutinized for the short term: how and where did farmers obtain seed for the most recent season and what is their plan for the following season. This includes farmer assessment of whether they planted (or will plant) ‘normal’ quantities of seed. Normal was defined as the amount of seed that farmers would seek to plant in most years for that crop during the particular season in question. The concept of ‘normal sowing’ was challenging for many of the enumerators as they noted farmer are accustomed to sowing several times as a function of rains. The working definition became ‘the quantity that you end up planting’ for that crop and season to arrive at your desired harvest in most years for that crop and season.

Farmer Seed sources and Quantities Planted, June- September 2017

Table 4.1 and Figure 4.1 show the sources and quantities of seed actually planted by farmers during June-September 2017. The table and graph make visible the relative use of sources and the scale of seed use for different sources.

Overall, 93% of the seed farmers sowed came from local channels, overwhelmingly own stock but also the social network of neighbor/family and in the local market.

Local markets accounted for at least 5% of all seed sourced for all crops. There was big variation within crops. For groundnut the local market accounted for 23% of all groundnut seed planted in 2017, for sesame the local market accounted for 15% of all sesame seed planted in 2017, for cowpea the local market accounted for 9% of all cowpea seed planted in 2017, and for sorghum the local market accounted for only 2% of all sorghum seed planted in 2017.

Neighbor/family were the second most important source of seed after own stock for sorghum and millet (5.6% and 7% of total seed sown respectively).

The household data showed that across all crops 7% of all seed sourced was from the local market and that for sesame and groundnut the local market was the #2 source while for cowpea and millet the local market was #3 source.

More formal seed channels: agro-dealers, government, ngo/project, and seed sourced directly from seed Producers accounted for 7% of all seed sown.

Both government and ngo/project were an extremely important source of seed for cowpea, maize, and rice (23%, 11%, and 18% of total seed sown respectively for these crops were from these two sources). Agro-dealer was cited as a source of seed only twice (cowpea and sesame) and accounted for 3 kg or .04% of all seed sown.

Table 4.1: Seed (kg) Planted and Percentage Planted by Seed Source: June – September 2017, Three Sites (N=242)

Crop	Total Seed Planted KG	% of Total								TOTAL %
		Own Stock	Friends / Neighbor / Family	Local Market	Agro-Dealer	Seed Producer	Gov't.	NGO / Project	Other	
Maize	611	84	3	1	0	0	11	0	1	100
Sorghum	3,747	88	6	2	0	0	2	2	0	100
Millet	1,012	86	7	7	0	0	0	0	0	100
Rice	482	69	6	5	0	2	10	8	0	100
Groundnut	1,341	68	9	23	0	0	0	0	0	100
Cowpea	1,073	64	4	9	0	0	3	19	1	100
Sesame	75	70	8	15	3	0	3	1	0	100
TOTAL-all crops	8,339	80	6	7	0	0	3	4	0	100

Figure 4.1. All Farmers (N=242) seed sources, June-September 2017, Three sites

Are farmers seed stressed? And if yes, why?

The SSSA team asked farmers to compare the quantities of seed sowed, by top three crops, with what they would normally sow at the same time each year and to indicate either more, less, or same. Farmers were asked to indicate the actual amount they ‘normally plant’ for the top three crops they reported and this was compared to what they actually planted. This data can be further analysed by identifying a sub-set of the households, for example female headed households or households with less limited land holdings.

Changes in seed sown compared to a normal year provide an indication as to whether farmers are seed stressed. Sometimes the stress may be indicated by planting more, such as in the case of re-sowing multiple times due to poor rains. Sometimes stress may be indicated by planting less, such as when a farmer reports not having enough labor resulting in lower land area sown and lower sowing. Sometimes farmers may report planting more or less as a function of access to seed. These examples illustrate why it is important to identify the underlying reasons why farmers sow more or less.

Farmers reported increased quantities sown for many crops (Table 4.2). Overall, when comparing what was sown in June – September to ‘normal’ we see more sowing than normal for maize (16.7% more), sorghum (16.25% more), rice (38% more), millet (13% more), and cowpea (26% more). This most important reasons cited for planting more were seed stress (poor rains in July 2017) followed by increased availability of seed and increased availability of labor (see Table 4.3)

In looking at the total amount of seed sown for June-September and comparing to ‘normal’, we see that for all crops 60% of households reported sowing the same. For cowpea and sorghum, more than 1/3 of households reported planting more in June-September 2017 compared to ‘normal’. For groundnut ¼ of households reported planting less than in June-September 2017 than normal. For cowpea 1/8 of household reported planting less.

Table 4.2: All farmers – Seed Planted in season of June-September 2017 - more, less, or same?

Households Planting in September 2017 Compared to a Normal Year					
Crop	Households	% of Households Planting More, Same, Less			Average Change in Quantity Planted (%)
		More	Same	Less	
Maize	80	24	66	10	17
Sorghum	234	35	58	7	16
Millet	107	21	71	8	13
Rice	55	18	76	6	38
Groundnut	65	20	54	26	4
Cowpea	153	38	50	12	26
Sesame	22	14	68	18	5
TOTAL-all crops	716	29	61	10	19

Seed specific reasons were not a driving factor for either planting more or planting less (See Tables 4.3 and 4.4).

Among the 198 responses for planting more seed than normal: 29% were due to poor germination rates; 21% were seed related, and 19% was due to more seed being available free.

Table 4.3: Reasons Farmers Planted More than Normal in 2017

Reason Given for Planting MORE than Normal	N	% of Responses
Related to SEED		
More seed available due to free seed	37	19%
Good quality seed / Good Variety	4	2%
Sub-total: SEED related	41	21%
Non-Seed Factors of Production		
Good access to labor/ more labor available for agriculture	33	17%
Good health	1	1%
More land / more fertile land	15	8%
Having tools, tractor, other equipment to help with farming	1	1%
Sub-total: non-seed factors of production	50	25%
Other - New Priority / New Strategy		
Want to increase income from agriculture / market well developed or a new market	20	10%
Looking for more food security / allocating more effort to agriculture	22	11%
Change in priorities for what crops to grow	5	3%
Replanting due to stress (poor soil, poor rains, poor germination)	58	29%
Other	2	1%
Sub-total: New Priority / New Strategy	107	54%
TOTAL	198	100%

*The TOTAL is every case where 'Less' or 'More' than normal was recorded. However, the responses to 'LESS' or 'MORE' are recorded in the rows above based on specific reasons that match one of the codes (e.g. a reason coded 1-20 for a case of planting MORE). If the codes are incorrectly written, i.e.- they are codes associated with planting LESS and not with planting MORE, they are not included here. That is why total % may be less than 100%. If multiple reasons are provided, it is also possible that total % may be more than 100%.

Table 4.4: Reasons Farmers Planted Less than Normal in 2017

Reason Given for Planting LESS than Normal	N	% of responses
Related to Seed		
No money to purchase seed / challenge to pay for seed or price is too high	1	1%
Seed available is not good quality or the variety is not appropriate	2	3%
Sub-total: SEED related	3	4%
Non-Seed Factors of Production		
Not enough labor	25	34%
Sickness / Poor Health	8	11%
Not enough land / land is not appropriate for agriculture or not fertile	13	18%
Lack of availability of complimentary inputs (irrigation, fertilizer, pesticides)	1	1%
Good weather / favorable rains	15	20%
Sub-total: Factors of Production	62	84%
Other - New Priority / New Strategy		
Market for the crops or crop products are not well developed	1	1%
Change in priorities for what crops to grow / less priority for agriculture	3	4%
Other - New Priority / New Strategy	4	5%
New agriculture techniques enable for a lower seed rate	1	1%
Sub-total: New Priority / New Strategy	9	12%
TOTAL	74	100%

*The TOTAL is every case where 'Less' or 'More' than normal was recorded. However, the responses to 'LESS' or 'MORE' are recorded in the rows above based on specific reasons that match one of the codes (e.g. a reason coded 1-20 for a case of planting MORE). If the codes are incorrectly written, i.e.- they are codes associated with planting LESS and not with planting MORE, they are not included here. That is why total % may be less than 100%. If multiple reasons are provided, it is also possible that total % may be more than 100%.

The most important reasons cited for planting less was labor, followed by good weather (no need to re-seed), and limited access to land or lack of fertile land. Complimentary inputs (fertilizer, pesticide, irrigation) was only cited once as a reason for planting less. Most striking is the importance of non-seed-related factors of production in explaining causes for more and less sowing than normal. Seed related factors accounted for a fifth of the reasons cited for sowing *more* seed than normal, while only 4% of reasons cited for sowing *less* seed than normal were due to seed-related factors. Non-seed related factors accounted for 84% of the reason cited for sowing *less* seed than normal. Among the non-seed-related factors, labor is the most important cause, which aligns with a more general theme in this seed assessment: labor is the major agricultural constraint in the target zones.

