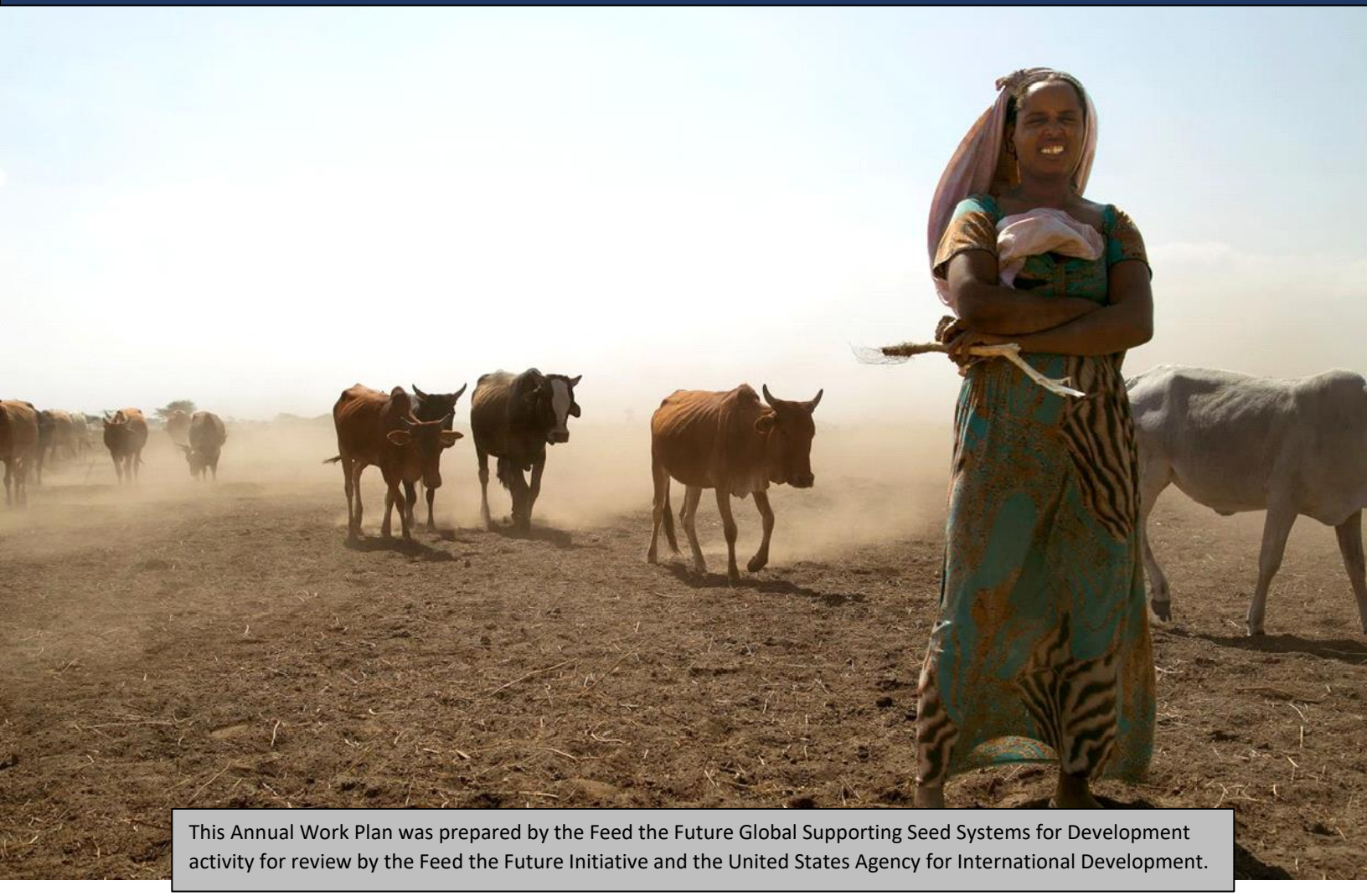
FEED THE FUTURE
The U.S. Government's Global Hunger & Food Security Initiative

GLOBAL SUPPORTING SEED SYSTEMS FOR DEVELOPMENT ACTIVITY

FY22 ANNUAL WORK PLAN
October 1, 2021 – September 30, 2022



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Acronyms and Abbreviations

AE	Agri Experience
AGRA	Alliance for a Green Revolution in Africa
The Alliance	the Alliance of Bioversity International and CIAT
CGIAR	Consultative Group on International Agricultural Research
CP	Consortium Partner
CSA	Central Statistical Agency
DCA	Development Credit Authority
DFC	United States International Development Finance Corporation
DiNER	Diversity for Nutrition and Enhanced Resilience
The DRC	the Democratic Republic of the Congo
DUS	Distinctness, Uniformity and Stability
EGS	Early Generation Seed
EHAR	Emergency, Humanitarian Aid and Resilience
gFSC	Global Food Security Cluster
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDW	Instructional Design Worksheet
IFDC	International Fertilizer Development Center
INRAB	Institut Natio nal des Recherches Agricoles du Benin
IP	Implementing Partner
ISSD	Integrated Seed Sector Development
KALRO	Kenya Agricultural & Livestock Research Organization
KEPHIS	Kenya Plant Health Inspectorate Services
MALFC	Ministry of Agriculture, Livestock, Forestry and Co-operatives (Kenya)
NARS	National Agricultural Research System
OI	Opportunity International
PABRA	Pan-Africa Bean Research Alliance
PASP	Private Agricultural Services Providers
PIA	Participatory Impact Assessment
PWD	Persons with Disabilities
QDS	Quality Declared Seed
S34D	Feed the Future Global Supporting Seed Systems for Development activity
SMS	Short Message Service (text message)
SSSA	Seed System Security Assessment
TASAI	The African Seed Access Index
WCDI	Wageningen Center for Development Innovation

I. Introduction

The Feed the Future Global Supporting Seed Systems for Development activity (S34D) is a five-year Leader with Associates Cooperative Agreement Award, funded by Feed the Future through the Bureau of Resilience and Food Security (RFS) and by USAID through the Bureau for Humanitarian Assistance (BHA). Catholic Relief Services is the prime and is leading a team of Consortium Partners (CPs). S34D's Life of Activity (LOA) runs from August 2018 through August 2023. The overarching goal of S34D is to improve the functioning of national seed sectors in an *inclusive* manner in our focus countries. The activity aims to meet its goals by increasing the capacity of each of the seed systems to sustainably offer quality, affordable seeds of a range of crops (***Objective 1***) and increasing collaboration and coordination among all seed systems actors and actions (***Objective 2***). This integrated approach is further strengthened by cross-cutting IRs that seek to improve policies and practices that support pluralistic seed systems, rather than focusing on individual parts of each system. For FY22, S34D has designed 35 activities as shown in **Table 1.**

This revised FY22 work plan contains 23 activities S34D will implement this year with its current obligation. These activities are called Tier 1 activities (**Annex A**). A table of the other eleven activities can be found in **Annex B**. S34D can implement the activities with the next obligation. These activities are called Tier 2 activities. The narratives of these Tier 2 activities can be found in **Annex E**.

Table 1. Number of activities by IR and Tiers, continued or new and core or Mission-funded.

	Tier 1				Tier 2	
	Core-funded		Mission-funded		Activities for next obligation	
Intermediate Result Areas	Continued activity	New activity	Continued activity	New activity	Continued activity	New activity
Formal (IR 1.1)	1				1	1
Informal (IR 1.2)						2
EHAR (IR 1.3)	2	3				
Interface between seed systems (IR 2.1 and 2.2)	2	3		4		4
Cross cutting (CCIR 1 and 2)			3	5		3

In this work plan, the activity descriptions are provided in section 2. Activity narratives have a justification section, some include how it contributes to building resilience, and how the activity is ensuring inclusivity. S34D will continue with evaluative learning activities, which is expanded upon in the M&E and Learning in section 3.

The Detailed Implementation Plan (DIP) can be found in **Annex A**, and the travel plan in **Annex C**. Although S34D is planning international travel, the activity will continue to comply with

COVID-19 restrictions and regulations from USAID, WHO, and host governments. An updated S34D organogram can be found in **Annex D**. Narratives of Tier 2 activities can be found in **Annex E**.

CRS' Impact Investment and Private Sector Engagement team (through cost share) will assist consortium members with business development services and private sector engagement integration to strengthen S34D's activities. With a specific focus on private sector engagement in EHAR activities for FY22, this will include identifying opportunities for market-based approaches and market systems development in humanitarian relief and recovery contexts with an emphasis on developing resilient markets. This may also include, as needed, facilitating managerial and business planning support for enterprises as well as providing feedback on current business models and identifying possible collaboration areas to strengthen their (producers, traders, and other private sector actors) capacities either directly or through a local partner and seeking support from a network of mission-oriented impact investors that could be leveraged as appropriate.

II. Work Plan

The implementation plan is color coded by timing and funding in **Table 2**.

- **Orange** colored activity are activities that will continue from previous FY(s).
- **Blue** colored activity titles are new FY22 activities.

Table 2. Summary table of centrally funded activities with current obligation.

Activity	Activity title	Lead Partner (supporting partners)	Outputs
1.1.3.1	Digital training of seed inspectors and samplers in Zambia (FY21) (RFS).	CRS, SCCI	SCCI will train 60 inspectors (16 female) in Zambia
1.3.1.1	Participatory Impact Assessment (PIA) of Emergency Seed Interventions (FY21) (BHA).	CRS	4 detailed PIA reports and one synthesis report
1.3.2.2	Generate recommendations for integrating vegetable seeds into humanitarian responses (BHA).	CRS	Best practice and recommendations
1.3.2.3	Participatory action research into cash-based seed security responses, Guatemala & E. Africa (BHA).	CRS	Synthesis report
1.3.3.1	Framework and response options for resilient seed systems (FY20) (BHA).	CRS, CIAT	One conceptual framework
1.3.3.5	Strengthen Capacity for Rapid Seed System Security Assessments (BHA).	CRS, gFSC members	Training curriculum and automated data analysis
2.1.1.4	Scoping business models to strengthen forage seed systems and production of cultivated forage in Zambia (RFS).	CRS and CIAT	two or three economics driven inclusive business model propositions
2.1.2.2	Strengthen capacity of forage (certified and quality declared assurance) seed production in Ethiopia (mission)	CRS, CIAT	Technical manual. 30 stakeholders trained. 3 partnerships formed.
2.1.2.3	Increase capacity of actors on animal feeding using cultivated forages in Ethiopia (mission)	CRS, CIAT	Developed 2 manuals, 2 training programs, and two flyers on balanced feeding using cultivated forages.
2.1.3.2	Promote access to locally grown legume seed through use of agricultural development agents in Zambia (RFS).	CRS, SCCI	Community-based seed production and grain marketing system developed, one policy brief, one report.
2.1.3.3	Strengthen the supply of forage early generation seed system (FEGS) in Ethiopia (mission)	CRS, CIAT	Partners identified, scoped, and three partnerships formed
2.1.4.2	Pilot the cultivation of improved forages and densification of cultivated forages into pellets (sites: one in Afar and two in SNNPR) (mission)	CRS, CIAT	three reports: 1 on forages 1 on feed reserves and 1 on machine and components needed for densification and their cost estimates.
2.2.2.2	Support the emergence of enhanced and resilient seed sectors in fragile states, e.g., in DRC, South Sudan, Haiti (FY21) (BHA).	CRS, WCDI, CIAT, AE	Case study report and a synthesis paper
2.2.2.4	Develop guidance for emergency, resilience, and development seed interventions (BHA).	CRS, CIAT	A report and guidelines
2.2.3.1	Develop and test market-based emergency seed security interventions (FY21) (BHA).	CRS	1 guideline on cash transfers.

CCIR 1.2.7	Establish a variety registration system dedicated to farmers/ pastoralists, separate from the regular variety ownership registration system in Ethiopia (mission)	CRS	A roadmap established to create the system, human and technical capacity, use-cases, and financial resources; approach to create the system identified.
CCIR 1.3.3	Facilitate and initiate implementation of seed policies and directives in Ethiopia (FY21) (mission)	CRS	Three actions taken to address three policy issues and operationalize three policy priorities with facilitation and guidance.
CCIR 1.3.5	Facilitate and conduct a stakeholder discussion session on seed reserves in Ethiopia (mission)	CRS	Workshop proceeding report and one policy dialogue facilitated.
CCIR 1.3.6	Seed systems and climate adaptation at the last mile, learnings and best practices: A global case study approach (RFS/BHA/Mission)	CRS	Six seed system interactive road maps digitized.
CCIR 2.1.6	Digitize seed systems regulatory roadmaps in Ethiopia (mission)	CRS	Forage indicator dashboard digitized; MoA hosts and shares in the public domain.
CCIR 2.2.1	Develop forage informatic dashboard using seed data and metrics and a policy brief on forage seed systems in Ethiopia (FY21) (Mission).	CRS	Augmented methodology / framework at the systemic level to conduct seed demand / market forecasting in Ethiopia.
CCIR 2.2.2	Test out recommendations from FY20 technical roadmap, in select zones (10-15) in Ethiopia (FY21) (Mission).	CRS	Process and approach to establish the network are identified and piloted.
CCIR 2.2.5	Establish a seed production and marketing information network at the national and regional levels in Ethiopia (mission)	CRS	Process and approach identified and piloted.

Gender

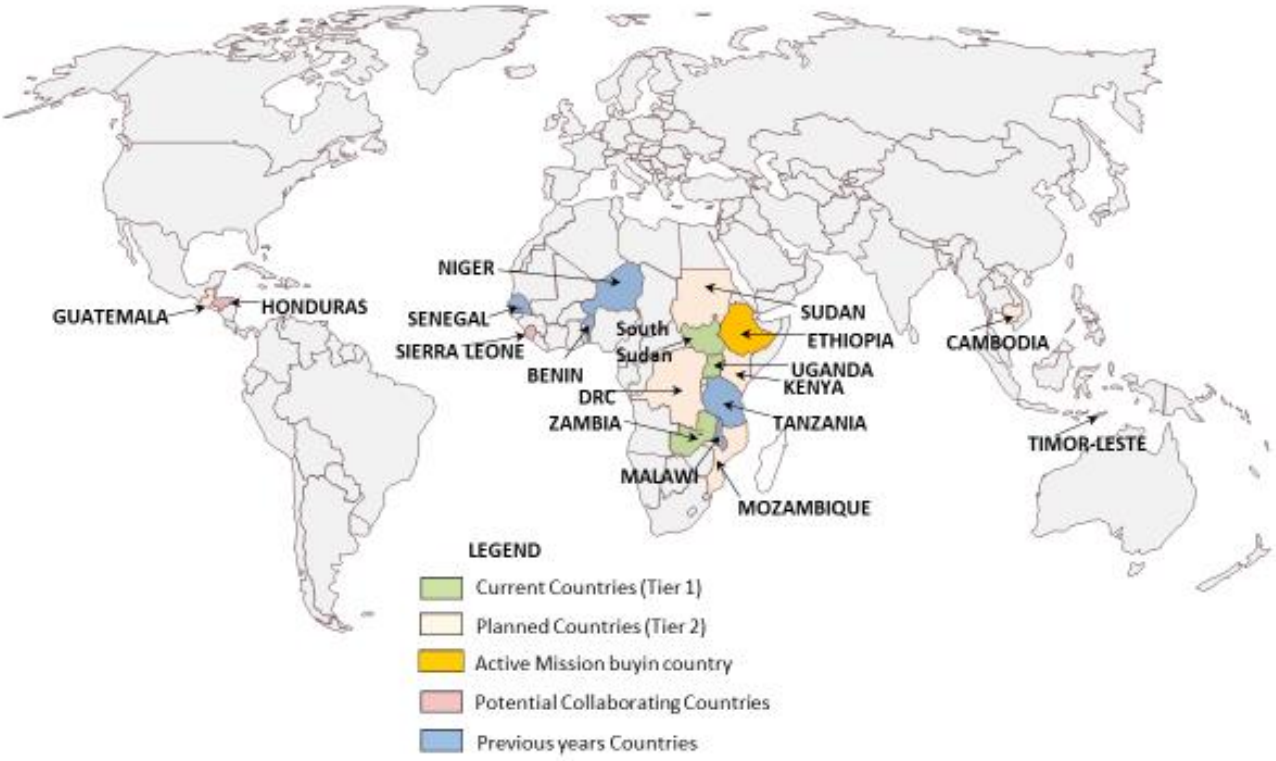
S34D is taking an active approach to ensure gender and youth considerations are incorporated in most activities described below. In addition, to explicitly state how S34D will integrate gender and youth aspects into the design of activities, the S34D gender advisor will review all SoWs, tools, draft frameworks, reports and briefs. The author of the materials reviewed will provide responses on how the threshold issues identified are addressed. For the gender learning agenda, selected S34D activities relevant to the learning question '*Which mechanisms or interfaces enabled greater number of women smallholder farmers (and youth) to sell, access, and purchase quality seeds, and more frequently?' have been identified along with specific learning areas and methods for gathering information.* These required reviews and gender learning areas are included in partner contracts and agreements. The gender advisor will engage with CRS' youth and PWD advisor as needed.

Geography

In FY22, S34D will start work in four countries: Zambia, Uganda, South Sudan and Ethiopia. S34D has designed activities for Sudan, Mozambique, the DRC, Kenya, Guatemala, Cambodia and Timor-Leste. These activities can be implemented when next incremental funding is obligated. These activities can be found in a table in **Annex A** and these activities narrative can

be found in **Annex E**. Throughout the year, S34D will continue to engage with Missions to design core and Mission-funded activities. S34D's current and planned countries of operation, as well as active Mission buy-in country are displayed in **Figure 1** below.

Figure 1. S34D Countries of Operation in FY22



Activities

Continue from FY21 *- Activity 0.1: Develop country profiles and framework for engagement in Kenya, Uganda (FY20) (RFS)*
This is a Tier 2 activity, and the narrative can be found in Annex E.

Formal Seed Sector

The formal seed sector activities will focus on increasing access to finance in DRC and expanding use of digital training for seed inspectors in Zambia. In the DRC, S34D will work with the Development Credit Authority (DCA) Guarantee Facilities, USAID D.R. Congo and Banyan Global, to increase the availability of seed sector finance. S34D will continue to work with SCCI in Zambia to develop a digital platform to train and test seed inspectors in the Southern Africa Region. Furthermore, the formal seed sector lead will work closely with the EHAR team to provide support to activities under Sub IR 1.3, 2.1 and 2.2.

IR 1.1 Constraints in formal seed systems identified and mitigated

Sub IR 1.1.1 Operational efficiency of seed companies increased

New *- Activity 1.1.1.12: Increase the availability of Seed Sector Finance in the DRC (RFS).*
This is a Tier 2 activity, and the narrative can be found in Annex E.

Sub IR 1.1.2 Seed availability of climate – smart crops increased, through enhancing EGS capacities of firms and producers

No activities planned under this Sub IR.

Sub IR 1.1.3 Capacities of local seed actors strengthened

Continue from FY21 *- Activity 1.1.3.1: Digital training of seed inspectors and samplers in Zambia (FY21) (RFS).*
Justification: Training and licensing inspectors from formal sector seed companies to conduct quality assurance inspections of crops (other than hybrid maize) provides the prospects for seed companies to increase the volume of certified seed, which can then be marketed through agrodealer networks and be made available to farmers. Increasing the number of public and private seed inspectors offers the opportunity to have more seed inspected at lower cost, if seed inspection is coupled with digital certification, compliance software. These factors, more inspectors, and use of modern compliance systems will provide greater efficiencies and flexibility within the seed system and this has the potential to reduce dependence on recycled seed, as more farmers will receive access to certified seed. In FY20, a virtual seed inspection training in Zambia, Malawi and Mozambique was established with partners Zambia Seed Certification and Control Institute (SCCI) and the Feed the Future Southern Africa Seed Trade Project. In FY21, S34D worked closely with the SCCI and developed the Terms of Reference for the development of the digital training and testing platform for seed inspectors and identified an appropriate digital training system and platform. In April, after a longer than expected procurement process, S34D signed a contract with Mwambu/iSchool to develop the platform. Soon after the contract was signed, iSchool produced a Project Initiation Document, which was approved in June. By August, SCCI developed 16 out of the 22 training units in Instructional Design Worksheets (IDWs). Completed units will then be transferred to the online platform.

Description: S34D will continue to work closely with SCCI and iSchool to facilitate the process of refining training materials, completing the last 6 IDWs and moving these onto the digital platform, develop a testing approach, and facilitate the training of trainers on use of the digital platform. SCCI will conduct a trial run on the digital platform with four crops but may add new crops onto the platform over time. It is anticipated that the digital learning process will enable flexibility for women to participate in the training, given household responsibilities and travel restrictions. To further support women in participating in this digital training, the training schedule will consider the length of each session and the amount of offline work and time allocated to complete it. The digital training materials will be designed so those who may have limited disabilities (e.g., hearing impairments) can actively participate in this training.

Outputs of this activity are training content for four crops developed and these training content and seed inspectors' testing option will be added to a virtual platform. SCCI will train 60 inspectors (16 female) in Zambia. The post course assessment will pay particular attention to the gender and disability aspects of this work, to find out how the course supported these groups with findings and recommendations. This activity will be completed by Q3 of FY22.

Sub IR 1.1.4 Sustainable models with private sector players to supply quality EGS and QDS to a range of suppliers piloted and scaled using innovative financing

No activities planned under this Sub IR.

Informal Seed Sector

The informal seed sector will finalize the niche market business models in Kenya (1.2.4.1) and assess the role of market pull of seed supply, and respond to emergency needs in South and North Kivu in DRC (2.2.3.2). The informal team will closely work with the integration and collaboration (IRs 2.1 and 2.2) and the EHAR activities (IR 1.3).

IR 1.2 Strengthened capacity of informal seed systems to offer a broader range of affordable, improved quality seed

Sub IR 1.2.1 Informal trader capacity and local seed networks assessed

No activities planned under this Sub IR.

Sub IR 1.2.2 Capacity of local seed entrepreneurs and non-traditional seed actors strengthened

New - Activity 1.2.2.4: Strengthening capacity of seed supply and grain market actors in Eastern DRC (RFS).
This is a Tier 2 activity, and the narrative can be found in Annex E.

Sub IR 1.2.3 Business models to leverage integrated operations validated

No activities planned under this Sub IR.

