End-of-term evaluation of IDSST project – final report

Submitted by Abdi Zeila,
Ph.D.
Aug. 3, 2021

Table of Contents

EXECUTIVE SUMMARY

An end-of-term evaluation was conducted for the Improved Delivery of Seed and Soil Fertility Technologies to Smallholder Farmers (IDSST) project, which was implemented by AGRA with co-funding from the International Fund for Agricultural Development ('IFAD') in Ethiopia, Mozambique and Malawi. This project sought to address the challenges faced by smallholder farmers in the three countries in accessing quality-certified germplasm, context-specific blended fertilizers and other relevant agricultural technologies. This project, which was to formally end in June 2021 but was extended to end of October 2021, sought to focus on strengthening soil and seed input delivery mechanisms for important crops in all the three countries.

The evaluation was conducted between March and June 2021 by way of key informant interviews, focus group discussions and triangulation with private sector players, including farmers and agrodealers in the project zones. The primary focus of the evaluation was on the performance of the six sub-projects (or grants) that were processed under IDSST. The results of the evaluation were subjected to validation at AGRA-organised national validation workshops: Blantyre, Malawi (May 8-9, 2021), Addis Ababa, Ethiopia (June 28-July 1, 2021), and Maputo, Mozambique (July 5-7, 2021). A total of two hundred and twenty-one farmers (121 in Malawi, 63 in Ethiopia, and 38 in Mozambique) were interviewed for the project during 11 FGD sessions held in the three countries. These farmers were interviewed *in-situ* as well as during the three country validation workshops. In addition, the evaluation team also interviewed thirty-eight key informants in all the three countries. The input further received at the validation workshops were used to revise (where possible) and strengthen the findings of the evaluation.

We find that the IDSST project was able to achieve the ambitious targets set out for 15 out of the program total of 22 indicators. This represents a 68 percent achievement. Among the core objectives of the project was to increase the proportion of farmers accessing and using quality-certified improved seeds by 50 percent. This turned out to be an overambitious target, given the available project resources (time and money) for the IDSST operation. On this score, we find that there was an across-the-board increase in the project zones, as compared to the baseline situation in 2017. The evaluation fount that there was an increase of 23 percent in Ethiopia (to 34 percent in 2021), 10 percent in Malawi (to 35 percent in 2021), and 2 percent in Mozambique (to 13 percent in 2021). Overall, the project interventions resulted in a general 27 percent increase in farmers accessing and using improved seeds and fertilizers from baseline, representing an above-average performance (55 percent achievement on target). Production of breeder seed, pre-basic and basic seed is on track, but there was significant slippage on production of certified seed in Malawi and Mozambique. An important lesson was that an important driver of varietal adoption in Malawi and Mozambique is market availability and value. Field interviews revealed that market availability was the major determinant of adoption of varieties, especially legume crops. Closely linked with market availability was market value of the legume crops. In Malawi, for instance, although the IDSST project had included five legumes (soya bean, common bean, cow pea, pigeon pea

and groundnuts) for promotion, farmers mostly grew three legumes there, namely groundnuts, beans and soya bean. The proportion of farmers growing these crops has been increasing over time.

Another driver of adoption of legume varieties reported by IDSST associates was agro-ecological factors. In Malawi, the project had pushed for the adoption of five legumes Lilongwe and Nkhotakota districts. We noted from discussions with IFAD teams that this was building up on the previous work on adaptive research trials promoting new legumes, especially cowpea and pigeon pea. In the IDSST project, RUMARK, an IDSST implementing partner, had focused on promotion of soya bean and groundnuts. However, the reality is that both crops (and remaining 3 legumes) are not adapted to Nkhotakota District across the board. They do well in some areas and not all areas, hence universal promotion was unlikely to work. Farmers reported that growing beans as a summer crop is not as profitable as growing during the winter.

The evaluation finds that the project was successful in disseminating its core philosophy of integrated seed and soil fertility technologies to 60,000 farmers in the three countries. Capacity enhancement was successfully conducted for 191 scientists and technicians working with national research and extension systems (NARES), which was way above the project's initial modest target of 73. Due to the short actual field-level project implementation, and on account of exigencies beyond the IDSST, we find that the actual number of crop varieties promoted through NARS support was 18 – representing 68 percent achievement. In the past decade, AGRA has focused on improving Africa seed systems by supporting training of a new generation of African crop breeders in different national research systems. This has paid off with regards to the seed specialists at Department of Agricultural Research Services (DARS) in Malawi and the Instituto de Investigação Agrária de Moçambique (IIAM) who have been able to breed and officially release new improved resilient crop varieties in the two countries.

In all the three countries, a measure of increase in yields of staple crops was noted, although this was less pronounced in Ethiopia, where a raging civil war and delays in start of project activities resulted in one entire cropping season being lost. In Ethiopia's Amhara region, the project has been successful in demonstrating to farmers 100 percent yield increases using improved practices including the lime technology in barley cropping system in Amhara region. By using blended fertilizers on improved teff variety ("*boset*"), some lead farmers have reported 142 percent yield increases (from traditional 0.7 t/ha to 1.8 t/ha). The supply of starter seed and fertilizer packs, together with technical handholding by Development Agents (DAs) and lead farmers can potentially improve yields, lives and livelihoods for the 12,000 SHFs reached across the three project states in Ethiopia. In Malawi and Mozambique, an extra 36,000 SHFs have been connected to the IFAD loan support scheme and stand to benefit from enhanced access to agrodealers and their input services.

The project performed strongly on knowledge performance, with twenty-one knowledge products of various kinds developed and disseminated, in the process helping to alleviate some of the COVID-19 related project constraints. In Ethiopia, for instance, four ISFM training manuals were prepared and translated into local languages and are being used as

reference materials for conservation agriculture. Farmers in three regional states are able to access knowledge contained in 4,100 posters, 2,880 brochures, and 72 roll-up banners. However, we find that there was a missed opportunity with regards to the use of radio communication for wider audience, in the light of limited funds and national COVID-19 restrictions. Radio listenership is still going strong in Africa, and recent studies show that the radio has hardly lost any audience due to the growth of social media. Use of well-structured radio broadcasts would have ensured even higher reach of captive smallholder farmer audiences.