The household survey also asked farmers to rate the production for their three most important crops. The farmers' evaluation of each crop's productivity for the previous season provides a critical context to the analysis of the data, because West African farmers are very responsive to the agro-ecological conditions that influence their yields.

Table 4.5: Farmer Assessment of Crop Production

Farmer Assessment of Crop Production				
Crop	Nb	Good	Average	Poor
Maize	88	45%	31%	24%
Sorghum	314	52%	41%	7%
Millet	121	61%	35%	4%
Rice	58	76%	17%	7%
Groundnut	80	36%	50%	14%
Cowpea	203	57%	36%	7%
Sesame	25	56%	24%	20%
TOTAL-All crops	889	54%	37%	9%

Overall, the 2017 season was very positive for farmers across all sites. Production was rated as good by at least 50% of respondents who listed sorghum, millet, rice, cowpea, and sesame as among their top three most important crops. Only maize production was assessed by more than 20% of farmers as poor which is attributable to maize sensitivity to rains versus other crops.

Table 4.6: Farmer Assessment of Crop Production by Source of Seed

Farmer Assessment of Crop Production by Seed Source				
Seed Source	Total Responses	Good	Average	Poor
Home saved /own stock	617	49%	41%	10%
Friends, neighbours, relatives	84	65%	35%	0%
Local market	67	42%	45%	13%
Agro-input dealer	2	100%	0%	0%
Seed Producers	4	100%	0%	0%
Government	44	82%	11%	7%
NGO / FAO	71	67%	15%	8%
Total for All Seed Sources	889	54%	37%	9%

Farmer assessment of crop production by seed source indicates that farmers considered crop production slightly better when seed was sourced from formal seed channels such as the government and NGO projects versus informal channels such as own saved seed, and friends & neighbours. Overall crop production was rated as good or average by at least 85% of

respondents for across all seed sources. The sample for agro-dealer (2 responses) and seed producer (4 responses) is too small to make any inferences.

Table 4.7: Farmer Assessment of Seed Quality

Farmer Assessment of Seed Used Last Season: June - September 2017				
Crop	Total Responses	Good	Average	Poor
Maize	88	94%	5%	1%
Sorghum	315	91%	7%	2%
Millet	121	91%	8%	1%
Rice	58	95%	5%	0%
Groundnut	80	94%	6%	0%
Cowpea	203	93%	6%	1%
Sesame	25	88%	8%	4%
TOTAL-All crops	890	92%	7%	1%

Farmers rated seed quality as good in at least 88% of the responses across all crops. Poor seed quality did not emerge for more than 2% of responses for any crop beyond sesame, 4% of respondents rated sesame seed quality as poor, based on farmer responses (n=890). There is little variance across crops in terms of farmer assessment of seed quality. While almost all of the seed planted comes from informal channels farmers do not perceive any real issues with seed quality. From the perspective of farmers seed quality is not an issue.

Table 4.8: Farmer Assessment of Seed Quality by Seed Source

Evaluation of Seed Used by Source Last Season: June - September 2017				
Source	Total Responses	Good	Average	Poor
Home saved /own stock	617	91%	8%	1%
Friends, neighbours, relatives	84	94%	6%	0%
Local market	67	87%	10%	3%
Agro-input dealer	2	100%	0%	0%
Seed Producers	4	100%	0%	0%
Government	44	98%	0%	2%
NGO / FAO	72	100%	0%	0%
Other	5	100%	0%	0%
Total for All Seed Sources	896	92%	7%	1%

There is little variance across seed sources in terms of farmer assessment of seed quality. Farmers rated seed quality as good in more than 90% of the responses (n=896) across all sources. From the perspective of farmers seed quality is not an issue. The sample for agro-dealer (2 responses) and seed producer (4 responses) is too small to make any inferences. Despite the farmer ranking of quality to be generally good for most crops and most seed sources, farmers describe ongoing seed stresses, which are now considered 'normal'. *Inter alia*, these include climate variability, drought, low soil fertility, and select plant diseases (striga, *Alectra vogelii*), and storage loss. These 'seed stresses' could also be understood as general stress on an otherwise robust seed system.

Overall Assessment of 2017

The 2017 season was extremely positive. Overall, 93% of the seed farmers sowed came from local channels, overwhelmingly own stock but also the social network of neighbor/family and in the local market. More formal seed channels: agro-dealers, government, ngo/project, and seed sourced directly from seed Producers accounted for 7% of all seed sown. There is little

sign of seed stress and the system is robust as reflected by farmers positive assessment of crop production (table 4.5) and favorable rating of seed quality across all sources of seed (table 4.8).

Farmer Seed sources and Quantities Planted, June- September 2018. Will farmers be seed stressed next year?

Table 4.10: Seed (kg) Planted and Percentage Planted by Seed Source: June – September 2018, Three Sites (N=242)

Crop	Total Seed Planted KG	% of Total								TOTAL %
		Own Stock	Friends / Neighbor / Family	Local Market	Agro-Dealer	Seed Producer	Gov't.	NGO / Project	Other	
Maize	744	74	6	1	2	0	15	1	1	100
Sorghum	3,810	85	3	1	0	0	10	1	0	100
Millet	1,093	84	2	1	3	0	10	0	0	100
Rice	537	60	4	0	3	1	28	2	2	100
Groundnut	1,375	75	2	21	0	2	0	0	0	100
Cowpea	1,264	77	4	5	1	0	8	4	1	100
Sesame	102	52	22	8	1	0	17	0	0	100
TOTAL-all crops	8,926	79	3	6	1	0	10	1	0	100

The main take-away from this table is the importance of saved seed in the respondents' production system. Comparing this table to Table 4.1 on page 28 (seed sources from last year), it appears that respondents engage in wishful thinking about seeds, as they indicated that they plan on receiving 10% of their seed from the government next season, while they received only 3% of their seed from the government last year. Throughout this report, careful attention should be allotted to the potential pitfalls of self-reported data.

Figure 4.2. All Farmers (N=242) seed sources, June-September 2018, Three sites

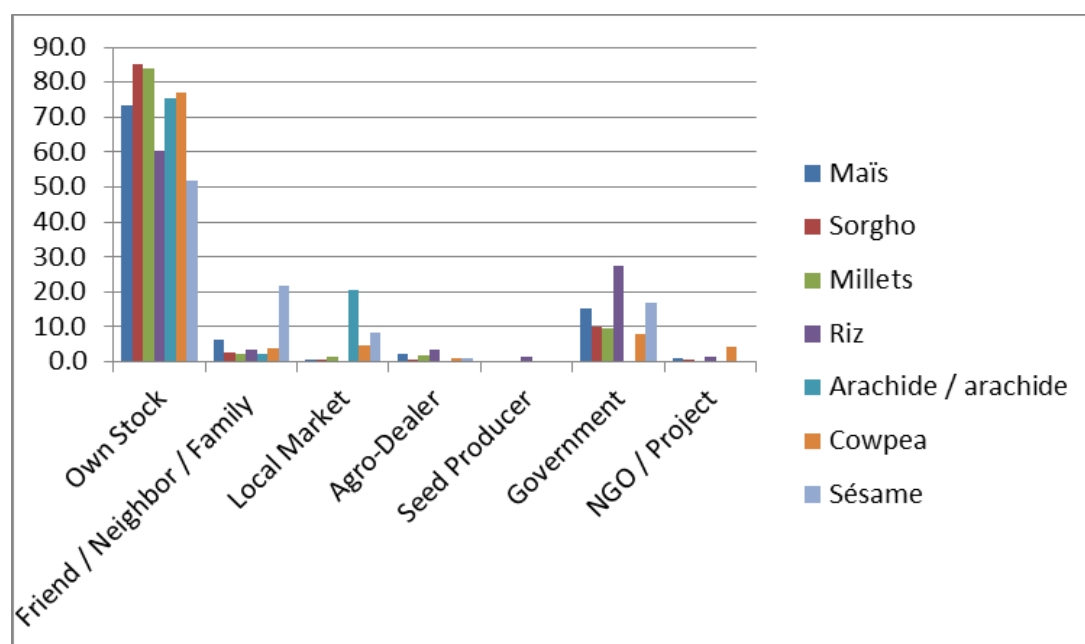


Table 4.11: Reasons Farmers will plant Less than Normal in 2018

Reason Given for Planting LESS than Normal	N	% of Responses
Related to Seed		
Sub-total: SEED related	0	0%
Non-Seed Factors of Production		
Not enough labor	21	39%
Sickness / Poor Health	2	4%
Not enough land / land is not appropriate for agriculture or not fertile	14	26%
Good weather / favorable rains	6	11%
Sub-total: Non SEED Factors of Production	43	80%
Other - New Priority / New Strategy		
Market for the crops or crop products are not well developed	1	2%
Change in priorities for what crops to grow / less priority for agriculture	6	11%
Other - New Priority / New Strategy	2	4%
New agriculture techniques enable for a lower seed rate	2	4%
Sub-total: New Priority / New Strategy	11	20%
TOTAL	54	100%

*The TOTAL is every case where 'Less' or 'More' than normal was recorded. However, the responses to 'LESS' or 'MORE' are recorded in the rows above based on specific reasons that match one of the codes (e.g. a reason coded 1-20 for a case of planting MORE). If the codes are incorrectly written, i.e.- they are codes associated with planting LESS and not with planting MORE, they are not included here. That is why total % may be less than 100%. If multiple reasons are provided, it is also possible that total % may be more than 100%.