Sub IR 1.2.4 Last mile delivery solutions through non-traditional partners and ICT strengthened

***New** - Activity 1.2.4.3: Conduct a cost-benefit analysis of the last-mile seed delivery by motorbike riders (bodaboda) to smallholder farmers in Kenya (RFS).*

This is a Tier 2 activity, and the narrative can be found in Annex E.

Emergency, Humanitarian Aid and Resilience (EHAR)

Activities within the EHAR portfolio cut across IR 1.3 (to strengthen the capacity of emergency and humanitarian aid programs) and IR 2.2 (to strengthen the interface between development and relief to resilient and market-based seed systems). Under Sub-IR 1.3, we aim to strengthen the capacity of emergency and humanitarian aid programs by: (i) generating an evidence base on the impacts of emergency seed interventions (Activity 1.3.1.1); (ii) generating learning and best practices for different types of emergency seed interventions (with particular focus on cash-based modalities); and (iii) developing conceptual and practical tools for use by humanitarian actors. Learning will be promoted through participatory approaches, particularly the use of participatory action research or 'learning by doing,' in which new approaches will be piloted and adapted by implementing partners (Activity 1.3.2.2). Best practices will be generated in collaboration with implementing partners through Activities 1.3.1.1 (based on impact assessment), 1.3.1.5 (focusing on cash transfers and gender), and 1.3.2.2 (on vegetable seeds). S34D will continue to work closely with members of the Agriculture Working Group of the Global Food Security Cluster (gFSC), particularly on Activity 1.3.3.5, which aims to strengthen capacity for the "rapid" seed system security tool developed in FY21 by developing a training curriculum and an automated data analysis tool. The development of a conceptual framework for resilient seed systems will allow for a greater understanding of what is needed to enhance seed system resilience. The theme of resilient seed systems is further explored at a more practical level through a focus on fragile states in Sub-IR 2.2 (see below).
Many of the EHAR activities will involve a collaborative approach, combining the range of sectoral expertise and perspectives from the different S34D partners and allowing the findings and lessons that have emerged to date from S34D activities to be further developed and applied in innovative ways.

IR 1.3 Strengthened capacity of emergency and humanitarian aid programs to respond effectively to acute and chronic stresses

Sub IR 1.3.1 Select emergency and humanitarian past actions assessed: focus on farmer evaluation, new varieties, and markets (local and formal)

Continue from FY21 *- Activity 1.3.1.1: Participatory Impact Assessment (PIA) of emergency seed interventions (BHA).*

Justification: This activity has been delayed due to COVID and the inability to start the fieldwork as planned in FY21. In FY21, S34D identified partners, the emergency seed interventions to be assessed, as well as the PIA consultant and other field team members. A partnership was also established with FAO's Evaluation Unit, and they will use the same methodology to conduct their own assessments. This will increase the number of assessments and the evidence base to be included in the overall synthesis. Current evidence on the impacts of emergency seed interventions is largely based on a combination of well documented intervention outputs and assumptions regarding the utilization of seed. Evidence of outputs is generally quantitative and comprehensive, but the translation of that evidence to outcomes in terms of increased seed utilization by beneficiaries is much less certain. Existing evidence for increased productivity and

consequent enhanced food security as a result of seed-based interventions appears to be almost entirely intuitive. There is no strong evidence to show that beneficiaries are subsequently more food secure than non-beneficiaries. There is a need to generate quality evidence that shows the extent to which emergency seed interventions may or may not be realizing their anticipated impacts. Such an evidence base is necessary to inform and improve humanitarian and development work, and to be able to communicate the effectiveness of different intervention types to donors and the general public.

Description: Under this activity Uganda is Tier 1 and Mozambique is Tier 2. The proposed activity aims to answer three broad questions: (1) How have selected emergency seed interventions impacted on the livelihoods of the male and female smallholder farmers and seed suppliers involved? (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? (3) What are the key 'best practice' approaches for the design and implementation of emergency seed interventions in order to achieve specific livelihood impacts that are gender-sensitive, e.g., on household food security, nutrition, resilience, income, on seed markets, etc.? Specific emergency interventions involving seed fairs and/or direct seed distribution implemented by various implementing partners (e.g., CRS/Caritas, World Vision International) will be identified for detailed assessment. Question 1 will be addressed through a participatory impact assessment (PIA) methodology, as described in the 2013 Feinstein Design Guide[1]. Livelihood outcomes will be assessed through a gender lens. PIA with additional key informant interviews will be used to address Question 2, including interviews with a range of seed suppliers with diverse backgrounds (gender, age, female-owned). Question 3 will be addressed in FY22 through a workshop involving the implementing partners and other in-country stakeholders, based on the data collected by the PIA.

The **outputs** will be four detailed PIA reports (one for each intervention assessed) and one synthesis report.

NEW - Activity 1.3.1.5: Assess differential effects of seed security cash transfers on men and women and intrahousehold dynamics (BHA).

This activity was cancelled.

Sub IR 1.3.2 Emergency and humanitarian responses that promote climate resilience, including food, income, cover and fodder crops are catalyzed

NEW – Activity 1.3.2.2: Generate recommendations for integrating vegetable seeds into humanitarian responses. (BHA)

Justification: While many humanitarian responses focus on staple crops, opportunities exist to better integrate vegetable crops for income generation and nutrition outcomes. Vegetable seeds are increasingly incorporated into humanitarian responses for nutrition reasons, though vegetables can also contribute to long-term income generation and livelihood diversification as well. Vegetable seed systems are often quite different from the staple crops that have primarily

[1] 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/

been the focus of emergency distributions in the past, as they are often hybrid, imported, have longer shelf life, and/or primarily managed by women in their kitchen gardens. Despite the unique nature of vegetable seed, there are currently no vegetable-specific guidelines for seed in emergency responses suitable for field-based implementers of emergency programs.
Description: This activity will conduct interviews with project staff to compile challenges and opportunities for incorporating seeds of vegetable crops into emergency interventions; KIIs with male and female seed vendors about challenges they face participating in seed responses led by humanitarians; and document case studies (successful and unsuccessful) of emergency programs involving vegetable seeds. A gender lens will be applied where there is sufficient disaggregated data available from the selected case studies to understand the extent that the emergency vegetable seed intervention reach women farmers with quality vegetable seed and gathering of promising practices to support women in benefitting from the vegetable seed humanitarian response. This would contribute to promoting resilience and gender inclusion, as vegetables are often the responsibility of women across the world. This activity would finish within FY22 and would contribute to formal, informal, and EHAR seed systems.
The **Output** of this activity is a brief with best practice recommendations for integrating vegetable seed into humanitarian responses.

***New** - Activity 1.3.2.3: Participatory Action Research into cash-based seed security responses in Guatemala and East Africa (BHA).*

Justification: With the increasing prevalence of cash in humanitarian aid programs, there is a small but growing body of examples of cash-based responses to seed security. With very limited levels of expertise in cash-based programming modalities for seed security, it is necessary to ensure that existing lessons from the 2019 S34D review of cash transfers for seed security are applied to future interventions. These planned interventions also offer an important opportunity for further learning through participatory action research. Within CRS, there are currently two cash-based seed security interventions planned for the future: (i) a cash-based seed fair intervention in Guatemala; and (ii) a cash-based seed security pilot project to take place in East Africa. Both interventions will be funded through existing (non-S34D) sources. S34D will provide the additional seed-related expertise needed for technical advice, monitoring and learning in relation to seed systems and seed security, and support in integrating last-mile agents to sustainably transition toward a market-based approach. It is expected that the learning from both interventions would be applicable beyond CRS and at the global level.
Description: The role of S34D within both the Guatemala (pending concurrence) and East Africa (likely Ethiopia) interventions will be to provide seed- and gender-related technical inputs to the design of the intervention itself (based on the 2019 S34D report[8] as well as lessons from FY21 activities and to provide the technical inputs needed to generate the evidence base to support learning, as well as the dissemination of lessons and best practices. S34D inputs to the Guatemala intervention will be focused mainly on piloting the Post Delivery Monitoring (PDM)-tools developed in FY21 Activity 2.2.2.1 and lesson-learning, whereas the East Africa intervention will include the design elements in addition to PDM and lesson-learning.

The two cash-based seed security responses in Guatemala and East Africa will provide an opportunity to compare and contrast seed security responses in short-term and long-term projects. The 5-year RAICES project in Guatemala was intentionally designed to transition away from humanitarian assistance through local service providers that deliver inputs at the last mile while the East African intervention will take place in response to an emergency over a shorter time span. Recommendations will be included for both short- and long-term projects on incorporating market-based approaches and strengthening local markets within the context of cash-based seed security interventions.

The Participatory Action Research would compile best practices in cash-based agricultural input fairs, share recommendations on phasing out fairs, and suggest ways to integrate market-based approaches like PASPs. This activity touches on all S34D themes and contributes to developing resilience in post-emergency situations where humanitarian responses transition to market-based approaches. The activity will address ways in which cash-based fairs may need to be adjusted so that women, male and female~~,~~ youth~~,~~ and PwD can equitably participate and benefit from the intervention. The Participatory Action Research would gather information about the new approach (cash-based seed responses) and include recommendations on what does and does not work in these interventions. A webinar to disseminate best practices and lessons learned will be held in a public forum.

Outputs: One PAR reports on each cash-based intervention, i.e., two PAR reports in total, plus a synthesis report containing lessons, best practices, and suggestions for future cash-based seed security responses.

Sub IR 1.3.3 Tools and information systems to enhance emergency seed security responses

Continue from FY20 *- Activity 1.3.3.1 Framework and response options for resilient seed systems (BHA).*

Justification: The current coronavirus pandemic has highlighted various weaknesses in the formal seed sector, particularly relating to quality testing. Informal seed systems have been seen to be inherently more resilient, and much of the work undertaken under IR1.2 is effectively enhancing resilience through seed quality improvements and working with traders to bridge the formal and informal systems. The concept of resilience is also useful in generating a common agenda and closer working relationships between development and humanitarian actors. Though this activity should have been completed in FY21, it will benefit from lessons that have emerged in relation to the COVID-19 pandemic and the emergency response.

Description: The activity is intended to provide a model and practical guidance for the development of 'shock responsive' seed systems for greater resilience. The model or conceptual framework will identify the key aspects of seed systems that render them resilient to different types of shocks. The response options will identify the different types of interventions that can usefully build resilience into seed systems, including formal and informal systems, and emergency seed interventions. The activity will involve an extensive literature review to identify the defining features of resilient seed systems and correspondence with key experts to generate a conceptual framework that also incorporates inclusivity, particularly in regard to gender and youth. Existing best practice, together with the findings from studies conducted by S34D to date will be used to generate inclusive response options.

The **outputs** of this activity are a conceptual framework for resilient seed systems and a series of response options for resilience-building interventions in different contexts.

New *- Activity 1.3.3.5: Strengthen Capacity for Rapid Seed System Security Assessments (BHA).*

Justification: S34D developed a 'rapid' and remote seed system security assessment (RSSSA) toolkit in FY 20. The approach assesses both formal and informal seed systems and determines appropriate emergency responses, including, where appropriate, ways in which seed systems can be more resilient. In conjunction with the gFSC, the methodology was piloted with 9 organizations in 7 countries in late 2020 and early 2021. Organizations participating in the pilot were generally pleased with the approach and several are planning RSSSAs in other countries. A review of the pilot identified critical areas to adjust and reinforce the RSSSA methodology. Pilot partners expressed a desire for more detailed training materials for field teams, digitized questionnaires in multiple languages, an automated system to undertake basic analyses of data, and better support for response analysis.

Description: S34D will continue to work with the gFSC Agriculture Working Group members to enhance the RSSSA tool and their capacity to undertake RSSSAs. This will include the development of a training curriculum, a tool for automated data analysis, and technical backstopping support. Gender considerations will be incorporated into each of these aspects. Discussions will also take place with USAID and others to determine how best to ensure that the RSSSA tool is complementary to the standard SSSSA tool; these discussions are expected to determine the contexts and level at which an RSSSA is appropriate, and when the standard

SSSA should be used. Note that since the RSSSA is not necessarily “rapid”, it is likely that an alternative name will be agreed with the gFSC partners.
The **outputs** of this activity are a training curriculum, automated tool for data analysis, disseminating RSSSA results to formal seed actors in RSSSA countries, a global rollout of the RSSSA toolkit, including a webinar and interim support for new RSSSAs until a more formal structure for backstopping - e.g., deployment team – is created.

Sub IR 1.3.4 Last mile delivery solutions especially for chronic stress areas (small packs, boutiques, WhatsApp seller linkages) developed

No activities planned under this Sub IR.

Interface and Collaboration

To bridge gaps between development and emergency contexts, S34D will assess the role of forage subsector to develop stronger interface between crop and livestock subsectors in Sudan (Activity 2.1.1.3) and Zambia (2.1.1.4). Similarly, to link formal and informal seed systems for the forages, S34D will develop technical manuals and disseminate those by leveraging existing forage development programs in Ethiopia (Activity 2.1.2.2 and 2.1.2.3). In partnership with the CRS Zambia team, S34D will pilot an innovative model to scale seed production of a new variety of chickpea (released by ICRISAT in 2016 with climate-smart properties) through partnerships and platforms between SCCI, farmers and private sector entities on the output market for high-quality grains. This will establish platforms between NARS, the regulator, farmers and private entities (Activity 2.1.3.2).

Activities under Sub-IR 2.2 address the interface between relief and development. In FY22, we will focus particularly on the role of markets and market linkages at the interface, and also on fragile states. Building on lessons from FY21 regarding the limited role that seed fairs play in promoting market linkages, Activity 2.2.2.4 will explore a wider range of emergency seed intervention modalities (direct seed distribution, vouchers, cash) to determine how best to promote commercial linkages between farmers and suppliers that allow farmers to access seed after the emergency is over. Activity 2.2.3.1 will document recent experiences with cash transfers for seed security in emergencies and how cash supports seed market development. In fragile states, where government institutions are either weak or non-existent, the role of markets is especially important, and it is essential that these markets are sufficiently resilient to be able to continue to function in protracted crisis contexts. Since informal seed systems are inherently more resilient than formal seed systems in fragile states, the role of informal traders is especially important, not only in linking relief and development, but also in potentially linking formal and informal seed systems. Activity 2.2.3.2 focuses on how informal traders can play a role in new business models involving the national agricultural research institute and NGO support for the supply of seed of improved varieties in DRC. More broadly, Activity 2.2.2.2 will draw together lessons from case studies of DRC, Haiti and South Sudan to determine how seed systems can be designed to be more resilient in fragile states.

IR 2.1 Strengthened interface and collaboration between formal and informal seed systems

Sub IR 2.1.1. Local seed network strategies (to interface, collaborate, and leverage) and local capacities are assessed.

New *- Activity 2.1.1.3: Scoping business models to strengthen forage seed systems and production of cultivated forages in Sudan (RFS).*
This is a Tier 2 activity, and the narrative can be found in Annex E.

New *- Activity 2.1.1.4: Scoping business models to strengthen forage seed systems and production of cultivated forages in Zambia (RFS).*

Justification: With Zambia's growing population, particularly in urban centers, the demand for animal source food is also increasing. Although there are large numbers of animal products[2][1] and live animals being exported to neighboring DRC and Angola, the productivity of the livestock sector is low because of slow growth rates (5-8 years to reach market weight), high calf and adult mortality rates (20-30% and 9% respectively) and low reproductive performance. The major livestock productivity constraints are poor quality of feed, low genetic potential of the animals, and high occurrence of animal diseases. Zambia is experiencing extended and more frequent droughts, most likely due to climate change.
In a recent study S34D conducted in Ethiopia for the Ethiopia Mission[3][2], results show the cost per nutrient for cultivated forages is lowest compared to alternative feeds – for meeting the demand in dairy, fattening, and quarantine sectors. Furthermore, consumption of forage-based feed leads to lower emissions of greenhouse gases (GHG) like methane.

The scope of the proposed activity will include the role of cultivated forages to meet the annual demand for dairy, and fattening sectors in Zambia, while also analyzing approaches to strengthen and link the forage seed systems with the forage output markets to increase livestock productivity. Without a viable and sustainable forage seed system, production of cultivated forages is not possible.
Description: In collaboration with the Ministry of Agriculture and Livestock's (MAL) Departments of Agriculture, Livestock Development and Agri-business and Marketing, as well as ZARI and SCCI, S34D (CRS with its consortium partner the Alliance) will conduct a scoping study to evaluate the potential costs, benefits and returns on investments from increased use of cultivated forages to meet livestock sector's needs in Zambia. S34D will inform USAID Zambia at the stage of the first consultations with whom they will work within the Ministry of Livestock and Fisheries and the Ministry of Agriculture. The goal is to provide contextualized business propositions and models driven by data and economics. These business models would reduce cyclical fluctuations of high-quality feed supply in Zambia and provide access to forage-based feed to livestock keepers and commercial entities year-round. The work will provide an investment footprint to bridge gaps between crops and livestock subsectors, identify in-country partners and collaborators, and hone in on business models for implementation piloting on the ground. The activity will also include policy implications and recommendations for further facilitation with national players to foster regional growth and greater trade in livestock products and outputs.
The **output** of this activity is one report with three economics-driven inclusive business model propositions (highlighting role for women and youth) and policy recommendations validated with stakeholders and disseminated through a webinar. Additional outreach to the ministry(s), universities, and extension services in Zambia will be done in consultation with USAID Zambia.

[2][1] 3.7 million cattle, 2.9 million goats, 42 million poultry, 1.21 million pigs, 270 thousand sheep (FAOSTAT, 2019).
[3][2] Dey et al. Forage Seed Systems and Feed Reserves: Business Propositions, Case for Ethiopia. 2021

Activity 2.1.1.5: Evaluate business models to strengthen forage cultivation and use as animal feed to boost livestock productivity, sustainability and resilience in Cambodia (RFS).

This is a Tier 2 activity, and the narrative can be found in Annex E.

New Activity 2.1.1.6 Scoping business models to strengthen forage seed systems and production of cultivated forages in Timor-Leste (RFS).

This is a Tier 2 activity, and the narrative can be found in Annex E.

Sub IR 2.1.2. Crop and seed platforms that link formal and informal seed systems are catalyzed and supported

***New** - Activity 2.1.2.2: Strengthen capacity of forage (certified and quality declared assurance) seed production (Mission).*

Justification: Inadequate linkages with the output markets and lack of training and awareness on forage crops as well as seed multiplication techniques has resulted in low adoption of forage seeds and thus a negligible supply of high-quality forage seeds. Once there is a functioning forage EGS system (Activity 3.1 above), the seed multiplication to produce certified seeds and QDS seeds could be scaled up. This needs to happen in conjunction with adequate training to the seed multipliers. Furthermore, the seed producers need to be connected to the forage crop producers who supply forages to the demand sinks. These essential market linkages are made possible by leveraging the presence of relevant sector stakeholders who are already on the ground (fully or partially) working on forage seeds and forages.

Description: This comprises two sub-tasks: 1. Develop and augment technical content for training seed and forage crop producers and 2. Disseminate the technical content by leveraging (and co-locating with) other ongoing activities by development and implementing partners.

S34D will introduce improved agronomic practices in planting, cultivating, harvesting, seed production, storage etc. Develop fliers, manuals, training programs in forage agronomy and production. Seven species are selected for this purpose: Lablab, Cowpea, Panicum, Rhodes grass, Mulato II, Oat, Alfalfa.

In collaboration with extension services, Development Agents (DAs), mobile app/ICT training, promote and create awareness on forage seed and forage availability and sources. This will leverage the work other implementing partners are doing in forages in Ethiopia. Example – work with the dairy farmers in the Ethiopian Highlands; link with USAID-funded RiPA and LGA initiatives.

Outputs: One technical manual developed for seven forage species. At least 30 stakeholders trained through two 1.5-day long workshops. At least seven stakeholders trained will be

women, and at least 10 stakeholders trained will be less than 30 years of age. At least 3 partnerships formed with stakeholders leading to MoUs.

***New** - Activity 2.1.2.3: Increase capacity of actors on animal feeding using cultivated forages (Mission).*

Justification: in Ethiopia, S34D's proposes to formulate a balanced ration in the form of pellets composed of over 70% cultivated forages for different class of animals: fattening animals, dairy animals that give up to 10 litres of milk/day and those that are high producers (> 15 litres/day). Former USAID projects dealt with formation on-farm of TMR (total mixed ration) by mixing concentrate-based ingredients for fattening animals, but did not use cultivated forages. The end users need training on feeding of pellets (how much for 0.5 kg/day gain in body weight, 1 kg/day gain in body weight, etc. and likewise for dairy animals). So far, farmers involved in fattening in Ethiopia have not used cultivated forage-based diets. Most of them use concentrate feeds and straws, which are expensive. To shift them from concentrate-based feeding to the cultivated forage-based pellet feeding (because the former is expensive), trainings are required. For such trainings, we need to produce training manuals. In addition to feeding cultivated forage-based pellets, the training and training manuals will also deal with TMR production on farm using a substantial amount (>70%) of cultivated forages. S34D's proposed manual and training materials will have three sections:

Section A for fattening animals. It will cover the formation of balanced rations on-farm in the form of total mixed rations (TMRs) using a substantial portion (> 70%) of cultivated forages, locally available biomass, minerals and vitamins, for different categories of animals: fattening animals with daily growth rate of 0.5 kg, 0.75 kg, 1 kg, 1.25 kg and 1.5 kg.

Section B for dairy animals. It will cover formation of balanced rations on-farm of TMRs using a substantial portion (>70%) of cultivated forages, locally available biomass, minerals and vitamins for dairy animals giving daily milk yield of 5 litres, 7.5 litres, 10 litres, 12 litres, 15 litres, 20 litres, 25 litres and so on.

Section C will have guidelines for feeding cultivated forage-based balanced TMRs in the pelleted form. These guidelines would cover feeding of pelleted balanced diets of different nutrient compositions targeting fattening animals of different daily weight gains and targeting dairy animals of different daily milk production. These aspects are not covered by a recently launched AfricaRising training manual[4].

