



# TOOLS4SEEDSYSTEMS: WORKING TOWARDS RESILIENCE THROUGH ROOT, TUBER AND BANANA CROPS IN HUMANITARIAN SETTINGS

WORKSHOP REPORT

23 - 25 MAY 2023

VIRTUAL MEETINGS





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**Prepared by Sue Canney-Davison, Leanne Davies, and Margaret McEwan**

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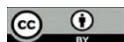
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## Contents

Acknowledgements.....	4
Acronyms .....	6
1 EXECUTIVE SUMMARY .....	7
2 BACKGROUND.....	8
2.1 Workshop processes and participants .....	8
3 DAY 1: Tuesday, 23 May 2023.....	9
3.1 Focus of the day.....	9
3.2 Opening session.....	9
3.3 Reflections and plenary discussion .....	11
3.4 Country-based breakout rooms .....	13
3.4.1 Opportunities.....	14
3.4.2 Specific humanitarian opportunities.....	15
3.4.3 General challenges.....	15
3.4.4 Challenges in particular humanitarian settings and conflict zones .....	16
3.4.5 Comments and observations from the side chat.....	16
3.5 End of day Mentimeter evaluation .....	16
4 DAY 2: Thursday, 25 May 2023 .....	18
4.1 Focus of the day.....	18
4.2 Presentations on RTB seed production technologies.....	19
4.3 Planned activities in Cameroon and DRC .....	21
4.4 Crop-based breakout rooms.....	22
4.4.1 Observations and insights.....	22
4.4.2 Challenges .....	22
4.4.3 Opportunities.....	22
4.5 Final reflections and way forward .....	23
4.5.1 End of day Mentimeter evaluation .....	24
5 ANNEXES .....	25
5.1 Agenda.....	25

## Acronyms

ABC	Alliance Bioversity-CIAT
CIP	International Potato Center
BHA	Bureau of Humanitarian Assistance
CAT	Context Analysis Tool
CNA	Capacity needs assessment
CRS	Catholic Relief Services
DRC	Democratic Republic of the Congo
EGS	Early generation seed
FAO	Food and Agriculture Organization of the United Nations
IDP	Internally displaced person
IITA	International Institute of Tropical Agriculture
IP	Implementing partner
IRAD	Agricultural Research Institute for Development
INERA	Institut National pour l'Etude et la Recherche Agronomiques
ISSD	Integrated Seed Sector Development
LAMP	Loop-mediated isothermal amplification
MINADER	Ministry of Agriculture and Rural Development
NGO	Non-governmental organization
ODK	Open Data Kit
OFSP	Orange-fleshed sweetpotato
PPP	Public private partnership
PVS	Participatory variety selection
RMT	Rapid multiplication technology
RTB	Roots, tubers and bananas
SAH	Semi- autotrophic hydroponics
SERT	Seed Emergency Response Tool
SSSA	Seed System Security Assessment
ToT	Training of trainers
UF	University of Florida
USAID	United States Agency for International Development
VPC	Vegetatively propagated crop
WFP	World Food Programme
WUR	Wageningen University and Research



## 1 EXECUTIVE SUMMARY

Under the auspices of the USAID Bureau for Humanitarian Assistance-funded project, *Tools4SeedSystems: working towards resilience through root, tuber and banana crops in humanitarian settings*, a two-day virtual workshop took place on 23 and 25 May 2023. The workshop brought together root, tuber, and banana (RTB) scientists, humanitarian organizations and a broad range of potential stakeholders to create mutual understanding, linkages and to design ways to explore the opportunities for RTB crops to contribute to food security, income and resilience in conflict and humanitarian settings.

With over 180 registrants from 56 organizations and 29 countries, and almost 100 participants, the two days were a strong opportunity for networking and information sharing.

### The discussions covered three main areas

1. While there is currently minimal focus and investment in RTBs in humanitarian settings, the potential for these crops to create real benefit is huge, both for short term recovery and for building longer term resilience. In many contexts, RTBs are part of local agrifood systems, and hence some production knowledge already exists. The advantages of RTBs include short to medium maturity periods; high nutrient density and food per unit area of land; flexible management and harvesting options, which are often undertaken by women; and considerable climate and disaster adaptability and resilience. They provide a combination of diverse types of food, (e.g., leaf, fruit, and root) and offer micro-nutrient-rich varieties. Challenges include vegetative reproduction and recycling of planting material, which can lead to the accumulation and spread of pests and diseases and seed degeneration; bulky perishable planting material and crops; limited processing and product value addition; and mostly informal non-commercialized seed systems with limited uptake of new, clean varieties.
2. Humanitarian actors and governments have focused on cereal and grains in emergency contexts and there is limited awareness and knowledge of RTBs, nor experience with these crops. Emergency seed assessment and delivery mechanisms have been established that could be modified to incorporate RTBs. The uncertain time horizon for interventions for internally displaced people (IDPs) or cross-border refugees, who may have little access to land, water, inputs, and agronomic technical support, provide considerable challenges. However, these crops provide good opportunities for contributing to resilient food security: potato and sweetpotato have shorter maturity periods, cassava offers relative drought resistance, and banana and plantain have low input requirements.
3. Needs assessments carried out prior to the meeting highlighted the need for RTB technical assistance to initially intervene with humanitarian organizations to create sustainable value chains for quality seed production, while simultaneously exploring how to raise capacity, awareness, and knowledge with humanitarian actors, other national organizations and also with those they serve. The other key repeated challenge was the need to decentralize seed production, knowledge, and capacity away from central research organizations without compromising seed quality and technical backstopping. Plans for training in Cameroon and the Democratic Republic of Congo (DRC), and preliminary findings on the context and needs for Bangladesh, Ethiopia, Haiti, Madagascar, and Mozambique were shared.

An [online voluntary networking form](#) was filled by over 60 participants to enable them to follow up with each other. The two meetings demonstrated the huge enthusiasm from humanitarian actors to understand how to best employ the right crops and varieties in each situation with technical support, knowledge and wide expertise in seed systems and rapid deployment with the research expertise and scientists.