In terms of project efficiency and value for money, we find that about 54 percent of the total resource envelope available to IDSST was spent on the implementation of the six sub-projects in the three countries. Together, these six sub-projects consumed $1,073,000. The project spent $18 per capita to reach each of the 60,000 farmers that were direct beneficiaries of the project's field-level implementation. This is below AGRA's own benchmark of $40 per capita, established by the Soil Health Program in 2011 following a review of its investments and impacts thereof, raising questions on whether there were meaningful engagements between the six sub-project teams and the farmers.[1]

Generally, the management of IDSST project was done well. At strategic level, IFAD's oversight was made possible through quarterly review and planning meetings (each entity had a focal point for effective coordination) conducted by the country teams – PROSUL, SAPP and PASDIP. Similarly, AGRA had quarterly progress review meetings with IDSST sub-project teams and followed up with meetings with each of them separately to pick out implementation issues and agreeing on solutions. Field visits by AGRA technical staff were conducted before the onset of the coronavirus pandemic.

Sustainability of project interventions beyond the project's terminal end is to a degree ensured by the inclusion of private sector players. In Malawi, for example, as a way of improving access of seed to smallholder farmers MUSECO had engaged 8 agrodealers in 2018: partly as a result of engaging the project, it increased this number to 36 in 2019 in-order to improve proximity. Through the lessons learnt from the project, MUSECO has embarked on direct supply of seed to farmers through clubs. There has been improved production efficiency and an enhancement in the quality of seed supplied to MUSECO, while most farmer groups continue to work with MUSECO in contract farming each year. In Ethiopia thirty-nine trained agrodealers, linked to technology-supplying private sector companies and the capacitated government-run extension systems, will continue to support the promotion of ISFM technologies. This will be supported by PASDIP II.

The project faced significant problems. A primary limitation of the project was the short period of implementation that made it difficult to track progress and see impact at scale. Lack of incentives for product processing means that processing remains elusive, especially for the

[1] Refer to the AGRA 2011 study on impact scoping and characterization of Soil Health Program investments in Africa, which established a baseline of per capita reach of $40 per smallholder farmer over the life of grants.

cassava sector in Mozambique. This challenge persists because there are still few factories or processing units: with the introduction of technologies, the production has increased, but the existing processing units have remained the same.

In addition, COVID-19 restrictions had serious impact on IDSST project in Mozambique and Ethiopia. The unstable security situation in Tigray[2] in Ethiopia meant that the farmers in the regional state were not able to participate in this project following the deterioration of the security situation by November 2020. In neighbouring Amhara regional state, pockets of insecurity also posed an issue for project implementation. The adoption of new agricultural practices by farmers is a process that takes time to understand, accept and adopt – which was short supply for this important project. As a result, reluctance by a few farmers to accept has been reported in all three countries.

There are several lessons learnt. The project required at least three years, perhaps even longer. This is a standard lesson across all the three countries. The public-private partnerships mooted in Malawi (featuring DARS, MUSECO and RUMARK) and Mozambique (IIAM, KULIMA and University of Eduardo Mondlane) have by and large worked well. Choice of experienced cassava producers is important, in the light of project's short timeline. Producers have some knowledge about cassava production, but they lack technical knowledge about increasing production and productivity using new technologies (improved varieties and application of fertilizers combined with good agricultural practices). Poor long-term business linkages between rural agrodealers and financial institutions means that a key structural problem remains unsolved.

Overall assessment: *satisfactory*

[2] To some extent, the Tigray farmers were reached under IDSST. Of the 236 technology demo plots, 21 were successfully implemented in the region. One important missing element in Tigray Region was the handover of seven imported soil test kits to the farmers in the region, as well as inability to undertake trainings related to the use of soil test kits.

General Evaluation Findings

Project design

- The project was appropriate and well-designed. The project's overarching focus was deepening seed systems in two countries (Malawi and Mozambique), while enhancing state capacity in Ethiopia on conservation agriculture and integrated soil fertility management. Seed availability has been a structural problem in all the three countries. In 2017, for instance, there was significant unavailability of improved and certified legume seeds in Malawi. Data shows that approximately 90, 75, 74, and 85 percent of seed demand for common beans, pigeonpea, cowpea, and soybeans was unmet at the time IDSST project was starting.[3]

Project impacts

- IDSST spurred a fair amount of improvements across the national seed value chains by building the capacity of private seed suppliers, government research and regulatory agencies, and seed producers, especially in Malawi and Mozambique. In Malawi, Chikwendeni agrodealers, whose capacity was strengthened under the IDSST project, increased the sales outlets from 1 in 2014 to 12 in 2020, with their growth trajectory mirroring project interventions in Lilongwe, and resulting in service to 40,000 smallholder farmers in central and northern Malawi. Ten percent of these farmers are able to obtain their seed needs on credit, courtesy of the skills imparted on the agrodealers by the project.
- Through logistics and infrastructure support and public-private coordination, the project eased seed access constraints faced by smallholder farmers: in Inhambane, Mozambique, for example, a new market built under the project offers a platform for trade in certified cassava to the tune of 300 tons a month.
- Upgraded contemporary seed research facility in Nampula, Mozambique, and community-based seed multiplication systems in Malawi have ensured significantly improved access to seeds for smallholder farmers living in last-mile locations.
- There is evidence of better service provision through a network of trained last-mile actors (such as input dealers/micro-retailers and village/community-based advisors) and innovative last-mile distribution mechanisms as promoted by KULIMA in Mozambique and Self-Help Africa in Ethiopia. As a result, in Ethiopia, the IDSST project was able to demonstrate significant increments in crop yield through the proper application of blended fertilizers, lime treatment for acid soil management, bio-fertilizer application and promotion of conservation agriculture practices.
- We noted that the adoption of new agricultural practices by farmers is a process that takes time to understand, accept and adopt – and time was in short supply for this

[3] Respectively seed demands and availability for common beans (26,000 MT vs 2,300 MT), pigeonpea (2,500 MT vs 605 MT), cowpea (1,300 MT vs 325 MT), and soybeans (12,300 MT vs 1,800 MT). Source of the data: Source: Seed Traders Association of Malawi (STAM), 2017

project. As a result, reluctance by a few farmers to accept was reported in all three countries. In addition, in Malawi, the domestic and regional market for cowpeas and pigeon peas has been quite low. This is reflected in low adoption of these crops in the country, based on KIIs with farmer cooperatives. There were other determinants of market adoption in Mozambique, including fibre content of some varieties, which was not appreciated by farmers, e.g., Amarelinha. Nevertheless, based on interviews with ministry officials, the data from the project associates as well as input from the validation workshop, a noticeable increase in adoption was noted across the three countries.