Description: In partnership with Hawassa University, S34D will develop content on feeding cultivated forages by developing fliers, manuals, training programs on 'Feeding strategies based on cultivated forages for use by feedlot farmers, quarantine station managers, and dairy farmers. These manuals and training programs would deal with formulation and feeding

[4] https://cgspace.cgiar.org/handle/10568/113387

of balanced diets prepared using cultivated forages. The diets based on cultivated forages is currently not widely used in Ethiopia. It is fed only by a small number of dairy farmers in the highlands, albeit not as a part of the balanced diet that meet the nutrient requirement of animals. The dairy farmers, feedlot farmers and quarantine station managers do not have knowledge on the preparation and feeding of balanced diets containing cultivated forages and other locally available ingredients. This activity would also lead to the decisions on the nutrient composition of cultivated forage-based pelleted diets for different categories of animals: fattening and dairy animals of different production levels.
Outputs: Developed and disseminated two manuals, two training programs, and two flyers (one each for dairy farmers and the other for feedlot farmers and quarantine station managers) on balanced feeding using cultivated forages.

Sub IR 2.1.3 Formal sector suppliers and NARs / breeders leveraged and linked with local farming communities and professionalized informal seed sellers

New - Activity 2.1.3.2: Promote access to locally grown legume seed through use of agricultural development agents in Zambia (RFS).

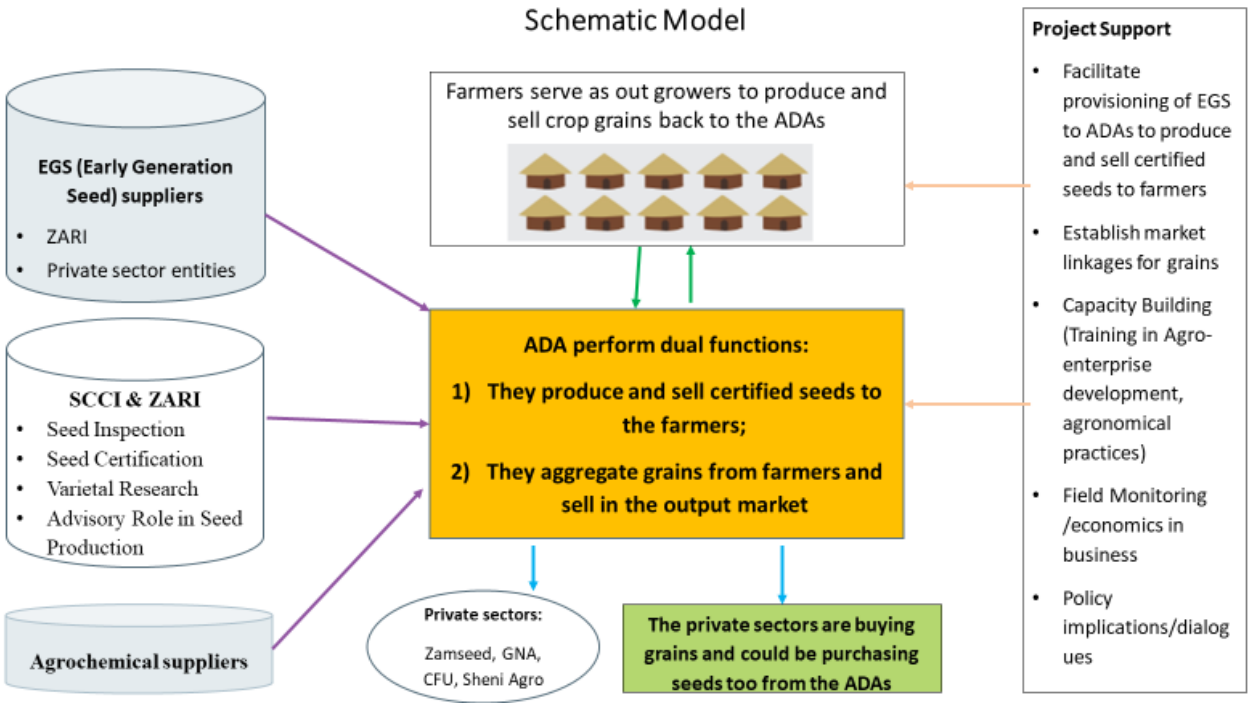
Justification: Most farmers in Zambia grow maize and some legumes which includes soya bean, common bean, and groundnut, but on a smaller scale with suboptimal yields due to poor quality of seeds used. The supply of high-quality seeds for non-maize crops is low. Due to the negative change in rainfall pattern, there is need for farmers to adopt climate smart agriculture practices, and one such way to adapt to unpredictable rainfall is to resort to legume production which is drought tolerant and fetches better prices on the markets. The crop also helps to improve soil fertility, soil organic matter, texture and it is a good source of protein. The inclusion of legume crops in the farmers' production system alongside maize is in line with the government's efforts to achieve crop diversification (Government of Zambia – 7th National Development Plan). In the proposed activity, soybean and pigeon pea will be intercropped with maize to increase the overall productivity per unit land area, and income. This mixed maize-legume cropping system has a significantly more pronounced effect on soil fertility, when maize is planted on the same field in alternate years, hence an added advantage of using the concept of "double-up" legume with a cereal. The pigeon pea variety was released by ICRISAT in 2016 and bears important climate-smart attributes.[5] This proposed intervention will contribute to farmers sustainably producing a diversified crop range through a reliable seed system. Through increased production, resulting from access to high quality seed, output market engagement will be higher and improved, resulting in increased incomes for smallholder farmers. Promoting diversified cropping systems, especially drought tolerant varieties of pigeon pea, will contribute to reducing the effect of climate change.
Description: The overall goal of the proposed intervention is that by 2022, approximately 40 ADAs in Katete, Chipata and Lundazi District of Eastern Zambia *will* have the capacity to

[5] https://www.icrisat.org/new-improved-pigeonpea-variety-released-in-zambia-to-withstand-climate-change/

produce their own seed (pigeon pea, soya bean[6] and drought tolerant maize) that can be accessed by farmers in their local communities. CRS Zambia will identify 40 Agriculture Development Agents (ADAs) (10 women; 10 <30 years of age) who will be trained to be legume Seed Growers by the Seed Control and Certification Institute (SCCI). Adapting CRS' "Integrating Gender into Private Agriculture Service Providers (PASP) Services" module, the ADA's will receive training to support them in making their legume seed services gender-sensitive. S34D will conduct a baseline assessment and undertake a cost-benefit margins and economic analyses for the 40 ADAs and 2,000 farmers (>30% women and 30% <30 years of age). The farmers will be selected and supported as commercial crop (grain producers) growers for soybean and pigeon pea. CRS Zambia will, with guidance from SCCI, support the site selection for growing the pigeon pea seed and identify isolated sites for seed production.
Under the supervision of the SCCI farmers will receive training in improved legume seed production for both pigeon pea and soybean; this training also includes training in seed grading. Through private sector engagement, seed houses are the possible buyers of seed at market prices from the ADA (Community-based Seed Producers) and S34D will facilitate an ADA-farmer out grower scheme for legume grain production. On the output side, the ADAs would be linked to the commercial grain markets. S34D will examine policy implications such as: what does this mean for operating an inclusive enabling environment? What are the impediments? Document those to drive evidence-based dialogues with national and regional decision-makers in Zambia

The model is schematically illustrated in **Figure 2**.

Figure 2. Schematic illustration of the proposed ADA model in Zambia



[6] The costs for soybean will be borne by the CRS Zambia office while S34D will fund that of pigeon pea.

Outputs: Farmer/community-based seed production and grain marketing system developed (volume of seed; volume of grain; 40 ADAs trained; 2,000 farmers reached and linked)**;** Output marketing for soya bean and pigeon pea grain strengthened (at least 4 linkages established); One policy brief; One report.

New *- Activity 2.1.3.3: Strengthen the supply of forage early generation seed system (FEGS) (Mission)*

Justification: Seed production of forages is complex as different forage crops require different agronomic practices, special techniques of harvesting, threshing, and seed processing. Unlike cereal and other food crops, currently there does not exist any established private or public forage seed production and marketing system in Ethiopia. Therefore, S34D proposes to strengthen the supply of forage early generation seeds (EGS) so there is a steady supply of "starter seeds" to produce certified or QDS assured forage seeds in the market. These seeds would be of improved forage varieties that are already released and registered in Ethiopia. The seed supply system is also weak due to inadequate extension systems focusing on forage development. Additionally, the existing forage seed market is dispersed and is not linked between suppliers and buyers – there is very little market information. Strengthening the supply of EGS for high-performing forage species suitable to specific agro-ecological conditions will be a necessary step to establish a viable forage seed system in Ethiopia.

In the Ethiopian seed generation system, breeder seed is increased to give rise to pre-basic or to basic seed. These generations are used to carefully increase the volume of the seed aimed at reasonable quality of the next generation(s) which would reach the seed users. In the case of forage seed production, the production of these generations of seeds needs to be handled by both public and private commercial seed companies. These companies could also produce certified seed to directly sell to farmers or to seed producing cooperatives or small private entities who are engaged in QDS production. Government owned seed enterprises, the Ethiopia Seed Enterprise (ESE), Amhara Seed Enterprise (ASE), Oromia Seed Enterprise (OSE) or Southern Seed Enterprise (SSE) or experienced private seed companies like Eden Field Agri Seed Company are potential partners for this undertaking. There is little experience in EGS production of forage varieties among these companies. Technical, material and training support is required to introduce systematic quality EGS production of forage varieties.

According to the rules and regulations of the Ethiopian seed sector, breeder seed supply is the responsibility of the breeder and the breeding institute hosting the breeder. Breeders are also expected to maintain the characteristics and quality of the varieties they developed. This proposed activity aims to strengthen breeder seed production and varietal maintenance works through trained manpower and materials which help the breeding work and the forage breeding seed production. Figure 3 provides an illustrative forage seed value chain in Ethiopia.

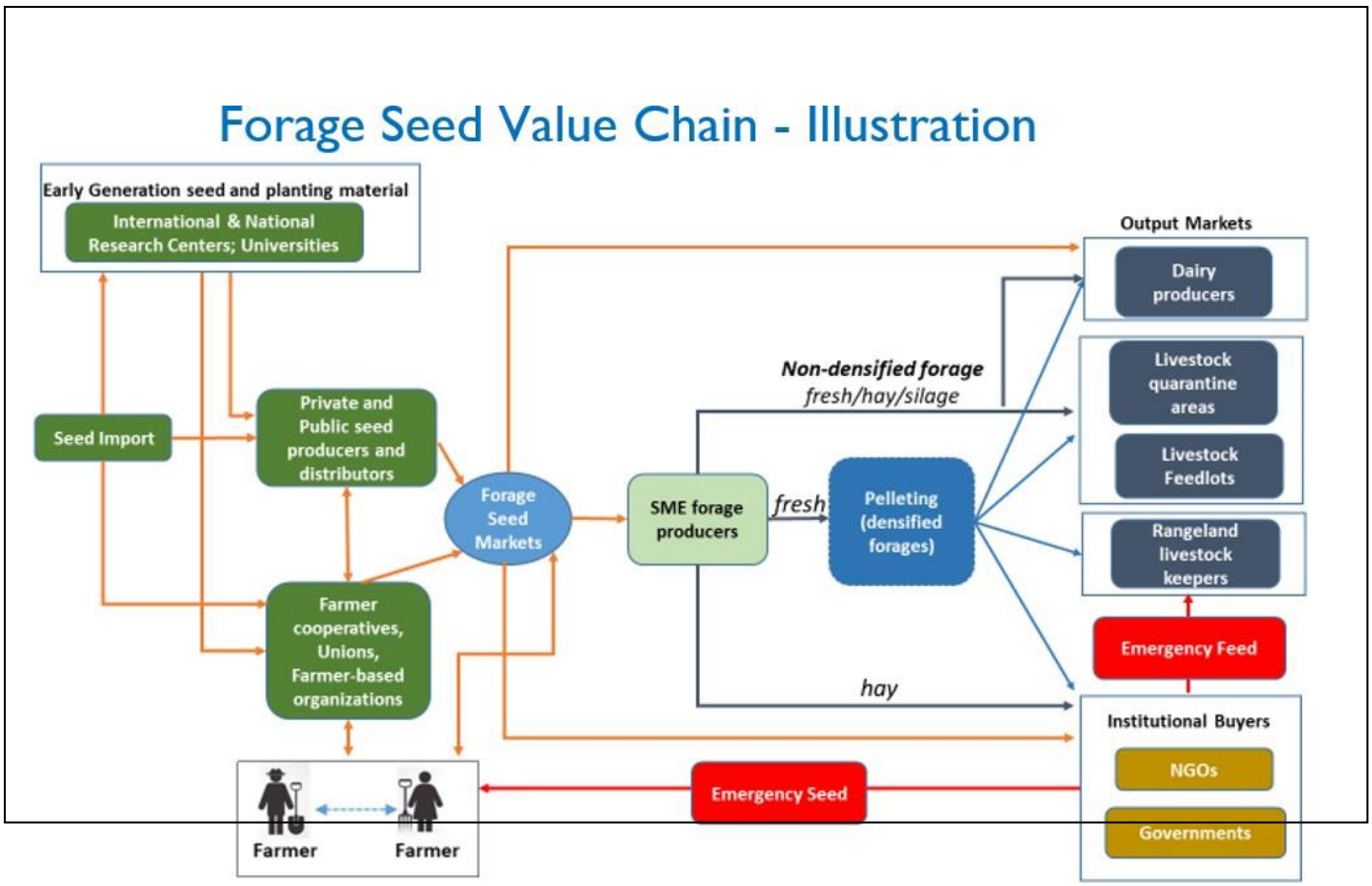


Figure 3. Illustrative Forage Seed Value Chain - Ethiopia

Description: S34D will identify key collaborators (EIAR, private and public seed companies) for forage EGS production of select varieties and species. Based on agro-ecological suitability conditions, map out the value chain to create linkages between breeder/basic seed suppliers and commercial certified (and QDS assured) seed producers for forages. Stock-taking of gaps in capacities and needs assessments will be conducted, and MoUs for partnerships established.

Output: Partners identified, scoped, and three partnerships formed with a detailed understanding of roles, responsibilities, and handoffs.

Sub IR 2.1.4 Effects of market-based interventions on seed market operations and last mile delivery systems are assessed.

***New** - Activity 2.1.4.2: Pilot the cultivation of improved forages and densification of cultivated forages into pellets (sites: one in Afar and two in SNNPR) (Mission).*

Justification: Droughts are common in Ethiopia and their frequency has increased in the last decade which is attributed to ongoing climate change. The regions severely affected are Afar, Somali and lowlands of Oromia and SNNPR. Back-to-back cycles of non-existent or poor rainfall coupled with the strongest El Niño on record, led to Ethiopia's worst drought in decades, Humanitarian partners estimated that some 2.25 million households need

livestock support such as animal feed, anti-parasitic drugs and other health interventions to ensure their animals survive (OCHA, 2017). The livestock sector in Ethiopia supports the livelihoods of about 80% of rural people in Ethiopia. During the last drought, using United Nations Central Emergency Response Fund (CERF) allocation and the European Civil Protection and Humanitarian Aid Operations (ECHO) funding, a total of 8,000 MT of animal feed were distributed to 24,000 households, benefiting 230,000 animals such as goats and lactating cows (OCHA, 2019). Forages in loose form have low bulk density and hence are difficult to handle, transport, and store. Thus, S34D proposes densification technologies that provide opportunities to increase the bulk density manifold and decrease the cost of transport and storage. In addition, densification enhances the shelf-life of the cultivated forages and is also an attractive preservation technology, especially for the drought periods. Storage, in the warehouses of World Food Program and cooperatives, of densified products in the form of pellets well before the drought hits, and their distribution at the time of emergency could save many livestock from dying and suffering due to starvation and malnutrition. This would help protect the livelihoods of many pastoralists and other livestock producers.

The introduction of the novel densification technology to form pellets could improve preparedness against natural calamities and save animals from hunger and death during emergencies. S34D proposes pellets for the following reasons: easy handling, ease of transportation and storage of the cultivated forage-based densified feeds in blocks or pellets, good nutritional quality and shelf-life. Pellets offer an attractive option for setting up feed banks near to the feed deficit areas. Densification in the form of silage or bailage is not an attractive option for establishing feed banks in Ethiopia because of long distance between areas of forage production and those generally affected by droughts. Silage contains up to 4-5 times more water than pellets, which increases the cost of transport of the nutrients. In addition, the shelf-life of densified forages in the form of pellets is higher than that of silage or bailage. These densified feeds can be stored up to 9 months in dry and rodent-free places. The pellets can even be air lifted to the remotest places to avert disasters. Studies have shown that such early actions see high returns on investment. For example, an FAO study of an Early Warning Early Action project in northern Kenya found that the benefit-cost ratio was 3.5[7] (considering the value of the saved animal or its higher market value due to better body conditions, as well as the value of the additional milk available). When the costs of avoiding emergency humanitarian assistance and livestock restocking programs were also factored in, this ratio rose even further to 9. This analysis illustrates the value that early actions can have during the beginning stages of a drought emergency. Besides the benefits provided by easier transport and storage, feed pellets make it possible to supply feeds of uniform quality throughout the year, with lesser price fluctuation, compared to the large price fluctuation and irregular supply of feeds and other feed ingredients in different seasons.

Formation of a balanced diet from individual components by farmers requires knowledge of nutrient contents of the components, which generally is missing among livestock farmers in

[7] FAO, 2018b; http://www.fao.org/3/i8497en/I8497EN.pdf

developing countries. The densified total mixed ration (TMR) in the form of pellets overcomes this constraint. The animals have a tendency to select ingredients of higher-quality and leave those of poor quality when fed in loose form. This enhances wastage and decreases efficiency of feed utilization. This constraint can also be mitigated through densification which does not allow animals to select ingredients.

Furthermore, the intake of pelleted feeds is higher and so is the nutrient availability from the consumed feeds to the animals. The release of nutrients from the pellets is more sustained and synchronized with the nutrient requirements of animals. This decreases methane emission from ruminants and enhances the feed use efficiency (FAO, 2012)[8]. The use of densified products as animal feed offers an attractive option to mitigate ongoing climate changes in addition to enhancing livestock productivity and production.

Densification of forages is currently being practiced in many countries, for example Kenya, Tunisia, Mexico, India. S34D conducted analyses of these countries. Results (from surveys conducted by S34D in FY20) show increased interest in the forage densification technologies and high potential for increasing livestock production and productivity and for managing emergency situations.

Description: In order to select physical sites for piloting the business models, we will first zero-in on the sites for cultivation of improved forages and in the choice of area-specific forages, involving pastoral communities, federal and regional governments, and site visits by S34D. Next, we will zero-in on the warehouse sites for establishing feed banks, and garner government support for such a system, by a national expert. Availability of land, water (irrigation schemes) and electricity, road network will be assessed. The next step would be to select different components of the densification units based on the type of forages and other biomass to be converted to feed pellets, by a national team (comprising of representative of governments and from private sectors particularly agriculture equipment manufacturers), through visits to at least 3 countries such as Turkey, Tunisia, India or any other country that manufactures forage densification machines[9]. A hybrid approach could be considered: a) Coordinate and collocate (leverage) on other implementing partners to accelerate cultivation of improved forages, and b) Cultivation through the S34D project[10], site selection, site-specific forage selection, land procurement followed by land preparation would take considerable time. For this phase we consciously focus on herbaceous forages; from seeding to first harvesting takes 60-90 days (trees and shrubs would take a longer time). All together this activity is expected to take at least one year.
Outputs: One report on the choice of improved forages and the sites for cultivation of

[8] FAO (2012). Crop residue based densified total mixed ration – A user-friendly approach to utilise food crop by- products for ruminant production, by T.K. Walli, M.R. Garg and Harinder P.S. Makkar FAO Animal Production and Health Paper No. 172. Rome, Italy http://www.fao.org/3/i2728e/i2728e00.pdf

[9] Visits could be on cost sharing basis. The visits will serve two purposes: selection of the machinery and capacity enhancement of local stakeholders. Another option could be organization of a two-day workshop in Ethiopia in which 4-6 experts from countries that manufacture and use forage densification are invited, and then national team and S34D team identify one country for the visit.

[10] This would depend on the sites selected

improved forages (3 sites and corresponding forages for these sites identified for the pilot); one report on the warehouse sites to serve as feed reserves (at least 6 sites identified). Site visits to at least 5 potential sites conducted. Three education tours of 7 days each to three different countries; one report on machinery and components needed for densification and their cost estimates.

IR 2.2 Strengthened interface and collaboration between development and relief to resilient and market-based seed systems

Sub IR 2.2.1 Seed System Security Assessments in Feed the Future Crisis Hotspot areas (focus on formal, semi-formal and informal seed systems) are adapted and scaled

No activities planned under this Sub IR.

Sub IR 2.2.2 Emergency and humanitarian responses that link relief to development, especially links to private sector and formal and biodiverse suppliers are developed and promoted.

Continue from FY21 *- Activity 2.2.2.2: Support the emergence of enhanced and resilient seed sectors in fragile states, e.g. in DRC, South Sudan, Haiti (BHA).*

Justification: This activity has been carried forward from FY21 to allow additional time to complete the South Sudan case study and the overall synthesis report. The South Sudan case study was delayed because initially S34D planned to work with Mercy Corp's (MC) ISSD fragile state activity, but MC pulled out and S34D started discussions in late FY21 with Wageningen Center for Development Innovation (WCDI) to take over this case study. The formal seed sector is either weak or non-existent in fragile states,[7] and formal sector models are either not profitable /viable in on-going economic and/or political crises such as DRC, South Sudan, Haiti, etc. Current approaches to emergency seed provisioning aim to support farmers with access to seed in the short-term; however, this often does little to support seed systems long-term. Agencies working in fragile states need guidance in designing seed interventions that are consistent with USAID's resilience agenda and appropriate to the humanitarian-development-peace nexus. The activity will contribute to resilience-building among farmers by proposing ways in which farmers in fragile states can access quality seed of appropriate varieties. It will contribute to resilient seed systems by proposing models for the (re-)establishment of new, more robust seed systems. Fragile states are characterized by conflict, insecurity and economic crisis (in addition to natural disasters and pandemics), requiring that the seed systems are able to adapt and transform to withstand these shocks and stresses. The interventions that will be proposed must necessarily bridge the divide between humanitarian and development assistance to ensure that short-term, emergency seed interventions do not undermine longer-term development objectives within seed systems.
Description: This activity will explore and develop models for the emergence of enhanced and resilient seed systems in fragile contexts. The models will encompass aspects of formal, informal and emergency seed sectors and explore how these three components can work to

support and strengthen each other. To date, some of the country-based literature has been reviewed, and the Haiti and DRC case studies are on-going. The DRC case study is being undertaken in tandem with the Alliance-led activity in DRC, activity 2.2.3.1 and 2.2.3.2. Whilst the Haiti and DRC case studies will likely be completed in FY21, the South Sudan case study has been delayed due to a change in the lead partner and will be implemented in FY22. The case studies will document lessons from seed interventions in three fragile contexts, including the respective funding modalities and implementing partners involved. The case studies will explore gender, youth and PWD aspects feeding into an inclusive synthesis report. The proposed models will integrate ideas that capitalize on gender, youth and PWD-related opportunities as well as suggestions for specific actions to mitigate barriers that impede their active participation and benefit as seed entrepreneurs and/or seed users, as appropriate. The **output** will be the South Sudan case study report and a synthesis paper containing proposed models based on the three global case studies and key stakeholder consultations. This will be disseminated via appropriate blogs and a webinar.