Table 4.12: Reasons Farmers will plant more than Normal in 2018

Reason Given for Planting MORE than Normal	N	% of Responses
Related to Seed		
More seed available due to good harvest	9	4%
More seed available due to free seed	6	3%
Good quality seed / Good Variety	2	1%
Sub-total: SEED related	17	7%
Non-Seed Factors of Production		
Good access to labor/ more labor available for agriculture	63	27%
Good health	1	0%
More land / more fertile land	25	11%
Having tools, tractor, other equipment to help with farming	2	1%
Have access to irrigation, fertilizer, or other inputs	1	0%
Good weather / favorable rains	2	1%
Good security / Not Fear of Theft	2	1%
Sub-total: Non SEED Factors of Production	96	41%
Other - New Priority / New Strategy		
Want to increase income from agriculture / market well developed or a new market	38	16%
Seeking more food security / More priority placed on agriculture	52	22%
Change in priorities for what crops to grow	9	4%
Replanting due to stress (poor soil, poor rains, poor germination)	22	9%
Other	2	1%
Sub-total: New Priority/New Strategy	123	52%
TOTAL	236	100%

*The TOTAL is every case where 'Less' or 'More' than normal was recorded. However, the responses to 'LESS' or 'MORE' are recorded in the rows above based on specific reasons that match one of the codes (e.g. a reason coded 1-20 for a case of planting MORE). If the codes are incorrectly written, i.e.- they are codes associated with planting LESS and not with planting MORE, they are not included here. That is why total % may be less than 100%. If multiple reasons are provided, it is also possible that total % may be more than 100%.

As the tables below indicate, households plan to greatly increase chemical fertilizer use in June – September 2018. This may be wishful thinking as it is not clear what will be different for the upcoming season versus 2017. Across all three sites and households, chemical fertilizer was mostly used on four crops: maize, sorghum, rice, and cowpea. Perhaps these households are hopeful to be among the lucky small minority of farming households which access highly subsidized fertilizer from the either the government or through NGO projects.

Table 4.13: Farming Households Using Chemical Fertilizer (N=243)

Households Using Chemical Fertilizer			
June-September 2017		June - September 2018	
Yes	55%	Yes	74%
No	45%	No	26%
N total	243	N total	243

Table 4.14: Households Using Chemical Fertilizer – Reported by Crop

Crop	Chemical Fertilizer Use by Crop			
	June - September 2017		June- September 2018	
	Nb	%	Nb	%
Maize	53	22%	67	20%
Sorghum	51	22%	96	28%
Millet	11	5%	28	8%
Rice	55	23%	67	20%
Groundnut	3	1%	2	1%
Cowpea	58	24%	68	20%
Sesame	3	1%	6	2%
TOTAL-all crops	234	100%	334	100%

Figure 4.3. Farmers Use of Chemical Fertilizer – Reported by Crop, June-September 2017, Three sites (N=234)

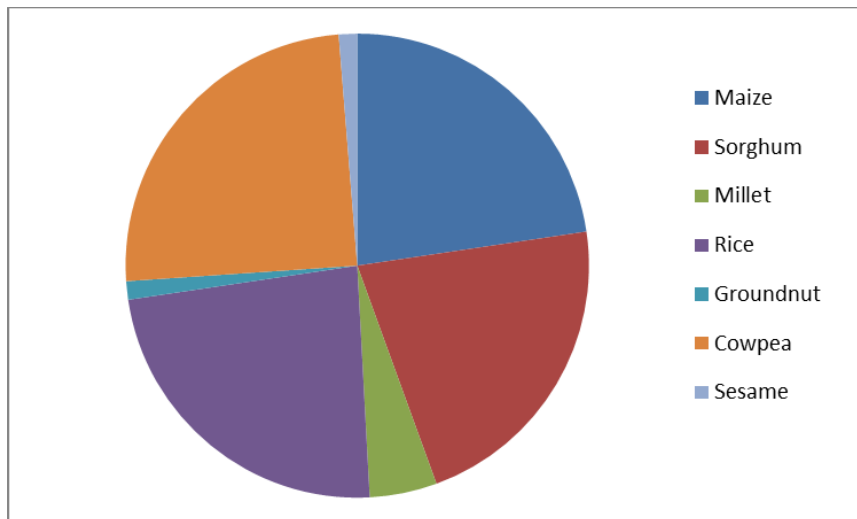
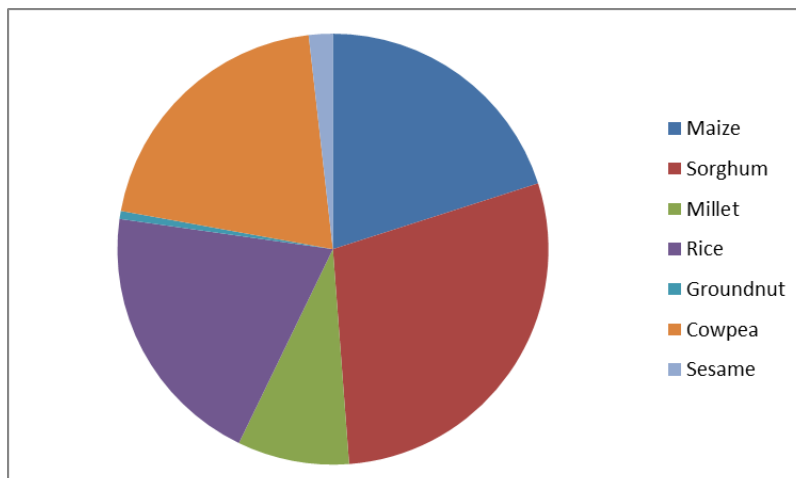


Figure 4.4. Farmers Projected Use of Chemical Fertilizer – Reported by Crop, June-September 2018, Three sites (N=334)



The most important reason cited for not using fertilizer was the cost. Too expensive accounted for 2/3 of the reasons cited for non-use in 2017 and 4/5 of the reasons cited for projected non-use in 2018. Nearly 75% of households surveyed plan to use chemical fertilizer in June-September 2018.

Table 4.15: Reasons Cited by Households Not Using Chemical Fertilizer

Reasons Cited for Not Using Chemical Fertilizer				
Reason	June - September 2017		June- September 2018	
	Nb	%	Nb	%
Not available	20	19%	8	14%
Not needed	5	5%	3	5%
Too Expensive	72	68%	47	81%
Other	9	8%	0	0%
Total	106	100%	58	100%

Seed dressing was added as a question to the survey after completing the first site of Togouri. The rationale for its inclusion was the recognition that it is a growing practice throughout the Sahel. Not surprisingly, nearly 2/3 of household's surveyed indicated that they used seed dressing in the previous season. Farmers indicated that without seed dressing they often must reseed between a quarter and a half of their fields. Seed dressing is gaining importance because it reduces the need for replanting, which exacerbates the labor constraint at a critical labor period in the agricultural season (once farmers finish planting all of their fields, they immediately return to the first field to begin weeding). Seed dressing also contributes to the resilience of farmers because it enables them to take advantage of the first rains, rather than replanting up to half of their field 10 days after the first rains, once they can surmise where germination did not occur.

