



# FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



## PARTICIPATORY IMPACT ASSESSMENT OF SELECTED EMERGENCY SEED INTERVENTIONS: SYNTHESIS REPORT



**USAID**  
FROM THE AMERICAN PEOPLE



**Activity Title:** Feed the Future Global Supporting Seed Systems for Development activity

**Activity start date and end date:** Aug 24, 2018 – Aug 23, 2023

**Cooperative agreement number:** 7200AA18LE00004

**Document title:** Participatory impact assessment of selected emergency seed interventions: Synthesis report.

**Publication date:** March 23, 2023

**Author's names:** Catherine Longley, Edward Walters and Omeno Suji

**Citation:** Longley, C., E. Walters and O. Suji, 2023. Participatory impact assessment of selected emergency seed interventions: Synthesis report. A Feed the Future Global Supporting Seed Systems for Development activity report.

**Sponsoring USAID office:** LOC Unit, Federal Center Plaza (SA-44)/M/CFO/CMP

**Technical office:** USAID/RFS/CA

**AOR name:** Daniel Thomson

**Activity Goal:** Improved functioning of the high-impact integrated seed systems

**Language of document:** English

**Submitted on behalf of:** Catholic Relief Services

**Submitted by:** Nikaj van Wees, Chief of Party S34D activity  
Catholic Relief Services  
228 West Lexington Street, Baltimore, MD 21201  
Nikaj.vanwees@crs.org

## Acknowledgements

The authors wish to thank the three non-governmental organizations for their partnership in the overall assessment: World Vision (WV) Uganda; Lutheran World Federation (LWF) Uganda; and Catholic Relief Services (CRS) in DRC. We are particularly grateful to Noel Anzo Alabi (WV), Joseph Balikudembe (LWF) and Taylor Lanton (CRS) and their colleagues for their support in planning the case studies, coordinating the fieldwork and in reviewing the draft case study reports. We are especially grateful to Adrian Cullis (Independent Consultant) and also Valerie Davis (CRS Gender Adviser) for their inputs at various stages throughout the assessment process, and in reviewing the draft case study reports and contributing to the synthesis report. We also wish to thank the excellent contributions and insights from the in-country team members: Catherine Tindiwensi and John Adriko in Uganda, and Espoir Bisimwa and Papy Bonkena in DRC. Many thanks to our Fieldwork Assistants in each country: Jesus Anyovi, Stephen Kirabo, Nadia Manzubo and Lilian Mazira in Uganda, and François-Ferdinand Tshisungu, Mireille Laloulikoutia, Victor Tshibusu and Espoir Entoumbe in DRC. We thank the many people who patiently shared their knowledge, experience and insights with us, most especially the farmers and community leaders, traders and agro-dealers in each of the case study locations. Any errors or misrepresentations remain the responsibility of the report authors.

**Cover page credit:** Kate Longley, CRS

### DISCLAIMER

This report was made possible by the generous support from the American people through the U.S. Government's Feed the Future initiative and the United States Agency for International Development through Cooperative Agreement 7200AA18LE00004. The contents are the responsibility of Catholic Relief Services (CRS) and the New Markets Lab (NML) and do not necessarily reflect the views of USAID or the United States Government.

**Feed the Future Consortium Partners** in the Feed the Future Global Supporting Seed Systems for Development activity:



## Contents

Executive Summary.....	7
1. Introduction.....	9
2. Methodology.....	10
2.1 Identification of partners and selection of interventions to be assessed .....	10
2.2 Composition of the field teams.....	10
2.3 Participatory impact assessment and data collection tools.....	11
2.4 Methodological lessons.....	13
3.The seed interventions assessed and the local contexts .....	14
3.1 Adjumani District, Northern Uganda .....	14
3.2 Central Kasai Province, Democratic Republic of the Congo.....	16
4.Impact assessment findings .....	18
4.1 Impacts on household food security .....	18
4.2 Impacts on livelihoods (income and expenditure) .....	18
4.3 Impacts on seed systems in the local area .....	19
4.3.1 Informal seed systems .....	19
4.3.2 Intermediary seed systems .....	19
4.3.3 Semi-formal and formal seed systems.....	20
5.Conclusions.....	22
5.1 Climate variability limits the potential impacts of emergency seed interventions .....	22
5.2 Assistance other than seed may be needed to improve food security.....	22
5.3 Improved varieties usefully increase diversity and resilience but do not necessarily increase yield.....	22
5.4 Crop and varietal focus is important .....	23
5.5 Complementary programming activities play a role in maximizing livelihood impacts.....	23
5.6 Emergency seed interventions can result in distortions to seed markets and seed systems .....	24
6.Discussion.....	25
6.1 Timing of the interventions in relation to the crisis.....	25
6.2 How to transition from emergency seed provisioning to support sustainable seed systems in the aftermath of disasters?.....	25
6.3 What emergency seed interventions can and cannot achieve .....	26
7. Lessons / recommendations for the design of seed interventions in crisis contexts .....	27

Annex 1. The emergency seed interventions assessed.....	30
1. World Vision intervention in Adjumani District, Uganda .....	30
2. Lutheran World Federation intervention in Adjumani District, Uganda.....	31
3. Catholic Relief Services intervention in DRC.....	32
Annex 2. Assessment Team’s appraisal of indicators and data collection tools used .....	34
REFERENCES.....	39

## Acronyms

B&A	before and after
BHA	Bureau for Humanitarian Assistance (USAID)
CRS	Catholic Relief Services
DRC	Democratic Republic of Congo (République Démocratique du Congo)
FAO	UN Food and Agriculture Organization
FGD	Focus Group Discussion
FSP	Farmer Seed Producer
IPC	Integrated (Food Security) Phase Classification
INERA	Institut National pour l'Étude de la Recherche Agronomique (National Institute for Agronomic Study and Research)
KII	Key Informant Interviews
LSB	Local Seed Business
LWF	Lutheran World Federation
NGO	Non-governmental organization
PIA	Participatory Impact Assessment
PDM	Post-Distribution Monitoring Survey
QDS	Quality-Declared Seed
RFS	Bureau for Resilience and Food Security (USAID)
RQ	Research question
S34D	Feed the Future Global Supporting Seed Systems for Development activity
SENASA	Le Service Nationale des Semences (National Seed Service)
UNDP	United Nations Development Program
UNHCR	United Nations High Commission for Refugees
USAID	United States Agency for International Development
VSLA	Village Saving and Loan Association
WV	World Vision
WFP	World Food Program

## Executive Summary

This report provides a synthesis of three participatory impact assessments of emergency seed interventions in Uganda and the Democratic Republic of Congo (DRC). The interventions were implemented by World Vision, Lutheran World Federation (LWF) and Catholic Relief Services (CRS) respectively, and the assessments were undertaken under the USAID-funded Supporting Seed Systems for Development (S34D) initiative, led by CRS. All three of the interventions assessed provided seed of improved varieties either through direct seed distribution (Uganda) or seed fairs and vouchers (DRC).

**Overall findings:** The study findings show that emergency seed interventions cannot be relied on to increase production in a single season, and that seed is not necessarily the most important constraint to agricultural production. Emergency seed interventions do little to support local seed management practices and can create distortions to formal, intermediate and informal seed markets. On the positive side, seed interventions can usefully increase the resilience of local cropping systems and potentially support income generation for female and male farmers through the sale of produce. Potential livelihood impacts can be enhanced through gender-sensitive complementary programming such as Village Savings and Loans Associations (VSLAs). These findings suggest that seed interventions are largely inappropriate as short-term, emergency measures to enhance food security through increased production and should instead be regarded as one possible component of broader measures to enhance the resilience of local cropping systems and support rural livelihoods. Both the needs assessment requirements and design considerations for effective seed interventions as part of broader resilience programming are substantial and require a level of technical expertise that is best achieved through longer-term programming rather than emergency operations.

**Impacts on food security:** Among the three interventions, food security increased only in the second season in DRC and only in the less arid World Vision project area in Uganda. In the case of the latter, the food security increase (reported by both male and female farmers) was due to increased access to land by refugee farmers, not due to the seed provided. In DRC, food security impacts varied by season, ecology, and gender; the increase in food security was linked to the increase in crop yields due to the provision of new varieties. In Uganda, however, farmers were already planting the improved varieties provided by the interventions; as such, they could not be considered as 'new'. Further, it was difficult to draw any conclusions on the impacts of the LWF seed intervention on food security due to low production caused by below average rainfall in the project area following the seed distribution and the lack of access to farmland.

**Impacts on livelihoods:** In the DRC, those farmers who received seed in Season A (September-November) reported increased incomes from the sale of groundnuts, cowpeas and maize harvested from the seed provided. The selection of crops benefited women farmers by enabling them to increase sales of cowpeas and groundnuts. The additional income provided multiplier effects as farmers invested in other productive activities such as livestock, bicycles (for transport), and children's education, thus enhancing livelihoods. No livelihood impacts were reported by farmers who received seed in Season B (January-May) due to the failed harvest.

In Uganda, although livelihood impacts were less clear, there was some evidence of increased investment in education, land and livestock by refugees, and an increase in financial investments in Village Savings and Loans Associations (VSLAs), especially by women, and especially from the sale of vegetables. The level of increases in these investments was however small and was not accompanied by reduced expenditure on food, as might have been expected.

**Impacts on seed systems:** The impacts on three different seed systems are considered here – informal, intermediary and formal seed systems. In the case of Uganda, the impacts on seed systems cannot be linked to a single intervention but a series of repeated interventions by many agencies over many years. Both positive and negative impacts were noted in both countries.



**Conclusions:**

- Climate variability limits the potential impacts of emergency seed interventions
- Assistance other than seed may be needed to improve food security outcomes
- Improved seed varieties usefully increase diversity and resilience but do not necessarily increase yield
- Crop and seed varietal focus is important and influences gender-differentiated impacts
- Gender-sensitive complementary programming activities play a role in maximizing livelihood impacts
- Emergency seed interventions can result in distortions to seed markets and seed systems

**Recommendations:**

1. To enhance food security through self-sufficiency, implementing agencies must identify and address broader cropping system constraints for male and female farmers – these may or may not include seed
2. Weather variability must be factored into the design of emergency seed interventions through the use of forecasting and contingency planning
3. Emergency interventions should aim to increase the resilience of cropping systems rather than simply attempt to increase crop yields
4. Donors and implementing agencies should recognize that identifying appropriate new varieties for increased resilience takes time and requires a gender lens
5. The design of emergency seed interventions should include complementary programming to maximize the potential livelihood impacts for men and women
6. Seed interventions should recognize and support the role of informal seed systems and the role of women within these systems
7. Interventions must avoid distorting local seed markets
8. Interventions should enhance availability and equitable access to new varieties by male and female farmers through seed system support
9. Donors and implementing partners should support further impact assessments to continue to expand the evidence base, generate learning and improve emergency seed interventions



## 1. Introduction

This report presents the synthesized findings of three participatory impact assessments of emergency seed interventions in Uganda and the Democratic Republic of Congo (DRC).<sup>1</sup> In Uganda, the interventions were implemented by World Vision and by Lutheran World Federation (LWF) among refugees and host communities in Adjumani District, Northern Uganda. In DRC, the intervention was implemented by Catholic Relief Services (CRS) in Central Kasai province among farmers who had returned to their homes after being displaced by conflict. The assessments were designed and carried out in the months of June-July 2022 in Uganda, and September-October 2022 in the DRC. The assessments were undertaken under the USAID-funded Supporting Seed Systems for Development (S34D) initiative, led by Catholic Relief Services.