## 2 BACKGROUND

In complex, post-conflict humanitarian situations, there is consensus for the need to “build back better” and support efforts to strengthen resilience among farmers who are vulnerable to the impact of climate-related shocks. In many contexts (e.g., the Great Lakes region in sub-Saharan Africa), roots, tubers, and bananas (RTB) are crucial crops for food security, nutrition, and income. RTB crops are versatile, nutritious staples that produce more food per unit area of land compared to many other crops, contribute directly to household food security, are often under women’s management, and are projected to be more climate resilient than grain crops. However, there is often limited awareness among humanitarian actors of the current role and contribution of RTB crops in local farming systems to re-build better, sustainable livelihoods.

The [RTB Toolbox](#) was launched in 2021 and is an evolving set of 11 tools (at present) and a glossary to diagnose, evaluate and improve seed systems of banana, cassava, potato, sweetpotato, and yam. The extension of the use of the RTB Toolbox to humanitarian settings is being led by CIP in collaboration with CGIAR centers (IITA, ABC), Wageningen University and Research (WUR) and the University of Florida. In 2022–2023, we have been working to understand the capacity needs of humanitarian partners to strengthen their root, tuber and banana interventions in Cameroon, Democratic Republic of Congo (DRC), Ethiopia, Madagascar, Mozambique, Haiti, and Bangladesh.

A two-day virtual workshop took place on 23 and 25 May 2023, to bring together RTB scientists, humanitarian actors and a wide range of potential stakeholders to create mutual understanding, linkages, and to craft a potential way forward.

### 2.1 Workshop processes and participants

Following contact through the [United Nations Inter Agency Standing Committee Food Security Cluster Coordinators](#) in the focus countries, and an open public call on the websites of seed system initiatives ([ISSD Africa](#), [SeedSystem](#) and [PRO-WASH & SCALE | Food Security and Nutrition Network \(fsnnetwork.org\)](#)), registration was opened on the [event website](#). Speakers’ biographies can be found on the event page.

Over 180 people registered representing over 154 organizations across 29 countries with between 60 and almost 100 participants across the days. The approximate distribution of stakeholders on each day was 50% humanitarian partners, 20% RTB scientists, 20% national and government organizations, 8% academics and some private sector organizations and consultants. Each day was opened with set of informative presentations followed by either a plenary discussion or breakout room for brainstorming around key questions ([see workshop program](#)).

Forty-six participants filled in a meeting specific voluntary networking google form ([link](#)) for participants to share their contacts and express what they can provide and what they need. The predominant requests covered needs:

1. To understand the humanitarian context
2. To understand RTB seed systems
3. To understand the opportunities for leveraging RTB crops to improve humanitarian interventions
4. To increase the opportunities for multi-stakeholder networking and coordination at local and organizational levels and contexts
5. To be technically trained on RTB value-chain segments (from seed multiplication, health quality, crop production, to market).





of plant disease. There is a profound need to understand each humanitarian context and customize RTB skills, tools, and approaches to respond to the specific contextual requirements. Margaret shared details of the RTB [Toolbox for working with root, tuber, and banana seed systems \(tools4seedsystems.org\)](https://tools4seedsystems.org) and the expectations for the virtual training process.

**Chris Ojiewo** (Leader of the CGIAR Seed Equal Initiative) shared the context of the project within Seed Equal in the CGIAR system ([presentation on event site](#)).

For emergency, SE could provide **technical assistance** and support on:

- choosing well-adapted and resilient varieties that are **fit-for-purpose** in a particular emergency context;
- rapid **seed production and multiplication systems**, technologies, and tools to make seed quickly available in emergency situations;
- rapid **testing and tracing strategies** for seed quality assurance and the prevention of inferior planting materials being supplied in emergency situations;
- **sanitary and phytosanitary support** to ensure disease and pest-free material is supplied;
- **rapid scale-up models** for credible/legitimate seed producers (including commercial, parastatal, and farmer-based producers) operating in emergency contexts;
- **seed distribution models** that appropriately leverage the participation of market actors public service providers, relief agencies, farmer-based organizations among others.



improved seed systems. Within Seed Equal, one work package focuses on Vegetatively Propagated Crops (VPCs). This focuses on sustainable early generation and further seed production, protocols and business models, effective germplasm exchange and expanded on-farm testing, research on seed demand and risk perception and developing tools and technologies across the whole seed value chain. The RTB [Toolbox for working with root, tuber, and banana seed systems \(tools4seedsystems.org\)](https://tools4seedsystems.org) is an evolving set of key technologies and tools. Seed Equal can provide technical support in humanitarian settings by identifying problems and fit-for-purpose varieties, rapid seed production and multiplication systems, testing and tracing seed quality and phytosanitary support, and scaling up using a variety of tested, appropriate seed production and distribution models. Seed Equal can provide rigorous analysis, research, and evidence on effective approaches to support emergency seed responses. The aim is to drive early adoption of improved varieties to build inclusion, resilience and reduce yield gaps.

Through conservation, breeding, and partnerships across over 130 countries, six integrated CGIAR Genetic Innovation initiatives aim to respond to five key sustainable development goal areas including nutrition, health, and food security. One of these initiatives, Seed Equal aims to increase genetic gains in farmers' fields and modernize CGIAR's role in seed delivery through

### Common Seed Issues in BHA Applications

1. Limited seed system / seed need's assessments to diagnose the seed issue - Access? Availability? Quality?
2. Seed quantities request assume farmers have no other seed sources and cannot produce seed.
3. Direct Seed Distribution is the dominant response modality proposed by partners.
4. Partners assume that all seed procured with BHA funding must be certified / low recognition of informal seed sources.
5. Low access to new and improved varieties beyond DSD (i.e. - demos, PVS, small packs).

**Stephen Walsh** (Senior Agricultural Advisor of USAID BHA; [presentation on event site](#)) followed by sharing that USAID Office of Humanitarian assistance works across three areas of classic emergency work, saving lives, reducing human suffering and reducing the impact of humanitarian crises, but they also seek to cover the whole landscape by reducing the opportunity for potential emergencies. As major

funders of seed supply in emergency situations, 64% of all applications involve seed and USAID is keen to include RTBs, which are currently under-invested. They are seeing a low level of diagnosis; a limited level of needs identification; often an assessment system with limited function; as well as limited recognition that farmers access

up to 95% of seed through informal systems. A strong humanitarian focus on direct seed distribution rather than strengthening localized commercial seed production based on market modalities can weaken formal systems. Given these realities, USAID currently support both certified and non-certified seed sourcing with additional quality assurance documentation. There is a significant opportunity to improve farmers access to improved, fit-for-purpose seed varieties. He reiterated how RTB crops are underinvested in humanitarian agricultural interventions and that humanitarian partners are extremely interested in improving their knowledge and capacity. The project creates a great opportunity to share knowledge and expertise with technically competent RTB research and development organizations. The three main aims of the joint project are to strengthen the diagnostic capacity in deciding which seed is needed, increasing timely availability of seed, and improving coordination among seed stakeholders.