Table 4.16: Households Using Seed Dressing

Households Using Seed Dressing			
June-September 2017		June - September 2018	
Yes	65%	Yes	68%
No	35%	No	32%
Total N	156	Total N	155

Table 4.17: Households Using Seed Dressing – Reported by Crop

Seed Dressing Use by Crop				
Crop	June-September 2017		June - September 2018	
	N	%	N	%
Maize	31	16%	30	16%
Sorghum	88	47%	87	47%
Millet	28	15%	26	14%
Rice	9	5%	11	6%
Groundnut	4	2%	5	3%
Cowpea	24	13%	22	12%
Sesame	4	2%	4	2%
TOTAL-all crops	188	100%	185	100%

Figure 4.5. Farmers Use of Seed Dressing – Reported by Crop, June-September 2017, Three sites (N=188)

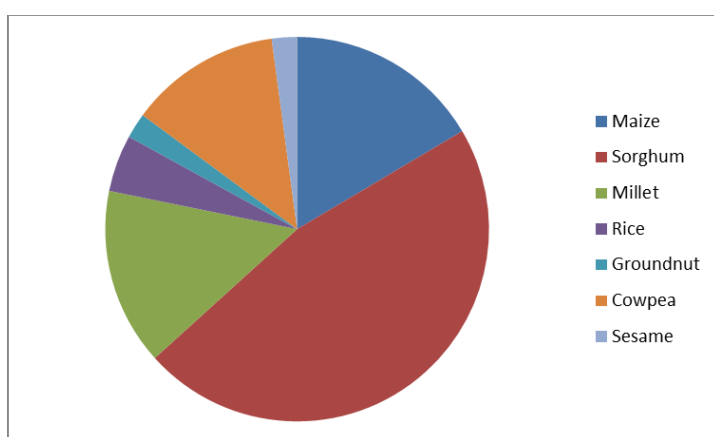


Figure 4.6. Farmers Projected Use of Seed Dressing– Reported by Crop, June-September 2018, Three sites (N=185)

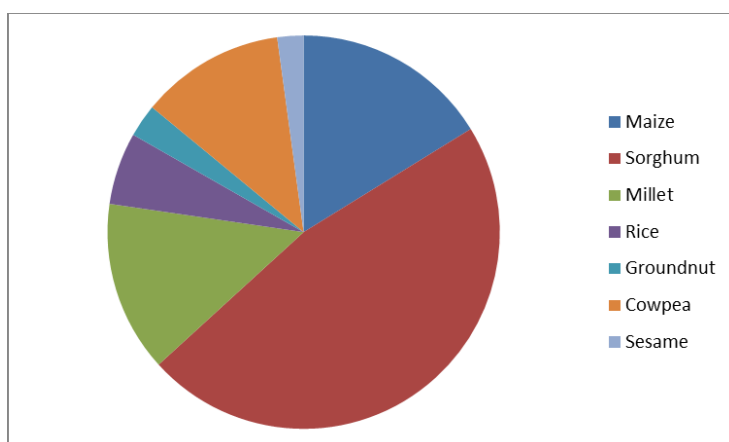


Table 4.18: Reasons Cited by Households Not Using Seed Dressing

Reasons Cited for Not Using Seed Dressing				
Reason	June - September 2017		June- September 2018	
	N	%	N	%
Not necessary / fertile soil	13	24%	13	27%
Too Expensive	4	7%	4	8%
Not familiar with seed dressing	5	9%	1	2%
Toxic / dangerous	23	42%	23	48%
Other	10	18%	7	15%
Total	55	100%	48	100%

Use of organic fertilizer is a widespread practice reported by nearly all farming households. This practice reflects both the desire for farmers to improve soil fertility and the commitment of farming households to allocate labor for more intensive agriculture, even with crops that may not appear to have a clear output market beyond the homestead. As stated in Box #5, composting is a missed opportunity for Burkinabé farmers in the target zones, particularly women farmers.

Box 6: Fertilizer Use on Sorghum and Millet

Women farmers often report that their plots are not fertile and they counter soil deficiency by applying a diversity of organic fertilizers. According to the household survey, 97% of women (n=101) applied organic fertilizer last year (while only 52% applied chemical fertilizer.) Small ruminants were their greatest source of manure, followed by cattle, and crop residues. Meanwhile 95% and 57% of men and used organic and chemical fertilizer respectively, and they sourced manure from the same animals as the women. Heavy reliance on soil amendments among men and women is indicative of the soils poverty in the target region and the necessity to address fertility.

Organic and chemical fertilizer require large amounts of labor (organic fertilizer) and financial investment (chemical fertilizer). Farmers in the assessment sites devote most of their agriculture land to millet and sorghum. While there is a perception that West African millet and sorghum farmers are reluctant to invest in or adopt improved agricultural practices, the assessment revealed that farmers do in fact invest in these crops through the application of organic and chemical fertilizer to improve the soil fertility of these crops.

The tables below show the correlation between land area and use of organic fertilizer (labor) devoted to the crops, with exceptions for the nitrogen-fixing cowpeas and groundnuts. Sorghum fields received the most mentions of chemical fertilizer use among men and women, logically following its primacy in their crop selection. Millet however received very little chemical fertilizer. The farmers seemed keener to apply chemical fertilizer to cash crops – women grow cowpea for market sales and men are more likely to sell their corn and rice in the market. Farmers have so little cash that they are most likely to invest cash into a crop's production if they can get cash out of the production (money only goes in where it also comes out).

Application of soil amendments among women in 2017

	Total seed used (kg)	Estimated seed rate (kg/ha)	Estimated hectares	% of cultivated land	% of mentions of organic fertilizer use	% of mentions of chemical fertilizer use
Sorghum	1,449	8	181	60%	46%	21%
Millet	455	6	76	25%	23%	3%
Groundnut	880	50	18	6%	2%	1%
Cowpea	416	25	17	5%	11%	34%
Maize	198	25	8	3%	15%	19%
Rice	133	30	4	1%	2%	21%

Application of soil amendments among men in 2017

	Total seed used (kg)	Estimated seed rate (kg/ha)	Estimated hectares	% of cultivated land	% of mentions of organic fertilizer use	% of mentions of chemical fertilizer use
Sorghum	2,285	8	286	65%	42%	22%
Millet	557	6	93	21%	23%	5%
Cowpea	654	25	26	6%	10%	19%
Maize	414	25	17	4%	24%	24%
Rice	348	30	12	3%	8%	25%
Peanut	461	50	9	2%	0%	1%

Despite a wide reported use of manure, focus groups with female farmers revealed that they are not composting. Composting is an excellent way of improving the efficacy of organic soil amendments. The main barrier to composting for West African farmers is labor. Watering the pits at frequent intervals and transporting the compost to the fields make composting very laborious. Female farmers can reduce the labor necessary for composting by (1) digging a cubic meter compost pit near or in their concession, (2) including kitchen scraps, ash, and other household detritus in their pits, and (3) watering the pits with wastewater from their daily washing duties (dishes, children, and clothes). CRS experience in other West African Countries has shown that once women experience the efficacy of compost pits in or near their concessions, they become champions of the practice.

Table 4.19: Household’s Use of Organic Fertilizer

Households Using Organic Fertilizer			
June-September 2017		June - September 2018	
Yes	96%	Yes	99%
No	4%	No	1%
Total N	243	Total N	226

Table 4.20: Household’s Use of Organize Fertilizer– Reported by Crop

Organic Fertilizer Use by Crop				
Crop	June-September 2017		June - September 2018	
	Nb	%	Nb	%
Maize	90	21%	83	20%
Sorghum	191	44%	181	43%
Millet	79	18%	69	16%
Rice	26	6%	33	8%
Groundnut	3	1%	3	1%
Cowpea	46	11%	44	11%
Sesame	1	0%	5	1%
TOTAL-all crops	438	100%	419	100%

Figure 4.7: Organic Fertilizer Use – Reported by Crop, June-September 2017, Three sites (N=438)