The aim of the assessments was to generate evidence on the impacts of selected emergency seed interventions on beneficiaries and local seed systems. A systematic review conducted in 2020 found that such evidence is currently lacking and is needed to inform and improve humanitarian and development work (Catley *et al*, 2021). The assessment addressed three broad research questions (RQs), as follows:

- RQ1: How have selected emergency seed interventions impacted on food security and livelihoods of the male and female smallholder farmers involved?
- RQ 2: What have been the impacts of selected emergency seed interventions on the informal and formal seed systems (including seed markets) in the local area?
- RQ3: What are the key 'best practice' approaches for the design and implementation of emergency seed interventions in order to achieve positive livelihood impacts for men and women?

Another underlying aim of the fieldwork was to develop, test and refine a participatory methodology that can be replicated elsewhere to assess the impacts of emergency seed interventions. This was the first time that participatory impact assessment (PIA) had been applied to emergency seed interventions.

---

<sup>1</sup> Each of the three individual assessments is reported separately: (i) Longley, C., Suji, O., Tindiwensi, C., Adriko, J. and Walters, E., (2023). Participatory Impact Assessment of World Vision Emergency Seed Intervention in Adjumani District, Northern Uganda. (ii) Walters, E., Suji, O., Adriko, J., Tindiwensi, C.K. and Longley, C. (2023). Participatory Impact Assessment of Lutheran World Federation Emergency Seed Interventions in Adjumani District, Northern Uganda. (iii) Walters, E., Suji, O., Bisimwa, E., Bonkena, P. and Longley, C. (2023). Participatory Impact Assessment of CRS Ditekemena Emergency Seed Interventions in Kasai Central Province, Democratic Republic of the Congo. All are published by CRS as Feed the Future Global Supporting Seed Systems for Development activity (S34D) reports.

## 2. Methodology

### 2.1 Identification of partners and selection of interventions to be assessed

The study was undertaken by the S34D initiative in collaboration with the Agriculture Working Group of the Global Food Security Cluster, World Vision, Lutheran World Federation, and Catholic Relief Services.<sup>2</sup> The NGO partners were initially identified through the Global Food Security Cluster. The three original NGO partners initially agreed to undertake the assessments in Uganda, DRC and Mozambique<sup>3</sup>, these being the countries where each had implemented emergency seed interventions in recent years. After Samaritan's Purse had to withdraw from the partnership, another partner (Lutheran World Federation) was identified through the Uganda Food Security, Livelihoods and Nutrition Technical Working Group since it had also implemented emergency seed interventions in the same district as World Vision.

In-country staff from the NGO partners assisted the assessment field teams by providing background information about the interventions, both by sharing available data and reports and by participating in the initial remote and in-person planning workshops. The study team then drafted detailed design documents containing background contextual information and details of the three interventions. These design documents were critically reviewed and agreed by the NGO partner staff prior to the fieldwork. NGO partner staff obtained the necessary permissions for the fieldwork, made introductions to key stakeholders, helped to identify key informants, and liaised with the communities to plan the fieldwork. At the end of the fieldwork, the field teams debriefed with the NGO staff. This allowed for the verification of findings and also opportunity for additional insights from the NGO partner staff at local and national levels. They later also reviewed the draft assessment reports.

One of the key criteria used in selecting the interventions for the assessment was the timing of the intervention implementation and how many agricultural seasons had since passed. It was agreed that there must have been at least one complete agricultural year since the intervention to be able to determine impact<sup>4</sup>, though more than two years would make it difficult for farmers and other stakeholders to recall the details. Fieldwork delays due to the Covid pandemic meant that the interventions originally identified for the assessment had to be re-selected. Details of each of the interventions assessed are provided in Annex 1.

### 2.2 Composition of the field teams

Each field team was led by an S34D Seed Systems Specialist and included an International PIA Consultant, two National Consultants, and four local Field Assistants. The teams were supported remotely by a second International PIA Consultant. The Uganda field team included two S34D Seed Systems Specialists to ensure consistency across the two countries. Within the refugee camps in Northern Uganda, it was sometimes necessary to hire local translators; these were often the Community Facilitators who had been trained by the implementing partner, though they had not been directly involved in the interventions. As far as possible, the field team's overall gender and age composition reflected the local gender and youth context in relation to seed systems. The field team divided into three sub-groups and collected data separately at the local level.

---

<sup>2</sup> Samaritan's Purse was originally identified as a partner through the Global Food Security Cluster and was involved in the selection of countries and interventions to be assessed, but later had to withdraw due to staff changes.

<sup>3</sup> A lack of support from the USAID Mission meant that it was not possible to undertake the assessments in Mozambique.

<sup>4</sup> A complete agricultural year is necessary to be able to determine the complete utilization of the harvest following the seed intervention. Specifically, we are interested to know whether any of the harvested output from the seed provided through the intervention was saved and planted the following season or the following year.

## 2.3 Participatory impact assessment and data collection tools

Participatory impact assessment (PIA)<sup>5</sup> was identified as the most appropriate methodology because it has been shown to be capable of measuring livelihood impacts in emergency settings where there is no baseline data available. PIA is briefly described in Box 1. The specific PIA data collection tools varied slightly across the different intervention contexts, but included: (i) transect walks to appreciate the broad livelihood context and the dynamics of food security and income levels within selected villages; (ii) historical timelines to establish exactly when the interventions started and ended; the discussions following the timeline exercise also established and prioritised, by consensus, the most significant activities and seed types provided and when; (iii) proportional piling to establish the production levels of each crop (for the seeds provided) before and after the intervention; (iv) seasonal calendars to establish changes in household food security before and after the intervention according to the number of months with staple foods from their own harvest and the number of “hunger months”; (v) proportional piling to establish and compare the different sources of (a) food and (b) income before and after the intervention; (vi) proportional piling to explore how farmers spent the income from the sale of crops before and after the intervention; (vii) proportional piling to compare (a) different sources of seed and (b) production of improved versus traditional varieties. Apart from the transect walks, these tools were used as part of focus group discussions with mixed groups of male and female farmers who had received seed from the interventions. In Uganda, the scoring exercises were conducted and recorded separately for individual farmers. This was adjusted slightly in DRC where the scoring was done by group consensus rather than individual farmers to encourage greater discussion among the group members, allowing for richer, more detailed data to be compiled.

---

<sup>5</sup> The PIA approach used here is drawn from Catley, A., Burns, J., Abebe, D., Suji, O. (2013). Participatory Impact Assessment: A Design Guide. Feinstein International Center, Tufts University, Somerville. <https://fic.tufts.edu/publication-item/participatory-impact-assessment-a-design-guide/>

### **Box 1. What is participatory impact assessment?**

Participatory impact assessment (PIA) involves adapting participatory methods to measure changes in people's livelihoods over time, and to understand how different factors caused these changes. In contrast to many traditional project monitoring and evaluation (M&E) approaches, PIA aims to measure the real impact of a project on the lives of project participants. This differs from evaluation because many evaluations focus on measuring project objectives, the extent to which they were achieved, and if they weren't, why not. PIA goes beyond typical evaluation and the measurement of objectives, and examines how project activities actually benefited the intended recipients, if at all.

There are three main types of PIA methods – ranking or scoring, visualization, and informal interviews. Conventional statistics can be used to summarize and analyze the numerical data produced by standardized ranking, scoring and visualization methods, and this can include comparisons of different types of activity or support. Measures of project impact can be translated into economic values, which, in turn, support benefit–cost analysis. These aspects of PIA are particularly useful when engaging in policy reform processes, or developing good practice guidelines.

Information and numbers from participatory methods are validated through triangulation, and analysis of a project's technical plausibility. The question of attribution is addressed through different types of comparisons. Using comparisons in PIA can be very useful for improving the credibility of the findings, but needs a good understanding of the project design and activities, and the wider context in which the project took place. When PIA is well-designed, with a good understanding of local context and the systematic use of comparisons and triangulation, it seems to produce evidence that is of reasonable quality and which a range of people – from community members to policy makers – can understand and use.

*Extracted and adapted from Catley et al, 2013.*

In addition to the focus group discussions that used PIA tools to determine impacts on food security and livelihoods, separate focus group discussions with mixed groups of male and female beneficiary farmers were conducted to compile detailed information relating to changes in the crops and varieties cultivated over time (both before and after displacement, and before and after the intervention), and changes in the seed acquisition channels for different crops. Since seed systems differ for different crops, it was necessary to focus the discussions on specific crops, not necessarily all that were distributed by the intervention. To determine which crops to focus on, farmers were asked which crop seeds received from the project were most important to them for food and for sale. Data was collected on three or four different crops with each focus group.

Key informant interviews were also undertaken at various levels with a range of different stakeholders to triangulate and verify data collected by the focus group discussions and to compile additional data relating to seed systems in the local area. The key informants interviewed included district- and local-level officials and community leaders, agricultural extension staff, NGO and UN agency staff, agro-input dealers, market traders, and seed production group leaders. Semi-structured interviews were conducted using interview checklists designed for different key informant types.

## 2.4 Methodological lessons

The three broad research questions above were expanded to six questions to ensure that detailed data were collected on the intervention itself, on food security<sup>6</sup> (in addition to livelihoods) and on community seed management practices (in addition to formal and informal seed systems). See Annex 2 for the more detailed research questions. The selection of the indicators was driven by the research team, broadly based on the aims of the interventions. Time did not allow for the farmers themselves to help determine the indicators, though modifications were made during the testing of the tools and also after the Uganda fieldwork. Annex 2 provides the field team's appraisal of the indicators and data collection tools used for each research question.

