

Seed Security Assessment and Distribution Guidance Note

1. Introduction

Seeds are critical for addressing the dual challenges of food insecurity and climate change. Farmers depend on quality seed of appropriate varieties to attain food security. However, in recent times, natural disasters, such as droughts, floods and hurricanes, and human-caused disasters, such as wars and civil conflicts, have had an increasingly devastating impact on rural livelihoods and crop production systems, by halting crop production, destroying agricultural assets, hindering farmers' access to agricultural inputs and decreasing food security.

The objective for this Rapid Seed System Security Assessment in BAY states is to provide a guidance that can enable a better understanding of the seed security situation in the North Eastern States of Nigeria. The guidance will assist organizations to conduct a RSSA that can inform responses with an evidence to the existing seed crisis resulting from the conflict-triggered displacements, seed loss and poor season crop performances.

The guidance note is also providing input on how to:

- Analyze and assess seed systems and seed security.
- Design seed-assistance interventions.
- Monitor and evaluate seed-assistance interventions.

This guidance note will assist partners' staff in identifying seed quality problems that can occur during seed relief activities and in taking appropriate action to maintain seed quality standards¹.

This guideline intends to assist FS partners in improving their planning, seed systems security assessment, and the quality and effectiveness of seed they provide in emergency and early recovery interventions.

Table 1: *What are some differences between the formal and informal seed systems?*

Criterion	Formal Seed System	Informal Seed System
Seed selection	Researchers and companies select.	Farmers select and save.
Supply Medium	Private companies, government and/or researchers multiply and sell seed.	Farmers exchange, borrow and/or buy seed from family, neighbors and local markets.
Seed Quality	Seed is certified and quality should be guaranteed. The seed is generally healthy and should have high germination rates.	Farmer uses own criteria to determine seed quality. Quality can be high but is often variable.
Variety Quality	New varieties are developed (sometimes called modern or improved).	Local varieties and long-known (recycled) modern varieties are used that have entered system through exchange or purchase.

¹ Plant Production and Protection Division of FAO

Resilience	Resilience comes through “proven” benefits of the seed (e.g. high yielding, drought-tolerant).	Resilience comes through diversity and long tested adaptation.
Outreach Scale	Limited	Wide
Traits of varieties offered	Often high-yielding and disease resistant varieties of some major crops; sometimes short-duration (depends on traits that have been bred).	Mainly local varieties of a range of locally important crops. Also modern varieties have been cycled within local system. Often these have good adaptation and important culinary qualities
Diversity of crops and varieties offers	Low	High
Seed Price	Higher	Lower
Quality and relevance of information provided	Limited: often restricted to package dealer information. Sometimes there are demonstrations.	High: sellers and growers share direct experience of use.

1.1 Basic Elements for Assessing Seed System Security

- ♣ What are farmers’ most important crops in normal times? What do they use them for? Consumption, income or both? What lesser crops might become important in times of stress? How do farmers’ usually get seed or planting material for these crops?
- ♣ What are the sowing basics for each major crop? (Average areas sown, seed rates, multiplication rates.)
- ♣ Are there important or preferred varieties, by crop?
- ♣ Which inputs and management practices might be essential for particular crops or varieties?
- ♣ Who within the household is responsible for decision-making and actual management of the diverse crops, at various stages of production and post-production?

TABLE 2: *Most important crops, theoretical example for West Africa*

Crop	For Consumption	For Income	Others (specify)
Cowpea	+	+ (cash crop)	
Millet	+		
Groundnuts	+	+ (cash crop)	
Rice	+	+ (cash crop)	
Sesame	+	+ (cash crop)	
Sorghum	+		

2. Seed testing

Routine seed testing conducted in laboratories:

- ♣ Physical purity: a test to determine the percentage of the pure seed, other crop seed, weed seed, damaged seed and inert matter in the seed sample. This is also referred to as analytical purity: the overall percentage of the seed that is of the same crop species but not necessarily the same crop variety.
- ♣ Incidence of noxious weed seed: an extension of the purity test to determine the rate of occurrence of certain weed seed (as designated by law or official regulations such as; *Nigerian Seed Council*).

- ♣ Germination: a test to measure the ability of the seeds to germinate and that can develop into normal seedlings, under appropriate conditions of optimum moisture, temperature, and light.
- ♣ Varietal purity: the percentage of the pure seed that will produce plants which exhibit the characteristics of that specific crop variety. The best time to determine varietal purity is during field inspection when the seed is being produced.
- ♣ Seed-borne diseases: standard principles and procedures are used by mycologists and psychopathologists to determine the presence of seed borne diseases.