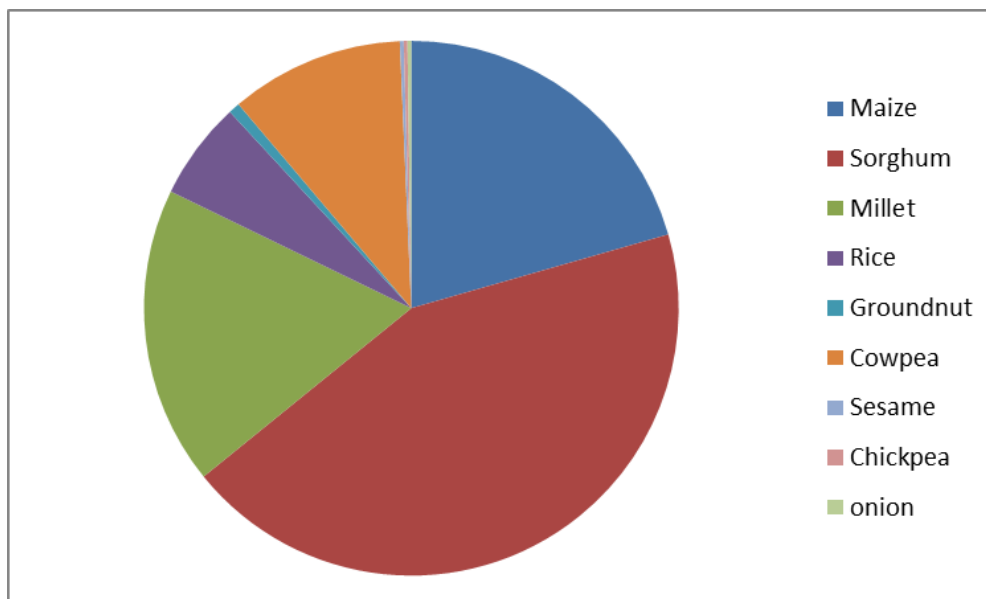


Figure 4.8: Organic Fertilizer Use – Farmers Projections by Crop, June-September 2018, Three sites (N=419)

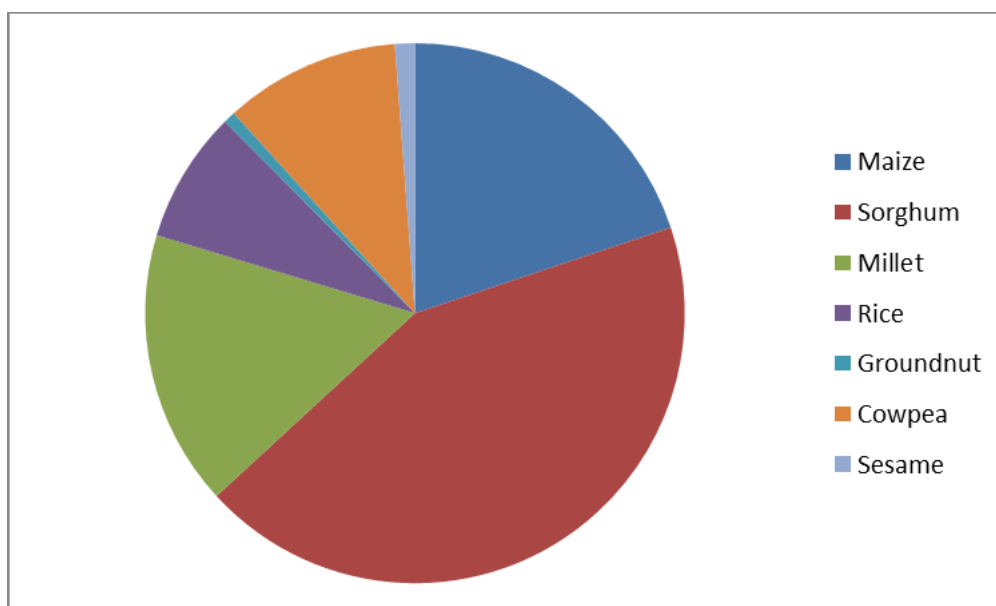


Table 4.21: Organic Fertilizer Types – Types Used in 2017 and Types projected to be Used in 2018

Organic Fertilizer Use by Crop				
Type	June-September 2017		June - September 2018	
	Nb	%	Nb	%
Large animals (cow, horse, mule)	154	29%	145	29%
Small ruminants (sheep, goat)	200	38%	186	38%
Bird droppings	32	6%	28	6%
Plant and residue (stock, stems, leaves)	96	18%	96	19%
Kitchen scraps / waste	25	5%	21	4%
Other	18	3%	17	3%
total	525	100%	493	100%

Less than 20% of households surveyed noted that they had storage losses in 2017 (from 2016 harvest). It is likely that all farming households surveyed experienced some form of post-harvest storage loss. However, only those households with noticeable losses responded affirmatively to having losses.

Table 4.22: Reported 2017 storage Loss based on harvest of 2016 (n=239)

Households Reporting Storage Loss	
Yes	18%
No	82%
Total N	239

Box 6: Intensifying millet and sorghum production with subsidies

In early 2015, a private funding organization released a call for pilot proposals in Mali, Nigeria, and Burkina Faso “to establish a more practical understanding of how the production of sorghum and pearl millet features in [farming] households’ overall livelihoods, and what that means for the investment choices they make regarding the production of these crops.” Working from the assumption that farmers are not sufficiently investing in and adopting improved agricultural practices for sorghum and millet, the funder wanted “to determine whether and how to invest to support farmers” in their sorghum and millet production. They funded a project that stimulates local demand and strengthens the Comité Interprofession de Céréales Burkina Faso (CIC-B), an organization representing input suppliers, farmers, traders, processors, and transporters. The project aims to increase the adoption of intensive agricultural practices in millet and sorghum production by:

- Obliging specific agricultural practices on participating farmers to ensure a high-quality and uniform harvest, including the application of organic fertilizer and the annual purchase of certified seed.
- Creating and guaranteeing credit mechanisms which help farmers to access inputs and local processors to access grain.. The farmers and processors must pay market prices for the inputs.
- Stimulating demand for sorghum and millet.

The funder sought to better understand the conditions under which West African farmers invest and adopt improved practices for millet and sorghum production. The project provides much needed credit and training to farmers and processors, enabling them to take the next step forward in the modernization of their value chain. The project shows that farmers will adopt and invest in improved agricultural practices when they are provided access to credit, when access is contingent on input purchases and following proscribed agricultural practices, and when farmers are linked to new markets for production.

The larger issue here is the tendency for donors and development partners to use subsidies to validate existing assumptions rather than critically examine the problem from the perspective of farmers. The risk in this approach is that the most significant challenges faced by farmers in investing in and adopting improved practices may not be understood or addressed.

To better understand the conditions under which West African farmers invest and adopt improved practices for millet and sorghum production understand low adoption rates, the development community should critically evaluate their own assumptions and improve their understanding as to how subsistence farmers evaluate risk and set production priorities under the constraint of limited resources (money, time, labor, knowledge). An ethnographic approach is warranted to better understanding farmer decision making relative to technology use and practice in millet and sorghum production systems.

In the upcoming project design phase, CRS should take a critical look at underlying assumptions and approaches to seed system development while maintaining a focus on the larger goal of kick starting market-based solutions that provide farmers durable access to quality seed that meets their demand. Is there a way to use project resources in ways that stimulate the adoption of new varieties and the long-term security of the seed system?

Table 4.23: Storage Loss – Reported by Crop (n=67)

Storage Loss Reported by Crop		
Crop	N	Average Loss
Maize	16	8.8%
Sorghum	22	10.0%
Millet	9	7.8%
Rice	1	10.0%
Groundnut	2	0.0%
Cowpea	16	42.5%
Onion	1	40.0%
TOTAL-all crops	67	17.3%

Table 4.24: Household Use of Chemicals in Storage

Use of Storage Chemicals			
June-September 2017		June- September 2018	
Yes	41%	Yes	37%
No	59%	No	63%
Total N	241	Total N	236

Table 4.25: Storage Chemicals – Reported by Crop

Use of Storage Chemicals - Reported by Crop				
Crop	June-September 2017		June- September 2018	
	Nb	%	Nb	%
Maize	10	9%	7	7%
Sorghum	28	24%	24	25%
Millet	7	6%	8	8%
Rice	4	3%	4	4%
Cowpea	66	58%	52	56%
TOTAL-all crops	115	100%	95	100%

An encouraging finding from the seed assessment was the extent to which households reported accessing new varieties over the past five years. More than 85% of household reported accessing a new variety over the past five years with the average household (n=239) accessing 2 varieties during this period. Government and NGO/FAO accounted for 80% of sources of new varieties over the past five years and direct distribution was the most common means of access.

Table 4.26: Source of New Varieties

Sources of New Varieties Accessed the Past Five Years		
Source	Nb	%
Friend / Family / Neighbors	47	13%
Local Market	11	3%
Agro-Dealer	8	2%
Seed Producer	2	1%
Government	135	36%
NGO/FAO	169	45%
Total	372	100%

Table 4.27: Means of New Variety Access

Mean by which New Varieties were Accessed the Past Five Years		
Means	Nb	%
Barter / Labor	7	3%
Gifts from Friend / Family / Neighbors	58	25%
Purchase	31	13%
Vouchers / Coupons	23	10%
Direct Distribution	112	48%
Total	231	100%

Box 7: Climate smart agriculture with local sorghum varieties

Farmers in Haba village, the largest in Bartiebogou Commune, have benefitted from many government and NGO efforts to promote improved sorghum varieties. However, they remain fond of their local varieties.