'Before and after' scoring served as a useful tool for discussion and analysis during the fieldwork, though when presented as graphs in the reports, the scores may have provided a false sense of certainty. Before and after scores to compare levels of production and food security are affected by variations in rainfall across different years. To control for seasonal variations, an alternative way of assessing impact would be to compare data collected from beneficiaries with that from non-beneficiaries. Whilst this type of comparison is not without its own challenges, it would be worth considering in future impact assessments.

A final lesson concerns the attribution of change. Although the PIA methodology is designed to enable attribution among various factors which influence change, in many cases, the levels of change in food security and livelihoods were so small that it was difficult to tease out the relative weights of the different factors that contributed to the changes described. In future, greater emphasis should be given to the determination of attribution through the ranking of factors that are mentioned by farmers as contributing to changes in food security and livelihoods.

---

<sup>6</sup> The additional research question originally covered food security and nutrition, but nutrition was later dropped due to time constraints for data collection.

### 3. The seed interventions assessed and the local contexts

All three of the interventions assessed provided ‘quality’ seed of improved varieties either through direct seed distribution (Uganda) or seed fairs and vouchers (DRC). In each case, the seed intervention was part of a larger project that was implemented several seasons after the crisis, when farmers had already re-established their farming activities. All of the seed interventions had been preceded by earlier phases of the same or similar projects.

Given the timing of the seed provisioning in relation to the crisis, the objective of the interventions was not to replace seed that may have been ‘lost’ due to the crisis<sup>7</sup>, but rather – broadly speaking – to enhance sustainable livelihoods and food security through increased productivity and greater self-reliance. As such, the results and recommendations are not necessarily applicable to emergency seed interventions that might be implemented immediately after a crisis. This is further discussed in Section 6.1. As with any intervention, it is important to understand the specific context in which it is implemented.

#### 3.1 Adjumani District, Northern Uganda

Adjumani District is located in the West Nile sub-region of Northern Uganda. The current refugee population is 245,289 (April 2022), of which 63% are children (under 18 years), 22% are women and 15% are men<sup>8</sup>. In 2017, the refugee population constituted 59 percent of Adjumani’s population. Adjumani District currently has 19 refugee settlements, each established in different years. Some are relatively small and old while others are big. Refugees from South Sudan arrived in Northern Uganda in two different waves, the first of which was in the 1990’s. Many of these refugees returned to South Sudan in the early 2000’s. The second wave of refugees arrived after a renewed outbreak of civil war in South Sudan in 2013.

On arrival in Uganda, new refugees are usually allocated a small area of land<sup>9</sup> in a designated refugee settlement area where they can establish a homestead and plant food crops. The average land size per refugee household is 0.23 acres with variations in the quality of land across settlements (UNDP, 2018). This amount of land cannot support household food sufficiency in the absence of food aid. Some refugees, both men and women, have been able to secure additional land through informal negotiations with the host community, but this has often led to problems because many landowners subsequently claim back the land after it has been cleared, or after just one season. A study on gender and displacement undertaken by Saferworld reported that male landowners prefer to lease land to female refugees possibly because it is seen to be easier to evict a woman, and also because women are vulnerable to sexual exploitation (Watson and Figueras, 2020). The same report also notes that some refugee women enter into intimate relationships with landowners through their own choice. In other cases, refugee and humanitarian organisations have helped groups of refugees to negotiate access to block farms.

Food insecurity in Adjumani District is high; some 46% of children are moderately and severely stunted in the West Nile sub-region. The UNHCR Food Security and Nutrition Report of 2017 puts the level of Global Acute Malnutrition prevalence in Adjumani District at 11.8% and prevalence of stunting in children at 14%.

Adjumani District has a diverse and dynamic cropping system with changes in recent years due to the arrival of the refugees, changing diets and new produce markets. The main food crops grown by farmers in the areas

---

<sup>7</sup> Whether or not seed is actually lost in a crisis is a contentious issue; there is evidence from different contexts and different types of emergencies showing that farmers are generally able to access seed through local seed systems following a crisis.

<sup>8</sup> Figures from the recent refugee re-registration exercise (June-July, 2022) were not available at the time of writing. The total refugee population includes 53% female and 47% male. Children aged under 18 constitute 63% of the total population with a roughly even gender breakdown. The adult population (aged 18 or over) constitutes 37% of the population (22% women, 15% men). The total proportion of youth (aged 15-24 years) is 26%.

<sup>9</sup> Up to 2016, the size of land was 50mx50m but after 2016 the land area allocated was reduced to 30mx30m.

visited are maize, beans, cassava, sorghum, rice, sweet potato and groundnuts. Maize, beans, sorghum, sweet potato and vegetables are particularly important for refugee women. Maize, beans, cassava, millet and groundnuts are also important for sale. Soybean and sunflower are grown as cash crops among host farmers. Vegetables are grown both for home consumption and for sale and include *sukuma wiki* (collard greens), onion, okra, tomato, eggplant, green pepper and cabbage.

Farmers generally save seed from one season to the next or purchase seed from traders or other farmers (i.e. the informal seed system – see Box 2), with the exception of some vegetable seeds (onion, green pepper, cabbage and improved tomato varieties), for which farmers rely on the NGO seed distributions. Smallholder farmers in refugee and host communities rarely, if ever, purchase seed from agro-input dealers (i.e. the formal seed system) due to cost and distance; almost all of the agro-input dealers are based in Adjumani Town and there are no sales outlets in the smaller market towns throughout the district. Adjumani District also has an intermediary seed system which involves the production of quality declared seed (QDS) by Local Seed Businesses (LSBs, often farmer groups) who have been trained in seed multiplication and marketing.

Cultivation methods are traditional and highly dependent on natural rainfall. Adjumani District has an average annual rainfall of 750-1500mm. The northern and north-western parts of the district have experienced high variation in rainfall patterns in recent years, including long dry spells. The LWF project area has been affected by below average rainfall since 2021.

The seed interventions assessed by the study involved the direct distribution of seed of improved varieties for a range of different crops to existing and new farmer groups, along with training in good agricultural practices and Village Savings and Loan Associations, as well as support for refugee farmers to access additional farmland, among other activities. Although the interventions were considered ‘emergency’ projects, their durations were two and three years respectively and had been preceded by earlier similar project phases.

### **Box 2. Informal, intermediary and formal seed systems**

The **informal seed system**, also known as the ‘local’, ‘traditional’ or ‘farmer’ seed system, includes most of the ways farmers and traders themselves produce, select, disseminate, and procure seed: directly from their own harvest, through barter or sale among friends, neighbors and relatives, and through local grain markets. In the informal system, seed is mainly produced or sorted as an integral part of grain production, and there are no external seed quality control mechanisms. Despite its name, the informal seed system plays a role in disseminating seeds of modern varieties that have been multiplied on farm.

**Intermediary seed systems** – also known as ‘semi-formal’ seed systems – refer to varied, small-scale enterprises, often local or community-based, including community seed production, farmer cooperatives, smallholder seed enterprises, Local Seed Businesses (LSBs), and other local seed system development programs. They integrate elements of both formal and informal seed systems to provide seed of modern varieties to farmers, generally at lower cost than the formal seed system. Quality control measures are less stringent than the formal seed system; depending on the seed classifications within national seed laws, the seed produced by intermediary seed systems might be quality declared seed or truthfully labelled seed.

The **formal seed system** provides farmers with certified seed of ‘modern’ or ‘improved’ varieties which is produced according to stringent quality standards which dictate what may or may not be labelled as seed. Modern or improved varieties are developed through plant breeding and varietal selection processes and must be tested and formally approved before the seed can be multiplied and disseminated to farmers, often by private sector seed companies and agro-input dealers.



### 3.2 Central Kasai Province, Democratic Republic of the Congo

In 2016, an estimated 1.6 million people were displaced from the DRC's Greater Kasai Region due to conflict between local militia and the DRC's state armed forces. After two years, 63% of the displaced persons had returned to their homes and farms. Local infrastructure and market networks, already severely limited in the region, had been decimated by the conflict. According to a food security assessment undertaken in 2019, 52% of the Central Kasai population had poor food consumption scores and was severely food insecure. An estimated 1/3 of the population was expected to be in crisis or worse<sup>10</sup>. The assessment identified different impacts of food insecurity amongst women and girls, including child marriage and negative coping strategies.

Central Kasai has vast expanses of arable land mixed with forest. The most fertile land is in the recently-cleared forest land, in addition to wetlands. Much of the non-forested land (known locally as savanna) is severely degraded. Reduced vegetation cover has led to increased soil erosion, loss of soil fertility and continual pressure on the forest as farmers seek more fertile land.<sup>11</sup>

The study showed that there are notable differences between men and women in, their access to the best farmland, types of major crops cultivated, expenditures, and income-generating activities. Women are given the least productive plots in the savanna and must often adjust cropping patterns to align with this reality. The savanna is also more susceptible to drought, making cultivation not only less productive but also riskier. It was also noted that women are involved more in subsistence crops while men mostly prefer to cultivate cash crops so that much of household finance is controlled by men.

Maize and cassava form the basis of the subsistence production system, and households generally have a few goats and chickens. Harvests cannot feed the household for an entire year, so families rely on other livelihood activities, mainly casual labor, to earn enough money to be able to purchase the balance of food from the local market. Many families supplement their income through the sale of palm nuts and artisanal manufacture of palm oil.

Farmers rely on the informal seed system to acquire seed, either from their own harvests or from local grain traders, often individual women who sell seed that they have multiplied on their own farms. The formal and intermediate seed systems in the DRC (referred to as the 'semi-formal' seed system in this report), and Kasai specifically, are relatively underdeveloped. The only improved varieties available were developed over 30 years ago, and there are just two or three different improved varieties of each crop. Commercial seed companies do not exist in Central Kasai Province, and there are no agro-input dealers present in Kananga (the provincial capital) that supply seed or other crop-related inputs. Instead, the government has created a system of private agri-multipliers to produce certified seeds.



Photo 1: Land in forest recently cleared through slash and burn



Photo 2: Transporting goods on a dirt road.

<sup>10</sup> This is measured by the Integrated Food Security Phase Classification (IPC) system. IPC Phase 3 indicates 'crisis'.

<sup>11</sup> CRS DRC, Global Land Restoration Funding Application, March 2022

The seed intervention assessed by the study operated from January 2021 through February 2022 and constituted the fourth phase of an emergency project that had been initiated in 2017. The project provided a combination of food assistance and seeds and tools to support and enhance agricultural recovery in an effort to address severe food insecurity. A series of year-long projects shifted from zone to zone. Beyond the immediate food security goal, the project adopted a second objective, to ensure the protection and restoration of livelihoods of crisis-affected households to support their self-sufficiency and access to staple foods. Farmers benefiting from the 2021-2022 intervention had returned to their homes two years prior to the seed intervention and had been cultivating their farms with locally available seed for over three seasons since their return.