***New** - Activity 2.2.2.4: Develop guidance for emergency, resilience, and development seed interventions (BHA)*

Justification: Recent studies on seed fairs, suggest that the use of seed vouchers and fairs is not only an effective means of enabling vulnerable farmers to restart their agricultural activities after a shock, but also is an effective means of introducing farmers to commercial supplies of seed.

The recommendations from recent studies on the use of seed fairs and vouchers is that *"due to the successful market linkages forged between farmers and input suppliers during and following the seed fairs that more projects should use this strategy to expand this market-based approach"*. The logic being that success in use of seed vouchers from humanitarian work should benefit farmers and input suppliers in resilience and development projects. This proposed expansion is based on the premise that farmers who have accessed quality seed through free distribution systems, such as vouchers gain in terms of observing the value of quality seed through increased productivity but also that the fair, provides a scalable means for building long term business relationships between vulnerable farmers and input suppliers. As such, farmers graduate from exchanging vouchers to paying for seed from specific vendors.

Description: Whilst the use of seed fairs and vouchers has gained considerable traction within the humanitarian and development communities as a channel for enabling vulnerable farmers to access quality seed, the strength of commercial, or market-based linkages between farmers and input suppliers is not well understood. More work is needed to explore the validity of this finding and project managers in humanitarian, resilience and development projects would benefit from guidelines on what to do and what to avoid if they are seeking a business solution that enables farmers to access quality seeds from formal market systems. The activity will undertake an assessment to gather information on the commercial linkages that have been established using direct seed distribution, use of vouchers and cash by humanitarian and development level projects. A gender and age lens will be applied to this assessment.

The work will also assess alternative models for improving commercial links between vulnerable farmers and seed suppliers, including supply chains that meet the needs and preferences of men and women. Provide a set of guidelines or best practices in seed interventions, when running different types of projects in emergency, recovery, development and or value chain type projects for project managers regarding what are they trying to achieve in terms of enabling / facilitating sustainable or short-term access to quality seed for different farmer segments (i.e. women, male/female youth). Provide information on strategies specifically designed to improve male and female farmer access to quality seed when they are currently beyond the market frontier for private seed companies.

The **outputs** of this activity are 1) a report on the types of seed exchange systems being used by humanitarian and development partners with a view to developing commercial, repeatable purchasing of quality seed by different farmer segments (men, women, male/female youth), and 2) Guidelines on Do's and Don'ts when investing in formal and informal seed systems targeted to small-scale farmers, particularly women and male and female youth farmers.

Sub IR 2.2.3 Emergency and development seed programs to capture market opportunities are leveraged.

Continue from FY21 *- Activity 2.2.3.1: Develop and test market-based emergency seed security interventions (BHA).*

Justification: This FY21 activity requires additional time to complete the review of cash transfers for seed security, which started later than anticipated. Within the humanitarian sector, cash transfers are now a major part of almost every humanitarian response[11], yet cash represents a relatively new approach to emergency seed programming. The earlier S34D review[12] found that there is potential to expand the use of cash transfers for seed security, and it is thought that significant experience has been developed in response to the COVID pandemic.

Description: In FY21, S34D will be able to complete the expanded framework for market-based emergency seed security interventions and one related actionable plan for a specific intervention in Madagascar. In FY22, S34D will complete the remaining work under this activity. S34D will complete an updated practice review of cash transfers for seed security and lessons emerging, including lessons to that support women and female youth farmers in equitably benefiting and mitigating unintended consequences for cash transfers or seed security. This will be drafted based on experiences since the completion of the earlier review by Keane et al (2019), including inputs from gFSC partners in the Agriculture Working Group and Cash and Markets Working Group, the CRS Markets in Crises Community of Practice, the Cash Learning Partnership (CaLP), among others. Cash Experts from the Humanitarian Response Department (specifically the Market-Based Response for Relief and Recovery Team) will provide additional technical expertise. This activity will disseminate its findings through a webinar.

The **output** of this activity is one report that reviews cash transfers for seed security.

New *- activity 2.2.3.3 Pilot and test business options to support informal and emergency bean and cassava seed sector opportunities in the DRC (RFS and BHA)*

This is a Tier 2 activity, and the narrative can be found in Annex E.

Sub IR 2.2.4 Shock-responsive and resilience-based models--by crisis type, crop profile, and broad agro-ecological system are developed and tested.

No activities planned under this Sub IR.

[11] The total amount of cash and voucher assistance (CVA) has doubled since 2016, from $2.8Bn to $5.6Bn in 2019. (CaLP, 2020)

[12] 'Study on cash transfers for seed security in humanitarian settings' by Jules Keane, Dina Brick and Louise Sperling. See https://pdf.usaid.gov/pdf_docs/PA00WH2D.pdf

Cross-cutting: Policy and Information Flow

The cross-cutting activities that target seed systems policies, regulations, and practices contribute to the overarching objectives of S34D. These include activities in Ethiopia, Kenya, Guatemala, and some that are global in nature, such as the one on climate change adaptation CCIR 1.3.4.

CCIR-1 Improved effective policy implementation and regulatory formulation for pluralistic seed systems

CCIR 1.1 Develop country specific seed policy road maps

No activities planned under this Sub IR.

CCIR 1.2 Practices to expand and liberalize seed quality possibilities are implemented and developed; market outlets and venues expanded; counterfeit seed issues addressed; free seed distribution restricted.

Continue from FY21 *- Activity CCIR 1.2.3: Implement and pilot of Standard Seed Protocol in Kenya (RFS).*
This activity is cancelled.

New - *Activity CCIR 1.2.7 Establish a variety registration system dedicated to farmers / pastoralists, separate from the regular variety ownership registration system in Ethiopia (Mission).*
Justification: Varietal selection is not only performed by formal seed system actors, such as research institutes, but also by farmers, who employ a range of practices to select and maintain their planting material. Examples include improving and maintaining local or adapted improved crop varieties and land races. Farmers select varieties for genetic diversity and thus strengthen / increase local agro-biodiversity. This practice enables farmers with coping mechanisms to minimize risks, stabilize livelihoods, and meet local needs – all key to strengthening resiliency at grassroots level. Farmers' traditional selection practices, coupled with more formal selection, help maintain the genetic diversity of crops. Thus, to support the conservation of local genetic diversity, there is a need for a variety registration system dedicated to farmers/pastoralists to register those diverse varieties (National Seed Policy, 2020). This effort will bring attention to indigenous germplasm development. In FY21, S34D is conducting an assessment in Benin – which is the only country in Africa to have a register catalogue for farmers' varieties. Learnings from this work will inform the proposed activity in Ethiopia.

Description: S34D will start off by initiating an approach to create the system – identify the needs, processes, technical capacities, and stakeholder mappings. Identify the policy and regulatory needs to establish the variety registration system and a catalogue (that is publicly accessible) for the farmers' varieties. The system will be first conceptualized using learnings from Benin (and other global cases), then piloted, and scaled. S34D will partner with the federal MoA, the RBoAs, the community seed producer groups, cooperatives, and the Ethiopian ATA.

The **outputs** are the roadmap established to create the system, human and technical capacity, use-cases, and financial resources; approach to create the system identified; at least 10 farmers' varieties identified with research support; and variety registration system established.

New - *Activity CCIR 1.3.4: Strengthen the enabling environment for bean and potato value chains in Guatemala. (RFS).*

This is a Tier 2 activity, and the narrative can be found in Annex E.

New *- activity CCIR 1.3.5: Facilitate and conduct a stakeholder discussion session on seed reserves (Mission).*

Justification: Ethiopia witnessed severe recurrent droughts for the past 30 years leading to hundreds of million dollars in foreign emergency aid. As a result, Ethiopia wants to set up a national seed emergency system that could effectively respond to emergencies caused by disasters. Within that system, the Ethiopian government wants to develop a national emergency seed reserve strategy which includes a pathway to create and maintain seed reserves. This would enable application of effective responses to specific seed security constraints. The strategy would also include approaches that aim to improve effectiveness and sustainability of existing seed emergency programs organized by the NGO community.

Description: This activity is a short-term FY22 proposed activity which will facilitate discussions with both national and international experts to derive the pros and cons of seed reserves to inform the Ethiopian government. S34D will first identify national and international stakeholders and conduct both remote, and in-person (pending Covid19 pandemic moratoriums) key informant interviews. Compile information and present findings through a facilitated 1.5 – 2-day workshop with national decision-makers and stakeholders.

The **Outputs** of this activity are the proceeding report of the workshop and one policy dialogue facilitated. The findings will help the GoE to determine whether it is feasible to do a seed reserve in Ethiopia.

***New** - activity CCIR 1.3.6: Seed systems and climate adaptation at the last mile, learnings and best practices: A global case study approach (Mission).*

Justification*:* Smallholder farmers are the first to be confronted with the effects of climate change, while having contributed the least to its causes. Across the developing world, smallholders are faced with increasingly unpredictable and extreme weather patterns, ranging from drought spells to flooding, and a general shortening of growing seasons. For these reasons, and since smallholders are the main sources of food for their communities, policymakers need to be aware of the current climate adaptation practices that smallholder farmers apply in their fields, and ways to strengthen these.
Description: Several recent efforts have prioritized climate change as a key thematic area of work. CGIAR has developed a resource toolbox specifically for that purpose[13]. Projects continue to be implemented to increase smallholders' adaptive capacity and resiliency at the last mile[14]. Many development partners – such as Oxfam Novib, and CRS country offices have implemented models and programs that targeted beneficiaries at the last mile to build resiliency and foster climate adaptations. The purpose of this activity is to collect anecdotal and empirical evidence from countries across different continents through ongoing activities and programs conducted by CRS and Oxfam Novib. Using a range of case studies from Zambia, Niger, Guatemala, Zimbabwe, Laos, Peru, and Ethiopia this activity will demonstrate how male and female farmers use agronomic practices, seed and variety selection, and other approaches to adapt to climate change in their local agro-ecologies. The level of research for Ethiopia as a country case study will be more in-depth relative to the other country case studies. These examples will provide a wide range of socio-economic context and cultural background to help frame the practices and approaches for policymakers and decisionmakers within both national governments and international donor partners. The study will aim to distinguish differences in adaptation and practices for men and women farmers, as well as between young and old smallholders. This is critical for designing better policies and practices that aim for inclusive agricultural transformation. The learnings from the global case studies will provide recommendations and best practices on climate adaptation at the last mile, contextualized practical recommendations for on-the-ground implementation efforts, that will support better designs for interventions aiming to strengthen seed systems in developing countries. One global webinar with key partners will disseminate findings.
Output: One report or peer reviewed publication with recommendations and best practices for climate adaptation outlined.

CCIR-2 Established enhanced quality information flows for seed systems

[13] https://ccafs.cgiar.org/news/new-tool-resilient-seed-systems

[14] https://ccafs.cgiar.org/news/open-source-seed-systems-climate-change-adaptation-kenya-uganda-and-tanzania-highlighting-importance

CCIR 2.1 Institutional and public policy information is better digitized.

New *- Activity CCIR 2.1.6: Digitize seed systems regulatory roadmaps in Ethiopia (Mission)*

Justification: In FY21, S34D is developing seed system regulatory roadmaps for the following six dimensions:

- public varietal research, development, and transfer;
- seed dealer and venue registration;
- seed variety registration and release;
- plant variety protection;
- seed certification and quality assurance; and
- anti-counterfeiting and consumer protection.

These Regulatory Systems Maps will serve as a tool to assist stakeholders' access and interpretation of the legal and regulatory system, which will be particularly important as it changes. Over time, these maps could also help evaluate challenges and successes in implementation of rules and regulations.

Description: In FY22, S34D proposes to digitize these maps and host them with an Ethiopian national partner on public domains. That effort will enable wider dissemination of the information contained in the maps, especially for the private sector entities who find it difficult to navigate the policy and regulatory space. The digital maps would also increase transparency of the processes and enable greater information sharing – thus lowering transaction costs for the seed sector stakeholders.

The **outputs** for this activity are six seed system road maps digitized, made interactive, and shared in the public domain. Uptake and utilization of these maps will be documented for further evaluation and sustainability.

CCIR 2.2 Tools and technologies to capture quality information about seed supply in a geo-referenced manner are developed.

Continue from FY21 *– Activity CCIR 2.2.1: Develop forage informatic dashboard using seed data and metrics and a policy brief on forage seed systems in Ethiopia (FY21) (Mission).*

Justification: Forages play a catalytic role in bridging gaps between crop and livestock sub-sectors. Increased livestock productivity is key for adapting and absorbing recurrent weather-related shocks and working towards building a transformative capacity in the long term for geographies with a high livestock population and where continuous crop production is not viable. Research shows the increased importance of cultivated forages in reaching livestock productivity potentials. Therefore, research and development partners, private sector investors, and governments need to understand trends in the forage sub-sector to invest in appropriate areas that enable inclusive agricultural transformation. More information about this less explored area will support discussions around making the right decisions and enable effective measurements to gauge developments. None of the existing seed indices – TASAI, ASI,

and EBA focus solely on forage seeds, which are very different from crop seeds and less studied. As such, an objective of this activity is to fill in this gap.

Description: In FY21, S34D in collaboration with national partners developed forage seed indicators that would be used by the forage seed association, and the forage seed consortium members, EIAR, RARIs, MoA to gauge development in the forage subsector. In FY22, this activity will digitize those indicator dashboards so they can be hosted under the Ethiopian MoA and shared in a public domain to foster transparency. This activity will be completed in Q1 of FY22.

Output: Forage indicator dashboard digitized; MoA hosts and shares in the public domain.

Continue from FY21 *- Activity CCIR 2.2.2 Test out recommendations from FY20 technical roadmap, in select woredas (10-15) in Ethiopia (FY21) (Mission).*

Justification: In FY20, CRS developed a technical road map for demand forecasting in Ethiopia. In FY21 S34D tested the systemic recommendations and linkages from the technical road map in a select set of diverse agroecological zones. Some of these recommendations were validated, tested, and used to refine the final set of suggested pathways for subsequent implementation.
Description: In FY22, S34D will develop an assessment of the current seed demand forecasting process in Ethiopia and a set of recommendations on how to strengthen that process and modernize the forecasting system. S34D will select up to 10 woredas across different zones and regions to pilot the recommendations that stemmed from the forecasting assessment. CRS will collaborate with the Ministry of Agriculture (MoA), Regional Bureau of Agriculture (RBoA), Small and Medium Enterprises (SME), Development Agents (DA), Farmer Cooperatives and Unions and the Central Statistical Agency (CSA).

The **output** of this activity is recommendations piloted in 10 woredas, feedback collected and documented how the pilot strengthened the system in these 10 woredas.

New *- Activity CCIR 2.2.4: Seed Systems Landscape Analysis in Sudan (RFS and BHA).*

This is a Tier 2 activity, and the narrative can be found in Annex E.

New *- Activity CCIR 2.2.5: Establish a seed production and marketing information network at the national and regional levels in Ethiopia (Mission)*

Justification: One of the bottlenecks identified is mismatches between seed production volumes and farmers' demand. Currently Ethiopia faces significant challenges in forecasting effective demand – both in variety and volumes (Seed System Development Strategy, 2020 MoA/ATA). This constraint was repeated as a major bottleneck in every consultation held by S34D. Therefore, S34D initiated an assessment of the current system and processes in place to forecast demand for certified seeds at varietal levels. Furthermore, currently, a market-oriented seed demand assessment system is missing. The system also lacks flexibility to incorporate shifts in demand by farmers / pastoralists (National Seed Policy, 2020).

Activity Description: S34D proposes to establish a seed production and marketing information network at the national and regional levels. This would strengthen national seed demand estimation and local market assessments and support the seed marketing system with ICT

(Information and Communication Technology) capabilities, making data and information available on national and regional platforms. It will involve downstream actors in the demand estimation processes. For example, the system will include a mechanism through which cooperatives could go beyond the Regional Bureau of Agriculture (RBoA's) estimation process and supply local market intelligence, including factors such as rainfall pattern and farmer preferences – that cause shifts in demands over time. This would need close collaboration with MoA, RBoA, Zonal and woreda level Development Agents (DAs), public seed enterprises, Ethiopian Agricultural Transformation Agency (ATA), Central Statistical Agency (CSA), seed producer cooperatives, private seed enterprises, CGIAR centers, national and regional agricultural research institutes (such as, EIAR).

The **outputs** of this activity are process and approach to establish the network are identified and piloted.

New Activity CCIR 2.2.6. Seed Systems Landscape Analysis in Timor-Leste (RFS) (BHA).

This is a Tier 2 activity, and the narrative can be found in Annex E.

CCIR 2.3 Last mile markets for new and quality-assured seed varieties are enabled by developing, piloting, adapting, and scaling feed-forward and feedback mechanisms that loop farmers' preferences, as well as provide information on new varieties and quality assured seed

No activities planned under this Sub IR.

III. Monitoring, Evaluation, and Learning Activities

This section describes the monitoring, learning, and evaluations S34D will undertake in FY22. **Section A** provides a quick overview of proposed activities. Evaluative learning plan and activities is provided in **Section B** – which includes independent evaluations (Section B.1), portfolio learning areas (Section B.2), and activity around incubating a global seed system community of practice with partner Oxfam Novib (Section B.3). Finally, the detailed implementation plan and dissemination approach is illustrated in **Section C**.

A. Brief overview of proposed activities

In FY22, S34D continues to expand to countries across continents with propositions for Sudan, South Sudan, Cambodia and Timor-Leste (for which S34D already received USAID Missions' concurrence) S34D may potentially also expand to Mozambique, Guatemala and Honduras (pending Missions' concurrence). There are several activities that are focused on developing tools (including development of guidelines, data collection, data monitoring, training manuals, frameworks, best practices, etc.), disseminating those tools and technologies (such as seed demand forecasting and forage seed informatics dashboard in Ethiopia), digitizing and sharing trainings through new and existing platforms (examples being seed certification training activity in Zambia; digitizing and sharing seed systems regulatory maps in Ethiopia).

The other major area of activities focuses on building capacity across formal, informal, and emergency seed systems – examples include activities related to training traders and informal seed actors in the DRC (1.2.2.4). To strengthen the interface between different seed systems, a key feature of S34D, FY22 proposed activities focus on piloting business models in the forage sub-sector for Ethiopia, and for beans and cassava crops in DRC (2.2.3.3).

On the seed policy and regulatory arena, S34D continues to pilot the Standard Seed Certification protocol in Kenya, evaluating whether the pilot is being successful and lessons learned that could be shared with key stakeholders such as – KEPHIS, KALRO, seed enterprises and producing groups. There is a few activities that focuses on fostering evidence-based dialogues related to climate adaptation and role of smallholders, seed reserves, and feed reserves in Ethiopia.

The key principles used to develop these activities include:

- Wider range of geographies to reflect the "global" aspects of S34D activity;
- Options that build stronger interface between seed systems;
- Model and solutions that target market efficiency;
- Frameworks and analyses that contribute to resiliency at the last mile, and;
- Activities that are inclusive of gender and youth.

Table 3 shows the Tier 1 and Tier 2 activities, their outputs, indicators, and targets.