Local Sorghum Varieties in Haba

Name	Meaning	Description	Key feature	Pre-dominance
Moursi	“it will always provide” / “ca va donner toujours”	White	120 days	#1 local variety in terms of surface area.
Kourbouli	“where there is water”	Gray / off white	90 days	#2 local variety in terms of surface area, widely grown in flood plains.
Kankuade -Hoabo	“one will not sell the goat”	White, long panicle	50 days	#3 local variety in terms of surface area.
Femoanga	“where the seed is lodged is red”	White	120 days	#4 local variety in terms of surface area.

The dynamic genepool management and farmer-participatory improvement aims at a simultaneous in situ conservation and improvement of plant genetic resources to meet farmer’s needs and the challenges of adaptation to climatic variability and site-specific conditions. Farmers and breeders cooperate to define the major site-specific production objectives and constraints, and the corresponding selection criteria. For each target site and/or specific



Mr. Victoir Soulama, Auxiliary Seed Extension Officer, Komandajari Province shows head of Kapelga (right hand) and Kourbouli (left hand).

production objective, a diversified base population is built through crossing and recombining the respective local landrace cultivar with farmer-selected genetic resources carrying new traits of interest corresponding to the defined selection criteria. Representative seed lots of base-populations are distributed to different farmers in the target region. Natural and recurrent selection by farmers and breeders act on the distributed material and lead to the development of new subpopulations that can be excellent sources of variation for specific adaptation, farmer-preferred traits, and new trait combinations (via recombination) not previously available. The sum of all subpopulations can be considered as new “mass reservoir of genetic adaptability”. This gene-pool approach provides the best opportunity to “offer a wide diversity of material to the wide diversity of farmers” for effective participatory plant breeding. It results in the development of new cultivars with superior performance and specific adaptation to farmer’s needs.

Actions that can be taken to strengthen the access and availability of local varieties in Burkina Faso include: promoting Farmer-participatory improvement of sorghum and pearl millet genetic resources for increased adaptation to diverse production environments.

Table 4.28: Reports of New Variety Access by Crop

Table 4.29: Time Frame when New varieties were accessed

Year when New Variety was Accessed		
Year	Nb	%
2017	113	30%
2016	53	14%
2015	83	22%
2014	76	20%
2013	35	9%
2012	17	4%
2011	2	1%
total	379	100%

Seed Aid was widely reported during this assessment and there were several seed projects implemented in each of the assessment sites over the past five years. The household assessment reflected this as 86% of households indicated that they were recipients of seed aid at least once over the past five years with the average number of times reported per household of 1.7. The main sources of seed aid were NGO's and FAO (40%) and the government (56%).

4.30: Seed Aid – Reported by Crop

Seed Obtained by Aid			
Crop		Nb	%
Maize		24	7.3%
Sorghum		87	26.4%
Millet		14	4.2%
Rice		46	13.9%
Sweet Potato		1	0.3%
Cowpea		122	37.0%
Sesame		25	7.6%
Onion		10	3.0%
Gombo		1	0.3%
TOTAL-all crops		330	100.0%

Table 4.31: Time frame when seed aid was received

Year when New Variety was Accessed		
Year	No.	%
2018	1	0%
2017	106	32%
2016	56	17%
2015	69	21%
2014	54	16%
2013	32	10%
2012	11	3%
total	329	100%

V. SUMMARY OF FINDINGS AND KEY RECOMMENDATIONS

Cross Site Seed Findings

HH data

- No sign of seed insecurity in our target sites. HH didn't have trouble accessing seed.
- Plenty of access to new varieties.
- New varieties are mostly provided for free and few are bought from formal seed sources like agro-dealers or seed producers.
- HHs are primarily accessing seed from own saved stock followed by government and NGO's. Much less accessing seed from Agro-dealers, friends/family/neighbors, or local markets, except for a few cases (cowpea, peanuts).
- The government and projects provide an important source of seed as reported by households at all three sites of the assessment.
- Almost all HH have accessed seed aid in the last 5 years.
- A high percentage of HH received seed aid multiple times over the last 5 years.
- HHs apply organic amendments to their fields from diversified sources (but the women are not composting).
- A strong percentage of HHs apply (expensive) chemical fertilizers despite their limited means.
- HHs use seed treatment, primarily on cereals. It's a widely reported phenomenon that is used by a minority of farmers.
- Storage loss was not a major issue.

Agro-dealers

- Excluding vegetable seed, seed sales make up no more than 25% of their business (their business is not seed).
- Agro-dealers generally expressed interest in building their seed business.
- Agro-dealers are showing dynamism and innovation in their sales and marketing approach (agents, mobile money, collaboration with other agro-dealers).
- Their 2 main constraints are the late arrival of seed and a limited amount working capital/credit.

- Two additional constraints are permits/certification and the lack of distribution networks.
- Agro-dealers can now sell seed to government and NGOs.
- The market for the agro-dealers has become more favorable (legal changes since 2015).
- The number of agro-dealers is very limited.

Seed Producers

- Seed producers generally lack an entrepreneurial spirit.
- Seed producers are well organized into producer unions.
- Legal changes are underway to make the seed structure more business friendly and harmonized with regional laws (OHADA).
- Seed producers are orienting their production toward government and NGOs, but not toward farmers and agro-dealers.
- Production decisions are driven by government and the market is not functioning.
- There are multiple cases of supply and demand not meeting (2017: overproduction of sorghum by 30 tons in Komandjari, and underproduction of peanut and cowpea in Thion).
- Lots of cowpea fields are declassified because of insect attack during flowering period.
- The auxilier semencier provincial works closely with seed producer unions – s/he is the primary source of technical support for seed producers and s/he heavily influences the crops and varieties that are produced.
- Current seed law stipulations on minimum amount of land for seed production hinders women and vulnerable populations from becoming seed producers.
- Too much seed is being produced. There is no indication that the amount of seed being produced could be sold at its current price.

Local Market

- Very limited reported sourcing from local markets, except for cowpea, peanuts, and sesame.
- Multiple cases of farmers sourcing seed from local markets, and grain traders selling seed, but HH data indicates it is not a significant source (under exploited opportunity to leverage local grain markets for seed value chain development and for promoting access to new varieties).

- The sale of seed at the local market strengthens the vendor's customer base for grain.
- Seed sales at the local market are based on trust and accountability.
- Reported cultural reticence to buying seed in the local market

Government

- Government play a massive role in the seed system (production, distribution, pricing, legal framework).
- Government subsidies to seed producers is the foundation of seed producers' business.
- The structure and processes of government seed distribution are becoming more developed (compared to before), but variable results in targeting the vulnerable.
- Basic seed production continues to present a challenge in terms of providing quantity/quality/price despite significant improvements.
- INERA seed fairs are innovative and present an excellent opportunity.
- Many examples of a lack of basic seed for specific crops and specific varieties.
- The collaboration between seed enterprises and seed producers does not exist.
- There is a lack coordination of seed activities at the communal level between government and NGOs

NGOs

- There is a lack coordination of seed activities at the communal level between government and NGOs.
- The amount of seed that NGOs provide to a given farmer is unnecessarily high, and it's potentially creating dependency.
- Large seed purchases from NGOs (appel d'offre) can destabilize the market.
- NGOs are an important source new varieties, innovations, and training for farmers.
- NGOs need to coordinate seed subsidies to avoid creating perverse competition among farmers.

Recommendations

The SSSA was conducted across three sites in Burkina Faso and covered 242 households. The recommendations are oriented to action areas which can help farmers to alleviate chronic stress and which can position the seed system to be more dynamic, responsive, and

sustainable. Overall, the SSSA did not identify seed insecurity which would warrant an emergency response or “quick one-off” set of seed system activities. The seed security issues identified by the assessment were more chronic. They require a more integrated and coordinated approach, working with a breadth of actors from the public and private sector, and with a longer term perspective and emphasis.

The recommendations below are practical and feasible. Implementation of these broad action areas will lead to positive seed system changes within a four year time frame. This set of recommendations is applicable across the SSSA sites and are clustered into four themes: expand varietal diversity; diversify sources and means through which new varieties are accessed; innovate approaches to support entrepreneurial seed producers; and improve seed productivity through promoting seed dressing and composting.