3. Seed Security Concept and Conceptual Framework

A household is seed secure when it has sufficient access to adequate quantities of good quality seed and planting materials of preferred crop varieties at all times following both good and bad cropping seasons.

The Seed Security Conceptual Framework (SSCF) made up of four key elements: Availability, Accessibility, Quality and Varietal Suitability. Therefore, seed insecurity exists when any of the above aspects is significantly constrained. An effective seed intervention can only be designed upon understanding of a seed system in relation to the aforementioned.

As more areas get liberated and more IDPs return to their lands, the need for support is increasing. In order to respond to the seed needs, an objective rapid seeds assessment is necessary to describe the seed systems of the crops cultivated in the region, analyze the various strategies of seed acquisition by farmers and in particular, ascertain vulnerable households seed needs, analyze the various elements of Seed Security (quality, availability, accessibility, variety) and identify ways to improve the seed security in the North Eastern. The initiative equally establishes the support required by the affected farmers in order to resume cultivation of their lands².

a. Seed security conceptual framework: Elements, Definitions and Indicators³

Table 3: Seed Security Conceptual Framework

Elements	Definition	Indicators
Availability	Seed supply from one or more sources (formal, semi-formal and/or informal) that is sufficient to meet seed needs of farming households within a defined geographic area at planting time.	a) Quantity – Seed should be sufficient (enough) to meet the planting need of all farmers. b) Proximity – Seed should be within reach of all farmers. c) Timeliness – Seed should be available in time for planting.
Access	The ability and willingness to acquire seed through cash purchase, exchange, loan, barter or use of power in social networks. Whilst seed may be available from alternative sources, it may	a) Seed prices – high price could limit farm family from accessing quality and quantity of seed they need. b) Disposable assets – this may include livestock, harvest from annual and perennial crops that the farmers may derive income from. c) Social capital – ability to borrow; receive gift and remittances from members of the family/society.

² http://www.fao.org/fileadmin/user_upload/FAO-countries/Nigeria/ToR/REPORT_Seed_Security_Assessment_in_NE_Nigeria.pdf

³ Seeds Security Assessment in North Eastern States of Nigeria, FAO 2016

	not be easily accessible by all farm families, especially when they have no or limited resources and poor access to credit.	d) Access to credit – presence of financial services could enable farm household access credit.
Seed Quality	Capacity of the seed to establish good crop under normal growing conditions. Seed quality includes a number of seed attributes or indicators. The seed meets farmer preferences.	a) Germination– ability of seed to sprout and grow into a normal seedling within a specified duration. b) Analytical purity – the extent to which a given seed lot has other crop seed, weed seed, broken seed, and the in heart matters. c) Varietal purity – the extent to which a given variety is mixed with other varieties of the same crop. This may or may not be of concern to farmers. d) Seed health (Phytosanitary) – the extent to which a given seed lot or source has pests and/or seed borne diseases. e) It includes traits that male and female farmers value— such as quick growing, good taste, easy processing. You may need to think of preferences for home consumption and for getting a high price at market.
Varietal Suitability	The extent to which crop varieties are adapted to local farming conditions (Soils, rainfall condition) and practices (intercropping), as well as social acceptability (having traits preferred by the farmers).	a) Adaptability – performance (growth & yields) of given variety within a range of agro – ecological zones. b) Preference – meeting end users' needs (e.g. food, fodder, feed, value addition, market, etc.) of the farmers

b. Nutrition and Seed Security

When integrating nutrition into a primary agriculture intervention, we need to better understand the nutrition situation of the targeted population. What is grown by our farmers often determines what is available at the home for consumption. When considering how to integrate nutrition into a fair, the first step is to understand the nutritional deficiencies the beneficiaries are facing by drawing information from a nutrition assessment and or including Food Consumption Score and Dietary Diversity Score into the seed systems security assessment⁴.

CRS commissioned a quantitative and qualitative review of 17 programs integrating agriculture and nutrition to document the approaches CRS was using. Some promising practices affirmed were: including nutritional objectives in agriculture projects such as; seed distribution or seed fair and vouchers will allow; targeting nutritionally vulnerable groups; investing in women; and increasing year-round access to diverse and nutrient-dense foods, which require us to understand the nutritional status and gender dynamics that affect agriculture programming like agriculture fairs and vouchers⁵ (Rhoe Davis and Ryan, 2014).