- As a result, demand for certified seed has grown in project zones, with their adoption and use in the respective IDSST project zones rising from:
  - In Ethiopia – 11 percent in 2017[4] to 34 percent[5] in 2021
  - In Malawi – 25 percent in 2017 to 35 percent in 2021
  - In Mozambique – 11 percent in 2017 to 13 percent in 2021
- In all the three countries, and working with partners, especially in the government and with programs funded by IFAD, the IDSST has been generally able to identify and invest in the best-fit soil fertility management technologies available for legumes and cassava.
- However, the project has not been able to scale them for maximum impact among project beneficiaries, in large part due to the very short duration given to the sub-grants awarded under the project and the coronavirus pandemic.
- Significantly, these efforts have also improved partnerships between private seed companies and public research and regulatory institutions.
- In addition, IDSST created knowledge hubs, especially in Ethiopia, wherein farmers were introduced to the concept of soil testing, in addition to developing and disseminating context-specific knowledge products in the local language.
- This has contributed to an advancement of regional and national dialogue among stakeholders on soil fertility and fertilizer recommendations.
- IDSST has also succeeded in entrenching this new approach and the knowledge to operate the new facilities with government institutions. This will help to disseminate the learnings from the project and encourage the use of context-, soil- and crop-specific fertilizer blends.

Overall finding

- *Satisfactory*

[4] Data comparison with figures for the 2017 IDSST baseline evaluation report
[5] Data for 2021 obtained from key informant interviews and triangulated with government data and sales data from agrodealers in the project zones

Key Performance Indicators at Project's End

Table 1: Performance of the IDSST project in accordance with the established indicators

Indicators	IDSST target	Malawi	Mozambique	Ethiopia	Overall Achieved	% of achieved
Number of NARI personnel trained to enhance deliver input technologies	73	23	128	40	191	262%
Number of crop varieties promoted through NARS support	27	14	4	12	30	111%
Number of companies producing certified seed of target crops in each country	2	2	0	0	2	100%
Proportion of target farmer using improved seed and fertilizer in the target countries	50%	35%	13%	34%	27%	27%
Value of IFAD loan support to key actors under this grant	$500,000	ND	ND	ND		
Number of beneficiaries of IFAD loan support under this grant	57,080	29,270	7,500	23,550	60,320	106%
Percentage change in volume of agrodealer operations from IFAD loan support program	50%	ND	ND	ND	0	0%
Number of recommended solutions adopted by other actors across the 3 target countries	10	6	1		7	70%
Value of investment leveraged towards IFAD programs	600,000			$900,000	900,000	150%
Volume of certified seed produced (MT)	500	170	0	0	170	34%
Quantity (MT) of Basic seed produced	200	389	0	0	389	195%
Number of cassava cuttings produced	2,767,750.00	0	172,000	-	172,000	6%
Number of shows organized to promote ISFM, CA practices and new varieties	5	4	2	2	8	160%
Number of Agriculture research institutions supported	4	1	1	4	6	150%
Number of seed company personnel trained on promotion of improved varieties	40	29	31	0	60	150%

Number of agro-dealers trained to improve access to inputs and strengthen distribution networks	40	61	16	9	61	215%
Number of NARI technicians trained to support the promotion of resilient varieties	60	0	7	80	87	145%
Number of extension officers trained from public and private sector to support the delivery of good agronomic practices	60	23	143	80	246	410%
Number of communication materials produced	3	1	14	5	21	700%
Number of policy briefs drafted	1	1	0	0	1	100%
Number of farmer video clips distributed	1	1	1	0	2	200%
Number of case studies documented	3	1	1	4	4	133%

1.0 INTRODUCTION

1.1 About the IDSST project

Since its inception, Alliance for a Green Revolution in Africa (AGRA) has focused on improving access, by millions of smallholder farmers, to inputs, chiefly high-quality seeds and properly formulated fertilizers—mineral and organic—that are the foundation of a successful farming enterprise. More than a decade of shared success has provided AGRA with the tools to deploy all its resources—its range of influential partners, its deep technical expertise, and its extensive pan-African experience—to trigger agricultural transformation on a continental scale.

With 800+ projects funded, worth more than $430m, AGRA has evolved into an organization that has a diversified value proposition, playing the role of convener, thought-leader, policy advocate, private sector partner, grantee capability builder, and implementation supporter, in addition to continuing with its vital role as a catalytic grant maker. With this capability; AGRA is now positioned to become the go-to partner for government and continental bodies seeking to drive agricultural transformation, providing strategy support for development of national plans, creation of bankable investment plans and implementation support to effectively and efficiently deliver results.

Under the aegis of the 4-year (2017-2021) **Improved Delivery of Seed and Soil Fertility Technologies to Smallholder Farmers** (IDSST) project, AGRA and the International Fund for Agricultural Development ('IFAD') formed a close partnership in three African countries, Ethiopia, Mozambique and Malawi. This partnership seeks to address the challenges faced by smallholder farmers in the three countries in accessing quality germplasm and fertilizers. This project, initially scheduled to end in June 2021 but extended to October 2021, sought to focus on strengthening delivery mechanisms (herein identified as agrodealers and seed companies), which are essential links between smallholder farmers and sustainable agricultural transformation in the focus countries, by addressing the underlying constraints of farmers' access to good quality seeds and fertilizers.