A more detailed action planning, involving a cross section of seed sector specialists and focused on the key cross sites findings and recommendations, is warranted. This could be done by using the data from this assessment and building on the identified action areas to make them more detailed, time bound, and to specify the roles and responsibilities of the most important seed system actors for each of the priority action areas.

1. Expand Varietal Diversity

Overview

There is substantial scope to expand varietal diversity. The focus for new variety access should be placed on sorghum, millet, cowpea, rice, and sweet potato. Modern, farmer-acceptable, and market preferred crops and varieties have to continually feed into local production systems. This will help farmers be more resilient in terms of adapting to changes in temperature and rainfall, in some case boost and in other cases stabilize yields, and expand market possibilities through access to more crop and varietal germplasm options. Across sites, only new cowpea varieties have entered farming systems in a significant way over the past five years. Otherwise, varietal turn-over and varietal diversity as measured by what farmers consider to be ‘new varieties’ is weak.

The SSSA showed that over 87% of households (n=239) across all three sites had accessed a new variety in the past five years with an average of 1.9 new varieties reported per household. However, further analysis reveals that access to new varieties was limited in terms of crops, varieties per crop, and in terms of sources by which households accessed new varieties.

Across the three sites, the SSSA had 383 reports of new varieties during the past five years of which 78% of these reports were for only three crops: cow pea (134 reports), sorghum (105 reports), and rice (58 reports). Millet and maize, both of which were top five crops in terms of total seed planted during the most recent campaign of 2017 and projected planting in the 2018 campaign, accounted for only 12% of the reports of new varieties received during the past five years (30 report for maize and 16 reports for millet). There was a single report of a new sweet potato variety.

For sorghum, community interviews and discussions with key informants (seed producers, district authorities) revealed that Kapelga was almost exclusively the new sorghum variety produced and accessed by farmers across all three sites. Sarioso 11 was also noted as being produced by a few seed producers. Both are earlier maturing varieties. Sarioso 11 was released by INERA in 1996. Kapelga was released by INERA in 1999. There are 23 sorghum varieties in the Burkina Faso seed catalogue as of 2017.

For rice, key informants revealed that FKR 19 (flood plain, released in 1986) and FKR 45 N (rain fed, released in 2006) were the dominant new rice varieties produced and accessed by farmers across all three sites. These are 7 rice varieties in the Burkina Faso seed catalogue as of 2017.

For cow peas, key informants revealed that Komkalle, Nafi, and Tilligre were widely produced and the three sites. Several cow pea seed producers acknowledged growing all three varieties. These varieties were released in 2012 and are highly tolerant to thrips and short cycle (60-75 days). There are 12 cow pea varieties in the Burkina Faso seed catalogue as of 2017.

For millet, key informants revealed two varieties were being promoted as new varieties in the assessment areas: Misari 2 (85 days) and IKMV8201 (80 days). None of the seed producers interviewed were producing millet seed. Misari 2 was released in 2009 and IKMV2801 was released in 1986. There are 7 millet varieties in the Burkina Faso seed catalogue as of 2017.

Problem: New varieties are limited in terms of both crop and varietal diversity.

Seed System Goal: Increase the diversity of improved locally adapted germplasm.

Tasks	Actions	
	1-2 seasons	+ 3-4 seasons
Identify available catalogued germplasm of sorghum, millet, cowpea, rice, and sweet potato which meet the desired varietal characteristics of farmers in target intervention zones.	Work closely with INERA and identify three candidate varieties per crop per intervention zone.	Continually identify potential germplasm through collaboration with INERA and INERA research partners (Universities / CGIAR) involved in plant breeding for these crops.
For sorghum and millet, identify land races whose attributes meet the desired characteristics of farmers in target intervention zones.	Identify material from both formal breeding and local genetic sources and introduce land races from areas of similar agro-ecologies. Conduct in community adaptability trials directly with farmer by providing very small quantities (50-100 grams per variety) and up to three varieties per farmer.	Link seed producers and agro-dealers with the results from adaptability trials so that they better under farmer demand for the different sorghum and millet varieties.
For cow pea, focus on exposing communities to the performance of the varieties released since 2010.	Conduct PVS for all varieties in a community site with one trial per village covered by program intervention.	Link seed producers and agro-dealers with the results from adaptability trials so that they better under farmer demand for the different cowpea varieties.

Tasks	Actions	
	1-2 seasons	+ 3-4 seasons
For rice, identify three irrigated and three rain fed varieties	Conduct PVS for rain fed and irrigated varieties; one PVS for irrigated rice per BAS FOND throughout the program intervention areas and two PVS for rain fed per commune.	Link agro-dealers with the results from adaptability trials so that they better understand demand for rice varieties.
For sweet potato, identify at least 2 orange fleshed and 3 white flesh varieties.	Identify up to 12 farmers per commune with access to irrigation to manage a PVS plot.	Provide technical training and support to small scale sweet potato vine multipliers.

2. Diversify the Sources and Means by which New Varieties are Accessed

Overview

There is substantial scope to expand the sources and means through which new varieties are accessed. The focus on sources should be placed on seed producers, local grain traders, and agro-dealers. These three sources were not important source of new varieties – accounting for under 10% of all reported sources (372 citations of new sources were noted in the SSSA). The focus on new means through which new varieties are accessed should be aimed towards the innovative use of vouchers and partially subsidized coupons.

Across the three sites, the SSSA had 372 reports of sources of new varieties during the past five years of which 81% were NGO's/FAO (169 reports) and Government (135 reports). Friends, family, and neighbors accounted for 13% (47 reports) while local markets, ago-dealers, and seed producers combined accounted for 6% (21 reports) of the reported sources of new varieties during the past five years.

Across the three sites, the SSSA had 231 reports for means by which new varieties were accessed during the past five years of which 48% (112 reports) were by direct distribution, 25% (58 reports) gifts from friends and neighbors, and 23% was from either direct purchase (31 reports) or vouchers (23 reports).

It is excellent that the government and NGO's are such an important source of new varieties. However, farmers will have more options through promoting existing but under used sources for new varieties and in some cases establishing new channels by which farmers access new varieties. Some other seed sourcing channels which can be used to promote new variety access include seed producers, local grain traders, and agro-dealers. Each of these sources could benefit from access to technical training and support in marketing and in packaging seed in small packets.

By law, seed producers are currently not allowed to sell seed to individual farmers. Change in seed regulation is necessary to enable seed producers to sell directly to individual farmers. Alternatively, seed producers can be encouraged to partner with agro-dealers and sales agent working in local markets to sell certified seed. The number of agro-dealers in all three of the

sites was quite limited. In the course of the SSSA in Bartiebogou we identified only three agro-dealers.

While seed producers and agro-dealers could serve as sources to access new varieties, seed dealers or agents working in local markets could also be a key new sourcing option if they could establish a legal / regulatory right to sell certified seed. These agents could operate on a commission basis where-by they hold a seed inventory during planting season on behalf of a seed producer or agro-dealer. In return for holding the inventory at free of charge, they charge a commission (30-50%) on the value of each transaction and maintain records of all sales.

Problem: New varieties are made available to farmers through limited sources and mostly by gift or free distribution.

Seed System Goal: Expand the sources and use innovative means through which farmers access new varieties.

Tasks	Actions	
	1-2 seasons	+ 3-4 seasons
Broaden sale venues for new varieties to stimulate the creation of a broader customer base. Expand the sources and innovative means through which new varieties are accessed.	Link under-utilized seed sources (seed producers, local grain traders, agro-dealers) with PVS results in the commune. Invite them to open field days, provided summary data sheets on varieties and performance, provide contacts information for certified and basic seed producers. Where possible, variety testing trials and demonstration in close proximity to where sales are taking place.	Farmer focused, VERY small packs sales (50-100 grams) with very small quantities (requiring small inventory) can be done across a range of venues where farmers buy seed. Small pack seed would all be certified and the models aimed to expand sources by farmer customers access high quality seed.
Support Seed Producers to identify new sales outlets and to carry a wider variety of crops as they will be under more pressure to find markets beyond the government and NGO's.	Work with seed inspectorate and seed producers to help them sell seed directly to farmers. Link seed producers with PVS / variety assessment trials. Train seed producers in seed marketing.	Help seed producers to carry a wider variety of crop. Work with seed inspectorate and producers to identify innovative ways by which producers can increase diversity of seed production and still certify production.
Support Local Grain Traders as sources of new germplasm and certified seed and help them improve quality of seed they put on offer. Seed/grain traders can have a large positive	Identify seed/grain traders in main markets that are willing to maintain a small inventory of certified seed. Link local grain traders with PVS / variety assessment trials.	Support traders to learn about new variety identification, attributes and management. Strengthen local market channels that all farmers use

Tasks	Actions	
	1-2 seasons	+ 3-4 seasons
impact in helping to farmers to access new varieties.	Train seed/grain traders on better storage techniques.	on a regular basis to access as source of new germplasm.
Support Agro-Dealers to be more prominent sources of new germplasm and certified seed. Help agro-dealers to become be better integrated with seed producers, variety assessment trials, and seed business development services (credit, sales & marketing, packaging).	<p>Link agro-dealers with PVS / variety assessment trials.</p> <p>Advocate that seed aid programs use voucher and coupons re-imbursed through agro-dealers.</p> <p>Train and support agro-dealers to maintain documentation on seed and other agricultural inputsales.</p> <p>Encourage agro-dealers to use small packs.</p> <p>Provide credit to agro-dealers so that they can maintain an inventory of seed during planting season.</p> <p>Transport and inventory credit to encourage agro-dealers to sell certified seed closer to farmer, such as at weekly markets during planting season.</p>	Identify and facilitate credit facilities with banks and agricultural loan programs.