With the aim of restoring agriculture-based livelihoods, the project implemented voucher-based seed and tool fairs and associated agronomic training for 17,500 and 18,500 households respectively. All households in the targeted communities received assistance. Given the gender dynamics and women's lack of autonomy in Central Kasai, CRS determined that prioritizing women as titular participants—as CRS does in other projects in DRC—would have put women at risk of physical or verbal abuse by men in their households. Therefore, CRS used registration forms and participant cards to include a primary and secondary “head of household” with two photos on the cards along with their names to help ease participants' use of the card.

Households received vouchers with a value of \$40 for seeds of maize, cowpea, rice, and/or groundnut for either agricultural season B (January-May) or season A (September-December). The vouchers enabled each beneficiary to purchase 10-15 kg of improved seed, sufficient for 0.25-0.3ha. Each household also received two hoes/spades. Agronomic training was delivered through a local partner and included soil fertility management, seed selection, cultivation practices, and post-harvest management.

## 4. Impact assessment findings

### 4.1 Impacts on household food security

Among the three interventions, food security increased only in the second season in DRC and only in the less arid World Vision project area in Uganda. In the case of the latter, the food security increase (reported by both male and female farmers) was due to increased access to land by refugee farmers, not due to the seed provided. In DRC, the increase in food security was linked to the increase in crop yields due to the provision of new varieties. In Uganda, however, farmers were already planting the improved varieties provided by the interventions; as such, they could not be considered as ‘new’. As described below in Section 4.3, one type of groundnut seed provided in Uganda led to a decrease in yields over time.

In Uganda, it was difficult to draw any conclusions on the impacts of the LWF seed intervention on food security, due to low production caused by below average rainfall in the project area<sup>12</sup> following the seed distribution and the lack of access to farmland. The apparent increase in food security (as indicated by a decrease in the number of hunger months reported in a year) was not matched by increases in crop production for all farmers. Refugee households reported decreases in production for all key crops except for tomatoes and experienced challenges in accessing additional land. A common complaint among refugees was that host farmers would agree to lease them land for farming, only to go back on the agreement after the refugees had cleared the land, or after just one season of farming<sup>13</sup>. Host farmer households reported increases in production for all key crops after the intervention as compared to before the intervention, largely due to increased access to fertile land. In some cases, this additional land had been cleared by the refugees.

In the DRC assessment, the impacts of the seed intervention on food security were seen to vary by season, ecology, and gender. Farmers reported increased production and income as a result of the seed intervention in Season A, but irregular rains during the 2021 Season B led to minimal harvests or total crop failure for many households. In Season B, crops planted in the forest area (generally by men) and wetlands performed better than those planted in the drier savanna area (generally by women).

### 4.2 Impacts on livelihoods (income and expenditure)

In the DRC, those farmers who received seed in Season A (September-November) reported increased incomes from the sale of groundnuts, cowpeas and maize harvested from the seed provided. The selection of crops benefited women farmers by enabling them to increase sales of cowpeas and groundnuts. The additional income provided multiplier effects as farmers invested in other productive activities such as livestock, bicycles (for transport), and education, thus enhancing livelihoods. No livelihood impacts were reported by farmers who received seed in Season B (January-May) due to the failed harvest.

In Uganda, livelihood impacts were less clear. There was some evidence of increased investment in education, land and livestock by refugees, and an increase in financial investments in Village Savings and Loans Associations (VSLAs), especially by women, and especially from the sale of vegetables. However, the level of increases in these investments was small and was not accompanied by reduced expenditure on food, as might have been expected.

---

<sup>12</sup> LWF’s project area is situated in the north east of Adjumani District which is drier than the south west of the district, where World Vision works.

<sup>13</sup> Although we heard of similar complaints in the World Vision project area, relations between refugees and host farmers appeared to be much better, possibly because the host farmers and many refugees came from the same language group (Ma’adi).

### 4.3 Impacts on seed systems in the local area

The impacts on three different seed systems are considered here, as defined in Box 2 above. In the case of Uganda, the impacts on seed systems cannot be linked to a single intervention but a series of repeated interventions by many agencies over many years. Both positive and negative impacts were noted in both countries.

#### 4.3.1 Informal seed systems

The repeated interventions in Adjumani District increased the diversity of seed types available within the informal seed system. Although not all the varieties provided necessarily met local preferences, farmers clearly appreciate the characteristics of some varieties (e.g. drought resistance, marketability, yield, duration, etc). By harvesting and re-planting their preferred varieties and selling part of the output in local markets, farmers have incorporated new varieties into the informal seed system. Feedback from farmers suggests the adoption of new, appropriate varieties over many years has strengthened the resilience of local cropping systems by broadening the range of varieties cultivated, thus reducing the risk of crop failure.

In the case of the DRC, the intervention usefully re-introduced quality seeds of appropriate improved varieties that were already known to farmers but had deteriorated over time. Farmers reported considerable yield differences between the seed received from the intervention and the locally available seed of varieties known by the same name, suggesting that the seed provided had improved the quality of seed available within informal seed systems. As in Uganda, the seed provided by the intervention has been incorporated into the informal seed system, making it available at a reasonable cost (i.e. through farmers and grain traders) in the future, provided that seed quality can be maintained.

A negative impact resulting from the seed fairs in the DRC was reported by local grain traders selling informal sector seed at planting time; the demand for their seed dropped after many of their regular clients obtained seed from the seed fairs, and they were forced to lower their prices.

#### 4.3.2 Intermediary seed systems

Although the agri-multipliers in the DRC might be considered as part of the intermediary seed system, we have categorised them as 'semi-formal' and describe them below. Uganda's intermediary seed system involves the production of quality declared seed (QDS) by community-based farmer groups known as Local Seed Businesses (LSBs). Other community-based seed groups known as Farmer Seed Producers<sup>14</sup> were also found to exist in the study area. LSBs multiply seed of mainly true breeding (self-pollinating) crops such as beans, rice and groundnuts for which private sector seed companies may not be able to make a profit, also crops with vegetative planting material (cassava, sweet potato) which is perishable and difficult to transport. Much of the seed produced by LSBs in Adjumani District is purchased by NGOs (for emergency and other seed-related interventions) and government development projects. In some cases, it might also be purchased by local farmers and traders. Vegetative planting material is often purchased by agro-input dealers for onward supply to NGOs and agricultural development projects.

Repeated emergency interventions over many years have influenced intermediary seed systems in the Adjumani District in three main ways, with both positive and negative consequences:

---

<sup>14</sup> Farmer Seed Producer groups are not officially registered and their seed is not certified as QDS, though they have received training in seed production. It is thought that the model evolved out of an earlier agricultural extension approach promoted by Uganda's National Agricultural Advisory Services in which improved seed was provided for a group demonstration plot with the expectation that the group (often a farmer field school) would multiply the seed to allow individual group members to acquire their own seed at harvest time.

- (i) Repeated emergency seed interventions have created considerable demand for QDS, and most LSBs currently rely on selling their seed to NGO and government buyers.
- (ii) Some specific project interventions have encouraged the establishment of Farmer Seed Producer<sup>15</sup> groups. More generally, the apparent demand for QDS by emergency seed interventions has prompted some farmer groups to become seed producers.
- (iii) Earlier interventions involving seed fairs<sup>16</sup> have provided some LSBs and Farmer Seed Producers with the opportunity to sell their seed to farmers in exchange for vouchers provided by the implementing NGO.

On a positive note, emergency seed interventions provide a market for seed produced by community-based groups, whether through seed fairs organised by NGOs, or sales of vegetative planting material through agro-input dealers, or sales of QDS direct to NGOs and government projects. These new sales outlets have helped to build the capacity of Farmer Seed Producers and LSBs and allowed them to become more commercially oriented. In one case, a Farmer Seed Producer group had ventured beyond local demand and established contact with private seed/grain traders from the neighbouring district for the sale of groundnut seed. The assessment team was unable to verify whether such sales of non-certified seed to private traders were a common occurrence, or whether this particular consignment was destined for subsequent re-sale through the informal seed sector (i.e. the grain market), or as potential ‘fake seed’ through the formal seed sector<sup>17</sup>.

On a negative note, the level of reliance on demand for seed for emergency interventions raises the question of the long-term sustainability of the LSBs and Farmer Seed Producers if NGO emergency seed interventions are to be scaled down in future. The interventions supported local seed production efforts by Farmer Seed Producers and Local Seed Businesses both directly and indirectly. Whilst community-based seed production can play an important role in providing good quality, affordable seed to farmers, there were concerns over the sustainability of the current seed production and marketing models within the intermediate system. This is further discussed in Section 5.6.

#### 4.3.3 Semi-formal and formal seed systems

In both the DRC and Uganda, it was surprising to see the extent to which the semi-formal and formal seed systems in the assessment areas were oriented towards the supply of seed to donor-funded emergency and development project interventions.

In the DRC, the formal seed sector is relatively underdeveloped<sup>18</sup>. We refer to it here as a ‘semi-formal’ seed system because seed multiplication in Kasai is undertaken by a system of farmer groups known as agri-multipliers. Agri-multipliers are usually members of farmers’ associations and cooperatives or unions of cooperatives. Agri-multipliers primarily produce seed for institutional buyers – NGOs, FAO and the government. Seeds are generally packaged and sold in 50kg bags, in some cases bearing the cooperative’s

---

<sup>15</sup> Farmer Seed Producer groups appear to operate at different levels, with some being more commercially oriented than others. In some cases, improved seed is provided through an emergency seed intervention for a group demonstration plot with the expectation that the group will multiply the seed to allow individual group members to acquire the seed. In other cases, Farmer Seed Producer groups may have been initiated by an NGO project as a VSLA which then decides to sell seed and planting materials to farmers within the local community as an income-generating activity. Some FSPs might eventually become Local Seed Businesses (LSBs).

<sup>16</sup> Prior to restrictions put in place in response to the COVID crisis, Lutheran World Federation had been implementing seed fairs and seed vouchers. The intervention assessed for this study had originally been designed as a seed fair / seed voucher intervention but was forced to switch to direct distribution due to the COVID-related restrictions.

<sup>17</sup> The issue of ‘fake seed’ is a major challenge to the formal seed sector in Uganda. It can arise where uncertified seed is packaged and labelled to make it look like certified seed.

<sup>18</sup> There are four main organizations operating in the formal seed sector in the Kasai – the agricultural research institute, INERA (Institut National pour l’Étude de la Recherche Agronomique), agri-multipliers, the National Seed Service (SENASEM), and institutions distributing seed (NGOs, FAO, Ministry of Agriculture).

label. Sales to individual farmers are minimal. Any unsold seed is sold as grain. In an interview with the leader of one agri-multiplier group, when asked about back-up plans if institutional demand falls in the future, he said he anticipates continuing to sell to institutions and has no plans for expanding private sales.