⁴ Agricultural fair & voucher manual 2018.

⁵ The site contains a number of useful tools, including a literature review and fact sheet (<http://www.iycn.org/2011/09/resources-for-agriculture-project-designers/>). Particularly, the Nutrition Impact Assessment Tool and Guidance (<http://www.iycn.org/resource/nutritional-impact-assessment-tool/>) assist project designers in assessing an agriculture project's likely impacts on the nutrition of vulnerable groups.

c. Seed Security Assessment Tools

The tools used in the Rapid Seed Security Assessment data collection should be customized to measure the five elements of Seed Security Conceptual Framework (Availability, Accessibility, Seed quality and Varietal suitability) at household and community level. They were further grouped into five broad categories: *a) key informant guide, b) local market and agro-input dealer checklist, c) seed producer checklist, d) Focus Group Discussion (FGD) guide and e) Household questionnaire*⁶.

Local Market (LM) and Agro-dealer's: Local markets and agro-input dealers usually form part of the sources of seed to farming households/communities; at least in Africa. The Local Market tool can be used to gather information on the various aspects of seed security: seed availability by crop and variety and sources, seed prices, quality and suitability of varieties available from these sources. It also looked at the conditioning practices carried out by the grain traders and agro-input dealers towards ensuring grain/seed quality.

Key Informants Interview (KII): This targets officials and or experts in selected organizations. It will provide contextual information—mostly qualitative with limited quantitative primary data. At State levels, the major focus will be on farming and the seed system, supply and distribution, crop production and the extent to which the states are affected by the insurgency in the past years, specifically for the last two years cropping seasons.

Seed producers: This helps in understanding seed production activities in the target states, types and volume of seed produced by various individuals, groups and cooperatives. It also ensures the quality of seed produced, the process of its verification/certification, and how it is marketed and accessed by individual farmers.

Focus Group Discussion: This guide should be used at affected community/village level. In each of the discussions, 6-20 farmers (males and females) can participate. Discussions should focus on seed security related issues including; the major crops and varieties grown in the area, average area under cultivation (per household), intercropped seeds, seed-rates, and yield in normal and constrained years & seed sources.

Household surveys (HHS): Household data need to be collected in the affected states. The household survey questionnaire should focus on demographic and livelihood characteristics; crop/seed system profile; and seed channels/sources, and on seed aid.

3.1. Seven Steps of Seed Security Assessment

- I. Identify areas for assessment.
- II. Describe seed systems for key crops in normal times.
- III. Describe how the disaster affected these systems.
- IV. Determine goals of an intervention based on farmers' needs.
- V. Assess the after-disaster seed channels.
- VI. Identify chronic stress that may require additional attention.
- VII. Identify appropriate responses for short/longer timeframes.

TABLE: 4 Range of seed relief approaches used in periods of acute emergency stress

⁶ Seeds Security Assessment in North Eastern States of Nigeria, FAO 2016

DIRECT AID APPROACHES⁷	
1. Direct Seed Distribution: Commercial-Based a.k.a Convention Seed Aid, Seeds and tools.	Procurement of quality seed from outside the region, for delivery to farmers. The most widely used approach to seed relief. Short-term response best suited to address problems of seed availability especially in situations of total crop failure and long-term displacement of farmers.
2. Direct Seed Distribution: Farmer-based or Local procurement and distribution of seed.	Procurement of quality seed from within the region, for delivery to farmers, a variant of 1. Short-term response to address problems of seed access or highly localized problems of seed availability.
3. Food aid, Seed Protection Ration.	Food aid is often supplied in emergency situations alongside seed aid so that the farming family does not need to consume the seed provided or to eat their remaining seed stocks.
MARKET-BASED AID APPROACHES	
4. Vouchers and cash to farmers.	Vouchers or cash are provided so as to give farmers the means to access seed where it is available, from local markets or the commercial sector. Farmers can access crops and varieties of their choice. Short-term response to address problems of seed access especially in situations of local seed shortages where local markets or barter between farmers are normally used.
5. Seed Fairs.	Seed fairs provide an ad hoc market place to facilitate access to seeds of specific crops and varieties, from other farmers, traders, and the formal sector. Usually used in conjunction with vouchers to provide poorer farmers with purchasing power. Short or medium-term response to address problems of seed access especially for subsistence crops, and where local markets are normally used.
6. Trade-Input, Multi-Input, Livelihood Fairs.	A variant of 5. In addition to seed, such fairs facilitate farmers' access to inputs such as small livestock, animal feed, fertilizer and tools.
7. Community-Based Seed Production	Seed to be produced within the communities with supervision of professional organizations (research institute and seed council) for the farmers to produce quality declared seed (QDS) A short- and long-term response to seed availability, accessibility, varietal suitability and seed quality Can also serve as an exit strategy.