**CONCLUSIONS: Hypotheses to explain potential disconnection between the agri-food system context and the agricultural response in humanitarian settings**

**RTB crop characteristics**

- Concerns about **the availability and quality** of planting material: low multiplication rate for RTB seed, accumulation of seed-borne pests and diseases.

**Awareness, knowledge & skills**

- RTB crops considered as **extremely important**
- Adapted to the agro-ecological conditions, short-growth duration and harvest ranges between 4-12 months, double consumption of leaves & tubers

**Procurement systems**

- **Transportation of bulky planting material was considered a challenge.** Most respondents referred to seed sourcing from the formal sector, and there were few indications of the informal sector being a potential seed source.

- **Limited discussion on constraints and opportunities in local farmer-managed (or 'informal') seed systems**
- **Further work is needed to understand the existing seed systems for RTB crops**

**Jorge Andrade-Piedra** (Senior Scientist, CIP, and co-lead of the project) then shared the feedback from the capacity needs assessment in Cameroon and the DRC, as well as preliminary results from Bangladesh, Ethiopia Haiti, Madagascar, and Mozambique. Key points include a perception that RTB crops are very important and can be characterized by both a more formal and an informal farmer-managed seed system. The main challenges include plant disease, availability of clean planting material, transportation of bulky crops, limited quantities of seed purchased

through seed fair modalities and land issues. Other issues included lack of funding, monitoring and slow adoption of new varieties. In the different seed systems, lack of information, procurement systems and uncertainty about seed quality stood out as the main concerns alongside the transportation of bulky planting material. Priority areas for capacity strengthening include Rapid Multiplication Technologies (RMTs) for RTB seed, diagnostics for seed-borne diseases, regulatory frameworks, and increased availability of practical information. The appropriate approach for capacity strengthening is the creation of in-country capacity strengthening opportunities (with demonstrations) followed by learning networks, on-line webinars, and e-learning modules.

### 3.3 Reflections and plenary discussion

**Erik Delaquis** (Research Team Leader, Alliance of Bioversity and CIAT) and **Israel Navarrete** (Associate Scientist, CIP) shared some reflections.

- There is a high demand for support for RTBs in humanitarian settings and this workshop is an opportunity to start to create a functioning network to understand how to tailor and contextualize available seeds, tools, and technologies.
- The types of humanitarian scenarios described (limited access to land, water, and resources, especially in refugee camps) and the implications for farming and seed systems varied widely—they would probably need multiple collaborative events if they wanted to get into specifics for all of them.

- There is an emphasis on the need for accessible technological solutions by participants (need for seed production technologies, etc.).
- On the logistics side, what documents are needed for seed certification? What procurement documents and systems are compatible with seed certification regulations (or equivalent) of different organizations working in humanitarian response?
- Quality assurance is becoming an ever-larger issue. Not only does it cause problems in producing large amounts of seed quickly; it also hampers the importation of seeds from outside the area of the crisis as governments seek to follow phytosanitary norms yet may not have the capacity on the ground to implement precautionary measures.
- Given the current emphasis on grains and cereals in humanitarian settings, there is an opportunity for RTB crops to be relevant that needs to be served. From the point of view of USAID BHA, Steven Walsh highlighted that humanitarian actors can usefully invest much more in this area.
- Several times, the need for closer coordination and involvement of farmers in RTB seed system interventions emerged in the discussions, (including for DRC and Haiti). Even more so than for grains/vegetables, RTB seed systems face limitations from centralization, which create a critical need to involve farmers on the ground from the start.
- The above two points combine to raise a third point—that building resilience over mid-long-term scales requires investment in people-centered seed systems, which short-term seed relief is not really designed to achieve. “Most of the humanitarian organizations just distribute planting materials. The don't have accompanying important packages such as capacity building and related technology promotion.....”
- There is consensus building around the need for tools and approaches focused on building human capacity (whether this should be educational materials and manuals for distribution or training protocols was not imminently clear).

These reflections were followed by a **plenary discussion**. The main points that emerged included:

To focus BHA investment on working through the considerable challenges of ensuring quality seed. The current need is to source seed through both the formal and informal supply systems and to support the limited diagnostic and implementation capacity within the formal regulatory systems. Partners need to follow due diligence steps, such as analyzing cassava field protocols on diseases developed by IITA a decade ago. Putting such protocols in place before buying seeds can lead to a better outcome. At this stage, there are some partners who are reluctant to purchase seed, because they do not know what to do or the quality assurance mechanisms to follow in emergency contexts.

BHA prioritizes working with RTB colleagues to find and implement ‘good enough’ ways, within the contextual limits, to trace verified planting materials and seed from source as the other quality assurance processes outlined in [USAID’s agriculture in emergencies guidelines](#) are flexible ([USAID/OFDA Proposal Guidelines Seed Grower Certification Agriculture Annex A](#)). This includes RTBs where disease is not visible and therefore need specific testing (e.g., potatoes).

The potential of private-public partnerships is key to strengthening seed systems where national level institutional links are currently weak. It is important to involve private sector partners as much as possible. The public sector must be involved in all elements and stages of an assessment to understand where the gaps are,

then bringing in the private sector when assessing what materials are available. For instance, in Cameroon, the Ministry of Agriculture and Institute of Research for Agricultural Development in charge of scientific research place a strong emphasis on certain crops so it is important to first understand their action plan and then see where you are going to intervene. At the same time, the private sector needs to be involved from the start to plan and then implement actions. This project will learn much from the Cameroonian experience in developing training courses based on needs assessments in humanitarian contexts. A useful approach is the [multi-stakeholder framework](#) in the RTB [Toolbox for working with root, tuber and banana seed systems \(tools4seedsystems.org\)](#), which is designed to identify and map the stakeholders, their roles, as well as their main motivations to help create the logical link between the different actors who will then be able to coordinate and work together to strengthen the sector.