Table 3. FY22 Proposed Activities, Outputs, Indicators and Targets

Activity	Geography	Partner	Outputs	Indicators and Targets	Disaggregated Targets (Sex, Age)
IR 1.1 Constraints in formal seed systems identified and mitigated					
Sub IR 1.1.1 Operational efficiency of seed companies increased					
1.1.1.12 Increase the Availability of Seed Sector Finance in the DRC (RFS).	DRC	OI	30 FSP staff (at least 10 women, and at least 10 below 30 years of age) trained.	OUT-1 = 30; OUT-2 =30; OUT-6 =1	10 women; 20 men trained; 10 less than 30 years of age.
Sub IR 1.1.3 Strengthening the capacities of local seed actors					
1.1.3.1 Digital training of seed inspectors and samplers in Zambia (FY21) (RFS).	ZM	CRS	SCCI will train 60 inspectors (16 female) in Zambia. 1 platform developed.	OUT-1 = 60; OUT-2 = 60; OUT-6 =1	16 are women out of 60; at least 15 are youth below 30 years of age among 60.
IR 1.2 Strengthened capacity of informal seed systems to offer a broader range of affordable, improved quality seed					
Sub IR 1.2.2 Capacity of local seed entrepreneurs and non-traditional seed actors strengthened					
1.2.2.4 Strengthening capacity of seed supply and grain market actors in Eastern DRC (RFS).	DRC	CIAT	30 traders (20 male, 10 female, 50% youth) will be trained on various aspects of seed and grain quality management in North and South Kivu.	OUT-1 = 30; OUT-2 =30; OUT-6=3	At least 10 are women out of 30; at least 15 are below 30 years of age among 30.
Sub IR 1.2.4 Last mile delivery solutions through non-traditional partners and ICT strengthened					
1.2.4.3 Conduct a cost-benefit analysis of the last-mile seed delivery by motorbike riders (bodaboda) to smallholder farmers in Kenya (RFS).	KE	CIAT	A cost-benefit analysis report including profitability of last mile delivery of seeds and other inputs using motorbike riders (boda boda)	OUT-5=1; OUT-12 =1	
IR 1.3 Strengthened capacity of emergency and humanitarian aid programs to respond effectively to acute and chronic stresses					
Sub IR 1.3.1 Select emergency and humanitarian past actions assessed; focus on farmer evaluation, new varieties, and markets (local and formal)					
1.3.1.1 Participatory Impact Assessment (PIA) of Emergency Seed Interventions (FY21) (BHA).	Global	CRS	One detailed PIA reports and one synthesis report.	OUT-5 = 5	
1.3.1.5 Assess differential effects of seed security cash transfers on men and women and intrahousehold dynamics (BHA).	Global	CRS	One report with suggestions for best practices. Monitoring tool for assessing intrahousehold dynamics in seed security responses.	OUT-5=1 OUT-6=1	
Sub IR 1.3.2 Emergency and humanitarian responses that promote climate resilience, including food, income, cover and fodder crops are catalyzed					

1.3.2.2 Generate recommendations for integrating vegetable seeds into humanitarian responses (BHA).	Global	CRS	Best practice recommendations for vegetable seed responses.	OUT-6 =1	
1.3.2.3 Participatory action research into cash-based seed security responses, Guatemala & E. Africa (BHA).	GT and E. Africa	CRS	Synthesis report on cash-based seed security responses.	OUT-5 = 1	
Sub IR 1.3.3 Tools and information systems to frame Shock Responsive Models developed					
1.3.3.1 Framework and response options for resilient seed systems (FY20) (BHA).	Global	CRS, CIAT	A conceptual framework for resilient seed systems and a series of response options for resilience-building interventions in different contexts.	OUT-6 = 1	
1.3.3.5 Strengthen Capacity for Rapid Seed System Security Assessments (BHA).	Global	CRS	A training curriculum, and automated data analysis.	OUT-6 = 2	
IR 2.1 Strengthened interface and collaboration between formal and informal seed systems					
Sub IR 2.1.1 Local seed network strategies (to interface, collaborate, and leverage) and local capacities are assessed					
2.1.1.3 Scoping business models to strengthen forage seed systems and production of cultivated forages in Sudan (RFS).	SD	CRS	A report with two or three economics driven inclusive business model propositions and policy implications validated with stakeholders and disseminated through a webinar.	OUT-5 = 1	
2.1.1.4 Scoping business models to strengthen forage seed systems and production of cultivated forages in Zambia (RFS).	ZM	CRS	A report with two or three economics driven inclusive business model propositions and policy implications validated with stakeholders and disseminated through a webinar.	OUT-5 = 1	
Sub IR 2.1.2. Crop and seed platforms that link formal and informal seed systems are catalyzed and supported.					
2.1.2.2 Strengthen capacity of forage (certified and quality declared assurance) seed production (Mission).	ET	CRS, CIAT	One technical manual developed for seven forage species. At least 30 stakeholders trained through two 1.5-day long workshops. At least seven stakeholders trained will be women, and at least 10 stakeholders trained will be less than 30 years of age. At least 3 partnerships formed with stakeholders leading to MoUs.	OUT-6=1; OUT-1 = 30; OUT-2 =30; RES-5 = 3	
2.1.2.3 Increase capacity of actors on animal feeding using cultivated forages (Mission).	ET	CRS, CIAT	Developed and disseminated two manuals, two training programs, and two flyers (one each for dairy farmers and the other for feedlot farmers and quarantine station managers) on balanced feeding using cultivated forages.	OUT-6 = 6;	
Sub IR 2.1.3 Formal sector suppliers and NARs/breeders leveraged and linked					

2.1.3.2. Promote access to locally grown legume seed through use of agricultural development agents in Zambia (RFS).	ZM	CRS	Farmer/ community-based seed production and grain marketing system developed (volume of seed; volume of grain; 40 ADAs trained; 2,000 farmers reached and linked); Output marketing for soya bean and pigeon pea grain strengthened (at least 4 linkages established); One policy brief; One report.	OUT-1 = 40; OUT-2 = 2040 RES-5 = 4; OUT-5 =1; OUT-12 = 1	8 of 40 ADA are women; and 10 ADAs less than 30 years of age. 600 of 2000 farmers reached, are women, and at least 500 less than 30 years of age
2.1.3.3 Strengthen the supply of forage early generation seed system (FEGS) (Mission).	ET	CRS, CIAT	Partners identified, scoped, and three partnerships formed with a detailed understanding of roles, responsibilities, and handoffs.	RES-5 = 3	
Sub IR 2.1.4 Effects of market-based interventions on seed market operations and last mile delivery systems are assessed.					
2.1.4.2 Pilot the cultivation of improved forages and densification of cultivated forages into pellets (sites: one in Afar and two in SNNPR) (Mission).	ET	CRS, CIAT	One report on the choice of improved forages and the sites for cultivation of improved forages (3 sites and corresponding forages for these sites identified for the pilot); one report on the warehouse sites to serve as feed reserves (at least 6 sites identified); one report on machine and components needed for densification and their cost estimates.	OUT-5 = 3	
IR 2.2 Strengthened interface and collaboration between development and relief to resilient and market-based seed systems					
Sub IR 2.2.2 Emergency and humanitarian responses that link relief to development, especially links to private sector and formal and biodiverse suppliers are developed and promoted.					
2.2.2.2 Support the emergence of enhanced and resilient seed sectors in fragile states, e.g. in DRC, South Sudan, Haiti (FY21) (BHA).	Global	CRS	South Sudan case study report and a synthesis paper containing proposed models based on the three global case studies and key stakeholder consultations. This will be disseminated via appropriate blogs and a webinar.	OUT-5=1	
2.2.2.4 Develop guidance for emergency, resilience, and development seed interventions (BHA).	Global	CRS	A report on the types of seed exchange systems being used by humanitarian and development partners; Guidelines on Do's and Don'ts when investing in formal and informal seed systems targeted to small-scale farmers.	OUT-5 = 1; OUT-6 =1	
Sub IR 2.2.3 Emergency and development seed programs to capture market opportunities are leveraged.					
2.2.3.1 Develop and test market-based emergency seed security interventions (FY21) (BHA).	Global	CRS	1 guideline on cash transfers.	OUT=6 = 1	

2.2.3.3. Pilot and test business options to support informal and emergency bean and cassava seed sector opportunities in the DRC (RFS) (BHA).	DRC	CIAT	The outputs of this activity are a case study report of different investment options, and a policy brief on accelerated access to quality seed in a fragile state using non-conventional seed channels.	OUT-5 = 1; OUT-12 = 1	
CCIR 1 Improved effective policy implementation and regulatory formulation for pluralistic seed systems					
CCIR 1.2 Develop and implement practices to expand / liberalize seed quality possibilities; expand market outlets/venue; address counterfeit seed issues; restrict free seed distribution					
CCIR 1.2.3 Implement and pilot of Standard Seed Protocol in Kenya (FY20) (RFS).	KE	AE	One seed policy brief, one guideline document and one manual that illustrated a standardized training approach and material for standard seed production.	OUT-12 = 1; OUT-6 =2	
CCIR 1.2.7 Establish a variety registration system dedicated to farmers/ pastoralists, separate from the regular variety ownership registration system in Ethiopia (Mission).	ET	CRS	The outputs are the roadmap established to create the system, human and technical capacity, use-cases, and financial resources; approach to create the system identified.	OUT-10 = 1	
CCIR 1.3 Strengthen linkages and coordination of seed development efforts through consolidation of data and evidence					
CCIR 1.3.3 Facilitate and initiate implementation of seed policies and directives in Ethiopia (FY21) (Mission).	ET	CRS	At least three actions taken to address three policy issues and operationalize three policy priorities with facilitation and guidance.	OUT-11 = 3; OUT-12 =1	
CCIR 1.3.4 Strengthen the enabling environment for bean and potato value chains in Guatemala (RFS).	GT	CRS	At least 100 seed producers with increased understanding of the seed regulation (20% women and 20% less than 30 years of age); 3 dialogues facilitated with local municipalities; One actionable policy road map assessing, identifying, and proposing solutions to barriers in seed marketing for municipalities to implement.	OUT-1 = 100; OUT-2 = 104; OUT-11 =3; OUT-10 = 1;	Of 100 seed producers trained, 20 women, and 20 less than 30 years of age.
CCIR 1.3.5 Facilitate and conduct a stakeholder discussion session on seed reserves (Mission).	ET	CRS	Workshop proceeding report and one policy dialogue facilitated.	OUT-11=1; OUT-12 =1	
CCIR 1.3.6 Seed systems and climate adaptation at the last mile, learnings and best practices: A global case study approach (Mission).	Global	CRS	One report or peer reviewed publication with recommendations and best practices for climate adaptation outlined.	OUT-5=1	
CCIR 2 Established enhanced quality information flows for seed systems					
CCIR 2.1 Institutional and public policy information is better digitized					
CCIR 2.1.6 Digitize seed systems regulatory roadmaps in Ethiopia (Mission).	ET	CRS	Six seed system road maps digitized, made interactive, and shared in the public domain. Uptake and utilization	OUT-13= 6	

			of these maps will be documented for further evaluation and sustainability.		
CCIR 2.2 Develop tools, technologies to capture quality information about seed supply in a geo-referenced manner					
CCIR 2.2.1 Develop forage informatic dashboard using seed data and metrics and a policy brief on forage seed systems in Ethiopia (FY21) (Mission).	ET	CRS	Forage indicator dashboard digitized; MoA hosts and shares in the public domain.	OUT-13=1	
CCIR 2.2.2 Test out recommendations from FY20 technical roadmap, in select woredas (10-15) in Ethiopia (FY21) (Mission).	ET	CRS	Augmented methodology / framework at the systemic level to conduct seed demand / market forecasting in Ethiopia.	OUT-14 = 1	
CCIR 2.2.4 Seed Systems Landscape Analysis in Sudan (RFS) (BHA).	SD	CRS	An assessment report of the three seed systems, (i) formal, (ii) informal and (iii) humanitarian and an analysis of the current strengths and weaknesses within and at the interface between formal and informal seed systems and between development and emergency-to-relief seed interventions.	OUT-5 =1	
CCIR 2.2.5 Establish a seed production and marketing information network at the national and regional levels in Ethiopia (Mission).	ET	CRS	Process and approach to establish the network are identified and piloted.	OUT-14 = 1	

B. Evaluative Learning

Given FY22 is the fourth year of S34D operation, evaluative learning is of highest priority under the MEL portfolio. The following approach is used to expand the learning and evidence base.

Collaborative and Adaptive Approach:

- Each learning area will be led by a technical sectoral lead, supported by MEL staff.
- Each learning agenda area should have a comprehensive learning brief evaluating activities that contribute to that specific learning question.
- Each brief produced at the end of FY22 should be between 10-12 pages.
- This is a very collaborative approach that will engage CRS staff as well as consortium partners.
- Time for these leads will be included in the budget specifically for producing these briefs.
- S34D will hold a learning meeting every 2-3 months, but follow up on each learning area every month separately with monthly team meetings with leads.
- Gender and youth inclusiveness is examined very closely in FY22.

B.1 Independent Evaluations

In FY22, S34D will conduct evaluations for the following areas using staff external to S34D to attain unbiased and objective results. These staff could be non-S34D CRS technical members, and/or, external Consultants sourced through a competitive bidding process.

First, we will assess whether the trainings conducted led to any capacity building at the end of the activity. We will survey the actors trained to evaluate what capacity changed due to the trainings. This would be done for the Activities – 1.1.1.12 and 1.2.2.4 in DRC, and for Activity 1.1.3.1 in Zambia.

Second, for Activity CCIR 1.2.3, we will evaluate whether the pilot of Standard Seed Certification in Kenya is successful using the economic framework of cost-benefit analyses. For example, using seed companies and seed producers as a cohort that participated under S34D, we would collect and analyze production cost data, compare with the revenue generated to examine whether the new seed quality assurance mechanism is sustainable and could be scaled-up for a range of crops. Furthermore, this analysis will include the gender component of learning to discern any differences (advantages or disadvantages) for women and youth.

Third, activities under the EHAR portfolio for the last couple years have developed and disseminated a range of tools (such as RSSSA) for the global humanitarian communities of practices and partners (example – gFSC). As this is the fourth year of S34D operation, we would evaluate the use-case values and adoption patterns of these tools by the humanitarian community, as well as global partners working in the emergency seed sector.

The **output** will be three evaluations – each report detailing the learnings and outcomes.

B2. Portfolio Learning Agenda

There are **three key portfolio learning areas** explored in FY22. These learning questions are defined in the S34D MEL Plan under the strategic learning agenda (See Questions – 4, 7, and 8 in the MEL Plan) approved by the USAID. **Table** 4 describes the activities in FY that will conform to the three selected learning questions and approach that will be used to explore answers to the questions.

Table 4. Learning Questions Linked with FY22 Activities and Approaches

Learning questions from approved MEL Plan	Learning areas in FY22	Link to Activity Numbers	How the activities contribute to the learning question(s)
Learning Area #4: ***What is the profile of seed security actions that leads to resilience?***	4.1 What are the features of seed system resilience? 4.2 How can seed markets be more resilient? 4.3 What is considered as best practice for different types of emergency seed interventions? 4.4 What are the positive and negative impacts of emergency seed interventions on the livelihoods of male and female farmers and on formal and informal seed systems?	1.3.1.1; 1.3.1.2; 1.3.2.1; 1.3.2.2; 2.2.2.1; 2.2.2.2; 2.2.3.1; 2.2.3.2	4.1 Features of seed system resilience will be determined using framework developed under 1.3.3.1. Activities 1.3.1.1, 1.3.1.2, 1.3.2.1, 1.3.2.2, 2.2.2.2, 2.2.3.1 and 2.2.3.2 will create an evidence-base of seed security actions that strengthen the resilience of seed systems, seed markets and farming communities. 4.2 A greater understanding of seed market resilience will be generated through Activities 1.3.1.1, 1.3.3.1, 2.2.2.2, 2.2.3.1 and 2.2.3.2. 4.3 Best practices for different types of emergency seed interventions will be synthesized from Activities 1.3.1.1, 1.3.1.2, 1.3.2.1, 1.3.2.2, 2.2.2.1, 2.2.2.2, and 2.2.3.2. 4.4 The impacts of emergency seed interventions will be summarized from Activities 1.3.1.1 and 1.3.1.2.
Learning Area #7: ***To drive inclusive policies and practices, what type of evidence and processes are needed to accelerate improvements in seed security?***	How can participatory impact assessment data provide the evidence needed to improve emergency seed interventions? How can seed quality assurance mechanism (Standard Seed Certification Protocol) be scaled? Do evidence-based facilitations and discussions change implementation policies in Ethiopia?	1.3.1.1 CCIR 1.2.3 CCIR 1.3.5, CCIR 1.3.6. CCIR 2.1.6, CCIR 2.2.1, CCIR 2.2.2	Activity 1.3.1.1 will collect primary impact assessment data and present this in ways that will promote improvements in emergency seed interventions. Other activities will be based largely on secondary data and more anecdotal evidence. Disaggregated data on costs of production, and sales information for the initial cohort of seed companies and seed producers will be collected as part of the evaluative learning. There are several evidence-based, and digitized information sets that S34D will develop and share with national stakeholders in Ethiopia. Those facilitations and discussions could potentially change a few operations on the ground and increase transparency. We will examine the actions that local, regional, federal governments take because of those activities.

Learning area #8*: Which mechanisms or interfaces enabled a greater number of women smallholder farmers to sell, access, and purchase quality seeds, and more frequently?*

USAID in the recent past recommended S34D pay greater attention to gender. Therefore, for the gender learning question, we would synthesize findings across relevant S34D activities that enable women and female/male youth seed entrepreneurs to expand and deliver services, extend their sales. We would also investigate how the activities have expanded women and female/male youth farmers' choices of crop-seed varieties as well as access to quality assured seeds for a range of crops. For the *first dimension – seed entrepreneurs*, the mapping of activities to the learning areas and the approach that S34D would take to cultivate those learnings are illustrated in **Table 5**. Similarly, **Table 6** shows mapping of activities to the *second dimension – women and youth farmers*, learning areas and approaches related to learnings.

Table 5. Women and Youth Seed Entrepreneurs: Mapping Activities to Learning Areas

Activity Number & Title	Learning Area	How	Partner(s)
1.1.1.12 Increase the availability of Seed Sector Finance in the DRC (RFS core).	What barriers do women-owned and/or female managed seed firms face in accessing funds from the Development Credit Authority Guarantee Facility? Did the gender and age bias training of FSP change perceptions and attitudes related to offering DCA loans to women and youth-owned/ managed seed firms?	Core questions included in consultation with seed firms and at the collaborative workshop Knowledge/ attitude survey before and after training	OI, CRS
2.1.3.2 Promoting Access to Locally Grown Legume Seed in Zambia – Use of Agricultural Development Agents (ADAs)	Is there a difference in seed yield between male and female youth ADAs? What gender, age-related and general barriers do women and female/ male youth (<30 years of age) ADAS face in being legume seed out growers (production and marketing)?	Collect and compare productivity data for ADAs and compare with estimated productivity rates. FGD with women and female/ male youth ADAs on barriers in producing and selling quality legume seed. Key Informant interviews with seed houses	CRS
2.2.2.2 Support the emergence of enhanced and resilient seed sectors in fragile states, e.g. in DRC, South Sudan, Haiti (core)	What lessons have we learned that support women and female/ male youth to be seed entrepreneurs within fragile states?	Summary of lessons from literature review and 3 fragile state case studies	CRS, OI, AE, ABC-PABRA
CCIR 1.2.3 Standard Seed Testing and Rollout in Kenya	Are there gender-specific and other bottlenecks that female-owned seed companies face with certified standard seed production and registration? What inhibits women and female/male youth standard seed outgrowers in producing seed at the estimated productivity level? What barriers do women and female/male youth standard seed outgrowers face in following the recommended agronomic practices by the variety developers? What specific support	Observation; pre-intervention and post-intervention KIIs with women and youth seed companies/ outgrowers and KEPHIS staff Finding from agronomic practices tracking assessment Hold FGD with women and female/male youth	AE, CRS

	do women and female/male youth standard seed producers need to increase productivity?	outgrowers on barriers in producing standard seed and how to address them	
CCIR 1.3.4 Strengthening the enabling environment for bean and potato seed production and marketing value chains in Guatemala (RFS core)	What gender, age-related and general barriers do women and female/ male youth potato and bean seed producers face in: ● implementing regulation related to seed production processes? ● having their seed certified? ● accessing basic seed from the private sector?	FGD with women, female/ male youth potato and seed producers, key informant interview with private sector basic seed producers and certification agents	CRS, Oxfam, Novib

Table 6. Women and Youth Farmers: Mapping of Activities to Learning Areas

Activity Number & Title	Learning areas	How	Partners
1.3.1.5 Assess differential effects of seed security cash transfers on men and women and intrahousehold dynamics (OFDA core).	What lessons have we learned to guide the design of cash-based seed security responses that support women and female youth farmers increased access to seed and input into how the cash from a cash-based seed security response is used What lessons have we learned to mitigate unintended negative consequences on women and female youth farmers resulting from cash-based seed security response?	Include additional gender-related questions in post-distribution monitoring Include additional gender-related questions into FGDs and KIIs with past project participants NEW - KII with implementation staff	CRS
1.3.2.2 Generate recommendations for integrating vegetable seeds into humanitarian responses (OFDA core)	What lessons have we learned that support women and female/male youth farmers in: ● accessing quality vegetable seed within emergency seed responses? ● benefitting from the access of vegetable seed received through an emergency seed response?	Summary of lessons pulled from documented case studies on emergency programs that incorporated vegetable seeds	CRS
1.3.2.3 Participatory Action Research into cash-based seed security responses (Guatemala and East Africa)	What lessons have we learned to guide the design of cash-based seed security responses that support women and female youth farmers increased access to seed and input into how the cash from a cash-based seed security response is used What lessons have we learned to mitigate unintended negative consequences on women and female youth farmers resulting from cash-based seed security response?	Include additional gender-related questions in post-distribution monitoring FGDs and KIIs with past project participants (men, women, male and female youth) New - Key informant interviews with implementation staff.	CRS

2.1.3.2 Promoting Access to Locally Grown Legume Seed in Zambia – Use of Agricultural Development Agents (ADAs)	What gender-sensitive approaches did ADA used to reach and benefit female (adult/ youth) farmers?	Individual interviews with ADAs. FGD with female farmers	CRS
2.2.2.2 Support the emergence of enhanced and resilient seed sectors in fragile states, e.g. in DRC, South Sudan, Haiti (core).	What lessons have we learned that support women and female/male youth farmers in accessing quality seed within fragile states?	Summary of lessons from literature review and 3 fragile state case studies	CRS, OI, AE, ABC-PABRA
2.2.3.1 Develop and test market-based emergency seed security interventions	What lessons have we learned to guide the design of cash-based seed security responses to support women and female youth farmers in providing input on or making decision over the use of the cash from a cash-based seed security response? What lessons have we learned to mitigate unintended negative consequences on women and female youth farmers resulting from cash-based seed security response?	Inclusion of gender-related content into the practice review template	CRS, OI, ABC-PABRA

Output - The three learning areas will produce 3 learning briefs – each not exceeding 10 – 15 pages.

B3. Global Community of Practice

To incubate a global seed system community of practice and foster global S-S learnings, S34D will explore and facilitate a novel OneCGIAR strategy that puts smallholders central (Building a Community-of-Practice) in collaboration with Oxfam Novib.

Smallholders are often viewed as “end users” or “beneficiaries” rather than as “co-creators” of innovations or “participants” in decision-making processes by international agencies. In the context of the OneCGIAR transformation process, this learning series will focus on approaches that would involve smallholder farmers as active participants in the breeding and seed production cycle rather than just as end-users. The objective is for global partners – especially CGIAR – to find novel ways to implement an approach that involves farmers in the entire breeding process, from setting goals to selecting materials to develop seed production initiatives.

Oxfam Novib and CRS will team up to co-organize a workshop series followed by one conference to investigate ways that include approaches and last-mile business models (in association with private sector partners) that put smallholder farmers at the center in breeding, quality seed production, and dissemination. This will leverage the ongoing work (in FY21) and experience the two INGOs bring from the fields. In addition, the partners will facilitate the development of road maps on how to take collaborative research material

to farms at scale. This will potentially have implications for future influential policy work. The workshop series will potentially address the following thematic areas of work:

- Participatory plant breeding (drawing from the recent series conducted by Oxfam Novib in 2020-21);
- Last-mile business models;
- Alliance building at the local level with farmer organizations, CSOs and local private sector initiatives (in alliance with NARS, OneCG and others), and;
- Ownership and benefit-sharing in participatory plant breeding.

Outputs: 3 joint virtual workshops (one in each quarter) on (1) involving farmers in the breeding process, (2) alliance building, (3) ownership, conditions for use, and benefit-sharing. 1 in-person conference (pending travel restrictions related to Covid19) to report our findings and forge a path forward.