3.2. Principles for sustaining and promoting agrobiodiversity in seed relief response

⁷ <file:///C:/Users/ACF521/Desktop/Seedrate,targeting,distribution and seed multiplication documents/Seed Relief Responses An Overview-Seed Aid for Seed Security.pdf>

- ❖ Do not engage in seed relief, that undermines functioning systems or that may compromise already stressed ones.
- ❖ Do not base the seed response on a large-scale transfer of seed of varieties not currently used by farmers.
- ❖ Think hard before importing seed into a region and never provide a single variety of just one crop for all farmers: vary crops and varieties.
- ❖ Build on what is working: strive to stabilize seed systems through use of the channels farmers routinely use. Keep normal flows of crops and varieties moving.
- ❖ If supply-side seed interventions are necessary, consider those that may maintain or add agrobiodiversity.
- ❖ In all cases, give farmers crop and variety options, and the advantage (as well as the information) to strategize about what does or does not fit into their agrobiodiversity planning.
- ❖ If new variety introductions are on offer, monitor their performance, feedback to research and the formal seed sector, and actively consider effects on agrobiodiversity.

3.3. *Introducing New Varieties in Acute Stress Periods: Key Steps*⁸

- ❖ Conduct a Seed System Security Assessment.
 - What are the current seed system weaknesses and strengths?
 - Would new varieties open up promising opportunities: why, how, for whom?
 - What are the potential risks?
- ❖ Work with farm communities and other informed personnel to choose possible new varieties. Is there sufficient prior evidence that varieties:
 - Are adapted to the specific agro-ecological zones?
 - Meet farmers' acceptability criteria (harvest and post harvest for subsistence and market use)?
 - Can be successfully used under farmers' own management conditions (e.g. without fertilizer)?
- ❖ Determine average seed requirement and price per household and understand the farming system
 - Establish average land size per household
 - Understand intercropping of legumes, dry and rainy season vegetables production
 - Establish the average seed requirement per household for different livelihood zones, dry and rainy season cultivation
 - Establish the total seed cost per household

3.4. *Seedling Multiplication Rates*⁹

Seed systems can recover very quickly after a disaster, particularly if there is sufficient and timely rainfall to allow for a good harvest. Some cereals (millet, sorghum, maize, rice) can recover within a single season, because they have low seeding rates and high seed-to-grain multiplication ratios (Table 1). Legumes, on the other hand, have high seeding rates and low multiplication rates, so it may take several seasons for the seed system to fully

⁸ file:///C:/Users/AC 521/Desktop/Seed rate, targeting, distribution and seed multiplication documents/seed-aid-for-seed-security (1).pdf

recover. Projects supporting the recovery of local seed systems should give priority to crops that have high seeding rates and low multiplication rates, e.g. beans, groundnut, barley, cowpea.

Table 5. Seeding and multiplication rates of different crops¹⁰

Crop	Seeding rate (kg/ha)	Multiplication rate
Maize	20	100
Sorghum	10	100
Pearl Millet	5	200
Wheat	100	25
Barley	100	15
Rice	20 (Up land)	50
	80 (Swamp)	
Beans	100	8
Groundnuts	120	6-10
Cowpea	90	15

Source: ODI Seeds and Biodiversity Program, 1996: 41

4. Training

Adequate training is one of the most critical elements of successful seed security assessment. All partners' staff from senior mid-level project managers, who are new to seed security assessment and seed based intervention will need to be trained on the purpose of the seed security assessment, its methodology, data triangulation and designing the intervention. Hence, they can provide training and oversight with their project teams during the design, implementation and monitoring stages.

The quality of the seed distribution intervention is directly related with the quality of the seed security assessment data collected and the methodology used to gather the data.