The stakeholder mapping needs to include at least three public sector elements in terms of all seed system interventions and not just RTBs.

1. There are research institutes that have the mandate to develop seed varieties. These play a crucial role in evaluating suitable varieties for different agroecologies. When it comes to RTB crops, these research institutes can produce early generation seed and to make seeds available to producers.
2. Engaging with the regulatory authorities tasked with ensuring good quality seed reaches the farmer through seed regulations and inspections and to find a balance between formal and informal seed systems.
3. Engaging with the agricultural extension services, who are very close to farmers, to discuss and provide them with technical support on crop production and seed production.

Ideally, any intervention best partners with national research, regulatory and extension institutes to ensure that there is interconnection around the entire seed system including the private sector, where even using agrodealers creates another challenge. It takes a concerted, coordinated effort with the private and public sector together to bring us to the “last mile” and must involve all the key actors, both public and private, as well as donors.

One reality to consider in humanitarian settings is that, in most interventions, very small packets of seeds are usually handed out to individuals. This can be practical for reaching more people, but in many contexts, the big producers are farmers who sell these seeds in the market. This holds true even in some of the situations where you have refugee camps and seed suppliers selling in formal markets. To respond to this, organizations such as Catholic Relief Services (CRS) do a lot of work on seed security assessments, in both humanitarian and development settings, not only to analyze the customer, public, farmers and growers but also to ask farmers for their opinions on what they want to buy, including the size, packages, etc. Just do your assessment, either in the emergency context or even in the development context. Matching the demand for the technology with the provision of the technology, especially in a market-based approach, is important in capacity building. Through this analysis, you can discover, for instance in Southern Madagascar, that sometimes improved varieties are not certified, cost more, farmers do not understand what they are getting and do not want to pay for these varieties.

### **3.4 Country-based breakout rooms**

Following the plenary, the participants then went into **different country-based breakout rooms** to briefly capture some key thoughts around the question: **“How can root, tuber and banana seed systems be more sustainable in humanitarian settings? List some of the**



**technical, institutional, socio-cultural, and humanitarian opportunities and challenges in your contexts”**. The countries included Bangladesh, Cameroon, a group of DRC, Haiti, Benin, Burkina Faso, and Niger.

The written feedback from the groups can be found here:

[https://docs.google.com/presentation/d/1IGABS33L-Ni7V9EG1PNHds0xfWZv\\_oc\\_TeCXmtKzazg/edit?usp=sharing](https://docs.google.com/presentation/d/1IGABS33L-Ni7V9EG1PNHds0xfWZv_oc_TeCXmtKzazg/edit?usp=sharing)

Overall, the key issues captured and discussed in the breakout rooms followed on from and reflected the initial presentations. They included:

### **3.4.1 Opportunities**

- Overall, RTBs are high-calorie staple food crops, productive per unit area, relatively resistant to drought contributing to food and nutritional (and vitamin) security, and high value. Some have short maturity cycles like sweetpotato and potato.
- All parts of the plant have different uses and are relatively easy to cook and consume.
- They have potential in emerging markets but are new to humanitarian settings.
- Small pilot tests show that interventions in the right places and contexts, e.g., marginal farmers’ vegetable markets, have the potential to create profitable markets.
- Increasing awareness, knowledge, access to seed and suitable varieties can introduce these crops into new suitable areas and food systems.
- Farmers want new varieties if they can easily access them at affordable cost.
- Potato and sweetpotato offer relatively short growing cycles.
- Farmers need training on seed, vine, and root storage and there is an opportunity to identify varieties that combine disease resistance with market-appropriate traits.
- There are existing seed systems that can be developed.
- Strengthen the early generation seed (EGS) systems, fund research institutions in seed production, and support capacity building for actors involved in the seed sector.
- Use the Open Data Kit (ODK) to support efficient data collection.
- Collect local varieties that have degenerated for virus clean-up in Kenya then multiply and redistribute to farmers.
- Facilitate the collection of pre-basic seed from research centers.
- Use a public-private-partnership (PPP) approach and include and involve experienced producers in the development and extension stages of the varieties to provide quality seed to farmers and create increased access to new varieties in a demand-driven way.
- Focus on straightforward opportunities with simple practices.
- Recruit ‘brave growers’ who can help demonstrate effective methods for seed production.
- Work with decentralized producers in different areas of intervention to identify practices using local resources to intervene in cultivation systems to avoid the spread of diseases between fields.
- Take the knowledge, research, and seed production closer to where it is needed.



- Respond to private sector demand (e.g., plantain in Madagascar) while finding ways to support farmers to meet that demand in terms of quality and quantity.
- Improve diagnostic tools for pests and diseases to ensure quality seed delivery without reinventing the wheel (such as those developed by World Veg).
- There is an opportunity (such as this meeting) to bring multiple institutions (local and international) such as governments and NGOs, the private sector, universities, research centers and policy makers together to create scaling out strategies that include commercialization.
- RTBs could be part of an agroforestry strategy with short-, medium-, and long-term benefits.

### **3.4.2 Specific humanitarian opportunities**

- Focus on working in refugee camps and IDP settlement areas and surrounding areas.
- Increase collaboration and coordination between the different actors (government, private sector, and research institutions working in humanitarian settings).
- Engage with, restore, and work through existing national platforms such as the Ethiopian Agricultural Task Force that was set up during emergency time.
- Create the opportunity for research and seed production institutions to work closely with the humanitarian community to design interventions and maximize resources to both identify specific preferred traits in these contexts (e.g., early maturing, nutrient dense, climate extremes and adaptability etc.) and focus on the right germplasm and facilitate access to seeds and training by encouraging local production.
- The RTB group can select and define interventions and provide information characteristics on each of the crops and provide small, accessible demo-plots and continue replication.
- Reinforce training at the farmer level for managing quality of planting material. Is there an opportunity for farmers to diagnose the quality of their planting material themselves?
- Identify and summarize why existing planting material technologies have not been taken up and create scale-out strategies where relevant.
- Employ RTB tools that can assist rapidly assess and build out basic understanding of existing RTB systems (e.g., multi-stakeholder framework) in these contexts (e.g., assess seed systems and markets); <https://tools4seedsystems.org/tools/multi-stakeholder-framework/>.
- There is an opportunity for humanitarian organizations to include management practices, capacity building and related technologies when distributing planting material and seed.