3. Innovate Approaches to Support Entrepreneurial Seed Producers

Overview

The network of seed producers and seed producer union is well organized across all three of the assessment sites and reflect the significant investment and policy focus from the Burkina Faso government since 2006. This has led to a big increase in area of seed production, wider range of varieties, and the total quantity of seed produced. However, the system is predicated in significant levels of subsidies and is not market oriented. Nearly all seed producers interviewed noted that their business is dependent on selling to the government. Seed unions reported selling certified seed in large lot tenders to NGO's supported by USAID funding. Discussions with seed producers and seed unions across all of the sites revealed that the government prices and even the NGO price at which certified seed is purchased is typically sold at a 200-800% mark up from grain prices. The level of subsidy encourages certified seed production but also results in seed surplus. For example, the Komandjari Seed Union reported a 30 metric tons surplus of certified sorghum seed in both 2016 and 2017. The high rates of subsidies does not encourage entrepreneurial spirit or market orientation from seed producers as they focus almost exclusively on selling to the government. At the same time, certified seed

standards are strict, with a minimum of 3 HA of land required for a certified seed producer, which is a barrier to entry for many potential seed producers.

Change is underway in Burkina Faso and discussions with two seed unions revealed that de-regulation of seed law is expected. Changes to the seed law in 2016 allowed for seed enterprises and agro-dealers to compete with seed producers in bidding on government seed contacts and moving seed from one province to another. This means that agro-dealers and seed enterprises can act as seed traders, buying certified seed in one part of the country and selling it in another. This trend of de-regulation is expected to continue. As of late 2017, seed unions reports that legal changes are under way to harmonize regional seed laws (OHADA) which will make it feasible for seed producers in Burkina to sell into neighbouring countries and vice-versa.

Problem: Certified Seed Producers in Burkina Faso are not entrepreneurial and are not well equipped to adapt to more de-regulated and competitive seed market.

Seed System Goal: Support the development of a network of entrepreneurial market oriented certified seed producers less dependent on government and NGO contracts for their survival.

Tasks	Actions	
	1-2 seasons	+ 3-4 seasons
Develop and launch a "direct seed marketing" program to help seed producers sell seed directly to farmers.	<p>Work with government authorities to test and learn from pilot direct seed marketing program where seed producers sell directly to farmers through organized seed markets and registered seed dealers / agro-dealers.</p> <p>Stimulate organized seed markets through introducing market subsidies (vouchers) to encourage more buyers and sellers to participate.</p>	Identify and address seed policy and seed regulatory issues which make it difficult for seed producers to sell directly to farmers or to local registered seed dealers and agro-dealers.
Establish an information platform for seed producers to access up to date information on availability of basic seed; certified seed prices in different locations; and relevant seed policy impacting seed producers.	<p>Create an open access information platform managed centrally with technical support from economists and IT specialists.</p> <p>Make user interface simple and oriented to seed producers (accessible via mobile phone messaging).</p>	Transfer management of information platform to an independent commission made up of seed producers, INERA, and seed inspectorate.

Tasks	Actions	
	1-2 seasons	+ 3-4 seasons
Identify and facilitate access to credit (working capital loans for seed producers)	Identify and facilitate credit facilities with local banks and agricultural loan programs.	

4. Improve Seed Productivity by Promoting Seed Dressing and Composting

Overview

Chemical and organic fertilizer as well as the use of seed dressing can raise overall seed productivity in terms of seed use (lower the use of seed due to higher germination rates and greater plant vigour and increased the yield from each seed planted).

Seed dressing was added as a question to the survey after completing the first site of Togouri. The rationale for its inclusion was the recognition that it is a growing practice throughout the Sahel. Not surprisingly, nearly 2/3 of households surveyed indicated that they used seed dressing in the previous season. Farmers indicated that without seed dressing they often must reseed between a quarter and a half of their fields. Seed dressing is gaining importance because it reduces the need for replanting, which exacerbates the labor constraint at a critical labor period in the agricultural season (once farmers finish planting all of their fields, they immediately return to the first field to begin weeding). Seed dressing also contributes to the resilience of farmers because it enables them to take advantage of the first rains, rather than replanting up to half of their field 10 days after the first rains, once they can surmise where germination did not occur.

Seed Dressing, particularly Apron Star, increases resilience to drought and reduces labor during the critical period when the labor is especially constraining. CRS trainings should focus messaging on the labor and resilience benefits of seed dressing when promoting its adoption. Demonstration plots should include a plot that demonstrates the results of Apron Star combined with reduced fertilizer expenditure (reflecting the real-life decisions farmers must make). CRS should also engage farmers in discussions about selling their labor after the first rain in order to buy Apron Star, which can reduce overall labor and result in earlier yields, due to higher germination rates and reduced replanting. This can be a hard sell because cultural practices dictate that a farmer should sow his own fields at the critical timing, thus demonstration plots should include a plot that shows the results of planting 5 days late with Apron Star.

Despite prolific use of manure, focus groups with female farmers revealed that they are not composting. Composting is an excellent way of improving the efficacy of organic soil amendments. The main barrier to composting for West African farmers is most often labor. Watering the pits at frequent intervals and transporting the compost to the fields make composting very laborious. Nevertheless, female farmers are in a unique position to reduce the labor necessary for composting by (1) digging a cubic meter compost pit near or in their concession, (2) including kitchen scraps, ash, and other household detritus in their pits, and (3) watering the pits with wastewater from their daily washing duties (dishes, children, and clothes). CRS experience in other West African Countries has shown that once women

experience the efficacy of compost pits in or near their concessions, they become champions of the practice.

CRS should promote the benefits of composting (in piles or pits) via demonstrations of its efficacy. Pits are less labor in the long run because a farmer only digs the hole once and they make more efficient use of the water, which is a repeated cause for labor. However, if the upfront labor of digging a hole dissuades adoption, piles make a good intermediary step in the adoption of composting.

Problem: Tried and proven methods to increase seed productivity are not widely practiced.

Seed System Goal: Maximize the productivity of seed through seed dressing and organic manure.

Tasks	Actions	
	1-2 seasons	+ 3-4 seasons
Increase use of seed dressing to help farmers be more resilient to drought and improve seed productivity (raise germination, plant vigour, and reduce need to re-seed).	<p>Demonstration plots with and without use of seed dressing (ApronStar).</p> <p>Credit support to agro-dealers and village level boutiques to encourage them to carry seed dressing products (Apron Star) at start of planting season.</p> <p>Selective use of voucher / coupons to encourage farmers to try seed dressing.</p>	Lead farmers (one per village) serve as seed dressing distributor linked to an agro-dealer in exchange for managing a seed dressing demonstration plot.
Increase use of composting to increase availability and use of organic fertilizer and improve seed productivity.	<p>Demonstration pits and training on pits construction, compost management, and compost application.</p> <p>Selective use of "composting rewards" for farmers following best composting practices.</p> <p>Selective use of labor vouchers to facilitate movement of compost to fields during periods of critical labor shortage.</p>	<p>Village managed labor credit fund / labor vouchers enables for sustainable mechanism to overcome labor constraint to composting.</p> <p>The village labor credit fund for agriculture works with the Village Development Committee and establishes a governing structure and by-laws.</p>

Tasks	Actions	
	1-2 seasons	+ 3-4 seasons
Improve understanding of adoption / best practices for both seed dressing and composting.	Baseline study of adopters and non- adopters and key behavior traits of each group.	Mid-term study to track progress for both use of seed dressing and composting: adopters and non-adopters and behavior trait of each group.

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