The focus of the partnership is, therefore, to help the identified seed companies and agrodealers improve their working relationships with national agricultural research systems ('NARIs') in the respective countries, increase and expand the supply of certified crop seeds, crop seed information and fertilizers to increase access to quality seed and fertilizers by smallholder farmers. The project sought to address the challenge of linking new crop varieties and improved soil fertility management research outputs to smallholder beneficiaries of IFAD-supported sub-projects in Ethiopia, Malawi and Mozambique. Specifically, it sought to:

- promote and disseminate improved seed and soil fertility technologies, and
- generate, document and share knowledge.

Improving Delivery of Seed and Soil Fertility Technologies (IDSST) project is a partnership between Alliance for Green Revolution in Africa (AGRA) and the International Fund for Agricultural Development (IFAD). Under the IDSST project, AGRA has been complementing IFAD supported programs in Malawi, Mozambique and Ethiopia to address the challenge of linking new crop varieties and improved soil fertility management research outputs to smallholder beneficiaries, which is key in sustaining gains made by the IFAD programs. To achieve the above goal, AGRA worked closely with IFAD country teams and Project Coordination Unit (PCU) to strengthen capacities in: (i) promotion and dissemination of improved seed and soil fertility management technologies and (ii) generation, documentation and sharing of knowledge.

1.2 Objective of the IDSST's End of Project Evaluation

The overall objective of the end of project evaluation is to **generate knowledge from the project experience in collaborating with and supporting the IFAD investments in the three target countries**. AGRA commissioned the Centre for Sustainable Development Initiatives (CSDI) to conduct this study as an end of project evaluation (EPE). The evaluation focused on the entire implementation period.

The objectives were to

- assess the overall program performance in relation to its objectives, and
- provide input into the new strategic directions or implementation designs/strategies of another phase should funds be available.

The evaluation was intended to be forward looking which will capture effectively lessons learnt and provide information on the nature, extent and where possible, the effect of the IDSST project. The emphasis on lessons learnt speaks to the issue of understanding what has and what has not worked as a guide for future planning, as well as scrutinizing other gaps and opportunities to be incorporated in future partnering arrangements.

The key stakeholders of this evaluation were:

- the governments of Malawi, Mozambique and Ethiopia
- the six grants ("sub-projects") that were made by IDSST in the three countries, and
- IFAD.

1.3 Evaluation Team

The evaluation commenced in mid-March 2021 and has been ongoing till July 6. Field activities have been completed in all the three countries. The following team has been conducting the ongoing evaluation (*see Table 1*).

Table 2: The study team

Name of team member	Qualification and relevance to this assignment	Role in the team
Abdi Zeila	Ph.D. in Soil Science and experienced in soil fertility analysis, experienced in project and program evaluation: has conducted baseline surveys in 8 countries on behalf of AGRA, supporting 16 projects in the process He led the team that successfully undertook baseline evaluation for IDSST Long experience working in Ethiopian highlands on agricultural intensification programs	Team leader, overall coordination and reporting Designing evaluation Responsible for coordination of fieldwork and data collection in Ethiopia, Malawi and Mozambique Responsible for overall quality control
Austin Ngwira	MPhil in Agribusiness Vast experience, of about 29 years, in agribusiness, soil fertility improvement, rural development and agricultural transformation in southern Africa, especially Malawi, Zimbabwe and Mozambique	Will be responsible for the socioeconomic aspects of the end-term evaluation Also responsible for data collection and impact evaluation in Malawi
Virgilio Massango	Bachelor in Agricultural Sciences, with special focus on improving resource use uptake and efficiency in nitrogen-deficient soils, under smallholder farming systems	Responsible for data quality checks for all countries Also responsible for data collection and impact evaluation in Mozambique
Samuel Feyissa	Ph.D. in Soil Science, extensive experience in research on farming systems in Ethiopia	Responsible for field work in Ethiopia
Sylus Musei[6]	MSc in Plant Science	

1.4 Validation of Results in-country

This report and its findings were validated by way of knowledge management workshops that were conducted in Blantyre (May 8-9, 2021), Addis Ababa (June 28-July 1, 2021), and Maputo (July 5-7, 2021).

[6] Associate Consultant

2.0 MATERIALS AND METHODS

2.1 SCOPE OF THE EVALUATION

The IDSST final evaluation assessed the IDSST performance since its inception in May 2017. This was achieved via scheduled visits in March, April, May and June 2021 (*see the workplan for the evaluation*) to sampled project areas in all the three target countries. The evaluation is now complete, and this preliminary report serves to highlight the final results of the study. The evaluation has taken place in all the three countries:

- **Ethiopia**, where IDSST, with a grant to Self-Help Africa, supported Participatory Small-scale Irrigation Development Program – Phase II (PASIDP II) to promote adoption of soil fertility management technologies and practices
- **Malawi**, where AGRA implemented two sub-grants to complement Sustainable Agricultural Production Program (SAPP) in creating a sustainable seed system to increase uptake of high-quality seed of improved legume varieties.
    - The objective is to increase the availability and accessibility of high-quality seed for soya beans, groundnuts, beans, pigeon peas and cowpeas among farmers and use of appropriate agronomic practices
- **Mozambique**, where AGRA awarded three grants to support PROSUL in sustainably disseminating quality and disease-free cassava cuttings and promote post-harvest technologies and local processing of cassava products.