### **3.4.3 General challenges**

- A lack of awareness about the potential and conditions needed to successfully grow and manage these crops.
- A lack of knowledge about planting techniques, variety information and marketing.
- Some crops have long maturity times and require bulk storage, transportation, and delivery.
- Different farmers have different perceptions on the value of RTBs.
- The Government can support biofortified crops.

- Lack of supportive national and governmental institutions including weak regulatory systems that do not yet have established RTB seed certification systems, even though there is demand.
- It is difficult to track and identify existing and new varieties, even at the national and institutional level.
- Farmer-to-farmer seed exchange in informal systems can spread crop diseases especially in conflict zones with no access to inputs and control mechanisms.
- Cassava and other roots and tubers can be heavy to transport longer distances to processing plants or markets, and because they are perishable, quality can suffer in the heat.
- In quite a few countries, existing varieties have already degenerated, making access to good quality seed a real challenge.
- Shortage of land, water and underlying land access and ownership policies.

#### 3.4.4 Challenges in particular humanitarian settings and conflict zones

- Each context and which crops are suitable will be context specific.
- There are usually a very limited number of actors in this area with high turnover and support actors are often focused on emergency needs.
- Procurement is a challenge when it does not provide customized information. In humanitarian settings the environment means working under conditions of uncertainty. The toolbox could provide guidance.
- How to provide the seeds to people who have been displaced and are no longer in their original locations?

#### 3.4.5 Comments and observations from the side chat

- It is important to include FAO who remain strategic partners in many countries.
- Can you share the rapid testing and tracing strategies you use for the RTB? Check these tools: <https://tools4seedsystems.org/tools/seed-tracing/>
- The capacity needs assessment will assist tailoring the training courses to country-specific contexts.
- What kind of documents are needed or requested for seeds certification through BHA funding? [https://www.usaid.gov/sites/default/files/2022-05/USAID-BHA\\_Ag\\_Annex\\_A\\_-\\_Seed\\_Grower\\_Declaration\\_of\\_Quality\\_September\\_2020.pdf](https://www.usaid.gov/sites/default/files/2022-05/USAID-BHA_Ag_Annex_A_-_Seed_Grower_Declaration_of_Quality_September_2020.pdf)
- Q: Can you elaborate more on "procurement systems are not compatible with organization regulations?" E.g., which procurement systems, formal/informal?

A: One of the main issues in procurement systems is quality assurance, especially for planting materials coming from informal sources, but even for formal sources. One of the main reasons for this is the low capacity from local regulators to diagnose seed-borne pests and diseases.

### 3.5 End of day Mentimeter evaluation

After submitting these insights and before closing these sessions, a few participants filled in a Mentimeter evaluation. Comments included the following.

**Q1: What I really appreciated about this session has been... /Ce que j'ai vraiment apprécié dans cette séance, c'est...**

- Information on seed systems in humanitarian settings.
- Meeting with diverse groups around the world.
- Experiences shared.

- Breakout discussions.
- Breakout room discussion.
- It was interesting, especially to know more on seed support in the humanitarian context.
- The presentations were precise and very informative.
- The content and discussions were excellent!
- Great Discussion!
- Breakout room discussion.
- Even with the tech challenges the presentation and the discussion were quite good.
- The interpretation of the meeting in two languages: English and French. But also the small group discussion which focused on relevant questions for which more time was needed.
- Information exchange.

**Q2: For me the most important outcome of this session is.../Pour moi, le résultat le plus important de cette session est...**

- Participation of different humanitarian groups though they don't have experience.
- Meeting new people with similar interests.
- Realizing that there is a massive demand for capacity strengthening for RTB seed systems in humanitarian settings.
- Stakeholders from different perspectives have shown us the challenges and opportunities with RTB crops.
- Help participants share practices and reconsider what they are currently doing in terms of scope and approach to sustainability.

**Q3: Next time, can we... /La prochaine fois, pouvons-nous...**

- Country-specific discussion with more time.
- Fix the links for registration :)
- Next time I am sure the tech issue will be solved :)
- Next time try to include other donors too. It is good to see their perspective too.
- Come back to the questions of groups on which everyone has not had time to share the experience? Wouldn't it be convenient to send questions to registrants before the session?

## 4 DAY 2: Thursday, 25 May 2023

### 4.1 Focus of the day

This session focused on understanding the specific context for humanitarian interventions and what this might mean for types of RTB seed production and enhancing RTB seed quality. The online meetings provided an opportunity to engage in a dialogue of how to optimize the use of RTB crop in different humanitarian contexts.

ISSD Africa Topic 2

#### Effective seed insecurity response

##### Action learning questions

- How can we improve the impact of emergency seed interventions?
- How can emergency interventions help create more resilient and improved seed systems in the long-term?

##### Aim

- To support humanitarian actors with clear guidance and principles on how to implement efficient and effective emergency seed responses.



After introductions and sharing in the chat, **Abby Love** (Agriculture Systems Technical Support Unit, Mercy Corps) started the session with an informative presentation on “What we already know?” ([presentation on event site](#)). Her focus was on how to improve emergency seed interventions and create resilient and improved seed systems over the long term. The aim was to identify the guidance

and principles that will allow humanitarian actors to implement efficient and effective emergency seed responses. She provided details of the [Seed Emergency Response Tool](#) (SERT) developed by Mercy Corps, SeedSystem, and ISSD building on 30 years of experience with input from USAID and implementers. Key features are seed system fundamentals; charts on seed response types; decision trees to select specific actions; 10 principles for good seed-aid practice with additional resources. She also shared the [SCALE Consultations on Seed Systems Assessments](#), which was implemented to better understand the variation in uptake and usage of seed system assessments in BHA-funded programming.