In Uganda, the main formal seed sector actors in the study area were private sector agro-input dealers. Seed distributions by emergency and development projects since 2013 appear to have led to the establishment of at least ten crop-focused agro-input dealers in Adjumani Town (but none in the smaller rural market towns); most of these dealers currently sell most of their seed to NGOs and government development projects. There appeared to be a disconnect between many of these agro-input dealers and most smallholder farmers involved in the assessment, who rarely – if ever – purchased seed from agro-input dealers. Whilst the capacity and seed sales of many agro-input dealers had increased due to demand from NGOs and development projects, some key informants and the study team had concerns about market distortions due to over-dependence on NGO/project demand, displaced seed sales, and weak seed marketing efforts.

Beyond the district level, there is also a risk that the high level of demand for seed for the emergency seed market can potentially encourage the spread of fake seed within formal seed systems - see above and Footnote 15.

In both countries, farmers tend not to purchase from existing formal seed systems due to high prices and the long distances to the seed providers (i.e. agri-multipliers in DRC: agro-input dealers in Adjumani Town, Uganda). In Uganda, agro-input dealers were regarded as a seed source of last resort for farmers who occasionally wanted to acquire seed of a particular variety on a one-off (rather than a regular) basis.



## 5. Conclusions

### 5.1 Climate variability limits the potential impacts of emergency seed interventions

Variable rainfall in both the DRC and Uganda led to reduced crop production and limited the potential impacts of the seed distributions. Given the increasing frequency and severity of extreme weather events associated with climate change, there would appear to be a high likelihood that emergency seed interventions will be negatively affected by irregular rainfall patterns, whether in terms of the timing of the rains and/or the amount of rainfall. As such, emergency seed interventions represent a very high-risk investment for donors and aid agencies. This risk might be reduced by ensuring that seed or access to seed is provided early in the season, but insufficient rainfall will inevitably reduce the level of production. Long-range weather forecasting and agroclimatology models and assumptions such as those used by FEWS NET can help to predict the seasonal outlook, and it is necessary for this type of early warning data to be taken into consideration when making decisions about the viability of potential seed interventions.

### 5.2 Assistance other than seed may be needed to improve food security

At the risk of stating the obvious, seed is not the only input required for agricultural production, and – depending on the context – it may not be necessary for agencies to provide seed at all. In Uganda, the food security increases recorded for both refugee and host farmers were not attributable to the seed received. Instead, it was increased access to land for farming that allowed for the increase in food security. Emergency programming approaches have a tendency to focus on seed – possibly because it is comparatively easy to procure and deliver – often at the expense of other aspects of agricultural systems that might be even more of a constraint, e.g. land (as in the Uganda case), family labour, cash to pay for casual labour or ploughing services, access to markets, etc.

In the DRC case, soil fertility is a major constraint. The inability to maintain soil fertility and soil health means that even with improved seed, harvests are minimal. Poor soil health and diminished organic matter (through seasonal burning) means that crops are ever more susceptible to the vagaries of weather. While some soil fertility issues can be addressed with short-term fixes, restoring overall soil health requires a process of several years and is not something that can be adequately addressed in a short-term emergency project.

Current guidelines emphasize the importance of the quality of initial assessment and selection of the most appropriate response areas<sup>19</sup> (SEADS, 2022). Put another way, it is necessary to ask whether seed and/or seed system support is actually necessary, appropriate and feasible as part of an emergency response. Both this study and others (e.g. Sperling and McGuire, 2010) suggest that seed is often locally available to farmers following a crisis. In both countries, the assessment teams compiled data on what the beneficiary farmers planted in the first season following their arrival in the refugee camps (Uganda) or their return home (DRC) and how they acquired the seed. In both contexts, farmers had been able to purchase or exchange seeds of all crops from local markets and from other farmers. Some farmers also reported having selected grains of improved maize varieties from their food rations for planting. None of the farmers met by the assessment teams reported that they were unable to plant due to lack of seed.

### 5.3 Improved varieties usefully increase diversity and resilience but do not necessarily increase yield

In both Uganda and the DRC, seeds of improved, high-yielding varieties were provided with the aim of increasing crop production and therefore food security. In the case of Uganda, most of the varieties provided

---

<sup>19</sup> The SEADS Guidelines identify three different response areas: (i) seed and seed systems; (ii) tools, equipment and other non-seed inputs; and (iii) crop-related infrastructure.



were already being cultivated by the farmers, and assessment results show that production increased for host farmers but decreased for refugee farmers. This was most likely due to the combined effects of rainfall and differences in access to land across different agro-ecologies. In the DRC, production increases due to quality seed of improved varieties were realized in Season A but not Season B due to drought. These results illustrate the risks inherent in agricultural production.

Rather than focusing on increasing production through higher yields, it is often more appropriate to reduce the risks of crop production by making available a range of varieties with different characteristics such as drought tolerance or disease resistance. Farmers in both countries, as elsewhere, clearly appreciate a range of different varietal characteristics (e.g. drought resistance, marketability, duration, etc) in addition to yield, as well as the importance of planting more than one variety to reduce the risk of crop failure. Given the risk-prone nature of agricultural production in the contexts where emergency seed interventions tend to be implemented, it is perhaps more appropriate to enhance cropping systems resilience rather than increase yield.

#### 5.4 Crop and varietal focus is important and influences gender-differentiated impacts

The assessment findings revealed differences in impacts among different types of farmer according to their status (i.e. refugee or host) and gender as well as differences in impacts between different crops and varieties. In Uganda, for example, access to land was one of the main constraints to food security, affecting refugees more than host farmers. In the DRC, women typically cultivate land in the drier, less productive savanna areas, while men often cultivate fields in the forest, where soils are more fertile. Differences such as these were incorporated into the project design, e.g. to support refugees to access land in Uganda, and to ensure that the crops provided were appropriate to women's farming and livelihood activities in the DRC.

In Uganda, some crops were reported to have greater impacts than others. Beans, sesame and vegetables (especially tomato, okra, *sukuma wiki* and onions) were the crops considered by farmers to have the greatest impact on livelihoods. These crops play an important role in terms of household nutrition, and – provided that the right varieties are grown – they can readily be sold for a good price in local markets. With a nearby water source, vegetables can be cultivated all year round and were regarded by female farmers as their “cash account”. However, not all varieties of vegetables can be sold in local markets. Farmers cited examples of bean, tomato and okra seed that had been provided by implementing partners but could not be sold in local markets. In some cases, the variety was cultivated for household consumption, but in other cases farmers simply abandoned the variety in favour of those with market demand.

The provision of improved cowpea and groundnut varieties in DRC enabled women to increase their production of these crops and earn more income. Cowpeas and groundnuts are locally considered as savanna crops, and are therefore particularly important to women. The cowpea variety provided (H36) is a short-cycle (2.5 months), high-yielding variety that is resistant to drought and disease. According to focus group discussions, this variety outperforms the local variety (*bipale*) by a factor of three, allowing women farmers to produce more and therefore sell more. Similarly, the groundnut variety provided (A65) yields twice as much as one local variety (*bafike*) and three times another local variety. In addition to the higher yields, A65 also fetches a price premium in the market, this allowing for higher incomes for women.

#### 5.5 Gender-sensitive complementary programming activities play a role in maximizing livelihood impacts

Each of the seed interventions assessed formed part of broader livelihood support projects. In Uganda, the seed interventions also involved access to land and ploughing and the provision of agronomic training for farmer groups, support for Village Savings and Loans Associations (VSLAs), as well as market linkage support. The positive impacts of land access have already been noted above. In both countries, farmers were appreciative of the agronomic training provided, but it was not possible to verify the extent to which improved agricultural

practices were adopted, or what impact these may have had on production or seed management<sup>20</sup>. In Uganda, the training promoted group farming and VSLAs. In some cases, it appeared that the main aim of seed provisioning was to support group activity, allowing farmer groups to establish block farms, apply good agricultural practices, and work together for shared benefit<sup>21</sup>. For marketable crops, the importance of providing varieties that are appropriate to local markets has already been highlighted. Farmers, especially women, reported that the VSLAs not only allowed them to better manage their harvested output to meet household food and expenditure needs<sup>22</sup> but also enabled them to use loans from the VSLAs to invest in land, labour and livestock for agricultural production.

## 5.6 Emergency seed interventions can result in distortions to seed markets and seed systems

Apart from the (re-)introduction of new varieties and increased varietal diversity, the seed interventions assessed had little impact on informal seed systems. Little or no effort was made to improve farmers' or traders' seed management practices. In the case of the DRC, the seed fairs had a negative impact on traders in the informal seed system who were forced to lower their seed prices.<sup>23</sup> Whilst efforts to support seed production through intermediate seed systems in Uganda were well-intentioned, the commercial viability of the seed production groups (both Farmer Seed Producers and Local Seed Businesses) is not certain, depending very much on their sales strategy, their crop focus and their initial start-up, e.g. whether the group was initiated through an NGO intervention, or by an experienced and enterprising farmer with a good understanding of market demand.<sup>24</sup> In both Uganda and the DRC, the level of demand for seed for emergency interventions and longer-term development projects has contributed to create formal and semi-formal seed systems in the local area that depend largely on sales to NGOs and other projects rather than sales to farmers. Whether these market distortions are a necessary stage in the longer-term evolution of intermediate, semi-formal and formal seed systems, or whether they create dysfunctional, unsustainable seed systems that are unable to respond to small farmer demand will depend on the scale, longevity and design of donor-funded seed interventions.

---

<sup>20</sup> In the DRC, the training package included advice on seed storage. Surprisingly, the standard agronomic training package in Uganda did not include training in seed management or seed storage; such training was only provided to seed production groups.

<sup>21</sup> In these cases, seed provisioning itself might be seen as complementary to the group farming approach being promoted, which supported groups to access blocks of land. The groups consisted of mainly refugees, though some groups also included farmers from host communities to help build good relationships between refugee and host farmers. One project used a 'Farming as a Business' approach which provided training in bulking and marketing, in addition to agronomic techniques.

<sup>22</sup> For example, some farmers explained that they used to sell all their food reserves to pay for school fees or other emergencies, but the VSLAs allowed them to save their money and cover these costs without selling all their food.

<sup>23</sup> It is likely that this was a temporary price change that lasted only during the period of the fairs' implementation. However, given the time-bound nature of seed sales, it may have had a negative impact on the overall income of the traders concerned, especially those who specialize in seed sales during the planting season.