The evaluation entailed an in-depth review of the grants to determine whether IDSST has made progress towards achieving its stated goal and objectives. The study initially included a household survey to collect credible impact and outcome data, which will be filled on the Indicator Performance Tracking Table, but this has been replaced with structured interview schedules for the awardees of the sub-grants and their partners. Over the course of April and May 2021, CSDI has conducted several in-depth key

Grants made under IDSST

Ethiopia

- 2019 ET 001 (*Promoting Soil Fertility Technologies Through Capacity Building of Farmer Training Centers in PASIDP Target Regions*) – $256,832

Malawi

- 2018 MW 002 (*Production and Delivery of Early Generation and Certified Seed for Improved Livelihoods of Smallholders in the farming communities supported by IFAD under the SAPP project in Malawi*) – $205,888
- 2018 MW 001 (*Strengthening Seed and Other Farm Inputs Distribution Systems for Improved Food Security and Incomes of Smallholder Farmers in Malawi*) – $131,950

Mozambique

- 2018 MZ 001 (*Capacity Building in Cassava Micro-propagation*) – $150,000
- 2018 MZ 009 (*Building the Capacity of Extension Agents in the Limpopo Corridor to Improve Adoption of Improved Inputs and Good Agricultural Practices in Cassava Production*) – $179,524
- 2019 MZ 001(*Building Capacity of Input and Output SMEs in the Cassava Value Chain Development in Limpopo and Maputo Corridor*) – $148,995

informant interviews with AGRA grantees and their partners. In addition, focus group studies has been conducted for agro-dealers and farmer associations.

2.2 DAC's Evaluation Methodology

In our evaluation procedures, we have used the internationally accepted Development Assistant Committee's[7] (DAC) criteria for evaluating development projects. This evaluation criterion has long been identified as a strong foundation for international development evaluation since 1991. The DAC evaluation procedures entail critical assessments of five (5) key planks, viz:

- **Relevance and appropriateness**: The extent to which the IDSST as a project was suited to the priorities and policies of the beneficiary communities in the three target countries (mainly smallholder farmers, national governments, seed companies, fertilizer companies, and the larger private sector) will be evaluated.
    - To what extent were the objectives of the IDSST as originally conceptualised valid?
    - Were the activities and outputs of the project consistent with the overall goal and the attainment of its stated objectives?
    - Were the activities and outputs of the IDSST consistent with the intended impacts and effects?
    - How relevant were the project planning, design, and implementation with regards to the delivery of the expected interventions?
- **Effectiveness**: This is a measure of the extent to which the IDSST attained its objectives. In evaluating the effectiveness of the project so far, the evaluation team have asked the following questions:
    - To what extent were the objectives achieved?
    - To what extent did the IDSST design contribute to the achievement (or otherwise) of the project's objectives?
    - Were the project activities implemented well?
    - What changes and impacts were brought about by the IDSST?
    - Were there better ways of project implementation that, if adopted, could have led to improved outcomes?
    - To what extent did the external assumptions in the IDSST's theory of change hold true and how well were the mitigating measures put into use?
    - Did the IDSST appropriately document lessons learned from its interventions?

[7] Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD)

  - What were the major factors influencing the achievement or non-achievement of the objectives?

- **Efficiency**: This measures the outputs -- qualitative and quantitative -- in relation to the inputs. It is an economic term which signifies that the significant investment by IFAD and AGRA and their partners use the least costly resources possible to achieve the desired results. This generally requires comparing alternative approaches to achieving the same outputs, to see whether the most efficient process has been adopted. Among other things, the assignment has evaluated:
  - the involvement of stakeholders in the design of the IDSST
  - the involvement of women and men equally in interventions funded by the IDSST, implementation, and benefits accruing therefrom
  - the subsequent sustainability of physical infrastructure constructed under the IDSST by the groups (NARIs, NGOs, FOs, etc.) supported
  - the efficiency of working with local stakeholders, including government bodies.
- **Impact (Outcome and Medium-Term)**: Under this, we have measured both the positive and negative changes produced by the IDSST interventions, directly or indirectly, intended or unintended. This involves outcome and medium-term impacts and effects resulting from the IDSST activities on the local economic and other development indicators, across all the three countries selected for this end-term evaluation. The examination has been concerned with both intended and unintended results and includes the positive and negative impact of external factors, such as changes in improved productivity, capacity building, and income stability at the community level.
  - What has actually happened as a result of the IDSST? Numbers? Retail figures? Productivity increases?
  - Networks created and supported?
  - What real difference has the activity made to the beneficiaries?
  - How many people (men, women, youthful persons, disabled persons, etc.) have benefited in the target countries?
- **Sustainability**: Sustainability is concerned with measuring whether the benefits of IDSST are likely to be continue after the official end of the program in 2021, especially in the light of the new AGRA revised five-year strategy (2017-2021).

Sampling methods: All the three countries have been included in the study. CSDI has had inception meetings with the IDSST team in the week of March 22-26, 2021, to study, and approve, the proposal for data collection as enumerated in this report (see the workplan). A total of two hundred and twenty-one farmers (121 in Malawi, 63 in Ethiopia, and 38 in Mozambique) were interviewed for the project. These farmers were interviewed in-situ as well as during the national country validation workshops, which were held in Blantyre, Malawi

(May 8-9, 2021), Addis Ababa, Ethiopia (June 28-July 1, 2021), and Maputo, Mozambique (July 5-7, 2021).

2.3 Key Evaluation Questions

The evaluation covered the broad objectives and milestones of the IDSST project as well as the extent to which the project responded to the changed implementation context (especially in the light of insecurity in Tigray, Ethiopia, for instance) to achieve its objectives, the impacts of the project among the stakeholders (especially smallholder farmers, farmer organizations, agrodealers, and the larger private sector). This is in addition to the overall project performance and lessons learned for future improvements. The evaluation examined the coherence of IDSST's countrywide-wide portfolios in line with national objectives and national priorities, organizational context, procedures, governance structures and management issues including project management as well as strategic partnerships.

The main objective of this end-term evaluation was to determine the impacts of the project, which will mainly focus on outcomes and medium-term impacts medium of the project interventions. In this regard, the evaluation has looked at:

- **Project's direct and indirect impacts** – what results have been delivered, what changes (outcomes, both intended and unintended) have occurred among the beneficiaries, the relevance of project's interventions, return on investments and the sustainability of the achievement to-date.
- **Project delivery mechanisms** – the approach adopted by the IDSST project to achieve the results highlighted above, e.g., models/best practices employed by the project; e.g., agrodealer network; partnerships developed (e.g., in-country networks); seed and fertilizer networks; seed production; etc. The study has also looked at how successful these models have been, lessons learned, and whether these results are likely to be sustainable.