Key challenges with seed systems assessments in emergencies include:

1. Applications fail to include a seed system security assessment (SSSA) or equivalent seed assessment.
2. Applications show an inaccurate understanding of the SSSA purpose.
3. [Central repositories of SSSAs](#) are not widely accessed by implementers.
4. Challenges with multi-agency coordination for assessments.
5. Limited expertise or capacity of staff in understanding the purpose of the tools and methods for the SSSA.
6. Potential strain on implementing partner (IP) resources to conduct the SSSA.
7. Difficulties assessing informal seed market systems; program bias toward formal market activities.
8. Limited awareness and availability of data analysis tools, resources, and research.

The SERT is complemented by the [Context Analysis Tool \(CAT\)](#). This tool is designed to help stakeholders quickly grasp the environment and circumstances in which seed systems function, and then to identify practical entry points for designing and implementing interventions to bolster such systems, making them more resilient. The presentation left participants with the question: **How can a RTB lens be overlaid on these principles and tools?**

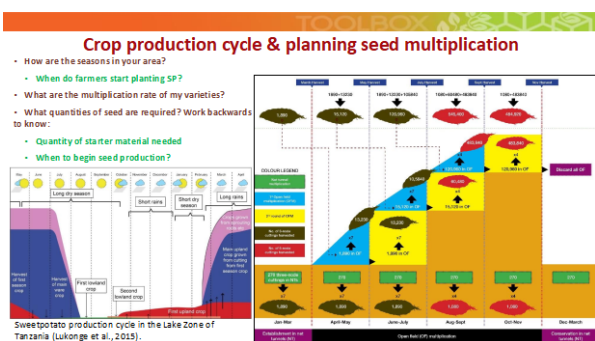
## 4.2 Presentations on RTB seed production technologies

This was followed by four excellent presentations on rapid multiplication techniques (RMT) for RTB seed production and quality management.



**Doudou Dunia** (Project Assistant, IITA) presented with **Paul Dontsop** (Project Coordinator and Impact Economist, IITA) on “Building resilience through the cultivation of roots, tubers and bananas in humanitarian situations” with a focus on cassava ([presentation on event site](#)). He emphasized how cassava serves not only as a staple crop but also as a source of income.

Cassava, as a high-calorie, subsistence crop for the people, is consumed daily throughout many sectors of society and as such is vital for food security as well as income generation. To improve the whole value chain, producers need better access to good disease-resistant cassava cuttings to prevent the spread of diseases through contaminated cuttings. He outlined the current informal and formal seed systems and shared insights into a third emerging hybrid system called Community Seed Multipliers. Small quantities of improved, approved



varieties are made available to seed producers in the informal system (peasant cooperatives, NGOs, etc.). Relevant cassava varieties are identified and selected in each location using a participatory varietal selection (PVS) approach, accounting for the different client needs and preferences (NGO, agri-multiplier, famer) and the type of beneficiary (on the move, quiet area, diet preferences). The PVS approach allows promising varieties to be tested in farmers' fields. He compared

and described the different early generation seed (EGS) technologies and approaches, in particular the advantage of a semi-autotrophic hydroponics (SAH) technology. Participants raised questions on the affordability of seed using this method and explored how to bring the costs down.

**Kwame Ogero** (Research Associate, CIP) followed with a presentation on sweetpotato production ([presentation on event site](#)). He emphasized that the goals, actors, product, technologies, location, and timing all need to be considered in effective seed production planning. He highlighted the questions to be asked and information sources needed to select the best variety and site location for that context. He shared the different vine multiplication technologies that have been developed for screenhouses, open nurseries, and the Triple-S approach (storage in sand and sprouting) for use in dry areas. He touched briefly on pest and disease management practices, rotation and record keeping, highlighting best practices for harvesting and transportation.

## Banana propagation



Banana suckers



Corm fragments



Tissue culture propagation and rooting



Hardening nursery

**Bonaventure Aman Omondi** (Scientist, Alliance of Bioversity and CIAT) then shared banana and plantain seed production practices ([presentation on event site](#)). He described what to consider and look out for in sucker mother gardens, and hardening nurseries as well as the factors likely to determine varietal selection and access to seed. He demonstrated how to plan for seed production and manage pests and diseases, giving links to support

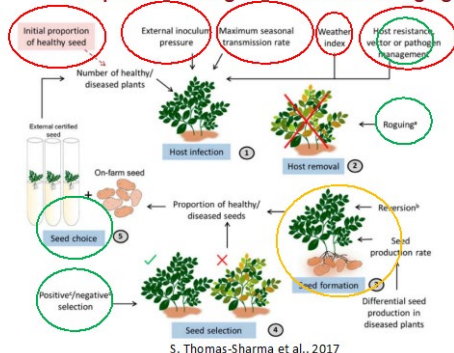
tools. He captured what can be done to mitigate the effects of the challenges presented by vegetatively propagated seed systems. This is shared in Table 1 below.

**Table 1.** Mitigating the effects of challenges presented with vegetatively propagated crops

## VPC seed systems concerns

Challenge	Effect	Tweaks and options
Low multiplication rates	Poor timing with the planting season	Mother garden – decapitation, false decapitation Low tech micropropagation: corm splits/ bucket system
Bulkiness, transportation	Bulkiness, perishability, loss of vigour	Localized acclimatization nurseries (for TC plantlets) Sucker local splitting and macropropagation
Packaging and handling	Space and spoilage during transportation	Trimming roots and leaves Wet gunny bag packaging (fast rooting necessary)
Storage: short shelf life	Rapid perishability in storage, loss of vigour during storage	Suckers, high ability to regenerate, cut off leaves Plantlets: possibility of 2 <sup>nd</sup> bud/ trim leaves, roots <b>Planning</b> – late or early delivery common issue
Disease and pest transmission	Risk of rapid spread of diseases Do no harm engagements!	Match disease risk with distribution rates Disease hazard management steps Paring suckers/ sterilize soil and use rich organic matter.
Varietal fidelity	Seed provided not cultivars desired Diversity of cultivar desires	Local mother garden tweaks to enable association Explore labelling details

### Components of degeneration and managing seed quality on-farm



- Isolation of seed farms from other farms producing the same crop.
- Rotation.