<sup>24</sup> Most of the seed production enterprises were farmers groups established through donor-funded projects that sold their seed to NGOs and government projects. The two enterprises that appeared to be more sustainable had been self-started by innovative and enterprising individuals who had identified specific crops and varieties for which there was a demand for seed and planting material by farmers.

## 6. Discussion

### 6.1 Timing of the interventions in relation to the crisis

All three of the interventions assessed were implemented some years after the initial crisis, when farmers had already re-established their farming activities. This leads to two questions: (i) could the interventions really be considered as ‘emergency’ intervention? And (ii) would the impacts have been greater if the study had been able to assess interventions that were implemented in the season immediately following a crisis?<sup>25</sup>

Emergency interventions must not only save lives but also restore livelihoods. As such, emergency interventions are expected to meet one or more of the following livelihood objectives: (i) to provide immediate livelihood benefits to people affected by crisis; (ii) to protect crop-related livelihoods of people affected by crisis; (iii) to re-build or support crop-related production, infrastructure, and systems to ensure livelihoods for people affected by crisis (SEADS, 2022). As with many emergency seed projects, the interventions assessed aimed to meet the third objective. Although the implementing partners regarded the projects as emergency interventions, they also recognized the need to replace repeated emergency seed distributions with a more strategic approach to build resilience. This transition is further discussed in Section 6.2.

In relation to the second question as to whether the impacts may have been greater for an intervention implemented in the season immediately following a crisis, there is very little data available to be able to answer this question. Although seed was first provided to farmers under the Ditekemena project in April 2019, this was still some 23 months after those who had been displaced started to return to their homes. An evaluation undertaken in September-October 2019 after an earlier phase of the project in a different zone, found that those who had received seed (who had also received food aid) had higher food consumption scores than beneficiaries who had only received food aid, but the selection criteria for the seed aid beneficiaries were such that they had higher consumption scores to begin with (Henderson and Herby, 2019). The same evaluation also showed that farmers were able to access seed for a broad range of crops through local seed systems. Various other studies (e.g. Sperling and McGuire, 2010) have also noted that seed is often locally available to farmers following a crisis, raising serious questions about the rationale on which many emergency seed interventions are based.

It is worth noting that the nature of emergencies has shifted over time to become more and more complex and long-lasting; protracted, long-term crises are increasingly normal (Development Initiatives, 2020; 2022). The implication of this is that emergency responses are also becoming longer in duration, often lasting for at least one year rather than just a few months, and often spanning over multiple agricultural seasons. Theoretically, this should allow more time for detailed needs assessments, including seed system security assessments.

### 6.2 How to transition from emergency seed provisioning to support sustainable seed systems in the aftermath of disasters?

Given the context of the seed interventions under assessment, combined with the realization by the implementing partners that it was no longer viable to continue with repeated seed distributions every planting season, a relevant question is how to transition from emergency seed provisioning to sustainable seed systems strengthening.

---

<sup>25</sup> This had been the intention, but the fieldwork was delayed by a year due to the COVID crisis, and the interventions originally identified for the assessment had to be re-selected.

The first step in this process is to recognize and understand existing seed systems and seed markets in the local area – informal, intermediate (or semi-formal) and formal – and the strengths and weaknesses of each system. It is also necessary to understand the nature of seed demand – why, and how often, do different types of farmers buy seed and planting material, what types (whether certified or not, which crops, which varieties), from whom, and at what cost – to understand what is realistic in terms of sustainable market development. Emergency seed programs can often be seen to prop up the formal and intermediate sector seed industries with the expectation that farmers who receive seed aid will eventually be able to buy seed for themselves. In both Uganda and DRC, farmer seed producer groups and agri-multipliers were designed to fill the void between the formal and informal seed sectors and provide affordable seed to resource-poor farmers. In reality, however, resource-poor farmers tend to rely on seed-saving, other farmers and local grain markets to access seed, and there is minimal demand by the poorest farmers for seed from the formal and intermediate seed sectors. To be sustainable, the crop and varietal focus of intermediate or semi-formal seed systems is key, and this may require linkages between input and output markets if farmers are to be encouraged to purchase seed. There is also potential to enhance existing informal seed systems by enhancing the quality of seed managed by farmers and traders, and by making seed of improved varieties more readily available through informal seed systems.

### 6.3 What emergency seed interventions can and cannot achieve

This study has shown that emergency seed interventions cannot be relied on to increase production in a single season, and that seed is not necessarily the most important constraint to agricultural production. Provided that appropriate crops and varieties are made available, and farmers have access to adequate land, seed interventions can usefully increase the resilience of local cropping systems and potentially support income generation for female and male farmers through the sale of produce. Potential livelihood impacts can be enhanced through complementary programming such as Village Savings and Loans Associations (VSLAs). Emergency seed interventions do little to support local seed management practices and can create distortions to formal, intermediate and informal seed markets.

These findings suggest that seed interventions are inappropriate as short-term, emergency measures to enhance food security through increased production and should instead be regarded as one possible component of broader measures to enhance the resilience of local cropping systems and support rural livelihoods. This requires a prior needs assessment of agricultural systems to determine the agricultural constraints to be addressed - including seed management and access to input and output markets - whether or not seed system support is appropriate, and which crops and varieties if so. If seed support is to be provided, then it is also necessary to determine the most appropriate programming modalities to avoid market distortions and strengthen seed systems.

Both the needs assessment requirements and program design considerations are substantial and require a level of technical expertise that is best achieved through longer-term programming rather than emergency operations.

## 7. Lessons / recommendations for the design of seed interventions in crisis contexts

### 7.1 To enhance food security through self-sufficiency, implementing agencies must identify and address broader cropping system constraints for male and female farmers – these may or may not include seed

The study shows that different factors apart from seed contribute to crop production and food security (e.g. access to fertile land, reliable and timely rainfall) and directly affect the overall impacts of a seed intervention. Some of these factors vary according to the gender of the farmer, e.g. access to land within certain ecologies, access to labour). The provision of seed alone cannot be relied upon to increase food security within a single season or a single year. Given the increasingly protracted nature of emergencies, longer-term interventions that can more accurately assess and address the challenges faced by male and female farmers and enhance the resilience of local food and seed systems would appear to be more impactful.

### 7.2 Weather variability must be factored into the design of emergency seed interventions through the use of forecasting and contingency planning

Long-range weather forecasting and agroclimatology data need to be taken into consideration when making decisions about the viability of potential seed interventions. In some cases, it might be possible to use this data to help determine which crops and varieties would be most appropriate to particular weather conditions and the cut-off dates for intervention, according to the timing of anticipated rainfall. In other cases, it might be necessary to cancel a planned seed intervention if the expected rainfall is deemed insufficient to allow for significant impacts from the intervention. In such a scenario, contingency planning should be used to provide other, more appropriate, forms of assistance.

### 7.3 Emergency interventions should aim to increase the resilience of cropping systems rather than simply attempt to increase crop yields

The resilience of food and seed systems can be enhanced by the introduction (or re-introduction) of appropriate varieties and crops (e.g. those that have resistance to drought; those that meet market demand) and the incorporation of these varieties into local seed systems so that farmers can effectively access them through their normal supply channels (i.e. from own-saved seed, other farmers and local markets).

Those programs that seek to increase farmers' resilience through a one-time injection of emergency seed should realize that such interventions will only provide temporary benefits, with potential negative impacts to the seed system, unless accompanied by complementary actions aimed at optimizing impacts and strengthening access to the varieties in the long term. See recommendations relating to complementary actions and seed systems support below.

### 7.4 Donors and implementing agencies should recognize that identifying appropriate new varieties for increased resilience takes time and requires a gender lens

The introduction of appropriate new varieties (especially drought tolerant varieties) can strengthen the resilience of local cropping systems. Identifying the appropriate varieties is not easy and requires consultations with male and female farmers, local Ministry of Agriculture officials, agricultural researchers and other experts. Male and female farmers often grow different crops in different ecologies and for different purposes and therefore have different crop and varietal requirements. In some cases, it might be necessary to work

with farmers over several seasons to undertake participatory varietal selection,<sup>26</sup> involving on-farm tests to determine the most appropriate varieties for men and women respectively.

### 7.5 The design of emergency seed interventions should include complementary programming to maximize the potential livelihood impacts for men and women

Emergency seed interventions that aim to enhance livelihoods should not be implemented as stand-alone activities but should be accompanied by complementary forms of livelihood support. In the case of Uganda, Village Savings and Loans Associations allowed female farmers to meet urgent household needs and invest the income generated from their produce into education, livestock and land. In the DRC, the assessment recommended that additional support was needed to enable farmers to invest in livelihood assets.

### 7.6 Seed interventions should recognize and support the role of informal seed systems and the role of women within these systems

Because the informal seed system is where 90% of farmers obtain the majority of their seed, efforts should be made to reinforce the capacity of the informal seed system to provide farmers with quality seed. Given the importance of informal seed systems, much greater emphasis should be given to seed-saving by farmers, and seed management by local (grain) traders who also provide seed. Given that women play a particularly important role in informal seed systems (both as farmers and traders), it is particularly important to understand the gender-related aspects of household seed management and informal seed markets. Needs assessments should determine the strengths and weaknesses of informal seed systems and seek to address these where possible, e.g. by encouraging farmers to learn from each other about effective seed storage and seed selection methods, and by working with grain traders to improve their seed management practices.

### 7.7 Interventions must avoid distorting seed markets

The purchase of seeds for direct distribution by implementing agencies has been shown to distort seed markets over time in that formal, semi-formal and intermediate seed systems become dependent on seed sales to implementing agencies rather than positioning themselves to serve local farmers. This can be avoided by not repeating direct distribution interventions for any longer than necessary, or by using alternative seed provisioning modalities (e.g. seed vouchers, or cash transfers for seed) in situations where seed is available but not accessible to farmers. Market-based programming approaches such as seed vouchers and seed fairs are generally thought to have less distortionary effects. However, this was not the case in DRC where informal traders complained that the seed fairs forced them to lower their prices. In the short term (i.e. within the timeframe of a single intervention), market price monitoring and contingency planning are needed to check and address any unintentional price changes resulting from market-based approaches. In the longer term (for interventions that are repeated from one year to the next), interventions should offer seed system support rather than seed provisioning (see below).