C. Dissemination Plan

Forums and platforms leveraged for dissemination and sharing under S34D CLA approach are listed below (but not limited to):

- USAID Feed the Future Agrilinks (Webinars and Blogs)
- USAID Country Mission seed system working groups (at country level)
- USAID Feed the Future Innovation Labs (Legumes, Peanut, etc.)
- Seedsystem.org
- Global Food Security Cluster (gFSC)
- S34D website, and newsletter
- S34D CoP (Seed Policy & Regulations Learning) Platform.

S34D will ensure relevant USAID Country Missions are well informed about findings, and as such, all learnings and reports will be shared, and their feedback and comments incorporated into the refined learning agenda.

The detailed implementation plan for FY22 MEL activities is shown in **Table 7** below.

Table 7: Monitoring, Evaluation, and Learning Implementation Plan

Planned activities	Outputs	Q1	Q2	Q3	Q4
1. Establish needs for the three independent evaluations	Needs established	X			
2. Conduct independent evaluations	Independent evaluations conducted			X	X
3. Evaluation – Reports furnished and disseminated	3 reports disseminated				X
5. Establish needs and protocols for the three learning areas with leads and partners	Needs established	X			
5. Review and glean learnings for the three areas with leads and partners	Meetings conducted		X	X	X
6. Three learning briefs produced	Learning briefs disseminated				X

7. Establish protocol and needs for the global CoP with Oxfam Novib, CGIAR, BMGF, and USAID	Protocols established with global community	X			
8. Conduct virtual workshops. Each workshop will produce a workshop proceeding for dissemination purposes.	3 workshops conducted; proceedings disseminated		X	X	X
9. Final Conference for the Global CoP. Conference proceeding produced. One comprehensive white paper for dissemination purposes.	1 conference proceeding disseminated; 1 White paper shared				X
10. Monitoring outputs and outcome targets	Routine monitoring conducted		X		X
11. Create a portfolio with anecdotal stories for FY22. Small vignettes with messages.	At least 5 anecdotal stories shared			X	X

IV. Annexes

Annex A. Tier 1 Activities - Detailed Implementation Plan

Please find the Detailed Implementation Plan attached as a separate Excel file.

Activity Number	S34D Activity Description	Geography	Implementor(s) (lead first)	Output(s)	Quarter Implemente	Q1	Q2	Q3	Q4	Total FY22
	Goal: Improved functioning of the high-impact integrated seed systems					Plan	Plan	Plan	Plan	Plan
	IR 1.1 Constraints in formal seed systems identified and mitigated									
	Sub IR 1.1.3 Capacities of local seed actors strengthened									
1.1.3.1	Digital training of seed inspectors and samplers in Zambia (FY21) (RFS).	Zambia	CRS	SCCI will train 60 inspectors (16 female) in Zambia.	Q1-4	units final	pilot platform		platform online, final	1 platform
	IR 1.3 Strengthened capacity of emergency and humanitarian aid programs to respond effectively to acute and chronic stresses									
	Sub IR 1.3.1 Select emergency and humanitarian past actions assessed: focus on farmer evaluation, new varieties, and markets (local and formal)									
1.3.1.1	Participatory Impact Assessment (PIA) of Emergency Seed Interventions (FY21) (BHA).	Uganda and Mozambique	CRS	4 detailed PIA reports	Q2-3		2 PIA reports	2 PIA reports	1 synthesis report	4 reports. 1 synthesis
	Sub IR 1.3.2 Emergency and humanitarian responses that promote climate resilience, including food, income, cover and fodder crops are catalyzed									
1.3.2.2	Generate recommendations for integrating vegetable seeds into humanitarian responses (BHA).	TBD	CRS	Brief with best practice recommendations for integrating vegetable seed in humanitarian responses.	Q3-4			Data collection	Synthesis report	1 brief
1.3.2.3	Participatory action research into cash-based seed security responses, Guatemala & E. Africa (BHA).	Guatemala and East Africa	CRS	Synthesis report on cash-based seed security responses.	Q2-4		Guatemala PAR	East Africa PAR	Synthesis report	2 PAR reports. 1 synthesis report
	Sub IR 1.3.3 Tools and information systems to frame Shock Responsive Models developed									
1.3.3.1	Framework and response options for resilient seed systems (FY20) (BHA).	Global	CRS	A conceptual framework for resilient seed systems and a series of response options for resilience-building interventions in different contexts.	Q1-2	x	x			1 framework
1.3.3.5	Strengthen Capacity for Rapid Seed System Security Assessments (BHA)	Global	CRS	A training curriculum, and automated data analysis.	Q2-4		x	x	x	1 training curriculum, 1 data analysis
	IR 2.1 Strengthened interface and collaboration between formal and informal seed systems									
	Sub IR 2.1.1. Local seed network strategies (to interface, collaborate, and leverage) and local capacities are assessed									
2.1.1.4	Scoping business models to strengthen forage seed systems and production of cultivated forage in Zambia (RFS).	Zambia	CRS	A report with two or three economies driven inclusive business model propositions and policy implications validated with stakeholders and disseminated through a webinar.	Q2-4		x	x	x	two or three economies driven inclusive business model propositions
	Sub IR 2.1.2. Crop and seed platforms that link formal and informal seed systems are catalyzed and supported									
2.1.2.2	Strengthen capacity of forage (certified and quality declared assurance) seed production in Ethiopia (Mission).	Ethiopia	CRS, CIAT	One technical manual developed for seven7 forage species. At least 30 stakeholders trained through two 1.5-day long workshops. At least 7seven stakeholders trained will be women, and at least 10 stakeholders trained will be less than 30 years of age. At least 3 partnerships formed with stakeholders leading to MoUs.	Q2-4		x	x	x	1 manual, 30 people trained, 3 partnerships
2.1.2.3	Increase capacity of actors on animal feeding using cultivated forages in Ethiopia (Mission).	Ethiopia	CRS, CIAT	Developed and disseminated two manuals, two training programs, and two flyers (one each for dairy farmers and the other for feedlot farmers and quarantine station managers) on balanced feeding using cultivated forages.	Q2-4		x	x	x	2 manuals, 2 training programs, and 2 flyers
	Sub IR 2.1.3 Formal sector suppliers and NARs/breeders leveraged and linked									
2.1.3.2	Promote access to locally grown legume seed through use of agricultural development agents in Zambia (RFS)	Zambia	CRS	Farmer/ community-based seed production and grain marketing system developed (Volume of seed; Volume of grain; 40 ADAs trained; 2000 farmers reached and linked); Output	Q2-4		x	x	x	40 ADA trained, 2000 farmers reached, 1 brief 1
2.1.3.3	Strengthen the supply of forage early generation seed system (FEGS) in Ethiopia (Mission)	Ethiopia	CRS, CIAT	Partners identified, scoped, and three partnerships formed with a detailed understanding of roles, responsibilities, and handoffs.	Q1-4	x	x	x	x	3 partnerships
	Sub IR 2.1.4 Effects of market-based interventions on seed market operations and last mile delivery systems are assessed									
2.1.4.2	Pilot the cultivation of improved forages and densification of cultivated forages into pellets (sites: one in Afar and two in SNNPR) (Mission).	Ethiopia	CRS, CIAT	One report on the choice of improved forages and the sites for cultivation of improved forages (3 sites and corresponding forages for these sites identified for the pilot); one report on the warehouse sites to serve as feed reserves (at least 6 sites identified); one report on machine and components needed for densification and their cost estimates.	Q1-4	x	x	x	x	3 reports

	IR 2.2 Strengthened interface and collaboration between development and relief to resilient and market-based seed systems									
	Sub IR 2.2.2 Emergency and humanitarian responses that link relief to development, especially links to private sector and formal and biodiverse suppliers are developed and promoted									
2.2.2.2	Support the emergence of enhanced and resilient seed sectors in fragile states, e.g. in DRC, South Sudan, Haiti (FY21) (BHA).	Global	CRS	The proposed models based on the three global case studies and key stakeholder consultations.	Q1-3	x	1 South Sudan case study	Synthesis report		1 case study report 1 synthesis report
2.2.2.4	Develop guidance for emergency, resilience, and development seed interventions (BHA).	Global	CRS	a report on the types of seed exchange systems being used by humanitarian and development partners; Guidelines on Do's and Don'ts when investing in formal and informal seed systems targetted to small-scale farmers.	Q2-3		x	x		1 report 1 guideline
	Sub IR 2.2.3 Emergency and development seed programs to capture market opportunities are leveraged									
2.2.3.1	Develop and test market-based emergency seed security interventions (FY21) (BHA).	Global	CRS	1 guideline on cash transfers.	Q1-2	Cash transfer report completed	Dissemination			1 guideline
	CCIR-1 Improved effective policy implementation and regulatory formulation for pluralistic seed systems									
	CCIR 1.2 Practices to expand and liberalize seed quality possibilities are implemented and developed; market outlets and venues expanded; counterfeit seed issues addressed; free seed distribution restricted									
CCIR 1.2.7	Establish a variety registration system dedicated to farmers / pastoralists, separate from the regular variety ownership registration system in Ethiopia (Mission).	Ethiopia	CRS	A roadmap established to create the system, human and technical capacity, use-cases, and financial resources; approach to create the system identified.	Q1-4	x	x	x	x	1 roadmap
	CCIR 1.3 Linkages and coordination of seed development efforts through consolidation of data and evidence are strengthened									
CCIR 1.3.3	Facilitate and initiate implementation of seed policies and directives in Ethiopia (FY21) (Mission).	Ethiopia	CRS	At least three actions taken to address three policy issues and operationalize three policy priorities with facilitation and guidance.	Q1-4	x	x	x	x	3 actions
CCIR 1.3.5	Facilitate and conduct a stakeholder discussion session on seed reserves in Ethiopia (Mission).	Ethiopia	CRS	Proceeding report of the workshop and one policy dialogue facilitated.	Q1-4	x	x	x	x	1 workshop report; 1policy dialogue facilitates
CCIR 1.3.6	Seed systems and climate adaptation at the last mile, learnings and best practices: A global case study approach (Mission).	Ethiopia/Global	CRS	One report or peer reviewed publication with recommendations and best practices for climate adaptation outlined.	Q1-4	x	x	x	x	1 report
	CCIR-2 Established enhanced quality information flows for seed systems									
	CCIR 2.1 Institutional and public policy information is better digitized									
CCIR 2.1.6	Digitize seed systems regulatory roadmaps in Ethiopia (Mission).	Ethiopia	CRS	Six seed system road maps digitized, made interactive, and shared in the public domain. Uptake and utilization of these maps will be documented for further evaluation and sustainability.	Q1-4	x	x	x	x	6 roadmaps
	CCIR 2.2 Tools and technologies to capture quality information about seed supply in a geo-referenced manner are developed									
CCIR 2.2.1	Develop forage informatic dashboard using seed data and metrics and a policy brief on forage seed systems in Ethiopia (FY21)(Mission).	Ethiopia	CRS	Forage indicator dashboard digitized; MoA hosts and shares in the public domain.	Q1-4	x	x	x	x	1 digital dashboard
CCIR 2.2.2	Test out recommendations from FY20 technical roadmap, in select woredas (10-15) in Ethiopia (FY21) (Mission).	Ethiopia	CRS	Augmented methodology / framework at the systemic level to conduct seed demand / market forecasting in Ethiopia.	Q1-4	x	x	x	x	10 recommendations piloted
CCIR 2.2.5	Establish a seed production and marketing information network at the national and regional levels in Ethiopia (Mission).	Ethiopia	CRS	Process and approach to establish the network are identified and piloted.	Q1-4	x	x	x	x	Process and approach identified and piloted.

Annex B. Proposed Tier 2 Activities.

Activity Number	S34D Activities Descriptions	Lead Partner (supporting partners)	Outputs
0.1	Develop country profiles and framework for engagement in Kenya, Uganda (FY20) (RFS).	CRS, CIAT	Country profile for Kenya
1.1.1.12	Increase the Availability of Seed Sector Finance in the DRC (RFS).	OI	30 FSP Staff (at least 10 women, and at least 10 below 30 years of age) coached
1.2.2.4	Strengthening capacity of seed supply and grain market actors in Eastern DRC (RFS).	CIAT	30 traders (20 male, 10 female, 50% youth) trained
1.2.4.3	Conduct a cost-benefit analysis of the last mile seed delivery by motorbike riders (bodaboda) to smallholder farmers in Kenya (RFS)	CIAT	A cost-benefit analysis report
2.1.1.3	Scoping business models to strengthen forage seed systems and production of cultivated forage in Sudan (RFS).	CRS, CIAT	Economic driven inclusive business model propositions
2.1.1.5	Evaluate business models to strengthen forage cultivation and use as animal feed to boost livestock productivity in Cambodia (RFS)	CRS, CIAT	evaluated business models, incl. recommendation to pilot and scale the most economically viable model(s).
2.1.1.6	Scoping business models to strengthen forage seed systems and production of cultivated forages in Timor-Leste (RFS).	CRS, CIAT	two or three economics-driven inclusive business model propositions and policy implications
2.2.3.3	Pilot and test business options to support informal and emergency bean and cassava seed sector opportunities in the DRC (RFS) (BHA).	CIAT	Case study report of different investment options, and a policy brief
~~CCIR 1.2.3~~	~~Implement and pilot of Standard Seed Protocol in Kenya (FY20) (RFS).~~	~~AE~~	~~One policy brief, one guideline, one Standard Seed production training manual~~
CCIR 1.3.4	Strengthen the enabling environment for bean and potato seed production and marketing in Guatemala (RFS).	CRS, Oxfam Novib and ASOCUCH	100 seed producers with increased understanding of the seed regulation, 3 dialogues facilitated with local municipalities; One actionable policy road map
CCIR 2.2.4	Seed Systems Landscape Analysis in Sudan (RFS) (BHA).	CRS, CIAT	Assessment report
CCIR 2.2.6	Seed Systems Landscape Analysis in Timor-Leste (RFS) (BHA).	CRS, CIAT	An analysis of the interface between formal and informal seed systems and between development and emergency-to-relief seed interventions.

Tier 2 Activities - Detailed Implementation Plan

Activity Number	S34D Activity Description	Geography	Implementor(s) (lead first)	Output(s)	Quarter Implemented	Q1	Q2	Q3	Q4	Total FY22
	Goal: Improved functioning of the high-impact integrated seed systems					Plan	Plan	Plan	Plan	Plan
0.1	Develop country profiles and framework for engagement in Kenya, Uganda (FY20) (RFS).	Kenya	CRS, CIAT, AE	Kenya country seed sector profile	Q1-2		x	x	x	1 profile
	IR 1.1 Constraints in formal seed systems identified and mitigated									
	Sub IR 1.1.1 Operational efficiency of seed companies increased									
1.1.1.12	Increase the Availability of Seed Sector Finance in the DRC (RFS).	DRC	OI	20 FSP	Q1-4					
	IR 1.2 Strengthened capacity of informal seed systems to offer a broader range of affordable, improved quality seed									
	Sub IR 1.2.2 Capacity of local seed entrepreneurs and non-traditional seed actors strengthened									
1.2.2.4	Strengthening capacity of	DRC	CIAT	30 traders (20 male, 10 female, 50% youth) will be trained on various aspects of seed and grain quality management in North and South Kivu.	Q1-4		training manual	training	training	1 manual, 1 training
	Sub IR 1.2.3 Viable last mile delivery solutions through non-traditional partners and ICT strengthened									
1.2.4.3	grain market actors in Eastern DRC (RFS). Conduct Cost benefit analysis of the last mile seed delivery by motorbike riders (bodaboda) to smallholder farmers in Kenya (RFS).	Kenya	CIAT	A cost-benefit analysis report including profitability of last mile delivery of seeds and other inputs using motorbike riders a feasibility report of an ICT enable dlast mile delivery of seed and complementary inputs and a policy brief and public webinar on last mile delivery using motorbike riders in collaboration with seed companies, KALRO and KEPHIS.	Q1-4		Data collection, cleaning & analysis	Webinar, policy brief	Activity report	1 CBA. 1 policy brief
	IR 2.1 Strengthened interface and collaboration between formal and informal seed systems									
	Sub IR 2.1.1. Local seed network strategies (to interface, collaborate, and leverage) and local capacities are assessed									
2.1.1.3	Scoping business models to strengthen forage seed systems and production of cultivated forage in Sudan (RFS).	Sudan	CRS	A report with two or three economies driven inclusive business model propositions and policy implications validated with stakeholders and disseminated through a webinar.	Q2-4		x	x	x	two or three economies driven inclusive business model propositions
2.1.1.5	Evaluate business models to strengthen forage cultivation and use as animal feed to boost livestock productivity in Cambodia (RFS)	Cambodia	CRS, CIAT	evaluated business models, incl. recommendation to pilot and scale the most economically viable model(s).	Q3-4			x	x	
2.1.1.6	Scoping business models to strengthen forage seed systems and production of cultivated forages in Timor-Leste (RFS).	Timor-Leste	CRS, CIAT	two or three economies-driven inclusive business model propositions and policy implications	Q3-4			x	x	
2.2.3.3	Pilot and test business options to support informal and emergency bean and cassava seed sector opportunities in the DRC (RFS) (BHA).	DRC	CIAT	A case study report of different investment options including feasibility and ROI analysis, and a policy brief on accelerate daccess to quality seed in a fragile state using non-conventional seed channels.	Q1-4		Data collection, cleaning & analysis	Activity report	Policy brief	1 report. 1 policy brief
	CCIR-1 Improved effective policy implementation and regulatory formulation for pluralistic seed systems									
	CCIR 1.3 Linkages and coordination of seed development efforts through consolidation of data and evidence are strengthened									
CCIR 1.3.4	Strengthen the enabling environment for bean and potato value chains in Guatemala (RFS).	Guatemala	CRS, Oxfam Novib	At least 100 seed producers with increased understanding of the seed regulation (target will be to have at least 20% women and at least 20% less than 30 years of age); at least 3 dialogues facilitated with local municipalities; One actionable policy road map assessing, identifying, and proposing solutions to barriers in seed marketing (for both local producers and seed companies) for municipalities to implement.	Q1-4		x	x	x	100 seed producers, 3 dialogues, 1 roadmap
	CCIR-2 Established enhanced quality information flows for seed systems									
	CCIR 2.2 Tools and technologies to capture quality information about seed supply in a geo-referenced manner are developed									
CCIR 2.2.4	Seed Systems Landscape Analysis in Sudan (RFS)	Sudan	CRS, CIAT	An assessment report of the three seed systems, (i) formal, (ii) informal and (iii) humanitarian and an analysis of the current strengths and weaknesses within and at the interface between formal and informal seed systems and between development and emergency-to-relief seed dis interventions.	Q1-4		x	x	x	1 report
CCIR 2.2.6	Seed Systems Landscape Analysis in Timor-Leste (RFS) (BHA).	Timor-Leste	CRS, CIAT	An analysis of the interface between formal and informal seed systems and between development and emergency-to-relief seed interventions.	Q3-4		x	x	x	1 analysis report