As the final presentation in this set, **Kwame Ogero** (Research Associate, CIP) explained the need to manage seed quality, in particularly with vegetatively propagated crops where pathogens accumulate and can be spread when vines, roots and tubers are shared. He gave detailed descriptive and quantitative examples of the yield losses caused by different pathogen build ups



and how they are transmitted. The challenge is enabling farmers to act to maintain quality seed. Demo plots demonstrating the benefits and tangible advantages have proved an important showcase in supporting farmers' awareness, knowledge and understanding. He described the formal quality assurance mechanisms and inspections that are beginning to be adopted in some countries as well as emerging accessible and affordable disease diagnostic tools and certification, such as LAMP (Loop-mediated Isothermal Amplification) SeedTracker, Plantvillage NURU for cassava and sweetpotato virus identification, Tumaini app for banana and the banana bacterial wilt training courses. Listing and acknowledging the existing challenges within the formal certification systems, he explored how, by taking the best of both the existing formal and informal seed systems, a hybrid system can be developed that builds the capacity for more formal quality assurance mechanisms while training informal seed producers and farmers in management practices on farm and linking them to disease-free early generation seed supplies.

### 4.3 Planned activities in Cameroon and DRC

**Victorine Fornkwa** (Potato Specialist, CIP) and **Doudou Dunia** (Project Assistant, IITA) then shared the realities and lessons for in country planning in Cameroon and DRC ([presentation on event site](#)).

#### TOOLBOX **Overview of Cameroon focus**

Table 1 Overview of proposed target crops and regions for Cameroon

Country selection	1st crop	2nd crop	Region	Institution	Comments
Cameroon (2023)	Sweetpotato (cv Vita and Ejumula)	Plantain	Northwest (NW) and Southwest (SW) regions	CPF Mbouo, West Region to provide ToT for BHA IPs, IRAD and MINADER in NW/SW	Staff from BHA partners and national institutions from NW and SW can travel to the West Region to participate in trainings
Cameroon (2023-24)	Sweetpotato	Under discussion	Adamawa and East regions	University of Ngaoundere, Adamawa Region	To support BHA IPs in East and Far North Regions. Potential link with WFP school garden support for dissemination of OFSP planting material

Victorine described the harsh realities in the far north of Cameroon where village populations bordering Nigeria and government troops face severe harassment, disruption, and displacement from Boko Haram incursions. Herders are being attacked, their cattle stolen and villages burned, driving out the women, children, and elderly, with whole populations moving to new locations. This not only affects food security but also brings diseases such as cholera. In the east, World Food Program (WFP) and other local and international NGOs work to support and settle the

entry of refugees from the Central Africa Republic who come with their cattle. A six-year conflict in the Northwest and Southwest has led to women, children, and older people often having to flee into Nigeria. Women form small businesses with village chiefs giving small parcels of land to grow short-cycle crops such as sweetpotato, potatoes, beans, and maize for survival. Due to the security issues, this project will start by focusing on the Northwest and Southwest regions and conduct a training of trainers (ToT) program for national and humanitarian organizations working in these regions, such as IRAD, MINADER and BHA implementing partners. The training will be held in the secure West Region and will focus on how to build quality sweetpotato and plantain seed production enterprises. Participants will develop their own action plans to further share or cascade the training in their contexts by sharing best agronomic and seed production practices and establishing demo plots and training farmers in agri-business skills. They will have a 'take-home' starter kit of planting materials and extension information and agree to on-going monitoring mechanisms to ensure the quality of the cascade training and technical backstopping. If further funding is confirmed, this ToT will be extended to the Adamawa and East regions next year with the potential to support the dissemination of orange-fleshed sweetpotato (OFSP) varieties through school gardens.

## 4.4 Crop-based breakout rooms

After a short break, the participants went into five crop- and language-based breakout rooms to explore the question: ‘What are the crop specific challenges with quality seed production technologies in humanitarian settings in your country/ies and how they can be addressed in the field?’

The feedback slides can be found here:

[https://docs.google.com/presentation/d/1WStySYUstEzi5F1F9qLWmcqNh\\_wu177w3p4cSUQWEsA/edit#slide=id.g224d0552762\\_0\\_16](https://docs.google.com/presentation/d/1WStySYUstEzi5F1F9qLWmcqNh_wu177w3p4cSUQWEsA/edit#slide=id.g224d0552762_0_16)

Many of the same issues raised on the first day, such as lack of awareness, knowledge gaps, lack of training in and access to diagnostic and seed production technologies as well as clean, context-specific varieties were further contextualized and reiterated. Some additional key insights, challenges and opportunities included:

### 4.4.1 Observations and insights

- Governments and the private sector are usually more focused on providing higher value commercial grain as food rather than seed and they may be better suited to immediate emergency responses while RTBs may serve much better in providing longer term food security during recovery periods.

### 4.4.2 Challenges

- Even in more formal RTB seed systems, the relatively few national actors do not always have the resources and capacity to identify exactly which varieties are being multiplied and potentially infected.
- Successfully planting out and acclimatization of *in vitro* plants as healthy cassava cuttings are otherwise unavailable.
- Long distances can mean costly in-country air transport for clean seed distribution where there are no conservation or research facilities integrated into local communities.
- Need to find a way to create access to clean EGS in decentralized systems where it is most needed and there is high demand.
- IDP translocation can contribute to the spread of degenerated seed if farmers do save seed rather than expect free seed next season.
- If the price of RTB seed from accredited companies is too high, farmers will take seed from other farmers.
- Prejudices and beliefs around some vegetatively propagated crops, e.g., that sweetpotato affects male virility in Madagascar.
- Lack of modern processing units.

### 4.4.3 Opportunities

- RTBs are relatively flexible with different parts of the plants being used for different uses. For instance, even though cassava can take five to six months to mature and bananas up to one year, cassava leaves can be consumed in the meantime, yet this practice is relatively unknown in some key countries.
- Research centers need to be supported to engage with communities to understand and define research needs.
- A better interaction between communities and research and extension services will lead to a better understanding of how to improve multiplication and seed production from a traditional knowledge base.
- To reemphasize the benefits and creation of much stronger linkages, exchange and coordination between all research, NGO, humanitarian actors and seed-system partners especially in localized interventions,

focused on increasing community awareness, benefits, and opportunities of multi-VPC seed production and of knowing the seed sources.