### 7.8 Interventions should enhance availability and access to new varieties by male and female farmers through seed system support

Farmers need to be able to continue to access quality seeds of appropriate varieties, whether through informal, intermediate, semi-formal or formal seed systems. Appropriate support for different seed systems requires longer-term interventions that are based on a good understanding of the nature of demand and supply in informal, intermediary and formal seed markets. Appropriate interventions should be designed according to the findings of detailed seed systems assessments. For example, here are some of the recommendations that emerged from the assessments in the DRC and Uganda: support to informal seed

---

<sup>26</sup> Participatory varietal selection is the selection by farmers on their own fields of finished or near-finished products from plant breeding programmes, including released cultivars, varieties in advanced stages of testing, and well characterised material from on-going breeding programs (Joshi and Witcombe, 1998).



systems might focus on participatory varietal selection, farmer seed saving, and seed management by informal traders. As mentioned above, female farmers and traders often play a particularly important role in these systems. Support to intermediate seed systems might focus on sustainable models for seed multiplication and marketing. As noted above, the crop and varietal focus of intermediate seed systems is a key factor in determining their success or failure, and this may require linkages between input and output markets. Support to formal seed systems might focus on enhancing farmers' access to quality seed through extending the reach of rural sales outlets, particularly for crops such as vegetables that are regularly in demand, especially by women farmers.

### 7.9 Donors and implementing partners should support further impact assessments to continue to expand the evidence base, generate learning and improve emergency seed interventions

The assessments conducted in Uganda and the DRC show that the participatory impact assessment approach and other qualitative data collection tools can usefully generate data and lessons needed to better understand and enhance the impacts of emergency seed interventions. More assessments will further expand the evidence base and the lessons learned. Section 2.4 and Annex 2 of this report provide some lessons that can be applied to future impact assessments, particularly in relation to the formulation of research questions, the selection of indicators and specific data collection tools.



## Annex 1. The emergency seed interventions assessed

### 1. World Vision intervention in Adjumani District, Uganda

The Adjumani Improved Self Reliance and Livelihoods Project was funded by WV Australia under two phases: Phase I was implemented January 2019 - September 2021 and Phase II implemented October 2021 - March 2022. The purpose of the project was to rebuild sustainable livelihoods for refugees and host communities in Adjumani District with a specific target of assisting refugees to produce their own food to supplement the food rations provided to refugees through WFP food assistance. The project was implemented in Maaji II, Maaji III and Mungula II refugee settlements and their surrounding host communities in Itirikwa and Ukusijoni sub-counties.

The project's planned outputs and outcomes included the following:

- Increased household agricultural production and productivity
- Increased access to improved agricultural technology and inputs
- Improved community-led environmental conservation practices
- Increased household income through diversification of income-generating activities
- Improved knowledge and skills on off-farm alternative livelihoods
- Improved access to profitable markets

In 2020, 2021 and 2022, WV assisted 25, 25 and 30 groups respectively with a total number of 9,640 members (6,748 refugee's households and 2,892 host community households). There were various group types, including refugee-only groups, host-only groups, and mixed groups of refugees and hosts.

Under the first phase of the project, groups received agronomic training through demonstration sites to establish kitchen gardens on their plots. They also received seed: cabbage, eggplant, African eggplant, green pepper, tomatoes, collard greens (sukumawiki), okra and onions. Many of the group members harvested vegetables for their household consumption and the surplus produce was sold to augment household income.

In the second phase of the project, the project also negotiated access to land in the form of 'block farms' to allow refugees to access larger areas for cultivation. In 2021, 100 acres of land were opened up for the farmer groups, and seeds of maize, beans, rice, soyabean and groundnut were provided to 31 groups, along with training in good agronomic practices.

Linkages were facilitated between refugee and host smallholder farmers and agro-input dealers<sup>27</sup> to learn about different agro-input packages. Planned linkages between farmers and seed companies were not possible due to the COVID-19 lockdown, but a farmer learning visit was made to Namulonge research station<sup>28</sup>. Building private sector linkages for value chain support was also supported by the project<sup>29</sup>.

---

<sup>27</sup> A consultation meeting was held for 55 farmer participants with 8 agro-input dealers.

<sup>28</sup> The research station at Namulonge (27 km north of Kampala) is known as the National Crops Resources Research Institute (NaCRRI). It is one of seven National Agricultural Research Institutes of the National Agricultural Research Organisation (NARO). NaCRRI conducts research of national strategic importance, focusing on legumes, root crops, cereals, horticulture and oil palm. Its crop improvement and development focus areas include pest and disease resistance, climate resilience, tolerance to low soil fertility, yield improvement, pre- and post-harvest management, and nutrition enhancement, among others.

<sup>29</sup> This was done through a consultation meeting with agro-inputs dealers, microfinance service providers, off-takers, processors, and a government representative from the district Production and Marketing Department.

## 2. Lutheran World Federation intervention in Adjumani District, Uganda

The emergency seed interventions that formed the focus of the assessment were implemented under two LWF projects: (i) Promoting Sustainable livelihoods, Environmental and Psychosocial Support in Adjumani; and (ii) Reconnecting Lives, Vision, and Empowerment. The seed interventions implemented under each of these projects are described below.

Promoting Sustainable livelihoods, Environmental and Psychosocial Support in Adjumani was a three-year project (April 2018 to March 2021) funded by Bread for the World (BftW). The project aimed to increase food security, enhance environmental protection and to increase access to psychosocial support services among South Sudanese refugees and the host community in Adjumani District. The project was implemented in five settlements and assisted 4,200 South Sudanese refugee and Ugandan host community families through support to 140 farmer groups (80% women). Participants were selected with the help of the refugee committees, UNHCR and the Office of the Prime Minister (OPM). The most vulnerable refugee and host community households were prioritised – female heads of household, pregnant and lactating women, disabled people and the elderly i.e. the households with the least possible labour.

To achieve the objective of increased food production, LWF trained community-based facilitators to support the farmer groups, and provided seed and training in good agricultural practices to the groups. Earlier phases of the project involved seed distribution through seed fairs and vouchers, but this was not possible in 2021 due to Covid restrictions, so seed was distributed directly. Outstanding groups were given work oxen. Kitchen gardens were established for model households, and group members were given vegetable seeds. To achieve the objective of increased incomes, training in farming as a business was provided to the farmer groups, as well as Village Saving and Lending Association (VSLA) methodologies and business management skills. Additional activities were undertaken relating to environmental protection and psychosocial support.

A ten-member, self-initiated local seed producer group was trained in seed multiplication and provided with foundation seed. Group members have been multiplying seed since 2017 on their own individual farms. Since that time, LWF has facilitated linkages with the National Agricultural Research Organisation for the supply of foundation seed and with the District Agricultural Office for official registration and seed quality checks. In 2018 and 2019, the seed producer group took part as a seed vendor in the seed fairs organized by the project, but seed fairs were not possible in 2020 and 2021 due to Covid restrictions. Seed produced by the group is sold to farmer groups (through the Sub-County Local Government office), to NGOs and to individual farmers.

Funded by USAID's Bureau of Population, Refugees, and Migration, the Reconnecting Lives, Vision, and Empowerment (Re-LiVE) project was implemented in Adjumani District, as well as Palorinya, Palabek and Kyangwali from 2020 to 2022. In Adjumani District, the project targeted approximately 8,000 South Sudanese refugees and Ugandan host community members in four refugee settlements (Nyumanzi, Pagirinya, Ayilo I and II) and the surrounding areas. The overall project goal was to empower refugee communities to reduce their vulnerabilities, and to prevent and respond to their protection risks by enhancing their well-being, self-reliance, and peaceful coexistence within, and with the host communities. The two project objectives were: 1) to strengthen the protective environment, psychosocial well-being and social cohesion, and 2) to provide skills for durable Solutions through empowering refugees and host communities to rebuild and sustain their livelihoods. The project built on the successes of an earlier PRM-funded project known as SALIMA.

Using the Farmer Field School (FFS) approach, the project worked with 100 existing and new farmer groups – 60 groups had been established in 2017 by the earlier PRM project – and the current project trained an additional 35 groups. Training was provided on modern agronomic practices, farming as a business production technologies, group dynamics, nutrition, post-harvest handling, value addition and marketing to

expand group enterprises and increase food production levels and food security. Production was also expanded through opening of additional acres of land (each group received a minimum of 5 acres tillage services from LWF for group-based production), and training in 'Farming as a Business', bulking and marketing, to enable the groups to branch out and expand their agricultural enterprises. Training in the Village Savings and Loan Association approach (VSLA) was expected to enable farmer groups to have capital to expand, improve and/or diversify their farming enterprises. See Annex 1 for the project outputs relating to these activities. In addition, a small number of youth groups and 300 extremely vulnerable individuals were supported to benefit from opportunities for commercial farming, backyard gardening and greenhouse gardening, though these were not included in the assessment.

### 3. Catholic Relief Services intervention in DRC

In 2017 the Catholic Relief Services (CRS) in partnership with Caritas Kananga, launched the initial Ditekemena (or 'hope' in the Tshiluba language) Emergency Project, in Greater Kasai. Between August 2016 and 2018, this area had been affected by conflict, and an estimated 1.6 million people were displaced. Many fled to forests in the zone; others crossed the border to Angola. After two years, 63% of the displaced persons had returned to their homes and farms. Many, however, had lost children and family members in the forest due to malnutrition and disease. Local infrastructure and market networks, already severely limited in the region, were decimated by the conflict.

Funded by USAID's Bureau for Humanitarian Assistance (BHA), the project provided a combination of food assistance, seeds and tools support for agricultural recovery in an effort to address severe food insecurity. A series of year-long projects shifted from zone to zone. In 2021, CRS launched the fourth phase of the Ditekemena Emergency Project in Central Kasai province in an area that had received no previous assistance from BHA. The project operated from January 2021 through February 2022. Unconditional food assistance was delivered in three rounds per targeted household (HH) via voucher fairs or food distributions. Beyond the immediate food security goal, the project adopted a second objective: to 'ensure the protection and restoration of livelihoods of crisis-affected households to support their self-sufficiency and access to staple foods'.

With the aim of restoring agriculture-based livelihoods, the project implemented seed and tool fairs and associated agronomic training for 17,500 and 18,500 HH respectively. All HH in targeted communities were covered by the assistance.

CRS carried out needs assessments that identified the seed prioritized by communities. These consisted of cowpea, maize, groundnut, and rice, as well as vegetable crops like green beans, amaranths, red onions, eggplant, and bambara nut. A Seed System Security Assessment had been carried out in Kasai Oriental in 2017 with many findings informing the design of the Ditekemena project. CRS also piloted a Rapid Seed System Security Assessment in Central Kasai in 2021 which identified seed access, availability, and quality issues in the area.

Households participating in seed fairs received vouchers with a value of \$40 for the maize, cowpea, rice, and/or groundnut for either agricultural season B (January-May) or season A (September-December). The vouchers enabled each beneficiary to purchase 10-15 kg of seed and plant 0.25-0.3ha. Each household also received two hoes/spades. The Service National des Semences (SENASSEM) participated in CRS seed fair activities, providing direct government oversight of seed quality for the certified seeds.