Annex C. International Travel Plan

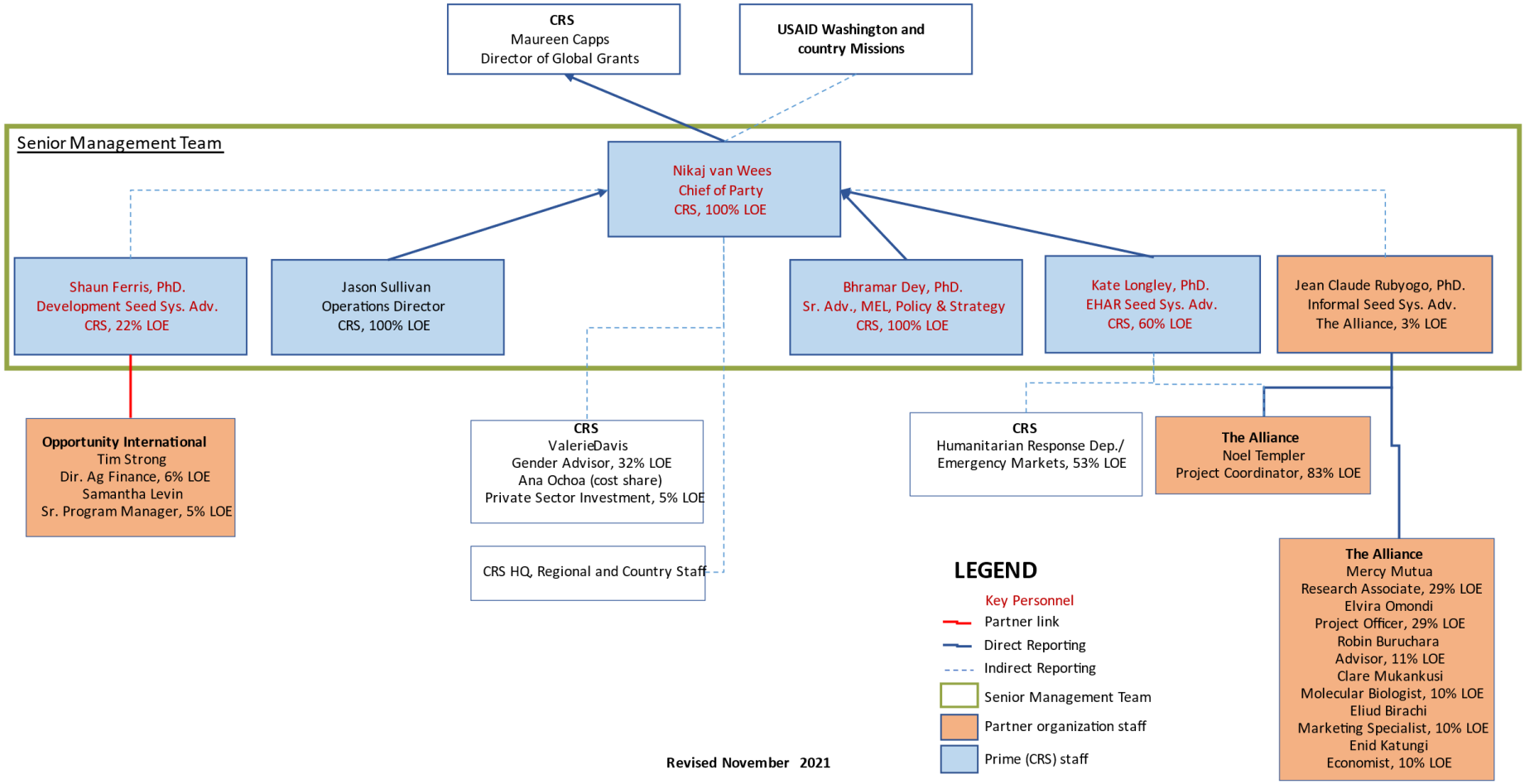
Tier 1 Travel plan

Activity number	Individuals Traveling	Origin	Destination	Number of					Unit Cost			Total Cost			In-country Cost					
				Trips	Days (for per diem)	Nights (for Hotel)	Total Days	Total Nights	Airfare Rate	Per Diem Rate	Hotel Rate	Total Airfare	Total Per Diem	Total Hotel	In-country Ground Transport	Taxi To/From Airport	Visas	Inoculations & medicines	Airport entrance / exit fees	Tier 1
1.3.1.1	Omeno Siji & Richard Muland	Ethiopia & Kenya	Uganda	2	9	9	18	18	$ 700	$ 38	$ 80	$ 1,400	$ 684	$ 1,440		$ 100				$ 3,624
1.3.1.1	Kate Longely (one) & Ed Walters (two)	US/UK	Uganda	2	11	9	22	18	$ 1,000	$ 38	$ 80	$ 2,000	$ 836	$ 1,440	$ 300	$ 160	$ 120			$ 4,856
1.3.2.3	Marcia Croft	US	East Africa	1	13	23	13	23	$ 1,800	$ 55	$ 110	$ 1,800	$ 715	$ 2,530	$ 150	$ 250	$ 100			$ 5,545
2.1.3.2	Bhramar Dey	East Africa	Zambia	1	5	5	5	5	$ 500	$ 55	$ 95	$ 500	$ 275	$ 475	$ 200	$ 100				$ 1,550
CCIR 1.3.6	Bhramar Dey	Seattle	Europe	1	7	6	7	6	$ 1,000	$ 60	$ 125	$ 1,000	$ 420	$ 750	$ 250	$ 250				$ 2,670
CCIR 2.2.2	TBD	US - Europe	Ethiopia	1	10	9	10	9	$ 1,500	$ 45	$ 120	$ 1,500	$ 450	$ 1,080	$ 250	$ 250				$ 3,530
2.1.1.4	Harinder Makhar	Europe	Zambia	1	10	9	10	9	$ 1,000	$ 55	$ 90	$ 1,000	$ 550	$ 810	$ 200	$ 165		$ 75		$ 2,800
2.1.2.2	TBD	Various	Ethiopia	8	15	14	120	112	$ 600	$ 45	$ 80	$ 4,800	$ 5,400	$ 8,960						$ 19,160
2.1.4.2	Bhramar Dey	USA	Ethiopia	1	15	14	15	14	$ 1,600	$ 45	$ 100	$ 1,600	$ 675	$ 1,400						$ 3,675
2.1.4.2	Harinder Makhar	Europe	Ethiopia	1	15	14	15	14	$ 750	$ 45	$ 100	$ 750	$ 675	$ 1,400						$ 2,825
2.1.4.2	CIAT/PABRA	Nairobi	Ethiopia	1	10	9	10	9	$ 600	$ 45	$ 100	$ 600	$ 450	$ 900						$ 1,950
CCIR 1.2.7	Bhramar Dey	USA	Ethiopia	1	15	14	15	14	$ 1,600	$ 45	$ 100	$ 1,600	$ 675	$ 1,400						$ 3,675
CCIR 2.1.6	TBD NML	US	Ethiopia	1	10	9	10	9	$ 1,500	$ 45	$ 100	$ 1,500	$ 450	$ 900	$ 50	$ 100				$ 3,000
CCIR.2.2.5	Bhramar Dey	USA	Ethiopia	1	15	14	15	14	$ 1,600	$ 45	$ 100	$ 1,600	$ 675	$ 1,400						$ 3,675
CCIR 2.2.5	TBD	TBD	Ethiopia	3	10	9	30	27	$ 600	$ 45	$ 100	$ 1,800	$ 1,350	$ 2,700						$ 5,850
Totals:				56	315	314	560	541				$ 60,510	$ 27,796	$52,545	$ 9,250	$ 4,919	$1,695	$ 875	$ -	$68,385

Tier 2 - Travel Plan

Activity number	Individuals Traveling	Tier 1 or 2	Origin	Destination	Number of					Unit Cost			Total Cost			In-country Cost					Tier 1	Tier 2
					Trips	Days (for per diem)	Nights (for Hotel)	Total Days	Total Nights	Airfare Rate	Per Diem Rate	Hotel Rate	Total Airfare	Total Per Diem	Total Hotel	In-country Ground Transport	Taxi To/From Airport	Visas	Inoculations & medicines	Airport entrance / exit fees		
1.1.1.12	Sakina Mandanda (OI)	Tier 2	Malawi	DRC	3	6	6	18	18	$ 1,400	$ 50	$ 175	$ 4,200	$ 900	$ 3,150	$ 1,500	$ 300		$ 400			$ 10,450
1.1.1.12	Shema Placide (OI)	Tier 2	Rwanda	DRC	3	6	6	18	18	$ 750	$ 50	$ 175	$ 2,250	$ 900	$ 3,150	$ 1,500	$ 300		$ 400			$ 8,500
1.3.1.1.	Omeno Siji & Richard Mulandi	Tier 2	Ethiopia & Kenya	Mozambique	2	9	9	18	18	$ 700	$ 47	$ 75	$ 1,400	$ 846	$ 1,350		$ 100	$ 100				$ 3,796
1.3.1.1	Kate Longly (one) & Ed Walters (two)	Tier 2	US/UK	Mozambique	2	10	9	20	18	$ 1,000	$ 47	$ 75	$ 2,000	$ 940	$ 1,350	$ 250	$ 144					$ 4,684
1.3.2.3	Marcia Croft	Tier 2	US	Guatemala	1	13	23	13	23	$ 1,800	$ 55	$ 110	$ 1,800	$ 715	$ 2,530	$ 150	$ 250	$ 100				$ 5,545
2.1.1.3	Harinder Makhar	Tier 2	Europe	Sudan	1	10	10	10	10	$ 750	$ 65	$ 95	$ 750	$ 650	$ 950	$ 250	$ 100	$ 100				$ 2,800
2.1.1.3	Bhramar Dey	Tier 2	Ethiopia	Sudan	1	10	10	10	10	$ 750	$ 65	$ 95	$ 750	$ 650	$ 950	$ 250	$ 100	$ 100				$ 2,800
CCIR 1.3.4	Oxfam Novib	Tier 2	Europe	Guatemala	1	10	9	10	9	$ 1,100	$ 50	$ 100	$ 1,100	$ 500	$ 900	$ 200	$ 200	$ 100				$ 3,000
2.1.1.5	Bhramar Dey/ Nik Van Wees	Tier 2	USA	Cambodia	2	7	6	14	12	$ 2,350	$ 45	$ 100	$ 4,700	$ 630	$ 1,200	$ 250	$ 400	$ 250				$ 7,430
2.1.1.5	Michael Peters (CIAT)	Tier 2	Nairobi	Cambodia	1	7	6	7	6	$ 1,500	$ 60	$ 100	$ 1,500	$ 420	$ 600	$ 250	$ 200	$ 125				$ 3,095
2.1.1.5	Harinder Makhar	Tier 2	Europe	Cambodia	1	7	6	7	6	$ 1,500	$ 45	$ 100	$ 1,500	$ 315	$ 600	$ 250	$ 200	$ 125				$ 2,990
2.1.1.6	Bhramar Dey & consultant	Tier 2	US/Europe	Timor Leste	3	10	8	30	24	$ 2,500	$ 50	$ 110	$ 7,500	$ 1,500	$ 2,640	$ 1,000	$ 600	$ 375				$ 13,615
2.2.3.3	CIAT/PABRA	Tier 2	Nairobi	DRC	3	5	5	15	15	$ 600	$ 80	$ 70	$ 1,800	$ 1,200	$ 1,050	$ 1,250	$ 200					$ 5,500
CCIR 2.2.4	Shaun Ferris	Tier 2	Kenya	Sudan	2	10	10	20	20	$ 750	$ 65	$ 95	$ 1,500	$ 1,300	$ 1,900		$ 200	$ 100				$ 5,000
CCIR 2.2.4	TBD	Tier 2	Kenya	Sudan	1	10	10	10	10	$ 750	$ 65	$ 85	$ 750	$ 650	$ 850	$ 150	$ 100					$ 2,500
CCIR 2.2.4	CIAT/PABRA	Tier 2	Nairobi	Sudan	1	5	5	5	5	$ 1,000	$ 80	$ 70	$ 1,000	$ 400	$ 350	$ 600	$ 150					$ 2,500
CCIR 2.2.6	TBD	Tier 2	TBD	Timor Leste	2	10	9	20	18	$ 1,280	$ 50	$ 80	$ 2,560	$ 1,000	$ 1,440							$ 5,000
Totals:					**56**	**315**	**314**	**560**	**541**				**$ 60,510**	**$ 27,796**	**$52,545**	**$ 9,250**	**$ 4,919**	**$1,695**	**$ 875**	**$ -**	**$68,385**	**$84,205**

Annex D. S34D FY22 Organogram



Annex E. Tier 2 Activity Narratives.

Continue from FY20 *- Activity 0.1: Develop country profiles and framework for engagement in Kenya, Uganda (FY20) (RFS)*

Justification: this activity was planned to be implemented in FY20 and FY21, but due to an initial focus on responses from the Uganda Mission and stakeholders, only the Uganda seed profile was completed in FY21, and the Kenya seed profile is planned to be completed for FY22. The seed sector profile activity is a means for S34D to undertake a basic assessment of the structure and performance of the formal, informal, and humanitarian seed systems in Kenya. The learning from this work will build on the results from the Uganda seed sector profile. This analysis will not only review the performance of the three seed systems individually, but also to provide insights into how these systems currently work together and aim to identify ways in which changes could be made within the individual systems and to the interfaces of these systems to improve male and female farmer access to quality seed. Key stakeholders are KALRO, KEPHIS, USAID Mission staff, development and humanitarian projects including MALFC.

Description: S34D will collaborate with the MALFC, KEPHIS, humanitarian agencies, CGIAR and private sector to conduct a landscape analysis of the formal, informal, and emergency seed system in Kenya to determine the performance of these different seed systems. The study will explore the channels that enable farmers of various economic segments, gender and age groups to access seed and based on this analysis provide implementation possibilities to improve the functioning of the individual seed systems and how they interact and engage between the systems. This work will provide trend data on the volumes of seed moving through the various seed systems with insights into the challenges and opportunities and investment recommendations to improve male and female farmer access to quality seed.

The **Outputs** of this activity will be an assessment report of the three seed systems, (i) formal, (ii) informal and (iii) humanitarian in Kenya and an analysis of the current strengths and weaknesses within and at the interface between formal and informal seed systems and between development and emergency-to-relief seed interventions.

IR 1.1 Constraints in formal seed systems identified and mitigated

Sub IR 1.1.1 Operational efficiency of seed companies increased

New - *Activity 1.1.1.12: Increase the availability of Seed Sector Finance in the DRC (RFS).*

Justification: Across numerous countries, access to finance is a limiting factor for seed firms and one of the noted constraints in accessing commercial lending, is the limited availability of collateral at the firm level to meet regulatory requirements. This is particularly pertinent to women and youth owned firms operating within the seed sector, as collateral replacement mechanisms have been documented as being particularly effective in addressing barriers to finance for these underserved clients across multiple markets. This activity will have localized impact to leverage the current Development Credit Authority (DCA) Guarantee Facilities to expand seed actor financing in Bukavu and Goma in Northeastern DRC and updated Technical Assistance support content for Banyan Global. However, global impact is forecasted as a template for seed specific DCA utilization is piloted for the broader United States International Development Finance Corporation (DFC) portfolio.

Previous activities[15] demonstrated a significant limitation in access to finance across the entire seed value chain. Interviews with stakeholders and FSPs indicated that over-leveraged firms did not meet necessary requirements for multi-year financing and that last mile distributors had a limited collateral base for meeting working capital lending requirements. Successful deployment of both DCA guarantees and other government/private PCG vehicles have demonstrated the viability of utilizing these risk reduction tools to bypass traditional hurdles for expanding sector specific financing, particularly for women and youth.

Building on the broader USG partnership between USAID and U.S. DFC, this investment would further promote the shared impact of two partner agencies. With a USAID investment into Seed Actor Specific FSP training, a high degree of leverage is expected as DFC's investment into the DCA for Equity Bank and FINCA further unlocks private sector capital for the sector. Particularly noting the current humanitarian crises in the region with the eruption of Mt. Nyiragongo and the ongoing evacuation of Goma, increased accessibility of financial services is critical to restart commercial agricultural activities in the area.

Key stakeholders in this work include the U.S. DFC and qualifying local Congolese FSPs, practically targeting credit, risk, product and sales staff. Proposed Co-design with current USAID D.R. Congo-funded DCA TA provider, Banyan Global. Pilot outcomes and tracked increase in DCA utilization will also be reported to the USAID D.R. Congo Economic Growth Office.

Description: This work is being undertaken in coordination with U.S. DFC to develop and deploy specialized seed sector financing training to local financial institutions participating in the Development Credit Authority Guarantee Facility in D.R. Congo. As the S34D access to finance consortium partner, Opportunity International will lead and coordinate with other Implementing Partners that are active in the D.R. Congo to achieve the outputs of this activity. The activity will begin with rapid, localized discussions with 1) USAID D.R. Congo, DCA representative, and DCA TA Provider Banyan Global, 2) rapid regulatory constraint assessment with Congolese FSPs (including one institution where OI owns 20% equity) and 3) consultation with seed firms (ensuring that at least 40% of firms are women-owned and/or with female managers). The rapid assessment will be conducted with both the DRC mission, seed firms, and FSPs to further fine tune against specific needs, including understanding the root causes why seed companies become over-leveraged. These discussions will develop the framework for FSP DCA utilization for the seed sector coaching materials, pulling from OI's work in Southern and Eastern African markets to provide broad support for DCA utilization. A gender bias training will be part of this coaching material. OI will then assist Banyan Global in refresher trainings for 30 DCA participating FSPs in coaching services. Following the coaching, OI will continue to track new lending into the seed sector to report on any increased leverage against the DCA and conclude the activity with dissemination amongst FSPs, USAID, U.S. DFC, and the Central Bank of D.R. Congo. OI anticipates a high likelihood of finalizing this activity within FY22, however is aware of the current activity of onboarding new DCA Guarantee holders that is ongoing with USAID D.R. Congo which may limit the start time of activities.

The **Outputs** of this activity are 1) a collaborative workshop with seed firms, FSPs, DFC, and USAID to document limitations in Seed Sector Financing in North-Eastern D.R. Congo, 2) FSP TA Coaching Materials, localized for N.E. DRC, 3) 30 FSP Staff coached, and 4) Dissemination of Activity Learning via a report and accompanying one-pager to be shared widely on existing platforms, e.g., DFC monthly mailer.

[15] 1.1.1.5 FSP Inventory Corridor Scan, 1.2.1.4 Seed Provider Financial Bottleneck Report, 1.1.1.9 Niger FSP Inventory Scan, 1.3.4.4 EHAR Seed Financing White Paper.

Sub IR 1.2.2 Capacity of local seed entrepreneurs and non-traditional seed actors strengthened

New - Activity 1.2.2.4: Strengthening capacity of seed supply and grain market actors in Eastern DRC (RFS).

Justification: Eastern DRC region has a high potential for multiple crop production (e.g., beans and cassava) despite the emergency challenges it faces. Crop production and productivity rely mostly on informal seed systems to deliver seed of diverse crops and varieties. An initial FY21 DRC study (forthcoming Birachi et al, 2021) showed several issues including (i) men were mostly engaged in bean seed and cassava planting material businesses/ enterprises including certified seed; (ii) NGOs were the major drivers of formal cassava cuttings and this hardly built sustainable demand-driven seed systems. (iii) women traders received lower prices than men; (iv) there was inadequate or non-existent link between INERA (source of improved varieties) and traders who sell 'seed'; (v) there was inadequate variety, agronomic and financial knowledge and information skills among traders engaged in seed business including handling and marketing 'seed'; (vi) inadequate infrastructural capacity to store and market seed; (vii) and there is limited participation of women and youth in the informal 'seed' trade and value chain due to lack of or inadequate skills and initial investments. The Alliance will address the capacity challenges of market-led quality seed production and processing, financial management and seed marketing.in this activity, as well as overall seed and grain quality management. Considering the above–mentioned challenges faced by women, men and youth seed traders, a gender training session will be added to unblock barriers they face in delivering their services as women, youth and men. This capacity strengthening effort will be based on two identified seed supply and planting material business models: Model 1: INERA- local seed entrepreneurs – informal traders[16] and Model 2: INERA-seed companies – decentralized seed shops & informal seed/planting material traders[17].

Description: This activity in North and South Kivu aims at seed system institutional strengthening to achieve several outcomes including increased knowledge and skills in seed business and efficiency of women and youth seed entrepreneurs. The activity will develop and test user-friendly training materials (tools) to enhance bean and cassava seed quality and marketing in informal seed systems in Eastern DRC. The tools will include gender-responsive and market-led quality seed production and processing, financial management, seed marketing and seed and grain quality management. The targeted partners

[16] Building on traders' specific variety and seed demand coupled with related information and knowledge, INERA and the Alliance will provide technical support to the informal traders and local seed and planting material producers identified during the FY21 concluded study: The support includes:

1. INERA and Alliance in collaboration with traders and seed and planting material producers will use business case tools to prioritize varieties.
2. Initially, INERA and Alliance will bring together local seed, grain and planting material traders and local farmer seed producers.
3. Local farmer seed producers will supply quality seed of farmer demanded varieties to the grains/seed traders to farming targeted communities.
4. The traders and their seed/planting material growers will be trained on quality seed production and management.

[17] Some private seed companies are in their early stage of development of suppling legumes seed. Their bean seed supply is still very limited and non-existent for cassava, but the potential to grow are present. Some of the challenges include variety prioritization, access to EGS and technical backstopping including: INERA and Alliance will 1) in collaboration with seed companies use business case tools to prioritize varieties, 2) will train the seed companies on seed business including quality seed production and marketing and 3) will in collaboration seed companies develop seed market intelligence and farmers' feedback systems to improve on seed marketing.

include farmers, large traders (e.g., Ets Baraka, Association Jeune Centre Developpement Kivu) and seed multiplication groups (e.g. ADEA, UMAMABU). The CRS' Impact Investment, Gender and Private Sector Engagement teams (through cost share) will review business related training materials (tools) to ensure the main business and gender challenges are addressed. They will assist in the capacity strengthening process either directly or through a local service provider for producers and traders to enhance their seed business. This activity will be completed in Q3.

The **outputs** of this activity are three user-friendly seed business training manuals (hard and e-copies) for non-traditional seed actors on quality seed supplies. Using the seed business training manual, 30 traders (20 male, 10 female, 30% youth) will be trained on various aspects of seed and grain quality management in North and South Kivu.

Sub IR 1.2.4 Last mile delivery solutions through non-traditional partners and ICT strengthened

New - *Activity 1.2.4.3: Conduct a cost-benefit analysis of the last-mile seed delivery by motorbike riders (bodaboda) to smallholder farmers in Kenya (RFS).*

Justification: In FY20 and FY21, the Alliance, PABRA and CRS have collaborated in piloting the point of sale (PoS) application in the niche market business model for micronutrient-rich beans in the high and low rainfall geographies in Kenya. After two seasons, five companies are now licensed to commercialize high iron beans. The pilot included determining the potential role of non-traditional actors (motorbike riders (*bodaboda*) in the last mile delivery of seed to the smallholder farmers. During these two seasons, S34D found evidence that not only the use of *bodaboda* enhances access, reach and use of improved, market demanded varieties, but also that not all farmers were aware that *bodaboda* riders are allowed to transport and deliver seed. S34D also identified a gap to validating the niche model, namely the cost-benefit analysis (CBA) of the use of *bodaboda*. This observation comes at an appropriate time when the regulatory body, KEPHIS, is open to explore jointly with partners, Uber-like delivery models with an assurance on seed quality safeguards. The CBA will include profitability analysis and establishment of concurrent social benefits e.g., timely access to quality seed by remote women farmers and attendant nutritional and health benefits to their families and benefits to the rider (who are predominantly youths), farmer, agro-dealer and seed company from a business perspective.

Description: In this activity the Alliance-PABRA will conduct a cost benefit analysis which will include profitability analysis and establishment of concurrent social benefits e.g., timely access to quality seed by remote women farmers, reduced time commitment in accessing seed, and attendant nutritional and health benefits to their families and, benefits to the rider (who are predominantly youths), farmer, agro-dealer and seed company from a business perspective. Participation and increase of youth motorbike riders, will contribute to employment opportunity and incomes for the youth. In its CBA, the activity will determine how efficient the *bodaboda* riders can reach women farmers in remote areas, and the effect this reach has in reducing workloads of the women especially regarding time spent to get seed through regular seed delivery models. It brings in complementary technologies and what can improve return on investment (RoI) for both seed and input businesses while strengthening the capacity of smallholder farmers (including women, youth and PwDs) to have resilient and better livelihoods. Additionally, the CBA report will detail information on Financial Internal Rate of Return (FIRR) and an overall Economic Internal Rate of Return (EIRR) as a way to negate paucity on financial and economic analysis of potential investments. Key stakeholders include the private sector (seed companies, agro-input companies, agro-dealers, and motorbike riders), regulators (plant and seed

health), researchers (KALRO), development partners, and smallholder farmers including women and youth. While the activity is designed in the formal and semi-formal systems, it will endeavor to highlight regulations can be critical elements in driving the increase in seed adoption. The activity will also inform policy reviews about last mile delivery of seed using motorbike riders and its impact on social inclusion. It proposes to work in other counties where formal and semi-formal (and emergency) seed systems co-exist. These scenarios will present findings on access to complementary inputs and technologies to the seed, as well as how to improve i) returns on investments for both seed and input businesses and ii) smallholder farmers' capacity to have better livelihoods. The timeline for this activity is Q1-Q4

The **outputs** of this activity are a cost-benefit analysis report, including profitability (FIRR and overall EIRR) of last mile delivery of seeds using motorbike riders (*boda boda*) for an inclusive seed delivery business model and a policy brief and public webinar on last mile delivery using motorbike riders in collaboration with seed companies, KALRO and KEPHIS.