Annex 1 lists the questions we have asked in the evaluation study, as well as details of individual methods that have been used in answering each question.

2.4 Data Collection Tools

Besides a desk review of all the relevant key technical documents provided by AGRA for the assignment at the onset, the study adopted three key data collection approaches:

- a formal structured questionnaire;
- focus group discussion guide and;
- key informants' interview schedule.

To assess and document the outcome and medium-term impacts that IDSST work has made, its effectiveness against set outcomes targets, replicability, value for money and sustainability of outcomes of the systems work and lessons learnt for future programming, the study used a mixed methods approach which utilized both the qualitative and quantitative data.

The **qualitative data collection** through focus group discussions and key informants' interviews has helped the evaluators to understand facilitators and barriers to the adoption of the IDSST-promoted technologies scaling out initiatives in the three countries. Focus Group Discussions (FGDs) are now being held to facilitate discussions with the target beneficiaries (especially the smallholder farmers organizations) in selected sites per country to get a feel of the impact and the changes they have seen arising from the IDSST sub-project(s).

Quantitative data collection has been used to provide incontrovertible empirical data on project impact. Indicator-based quantitative rapid assessments have been conducted on agrodealers to obtain statistical evidence on practical outcomes and impacts of the sub-projects financed under IDSST.

Both the qualitative and quantitative data collection endeavor to answer all the questions (as outlined in Table 2). All the tools for the evaluation study were developed and were shared with AGRA for review, input, and approval in the week of March 22-26, 2021, to deploy timely field deployment. Approval was obtained and administration of the tools done in the three countries.

2.5 Respondents for the Evaluation

The key stakeholders consulted included awardees of AGRA sub-grants, smallholder farmers, agribusinesses, relevant government officials and the private sector institutions including the target agribusinesses staff and beneficiaries (smallholder farmers; agrodealers, seed companies), selected project partners, as well as selected AGRA staff to capture opinions, expectations and vision about the contribution of the IDSST towards the achievement of its objectives. Annex II gives a list of those who were contacted for the evaluation study.

3.0 EVALUATION RESULTS

3.1 General Project Results

The Improved Delivery of Seed and Soil Fertility Technologies (IDSST) project was jointly funded by the International Fund for Agricultural Development (IFAD) and Alliance for a Green Revolution in Africa (AGRA) to increase the availability of seed and soil fertility technologies in three African countries. The overall vision of the project was to enhance the competitiveness of cassava and maize value chains to foster broad-based and sustained economic growth in Malawi, Mozambique and Ethiopia. The project focused on established AGRA intervention zones in the three countries, which play host to millions of smallholder farmers, and addressed technology constraints in the cropping systems.

AGRA was the implementing agency, with direct technical support provided through the various country offices as well as from Nairobi. AGRA also successfully incorporated a university, local non-government organizations and public and private sector institutions in the three countries. Research institutions and departments of the Ministry of Agriculture and other offices within the respective national governments also played an important role in project implementation.

The AGRA-IFAD partnership began taking shape in 2012, when Kanayo F. Nwanze, IFAD's President and AGRA President Jane Karuku called for a continued global push for increased smart investments in Africa's agriculture, both by governments and the private sector. This was at a Chatham House-organised workshop on food security titled *Sustainable Intensification: Miracle or Mirage* conference. The two presidents emphasized that farming is a business and the private sector must fuel the development of Africa's agribusiness in upgrading smallholder agriculture to meet demand from foreign and emerging markets in developing countries. Under IDSST, the partnership has been consummated at the country-level, where the respective country programs, including PROSUL (later on succeeded by PROCAVA), PASDIP and SAPP in Mozambique, Ethiopia and Malawi took the lead in robustly supporting the implementation of IDSST in the respective regions within the countries. IFAD technically supported the grantees and the larger agribusiness concerns affiliated with IDSST in attracting much needed capital to rural areas and to underserved segments of agribusiness value chains in the three countries – and especially in Malawi and Mozambique. IFAD's contributions helped in ensuring that IDSST targeted commercially viable ventures for the PPP initiative in Malawi.

The project supported various stakeholders including producers, agro-input dealers, agricultural marketing enterprises, farm service providers, industrial food and feed processors, private sector actors involved in seed and fertilizer production and distribution, research institutions/laboratories, and government and regulatory bodies responsible for creating and maintaining an enabling environment for a dynamic agricultural sector. IDSST interventions generally had fairly positive results that fed into the overall projects goal of a more competitive cassava and maize value chain in Malawi, Mozambique and Ethiopia and created a measure of impact around the following two key areas:

- Increased efficiency of government research and development functions that has successfully supported seed and ISFM technology development, release, and dissemination
- Increased private sector actors' role and capacity in developing and disseminating improved seed and fertilizer technologies

3.2 Impact on seed systems

IDSST spurred a fair amount of improvements across the national seed value chains by building the capacity of private seed suppliers, government research and regulatory agencies, and seed producers, especially in Malawi and Mozambique. Through logistics and infrastructure support and public-private coordination, the project eased accessed constraints faced by smallholder farmers. In addition, the upgraded contemporary modern seed research facility in Nampula, Mozambique, as well as community-based seed multiplication systems in Malawi have ensured significantly improved access to seeds and other inputs for smallholder farmers living in last-mile locations, with better service provision through a network of trained last-mile actors (such as input dealers/micro-retailers, village/community based advisors) and innovative last-mile distribution mechanisms as promoted by KULIMA in Mozambique and Self-Help Africa in Ethiopia.

As a result, demand for certified seed has grown, with its use rising from 10% of total seed use in 2017 to more than 27% in 2021 in most of the project areas. Significantly, these efforts have also improved partnerships between private seed companies and public research and regulatory institutions. In 2021, the private sector directly supplied nearly 1,000 MT of certified seed into the project-supported smallholder farmers in the project zones in the three countries – resulting in direct gains to 60,000 farmers in the countries. By facilitating a more competitive private seed industry and stronger public research system, IDSST has made a contribution that will foster further sustainable growth in the national seed sectors, especially for cassava and legumes.