Farmers were also provided with training in Best Agricultural Practices including fertility management, seed selection, cultivation practices, and post-harvest management. Initial training was delivered through CRS's local partner, Inspection Provinciale d' Agriculture, Pêche et Elevage (IPAPEL), to agricultural monitors. This was followed by cascade training of farmers by the agricultural monitors.



## Annex 2. Assessment Team’s appraisal of indicators and data collection tools used

Note that the original three research questions (RQs) were expanded into six questions (RQ0 – RQ6), as below.

Research Question	Indicators	Data collection tools and methods	Field Team Appraisal
Background info & planning	n/a	Remote call with project staff	Useful as intro and kick-off, but not as much detailed info as we would have liked. Useful as part of the pre-planning phase to figure out which project(s) to focus on and where..
		Initial face-to-face meetings with project staff	This was essentially a continuation of the remote call, but easier in person. Key meetings with senior staff usefully identified the questions and issues that they were asking in terms of programming and ‘what next’ – this helped to situate the studies and make them relevant. Other meetings (e.g. with project staff in Adjumani) tended to focus on logistical issues relating to fieldwork.
		Transect walk through villages with informal conversations	RQ0 – this helped to make inferences from observations and refute claims about food insecurity. Provided a good “grounding”. Two village transect walks were undertaken in DRC. Also visited a seed production field.
Background info & RQ4	Descriptive data about seed demand and supply.	Market visits (both planned and impromptu) and interviews with grain and seed traders	Useful insights into grain and seed markets and food security aspects as well as detailed info about informal seed markets (see RQ4 below).
RQ0: Why, when, how, and what types of seed were received by farmers? [And what did they do with them?]	Descriptive data about intervention (incl. 2 points below)	Review of project documents	Informative docs in Uganda, but less so in DRC. DRC Project doc <sup>30</sup> was missing relevant information from earlier project phases. DRC PDM and final Evaluation document were provided – both useful and very revealing, e.g.PDM showed improvements in food security, but by the time of the final evaluation the scores had reverted back to baseline.

<sup>30</sup> The project document was upgraded each year but did not contain the detailed material from the original document, making it necessary to locate and review the original project document.

Research Question	Indicators	Data collection tools and methods	Field Team Appraisal
		Discussions / KIIs with project staff	Limited staff accessibility in DRC due to staff turnover; not many of the staff involved in the project were still working for CRS - only 2 people were engaged (one in Kinshasa, one in field).  Lots of informal time spent with field agents during the fieldwork in Uganda – this was not very structured, though useful.  Formal debriefing meetings with more senior staff at the end of the fieldwork usefully provided additional information and allowed the field teams to ask questions that had arisen during the fieldwork.
		Historical timeline with farmers	Went well in Uganda and usefully identified project start and end. Exception was the Dinka groups which were challenging. Challenge in DRC was the time between the displacement and the return – the dates of return varied and were not clearly defined for different groups. Drought following the seed distribution was usefully established by the time line.
	Whether or not seed was planted	Farmer FGDs	Important not to assume that seed was planted – this question must always be asked for different crops and varieties provided. For seed not planted, it's also important to ask why – if seed is provided late, it might be saved for planting in the following season. If seed is eaten, it might be because it was late or inappropriate, not necessarily because farmers lacked food.
	Whether or not seed germinated and was harvested	Farmer FGDs	This can usefully provide an indication of seed quality as well as other production constraints, e.g. drought, other inputs. Necessary to distinguish crops and varieties.
RQ1: How have emergency seed interventions impacted	Change in number of hunger months (before / after)	Seasonal calendar Before & After (B&A) Scoring	Uganda – B&A - worked well, focusing on the food from the seeds that were provided (not food aid, not food from other sources). Possibly difficult for farmers

Research Question	Indicators	Data collection tools and methods	Field Team Appraisal
household food security of male and female smallholder farmers?			to distinguish food from different sources / seeds when scoring the hunger months. Difficult to verify the data on hungry season due to the way it was collected (with narrow focus on food from seed provided).  DRC – too difficult to define B&A – general seasonal calendar only (all foods). This usefully revealed importance of cassava for food (though cassava was not provided by seed distribution).
	Change in production (before / after)	B&A scoring	Uganda – difficult to trace the seeds provided – farmers talked about crops in general, not necessarily for the specific varieties. Impacts of drought also made it difficult to understand changes that related to seed per se. Production relates to many other factors, not just seed. This indicator was dropped due to attribution challenges.
RQ2: How have emergency seed interventions impacted on the incomes and livelihoods of male and female smallholder farmers?	Changes in income from sale of crops for which seed was provided (before / after)	B&A scoring Not possible to use this in DRC for both seasons - When there's no harvest, then there's no income, so you can't determine how the income was used.	Uganda – farmers could say how incomes were used and investments made. Necessary to be clear about attribution– some of the income may not have been linked to the seed provided.
	Changes in income sources B&A (DRC)	Proportional piling (one score agreed by consensus of the group participants). Average score was then calculated across the groups.	This helped to get a better understanding of livelihoods and different income sources and to attribute changes to income overall. Where harvest had increased, this allowed for a conversation about the different crops and varieties that contributed to increases. Can be done even when there's no harvest.
RQ3: How have the varieties and seeds received been incorporated into local cropping systems and local seed management practices? If so, how? To	Whether or not seed of variety provided was saved for re-planting	Farmer FGDs	Good indicator, easy to collect. Useful for analysis
	Comparative yield of varieties (local vs improved)	Farmer FGDs	Some estimates were possible from the FGDs, also from the Field Agents (based on trials). Challenge in the selection of the varieties to compare. Yield is just one of many varietal characteristics that farmers consider.



Research Question	Indicators	Data collection tools and methods	Field Team Appraisal
what benefit(s)? Any disadvantages?	Whether or not variety provided was “new” to farmers	Farmer FGDs	DRC – improved varieties that had been provided previously were lost when farmers were displaced.
	Descriptive data about varieties	Farmer FGDs KIIs with project staff and agric officials	Useful to ask farmers to describe each of the different varieties (as an open-ended question) to understand which characteristics they regard as important. Some documentation was also available from the Agricultural Research Institutes
RQ4: How have emergency seed interventions impacted on informal and formal seed systems (including seed markets) in the local area?	Changes in seed system actors (type and number)	KIIs	Note that changes in actors may not necessarily relate to the emergency but to the broader history of agricultural development projects and policy changes in the seed sector, e.g. LSBs and FSPs in Uganda.
	Changes in volumes of seed sales by specific actors and to different types of buyer	KIIs	Not always possible to get precise quantities, but approximate comparisons are useful, e.g. comparative volumes of seed sales to farmers vs seed sales to NGOs and/or development projects. Need to differentiate crops and varieties.
	Changes in types of varieties available through different channels	KIIs	Useful to know how agencies are sourcing their seed for distribution and/or who is providing what types of seed at seed fairs. As above, changes may not necessarily relate to the emergency but to the broader history of agricultural development projects and policy changes in the seed sector.
	Changes in seed sources for farmers	Farmer FGDs	Useful to understand these over time (e.g. before and after crisis; before and after intervention) and space (e.g. original home, place of refuge, return). Necessary to ask about different crops separately.
	Changes in seed quality control systems	KIIs	Necessary to understand what prompted any changes. Changes may relate to the broader history of agricultural development projects and policy changes in the seed sector, or might have been brought about by seed quality challenges within emergency seed provisioning modalities.
	Perceptions of seed quality	Farmer FGDs KIIs	Necessary to get different perspectives on seed quality, e.g. farmers, project staff, Ministry staff, etc.

Research Question	Indicators	Data collection tools and methods	Field Team Appraisal
	Descriptive data about informal seed markets	Market visits and interviews with seed traders	Very useful to identify and interview various traders about whether and how they manage seed and grain separately and whether there is a price differential. Inferences about seed quality can be made according to the ways in which seed is sourced and managed by traders.
RQ5: What recommended changes in the design and implementation of emergency seed interventions amongst refugee and host community male and female farmers will support improved livelihood and seed system outcomes?	n/a	Ideas / suggestions might emerge from any FGD or KII Informal discussions among field team members Feedback meetings	Knowledge / experience of field team members is important. Very useful to get feedback from project staff on any ideas / suggestions.

## REFERENCES

- Catley, A., R. Henderson and A. Radday (2021). Emergency Agriculture Interventions: Reviewing evidence on the impacts on livelihoods, food security, and nutrition. SEADS Brief 1. [https://seads-standards.org/wp-content/uploads/2021/04/SEADS\\_brief1\\_4.26.21.pdf](https://seads-standards.org/wp-content/uploads/2021/04/SEADS_brief1_4.26.21.pdf)
- Catley, A., Burns, J., Abebe, D., Suji, O. (2013). Participatory Impact Assessment: A Design Guide. Feinstein International Center, Tufts University, Somerville. <https://fic.tufts.edu/publication-item/participatory-impact-assessment-a-design-guide/>
- Development Initiatives, 2020. *Global Humanitarian Assistance Report 2020*. <https://devinit.org/resources/global-humanitarian-assistance-report-2020/>
- Development Initiatives, 2022. *Global Humanitarian Assistance Report 2022*. <https://devinit.org/resources/global-humanitarian-assistance-report-2022/>
- Henderson, R. and Herby, L. 2019. Catholic Relief Services Democratic Republic of the Congo Ditekemena emergency food security project evaluation September to October 2019. Catholic Relief Services. <https://seads-standards.org/wp-content/uploads/2021/04/Henderson-R-2019.pdf>
- Joshi, A. and Witcombe, J. R., 1998. Farmer participatory approaches for varietal improvement. In *Seeds of choice: making the most of new varieties for small farmers*, pp.172-190. (Eds J.R. Witcombe, D.S. Virk and J. Farrington). New Delhi: Oxford and IBH Publishing Co. London: Intermediate Technology Publications.
- SEADS, 2022. *Standards for Supporting Crop-related Livelihoods in Emergencies*, Rugby, UK: Practical Action Publishing. <http://dx.doi.org/10.3362/9781788532419>
- SEADS, 2022. *Standards for Supporting Crop-related Livelihoods in Emergencies*, Rugby, UK: Practical Action Publishing. <http://dx.doi.org/10.3362/9781788532419>
- Sperling, Louise and Shawn J. McGuire, 2010. 'Persistent myths about emergency seed aid', *Food Policy*, Volume 35, Issue 3, pp. 195-201, ISSN 0306-9192. <https://doi.org/10.1016/j.foodpol.2009.12.004>.