Sub IR 2.1.1. Local seed network strategies (to interface, collaborate, and leverage) and local capacities are assessed.

New - *Activity 2.1.1.3: Scoping business models to strengthen forage seed systems and production of cultivated forages in Sudan (RFS).*

Justification: Livestock employs 40% of the population in Sudan, contributes to export, income, and nutrition. Pastoralists, agro-pastoralists and sedentary farmers own and manage approximately 90% of the Sudan's livestock. The rest that does not fall into the foregoing categories are mainly in the industrial systems located near Khartoum and include dairy farms, poultry and egg production units. The production of animal source foods through the intensive system does not satisfy the local market. Sudan imports a considerable amount of milk powder to meet the milk requirement of its population, mainly in the urban areas. In a recent study S34D conducted in Ethiopia for the Ethiopia Mission[18], results show the cost per nutrient for cultivated forages is lowest, compared to alternative feeds – for meeting the demand in dairy, fattening, and quarantine sectors. This proposed activity will scope the role of cultivated forages to meet the annual demand for dairy, and fattening sectors in Sudan, while also analysing approaches to strengthen and link the forage seed systems. Without a viable and sustainable forage seed system, production of cultivated forages is not possible. Use of cultivated forage-based diet for fattening is negligible. Overall lack of availability of green forages of good quality compels commercial farmers to use the concentrate feed which is expensive. In the intensive and semi-intensive dairy and fattening systems animals are fed on pasture in the morning (30–40%) and supplemented with crop residues, concentrated feed and agriculture by-products for 60–70% of their ration. The availability of pastures is decreasing due to the expanding cereal crop cultivation. Concentrate feeds are expensive and their use increases the feeding cost. During the dry periods the scarcity of feed increases, which further enhances the feeding cost.

Description: In collaboration with the Rangeland and Forage Directorate in the Ministry of Animal Resources, Agriculture Research Corporation (ARC) and Arab Sudanese Seed Company (ASSCO), S34D-CRS will work with the CIAT Forage team and international and local consultants to conduct a scoping study to evaluate the potential costs, benefits and returns on investments from increased use of cultivated forages to meet livestock sector's needs in Sudan. The goal is to provide business propositions and models driven by data and economics. These business models would reduce cyclical fluctuations of

[18] Dey et al. Forage Seed Systems and Feed Reserves: Business Propositions, Case for Ethiopia. 2021

high-quality feed supply in Sudan and provide access to forage-based feed to livestock keepers and commercial entities. The work will provide an investment footprint to bridge gaps between crops and livestock subsectors, identify in-country partners and collaborators, and hone in on business models for implementation that take into consideration gender dynamics. The activity will also include policy implications and recommendations for further facilitation with national players.
The **output** of this activity is one report with two or three economics driven inclusive business model propositions and policy implications (particularly for the USAID's ZoI in Sudan) validated with stakeholders and disseminated through a webinar. The models would explore climate resilient pastures and climate-smart seed varieties of improved forages.

Activity 2.1.1.5: Evaluate business models to strengthen forage cultivation and use as animal feed to boost livestock productivity, sustainability and resilience in Cambodia (RFS).

This is a Tier 2 activity, and the narrative can be found in Annex E.
Justification: The most common breed of cattle is "yellow cattle" while improved breeds such as Haryana and Brahman (both from India) are rising in numbers in recent years as the importance of livestock products and the demand for milk products has seen a sharp increase due to rapid urbanization. Currently, 78% of milk is imported in Cambodia (dried skimmed milk powder, condensed milk, whole dried milk). Furthermore, there is increased demand for livestock (cattle) and shift in dietary preferences in the region from Thailand and Vietnam. This implies a big domestic and export market for Cambodia. The number of commercial dairy farms in the country has seen new entrants[19] in recent years. However, access to feed during wet season in lowlands and dry season in upland farms is a major challenge. Feed is dependent of rice production (rice byproducts – rice straw, broken rice, rice bran; crop residues) which is high in fiber, but poor in protein content and digestibility leading to unbalanced diets and low animal productivity. Commercial feed and concentrates are expensive, largely manufactured for poultry production. Thus, poor animal nutrition is a limiting factor of Cambodia's livestock market, that could potentially be resolved by using cultivated forages.
Study conducted by S34D[20] in Ethiopia and experiences from India and Thailand show that quality of forage in terms of protein and energy could be enhanced 100% and yield by 40-60% per unit land area by using quality seeds and good agronomic practices. Furthermore, our Ethiopian study showed that the replacement of the concentrate with the cultivated forage-based densified diets could decrease enteric methane emission by up to 45%, land requirement by 30-40% and the cost of nutrient supply (protein and energy) by 300-500%. Forages are important not only as feed, but also play an important role in maintaining the natural assets in marginal areas (arid and semi-arid) through soil stabilization, preventing soil erosion, and together with food-feed legumes contribute to soil fertility through microbial nitrogen fixation, soil cover and provision of organic matter. In addition, improved forages could make systems more resilient in adapting to vulnerable climates often combining some level of waterlogging tolerance to forages adapted to dry environments and some level of drought tolerance to forages adapted to more wet environments. Moreover, well managed forages can contribute to climate change mitigation through a) improving emissions intensities i.e., having higher output of livestock products per unit GHG emission, b) have genetic characteristics reducing emissions such as tannins

[19] https://www.b2b-cambodia.com/news/new-cambodian-dairy-farm-enters-production/

[20] Dey et. al. Realizing economic and environmental gains from cultivated forages and feed reserves in Ethiopia. 2021 (Forthcoming)

reducing methane emissions or capitalizing on biological nitrification inhibition and/or c) sparing land through higher carrying capacities.

Description: This activity proposes to conduct an assessment to validate, refine, and evaluate key business models to serve as a tool / investment plan for national stakeholders and implementing partners to prototype and implement on the ground. These models (which are hypotheses at the moment) would aim at building stronger interface between crop and livestock sub-sectors while strengthening the market linkages between communities and private sector entities – using cultivated forages and densification technology (as feed preservation techniques) to improve livestock feed and forage-based seed system in Cambodia. For each of the models that follow, the assessment would conduct cost-benefit economic analyses, characterize the forage formal and informal seed systems, evaluate partners and capacities on the ground, conduct agro-ecological suitability analyses to help determine forage suitability across different regions, define temporal and spatial niches to maximize systems efficiency, assess negative and positive environmental effects, provide uncertainty and risk analyses and determine ways to strengthen linkages with the private sector to ensure long-term sustainability.
All assessments will include stakeholder/expert consultations to capitalize on past experiences and add value, defining options responding to specific agro-ecological and socio-economic niches.

The four models are:

Model 1: Use of dual / multipurpose / cover crops in rice and maize production

Model 2: Cultivation of forages in uplands / feed densification

Model 3: Prototype a "Thailand model"

Model 4: Cover crops in rubber plantations.

Output: A report of publishable quality with the business models evaluated, including recommendation to pilot and scale the most economically viable model(s). The findings will be disseminated both in-person and through a webinar.

New Activity 2.1.1.6 Scoping business models to strengthen forage seed systems and production of cultivated forages in Timor-Leste (RFS).

Justification: Livestock is a critical industry for the Government of Timor-Leste (GoTL)[21]. To contribute to the GoTL Strategic Development Plan's[22] (SDP) goal of food self-sufficiency by 2030, the GoTL will develop and promote livestock feeding systems. In the National Adaptation Programme of Action (NAPA) on Climate Change[23], GoTL is also prioritizing the promotion of sustainable and balanced food for livestock production as an adaptation measure to climate change. In the National Biodiversity Strategy and Action Plan [24] (NBSAP), the government identified strategic actions; one of them is to establish demonstration plot for fodder.

[21] Timor-Leste Strategic Development Plan 2011 – 2030. Version submitted to the national parliament.
[22] Timor-Leste Strategic Development Plan 2011 – 2030. Version submitted to the national parliament.
[23] National Adaptation Programme of Action (NAPA) on Climate Change 2010
[24] The National Biodiversity Strategy and Action Plan of Timor-Leste (2011 – 2020), Revised Edition 2015

Feed is derived from within the household systems in Timor-Leste through grazing of crop residues and forages on-farm or nearby areas, with few external suppliers of concentrate or mixed feeds and minerals (except salt). Most cattle producers in Timor-Leste use extensive grazing systems. With low inputs (feed, labor, capital), outputs (live weight production) and performance indicators such as calving rates and turnoff rates are low and mortality rates are high[25]. The low Live Weight Production Ratio (LWPR) is due largely to low quantity and quality of feed. In general feed is used for maintenance rather than production. There is a high calf mortality due to poor nutrition of cows, and insufficient milk production to keep the calf alive. There is a high demand for beef from urban areas and this demand provides opportunities for farmers to sell beef cattle to these markets. However, the annual pasture production is 100,000 tonnes and the minimum pasture production required to achieve a low level of animal production is 500,000 tonnes. Because local production and use of good quality forage seeds and planting material is non-existent, there is a lack of available quality forages. The forages that are grown are of poor quality. Most forage seeds are imported and traded in Timor-Leste. Use of cultivated forage-based diet for fattening is negligible. Overall lack of availability of forages of good quality compels commercial farmers to use the concentrate feeds, which are expensive, and their use increases the feeding cost. During the dry periods the scarcity of feed increases, which further enhances the feeding cost and decreases livestock productivity as well as production. ACIAR research identified high productivity potential through improved feed and cattle management systems and support for more progressive farmers, including in the fattening sector[26].

In a recent study S34D conducted in Ethiopia for the Ethiopia Mission[27], results show the cost per nutrient for cultivated forages is lowest, compared to alternative feeds – for meeting the demand in dairy, fattening, and quarantine sectors. This proposed activity in Timor-Leste will scope the role of cultivated forages to meet the annual demand for dairy and fattening sectors in Timor-Leste, while also analyzing approaches to strengthen and link the forage seed systems. Without a viable and sustainable forage seed system, production of quality cultivated forages is not possible.

Description: In collaboration with the Ministry of Agriculture and Fisheries (MAF) and other national partners e.g., ACIAR, UNTL and RAEBIA, S34D will conduct a scoping study to evaluate the potential costs, benefits and returns on investments from increased use of cultivated forages to meet livestock sector's needs in Timor-Leste. S34D will inform USAID Timor-Leste at the stage of the first consultations with whom they will work within the MAF. The work will evaluate / validate the proposed mid- to long-term propositions, identify in-country partners and collaborators, and hone-in on business models for implementation. Potential models might be 1. *multi-purpose forage crop*, 2. *forage cultivation in the mid-term, feed densification in the mid to long-term,* and 3. *forages as a cash crop in the mid to long term*. The activity will also include policy implications and recommendations for further facilitation with national players.

Outputs: The output of this activity is one report with two or three economics-driven inclusive business model propositions and policy implications (particularly for the USAID's ZoI in Timor-Leste), validated with stakeholders and disseminated through a webinar. The models would explore climate-resilient pastures and climate-smart seed varieties of improved forages. Additional outreach to the ministries, universities, and extension services in Timor-Leste will be done in consultation with USAID Timor-Leste.

[25] ACIAR Project LPS-2009-036 Enhancing smallholder beef production in Timor Leste - Report for Markets and Policy component - Sub-sector analysis of the Timor-Leste Beef Industry, 2015

[26] ACIAR Project LPS-2009-036 Enhancing smallholder beef production in Timor Leste - Report for Markets and Policy component - Sub-sector analysis of the Timor-Leste Beef Industry, 2015

[27] Dey et al. Forage Seed Systems and Feed Reserves: Business Propositions, Case for Ethiopia. 2021

Sub IR 2.2.3 Emergency and development seed programs to capture market opportunities are leveraged.

New - *activity 2.2.3.3 Pilot and test business options to support informal and emergency bean and cassava seed sector opportunities in the DRC (RFS and BHA)*

Justification: The assessment from FY21 under Activity 2.2.3.2 in the DRC (forthcoming Birachi et al, 2021) showed several issues including (i) men were mostly engaged in bean seed and cassava planting material businesses/ enterprises including certified seed; (ii) NGOs were the major drivers of formal cassava cuttings and this hardly built sustainable demand-driven seed systems. (iii) women traders received lower prices than men; (iv) there was inadequate or non-existent link between INERA (source of improved varieties) and traders who sell 'seed'; (v) there was inadequate variety, agronomic and financial knowledge and information skills among traders engaged in seed business including handling and marketing 'seed'; (vi) inadequate infrastructural capacity to store and market seed; (vii) and there is limited participation of women and youth in the informal 'seed' trade and value chain due to lack of or inadequate skills and initial investments. Because new business approaches are required to improve the informal seed sector, enable greater investment in the seed value chain and strengthen its linkages with INERA to source quality EGS of farmer and market demanded improved varieties, the study recommended inclusive investment options: a) Model 1: INERA- local seed entrepreneurs - informal traders b) Model 2: INERA-seed companies –decentralized seed shops and informal seed/planting material traders. These options provide insights on how seed producers and traders can enhance their seed business in a fragile state, typically associated with multiple challenges. Sustaining the seed supply of market-demanded varieties to seed producers, farmers and traders will ensure adequate quantities of bean and cassava seed.

Description: This activity will pilot two investment options: Model 1 - INERA- local seed entrepreneurs - informal traders and Model 2 - INERA-seed companies –decentralized seed shops and informal seed/planting material traders. The activity will assess the appropriateness of business models in relation to (1) providing adequate information to allow farmers to make informed variety choices, (2) making business sense (feasible and ROI), (3) being inclusive and (4) delivering quality seed of farmer and market demanded varieties to the farmers. In collaboration with financial service providers, including Opportunity International (OI), and CRS Impact Investment team, the pilot and roll out of an inclusive business and investment option will support informal and emergency seed sector opportunities in Eastern DRC for bean and cassava. The pilot results will show the strengths and weaknesses of each of the investment options. This will allow for targeted investment to be made later to scale the business options to build the market system and capacities of stakeholders in the seed sector for a more stable and resilient community. Five major seed producers and informal traders in each province will be supported to pilot business options around few market-demanded bean and cassava varieties. The documented lessons and generated data will be made available for use by both business and humanitarian actors in addressing seed supply issues in the two provinces and other relevant areas. The CRS' Impact Investment and Private Sector Engagement team (through cost share) will review the investment options and provide technical assistance to the business pilot to ensure producers and traders enhance their seed businesses and inclusivity. This activity will disseminate its findings through a webinar. This activity will be completed in Q3.

The **outputs** of this activity are a case study report of different investment options that include feasible analysis and ROI analysis, and a policy brief on accelerated access to quality seed in a fragile state using non-conventional seed channels.

CCIR 1.3 Linkages and coordination of seed development efforts through consolidation of data and evidence are strengthened

New - *Activity CCIR 1.3.4: Strengthen the enabling environment for bean and potato value chains in Guatemala. (RFS).*

Justification: Agricultural production is a major sector in the Cuchumatanes region, which is rich in original crop diversity, for maize, beans and potatoes. Seed systems are poorly developed, and the local population depends heavily on their own seed production or on seed available from informal local markets. Over the years, efforts have been made to improve crop diversity, access to good quality seeds and production of more nutritious crops. However, these investments have remained limited and need strengthening to improve the resilience of indigenous groups populating the Cuchumatanes, and improving their food and nutrition security as well as their livelihoods. Successes may provide the local population an incentive to stay and not to migrate. The proposed activity will be implemented in the Municipalities of Chiantla, Concepción Huista, Todos Santos Cuchumatan and Petatan, within the Huehuetenango department. Our target is 28 female and 72 male seed producers. This aligns well with the USAID's ZoI (see Map 2 below). S34D will reach out to and seek collaboration with Post Cosecha, a local agribusiness, that was involved with the development of a High-Tech Lab built in Chiantla Huehuetenango under the USAID-funded PAPAIS project. This Lab produces certified potato seeds in-vitro and green-houses to scale up the production and supply certified potato seeds in Huehuetenango and the region. One of the first tasks of this activity is for S34D to reach out to ICTA to discuss their work on higher yield beans, under the Mas Frijol project and other programs, to ensure a smooth activity start up.

Description: Farmers produce certified potato seed under the formal certification scheme, however there is a lack of knowledge of the processes involved in obtaining the certificates (this is basically handled by the leaders of the organizations). In the case of bean seed, a quality seed, it is not under the formal certification scheme. The proposed activity will do the following:
Create gender-responsive awareness with 147 potato and bean seed producers (who are linked with 3 potato seed companies and 1 bean seed company) on the regulations that regulate the seed production processes at the Guatemalan level in the formal system. Following the training, barriers that male and female seed producers face in implementing regulation will be documented. The program will establish collaboration agreements with the private initiative for production of basic bean and potato seed, to ensure the flow of genetic material to the area. The private company is in the Huehuetenango area that has a plant to produce basic potato seed for now, however, the possibility to do the work in other crops can be explored. Based on the two marketing plans of the two value chains (potato and seed) developed by Oxfam Novib and ASOCUCH, this activity would evaluate the implementation progress to understand policy, regulatory, and marketing barriers (particularly for generating off-farm opportunities that are economically viable). A dditionally, S34D would create awareness at the local levels so the seed companies can commercialize the produced seed in an adequate way. Finally, the team would gather policy implications and learnings from all the above and present to 4 municipalities to facilitate policy dialogues and regulatory decision-makings for operations in those communities.

The **outputs** of this activity include at least 100 seed producers with increased understanding of the seed regulation (target will be to have at least 20% women and at least 20% less than 30 years of age); at least 3 dialogues facilitated with local municipalities; One actionable policy road map assessing, identifying, and proposing solutions to barriers in seed marketing (for both local producers and seed companies) for municipalities to implement.

CCIR 2.2 Tools and technologies to capture quality information about seed supply in a geo-referenced manner are developed.

New - *Activity CCIR 2.2.4: Seed Systems Landscape Analysis in Sudan (RFS and BHA).*

Justification: Sudan is undergoing rapid change since the recent revolution that ousted the Bashir Government. Following a decade of sanctions, recent lifting of these restrictions and signing of the Abraham accord the USAID / BHA Mission is anticipating a considerable increase in activity to support the new Government and the people of Sudan in both humanitarian and development assistance. The proposed seed profile activity is a means for S34D to undertake a basic assessment of the structure and performance of the formal, informal, and humanitarian seed systems in Sudan. This work will build on the results from the Uganda and Kenya seed profiles. This analysis will not only review the performance of the three seed systems individually, but also to provide insights into how these systems currently work together and aim to identify ways in which changes could be made within the individual systems and to the interfaces of these systems to improve farmer access to quality seed. Key stakeholders are Gov of Sudan's Seed Unit, USAID Mission staff, development, and humanitarian projects, Ministry of Agriculture and National and State level Research and seed multiplication centers and farmer seed producer associations.

Description: S34D has proposed to the USAID mission to conduct a seed profile / landscape analysis to assess roles, responsibilities, capacities of seed sector actors across different seed systems in Sudan (formal seed system, informal seed system, and emergency seed system) to determine immediate and medium term activities to improve the functioning of the seed sector in collaboration with the Federal Ministry of Agriculture, Animal Resources and Irrigation (MAARI) Agriculture Research Cooperation (ARC), CGIAR, humanitarian organizations and private sector.

The last seed study for the staple crops was completed by FAO in 2011 and this seed systems assessment was focused on access to seeds for a humanitarian response. There are very few seed reports and or analytical documents in public domain which provide insights into the formal seed system and the informal system. An updated evaluation into the status of the main seed sectors in Sudan will provide the basis for a prioritized, sequenced set of seed systems interventions / investments plans. During the key informant interviews, all opportunities will be taken to explore opportunities for women and youth. This approach will lay the foundation for strengthening a more integrated and more resilient seed approach that meets the needs of humanitarian, resilience, and commercial seed needs. An assessment of the scale of the emergency seed system in terms of annual procurement of seed, origin of seed and target destinations of feed seed distributions. Clear investment recommendations.

The **Outputs** of this activity are an assessment report of the three seed systems, (i) formal, (ii) informal and (iii) humanitarian and an analysis of the current strengths and weaknesses within and at the interface between formal and informal seed systems and between development and emergency-to-relief seed interventions.

New Activity CCIR 2.2.6. Seed Systems Landscape Analysis in Timor-Leste (RFS) (BHA).

Justification: S34D had developed a country level assessment tool to identify key bottlenecks, opportunities, and the level of integration of the three elements of a national seed system, these being formal, informal and emergency seed systems. This analysis will draw on existing information on the formal sector and complement this with data and targeted survey information from the informal and emergency seed systems. The seed system landscape analysis serves as a reference point for the seed systems, will provide an evaluation of the status of the seed sector in Timor-Leste, and provide prioritized, sequenced seed systems investments plans. It will include a consolidated view of the various parts of the seed systems and an integrated approach to strengthen national seed systems that meets the needs of humanitarian, resilience, and commercial seed needs. The output from this activity is a cross seed sector country profile (5-10 pages), detailing the structure and performance of the formal, informal, and emergency seed system and how well they work together. The findings will provide a framework for engagement with USAID, host governments and private sector actors. S34D has completed one seed systems landscape analysis in Uganda, is wrapping up one for Kenya and will start another in Sudan.
Description: S34D will start with a virtual design consultation with CRS Timor-Leste and S34D's formal, informal, and emergency seed systems leads to update the assessment tool and approach for undertaking the country landscape analysis. After reviewing existing information on the formal sector, S34D consortium, other S34D network partners and national partners such as Ministry of Agriculture and Fisheries, ACIAR, UNTL, local NGOs/CBOs (e.g., RAEBIA) and INGOs will also gather information in the informal, emergency and policy areas. Although CRS will lead this activity, this work will draw heavily from other direct consortium partners, CRS Timor-Leste and from S34D's network partners to gather information in the informal, emergency and policy areas. The results from the reports will first be shared with the Mission, and a half day meeting with key 'seed stakeholders' to socialize the learning, gain additional insights, help verify the findings and to prioritize critical investment needs, will be requested a couple months in advance.
Outputs: 1. Assessment report of the (i) formal and (ii) informal seed systems, and (iii) humanitarian seed interventions. 2. An analysis of the current strengths and weaknesses within and at the interface between formal and informal seed systems and between development and emergency-to-relief seed interventions.

------ End of FY22 AWP ------