- Support community-based organizations (CBOs) and cooperatives to be producers and distributors of clean seed and new variety producers with a business approach, while encouraging networking and sharing experiences.
- Give humanitarian actors the tools required.
- Focus where the crops are already seen as a daily essential, e.g., cassava (as fufu) in DRC.
- Choose manageable scales of intervention to start with so as not to feel overwhelmed by the scale of increasing problems.
- Support the creation of national gene banks for conservation and sustainable decentralized seed production while adapting to the range of possibilities, e.g., the availability of stem cuttings rather than tissue-culture seeds in Sudan.

## 4.5 Final reflections and way forward

The session concluded with reflections and thoughts on the way forward from Margaret McEwan and Stephen Walsh.

### Next steps

- **Core countries:**
  - In-country training events
  - Application of some RTB Toolbox tools e.g., seed tracing, variety & trait preferences for different types of consumers, multi-stakeholder framework to understand stakeholder perspectives, understanding farmer-managed seed systems and how to link with sources of improved varieties and quality seed
  - Preparation of case studies on what we are learning about RTB interventions in humanitarian contexts
  - Revisiting capacity needs
- **Virtual countries**
  - Please! Complete on-line capacity needs assessment
  - Country focused virtual meeting to agree on priority support & how it can be delivered (e.g., joint preparation of proposals, in-country training if additional funds available, joint seed security assessments, diagnosis of SS bottlenecks)
  - **Suggestion:** propose focal person/s for each country from humanitarian actors (& FSC link)
- **Broader engagement community**
  - Crowd-sourcing new thinking around priority topics (e.g., co-development of appropriate seed quality assurance protocols in humanitarian seed response)
  - Engagement in various learning network events – open to all interested!!

In her recap ([presentation on event site](#)), Margaret emphasized the proactive response from the humanitarian communities and other stakeholders, which enabled constructive engagement and networking across at least 154 organizations in 29 countries. She reflected that, over the two days, participants had gained a general overview of RTB [Toolbox for working with root, tuber, and banana seed systems \(tools4seedsystems.org\)](#) and perspectives from USAID BHA. The discussions were well informed by

the feedback from the capacity needs assessments in Cameroon and the DRC and the initial findings from five other countries. The existing SERT and CAT tools for assessing need and seed systems in emergency settings have been shared and can be built on with an RTB lens. On the second day, there were very practical insights into quality rapid seed production technologies for different RTBs. After sharing links to resources and emphasizing the need for much greater and on-going in-country and inter-country learning, she outlined the next steps within the USAID BHA project countries.

The aim is to create a learning network across the two core countries and extend to the five countries with virtual support and further to all the other countries or individuals who have shown interest. We will also continue to link with other seed system initiatives and networks and those that work on seed in emergencies. There will be opportunities to learn more about putting certain RTB diagnostic tools into practice, developing case studies about RTB interventions in different humanitarian contexts with the colleagues working on communication (**Alain Ngono**) and knowledge management (**Bebel Nguépi**).

Over the next one or two months, we propose country-specific meetings for Bangladesh, Ethiopia, Haiti, Mozambique, and Madagascar to discuss the findings from the capacity needs assessment and feasible virtual support (e.g., joint preparation of proposals, and in-country training if additional funds are available). It will be helpful to identify one or two focal people in each “virtual” country with whom to share this information. We also recognize the important role of the food security cluster coordinator where there are many implementing partners.

**Stephen Walsh** then applauded all the work done over two days. With excellent presentations, the level of participation was immeasurable and encouraging. BHA funded the grant because they believe that humanitarian partners want to do better regarding roots, tubers, and bananas. The system encourages all of us to be able to try, however we can, to engage with the most vulnerable through our humanitarian partners. It goes without saying that most people do not self-select as a most vulnerable person and can be afraid to voice their issues or need for knowledge. It takes skills to be able to create an environment where people are comfortable to be able to share their vulnerability. Therefore, we need to work out how to meet our partners where they are and develop appropriate technologies and support. It is not always necessary to use high-end techniques or technologies in the humanitarian context as even small, improved steps in much more basic limited ways are improvements. The expectation is to see these efforts translate concretely and improve the capacity of our interventions and our responses in the humanitarian context and share the learning.

#### **4.5.1 End of day Mentimeter evaluation**

A few people responded in the chat:

Q1: ‘what I really appreciated about this session has been... /Ce que j’ai vraiment apprécié dans cette séance, c’est’.

- Very good training, great information.
- Very nice, productive and context-specific discussions in breakout rooms.
- Open discussions and very informative.
- The sharing and interactions are helpful.
- The presentations were superb, clear, and concise.
- I hope we reach out each month.
- The session was interesting, participative, and informative and I look forward to seeing improvement in RTB crops as they are widely consumed worldwide.
- Great participation from humanitarian actors.

Q2: Next time, can we... /La prochaine fois, pouvons-nous..

- Give more time to this kind of sessions. Thank you very much.
- More time.
- Include a panel discussion.
- Some presentations were so fast. Suggestion for next time - increase time for presentations and breakout session.

The two translators, Erick Opon and Julie Tuyisenge from CITELS language services in Nairobi (<https://www.citels.co.ke>) were rated excellent and very good. They can be reached at [info@citels.co.ke](mailto:info@citels.co.ke) or [translation@citels.co.ke](mailto:translation@citels.co.ke).

## 5 ANNEXES

### 5.1 Agenda

[Link to agenda](#)

WWW.CIPOTATO.ORG

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The International Potato Center (CIP) was founded in 1971 as a research-for-development organization with a focus on potato, sweetpotato and Andean roots and tubers. It delivers innovative science-based solutions to enhance access to affordable nutritious food, foster inclusive sustainable business and employment growth, and drive the climate resilience of root and tuber agri-food systems. Headquartered in Lima, Peru, CIP has a research presence in more than 20 countries in Africa, Asia and Latin America.

[www.cipotato.org](http://www.cipotato.org)

CIP is a CGIAR research center, a global research partnership for a food-secure future. CGIAR science is dedicated to transforming food, land and water systems in a climate crisis. Its research is carried out by 13 CGIAR Centers/Alliances in close collaboration with hundreds of partners, including national and regional research institutes, civil society organizations, academia, development organizations and the private sector.

[www.cgiar.org](http://www.cgiar.org)

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