5. Seeds Distribution Guideline for North Eastern Nigeria FAO, (Adamawa, Borno & Yobe)

The following standard seed distribution guideline is applicable for Borno, Adamawa and Yobe states for Northern Guinea Savannah, Sudan-Savannah and Sudano- Sahelian Savannahs live zones. The seeds consist of vegetables, grain crop and commercial crop seeds types, alongside the seed amount per household and per hectare be distributed during rainy and dry seasons as agricultural recovery support. This guideline is used by FAO, Maidugri office for distribution to farmers in all three states. The guideline outlines the specific types and quantities of seeds for both seasons, alongside respective seed rates per hectare.

Table 5: Dry & Rainy Season Vegetables and crop seeds (FAO, North Eastern Nigeria)¹¹

Vegetables			
#	Type of Seed	Seed Rate/hhd/kg	Size of Land/Hectare

¹⁰ CRS, ICRISAT, and ODI. 2002. Seed vouchers and fairs: a manual for seed-based agricultural recovery after disaster in Africa. PO Box 49675, Nairobi, Kenya: Catholic Relief Services; PO Box 39063, Nairobi, Kenya: International Crops Research Institute for the Semi-Arid Tropics; and Westminster Bridge Road, London, UK: Overseas Development Institute. 72 pp.

¹¹ Dry and Rainy season crops/vegetables, seed rate and area/hectare distributed by FAO, North East Nigeria (Adamawa, Borno and Yobe)

1	Okra	0.03	200 sqm
2	Amaranthus	0.02	200 sqm
3	Tomato	0.01	200 sqm
4	Carrot	0.06	200 sqm
5	Cabbage	0.01	200 sqm
6	Onion	0.12	200 sqm
Cereal/Grain Crops			
#	Type of Seed	Seed Rate/hhd/kg	Size of Land/Hectare
1	Rice (Faro-44)	12.5kg	1/4 th Ha or 2,500 sqm
2	Maize	10 Kg	½ Ha or 5,000 sqm

Rainy Season Vegetables and Crop Seeds			
Crop/Grain Seeds			
#	Type of Seed	Seed Rate/hhd/kg	Size of Land/Hectare
1	Cowpea	10 kg	1/3 rd ha
2	Sorghum	8 kg	1 ha
3	Millet	6 kg	1 ha
4	Maize	10 kg	½ ha
Commercial Crops Seed			
#	Type of Seed	Seed Rate/hhd/kg	Size of Land/Hectare
5	Groundnuts	26 Kgs	1/3 rd ha
6	Sesame	1.5 kg	½ ha
Vegetable Seeds			
#	Type of Seed	Seed Rate/hhd/kg	Size of Land/Hectare
7	Okra	0.10 kg	100 sqm
8	Amaranthus	0.08 kg	100 sqm

*Either Sorghum, Millet or Maize distributed alternatively according to the priority of the sub locations.

*Either Groundnuts or Sesame distributed alternatively according to the priority of the location

6. Complexity of Agriculture

Agriculture is complex and location-specific. Very often, it is the main livelihood of the beneficiaries you are trying to assist. Always remember that you are working in an already stressed time, with people whose land, labor and time are stretched. Use their time and precious resources wisely. Agriculture—and the seeds used—are usually at the core of farmers' existence and well-being. Be sure to consider what, how and why these resources will help the beneficiaries now and in the future as their livelihoods could be at stake. Anything you do or do not do will have an effect (positive or negative) on both the present agricultural season and the future ones as well. Your intentions—even if well-meaning—need to be firmly grounded in what best serves the needs of the male and female farmers you are serving¹².

¹² Seed Vouchers & Fairs; A Manual for Seed-Based Agricultural Recovery in Africa, CRS, ODI, ICRISAT

7. Exit Strategy

Seed aid distribution is taking place in an alarmingly large number of countries: one season, two seasons, three seasons, and beyond. Giving seed aid is itself becoming a chronic activity. There seem to be few checks for stopping such assistance (simply when funds dry up?) and deliberate exit strategies have not been planned. Seed aid systems should develop a proper and clear exit strategy.

The rise of a chronic seed aid system has been identified as a profitable business opportunity for entrepreneurs, who specialize in quick delivery of a small range of crops. It has also led to the rise of a separate Relief Seed System (see cases from Ethiopia and Zimbabwe).

The lack of any diagnosis related to the seed system is a widespread problem (see Brief No. 7). In the absence of seed-related needs assessment, the default option has been to assume that there is a lack of available seed. Two sources of information indicate that this automatic assessment of lack of availability is often incorrect in the extreme

Community based seed multiplication schemes and community owned seed banks are some of the exit strategy that should be considered during the design and implementation of seed assistance programs.