3.3 Impact on Fertilizer Systems

In all the three countries, and working with partners, especially in the government and with programs funded by IFAD, the IDSST has been generally able to identify and invest in the best-fit soil fertility management technologies available for legumes and cassava. However, the project has not been able to scale them for maximum impact among project beneficiaries, in large part due to the very short duration given to the sub-grants awarded under the project as well as the COVID-19 pandemic.

However, the project was noted for significant investments made in raising awareness on soil fertility and integration with improved seed systems. Through various dissemination mechanisms, from demonstration plots to starter packs to video extension, IDSST has created a measure of sustained demand for certified seed, ISFM technologies, and good agricultural practices. With the improved fertilizer application practice, some farmers in Ethiopia have reported improved crop output and enhanced gross margins.

In addition, IDSST created knowledge hubs, especially in Ethiopia, wherein farmers were introduced to the concept of soil testing. This has contributed to an advancement of regional and national dialogue among stakeholders on soil fertility and fertilizer recommendations. IDSST has also succeeded in entrenching this new approach and the knowledge to operate the new facilities with government institutions. This will help to disseminate the learnings from the project and encourage the use of context-, soil- and crop-specific fertilizer blends.

3.4 Impact on Production Systems

Throughout, the project generally adopted the use of farmer-friendly technology dissemination mechanisms. The project disseminated yield enhancing technologies largely through mounting farmer-managed demonstration plots and field day events at those sites. This has been largely achieved through the hundreds of demonstration plots established under IDSST. In Ethiopia's Amhara region, for instance, the project has been successful in demonstrating to farmers 100 percent yield increases using improved practices including the lime technology in barley cropping system in Amhara region. By using blended fertilizers on improved teff variety ("*boset*"), some lead farmers have reported 142 percent yield increases (from traditional 0.7 t/ha under farmer practice to 1.8 t/ha in the demonstration plots).

It was also reported that the promotion of soyabean varieties in the project areas also brought an awareness of the inoculant technology and its suppliers amongst both farmers and agrodealers, especially in Malawi. Research by IITA in Malawi has demonstrated that application of high-quality inoculant to soyabeans can increase yield by between 30 and 40 percent. The commonly reported inoculants were Mandolo inoculant by Mandolo company and Nitrofix by Agri-Inputs Suppliers Ltd (AISL).

In addition to inoculant awareness, farmers were taught yield enhancing agronomic practices at demonstrations plots and during field days as well as regular farmer meetings with lead farmers, respective government agricultural units, VBAs and agrodealer agricultural extension officers.

To improve soil health and thus farmers' productivity and incomes in the three countries, IDSST teams tried to combine the promotion of certified seed use with intensive messaging through awareness campaigns and demonstration of ISFM technologies and their benefits. ISFM strategies centered on the combined use of mineral fertilizers and locally available soil amendments and organic matter to condition the soils and in some cases, to replenish soil nutrients.

3.5 Project Relevance

- Both the legumes and cassava subsectors face serious challenges of availability of improved seed in Malawi, Mozambique and Ethiopia. All the three countries are facing structural agricultural problems related to seed and soil systems.
- In **Mozambique**, the project focused on enhancing the production of cassava. Cassava is the principal starch in Mozambique, which accounts for 30 percent of calories. Most processing in Mozambique is artisanal, to eliminate cyanogenic glycosides in the 90

percent of production from pest-resistant bitter varieties. Only 6 percent of production in 2011 was used commercially for non-food, two-thirds for feed and one-third for starch. Low levels of productivity for cassava compared to elsewhere and poor transportation are the main barriers to the development of a processing industry. Unit costs of production range from US$0.09 to US$0.30 U.S. cents per kg.[8]

- Producers would need to achieve 15 tons/hectare to be commercially viable, compared to average yields between 5 and 9 tons/hectare in Mozambique.[9] To achieve this, a network of service providers is required to operate in smallholder areas to deliver improved inputs and extension. There is also need for the promotion of farmers' associations for better access to service providers, in tandem with research pest- and disease-resistant sweet varieties and greater availability of market intelligence for smallholder farmers. In addition, previous studies have recommended capacity-building for processing, and the introduction of legal norms to prevent processors from polluting.
- The IDSST project design covered most of the structural recommendation enumerated above for the reinvigoration of the cassava sector in Mozambique.
- In **Malawi**, the majority of smallholder farmers have shifted to the cultivation of leguminous crops in the last 10 years. Groundnuts and pigeon-pea are the most important crop legumes cultivated in the country.[10] While smallholder agriculture in Malawi is dominated by the staple maize crop that occupies at least 70 percent of the cropped lands, grain legumes (groundnut, beans, soybean, pigeonpea and cowpea) are integrated in the maize-based systems as intercrops or rotations.[11]
- It therefore follows that grain legumes have been identified in Malawi as offering opportunities for not only diversifying cropping systems but also enhancing soil fertility management due to their multiple benefits, including a high content of protein and minerals, and their ability to improve soil fertility through biological nitrogen fixation and soil organic matter restoration in the already degraded soils of Malawi, with ongoing soil fertility decline. For instance, pigeon pea produces large amount of biomass (4 to 10 t per ha) that contributes to soil organic matter content of soils. When

[8] See World Bank, 2019. The Cassava Value Chain in Mozambique. Accessed on July 7, 2021, at https://openknowledge.worldbank.org/bitstream/handle/10986/31754/The-Cassava-Value-Chain-in-Mozambique.pdf?sequence=5&isAllowed=y

[9] See World Bank, 2019. The Cassava Value Chain in Mozambique. Accessed on July 7, 2021, at https://openknowledge.worldbank.org/bitstream/handle/10986/31754/The-Cassava-Value-Chain-in-Mozambique.pdf?sequence=5&isAllowed=y

[10] See Joe-Nkamuke, U., Olagunju, K.O., Njuguna-Mungai, E. et al. Is there any gender gap in the production of legumes in Malawi? Evidence from the Oaxaca–Blinder decomposition model. Rev Agric Food Environ Stud 100, 69–92 (2019). https://doi.org/10.1007/s41130-019-00090-y

[11] See Michigan State University, undated. "Integrating diverse grain legumes for increased land productivity on small farms in Malawi." Accessed on July 7, 2021, at http://globalchangescience.org/eastafricanode/wp-content/uploads/2015/10/FAO-profile-of-lab-research-in-legumes-in-Malawi.pdf

grown in rotation with maize it can reduce mineral fertilizer requirement by 50 percent with minimal yield compromises.

- Hence the project was relevant and well-designed.

3.6 Project Effectiveness

- There was consensus that generally, in project areas, productivity has improved over time – especially for cassava in Mozambique, which improved from 4-7 t per ha to between 15 and 20 t per ha for the farmers in Inhambane and Gaza provinces. It is worth noting that cassava producers would need to achieve 15 t per ha to be commercially viable. This has been largely achieved with the four variants promoted by IIAM and KULIMA in Mozambique.
- The project has been successful in demonstrating to farmers 100 percent yield increases using improved practices including the lime technology in barley cropping system in Amhara region of Ethiopia. However, the improvement metrics showed that the attainable crop legume yields are still quite low in Ethiopia.
- By using blended fertilizers on improved teff variety ("*boset*"), some lead farmers have reported 250% yield increases (from traditional 0.7 t/ha to 1.8 t/ha). Other farmers have seen 20% increases in yields on their landholdings, especially for barley.
- The supply of starter seed and fertilizer packs, together with technical handholding by Development Agents (DAs) and lead farmers, has helped to improve yields, lives and livelihoods for the 12,000 SHFs reached across the three project states in Ethiopia. In Malawi, in addition to new and better genetics, the yield increase was further attributed to application of such technologies as inoculant to soya bean production and farmer adoption of appropriate plant spacing, increasing plant population. However, farmers also indicate that in certain cases they expect that legumes yield would be affected by erratic rainfall pattern.
- In addition, IDSST created knowledge hubs, especially in Ethiopia, wherein farmers were introduced to the concept of soil testing. This has contributed to an advancement of regional and national dialogue among stakeholders on soil fertility and fertilizer recommendations, in addition to improving productivity.
- IDSST has also succeeded in entrenching this new approach and the knowledge to operate the new facilities with government institutions. This will help to disseminate the learnings from the project and encourage the use of context-, soil- and crop-specific fertilizer blends.
- The project depended on the agrodealer network to distribute farm inputs (legumes seed, fertilizers, etc.) in Malawi and Mozambique. This was not the case for Ethiopia, where the reliance was on farmer cooperatives as the last-mile links between input suppliers and the smallholder farmers. However, despite overstimulating farmer demand for farm inputs, the agrodealer network performed below market expectations.

- Agrodealers were not linked to financial institutions to obtain credit to scale out IDSST beyond their own savings. Retail agrodealers did not have enough capital for bulk purchases of farm inputs, have difficulties accessing input supplier credit facilities, and have not linked to financial institutions.
- In Mozambique, the IDSST project's most important impact has been the introduction of three new varieties of cassava crops, namely CHINHEMBWE, UMBELUZI 2, and TAPIOCA.
- Production of breeder seed, pre-basic and basic seed was on track, but there was significant slippage on production of certified seed in Malawi and Mozambique.
- Capacity enhancement business management training for community-based facilitators (or CAEs) has highlighted portance of organizing into associations to be able to negotiate prices, facilitate the flow of products, attract other types of investments to set up processing units.
- Mozambique sub-projects noted for strong performance on knowledge management, with 40 knowledge products developed (including case studies) and 22 radio broadcasts aired.
- As a result, farmers have acquired knowledge of when and how to apply fertilizers, their importance and advantages, and where to buy them.
- This would have significant impact, leapfrogging infrastructure, sustainability and national COVID-19 restrictions.

3.7 Project Efficiency and Value for Money

- In terms of project efficiency and value for money, this evaluation considers the fact that IDSST was generally "testing-of-proof-of-concept" project, originally intended for a period of four years but due to budget constraints was reduced to less than two years of actual field-level implementation. Another contextual factor was that AGRA's focus in the IDSST project was crop productivity, earmarking production and distribution of early generation seed. The project, therefore, had limited resources in terms of budget and time, but ambitious reach.
- Total investment in the three sub-projects in Mozambique was $585,351. The per capita cost of reaching one farmer is $19 – which is way below the AGRA-established benchmark of $40 per capita. The average cost for reaching the entire IDSST operation in all the three countries came to US$18 per smallholder farmer. This raises questions on whether there were meaningful engagements between the sub-project teams and the farmers.

3.8 Project Impact

- **Increase in yields**. Yield increases across the many of the thirty species promoted by the project were noted. Data from 2,800 demonstration plots show an increase in

varietal yields of cassava, for instance, from 4-8 ton/ha under farmer practice to a yield of 15-20 ton/ha under research conditions and in farmer-managed trials.

- **Agrodealer business growth and expansion**. The project rapidly increased customer base and business volume for agrodealers. One of the key challenges that farmers face in the three target countries was access to high quality improved seed. In Malawi, the project was designed to address this challenge through multiplication of improved legumes seed by MUSECO in partnership with DARS. The latter produced breeder seed whilst the former multiplied pre-basic, basic and certified seed through its contact farmer producer groups. The project created farmer awareness of the new seed varieties mostly through mounting of demonstration plots, typically one "mother" demo site per selected section of the Extension Planning Area. It further strengthened agrodealer capacities to distribute the improved seed varieties through business training and linkages to both farmers and farm input suppliers.
- **Germplasm infrastructure investment**. There was significant investment in infrastructure for germplasm in Mozambique. As a result of this, the project has been able to achieve the dissemination of improved varieties that possess desirable characteristics for the SHFs: resilient to adverse climatic conditions (droughts) and pests and diseases attacks. The project established irrigation system for germplasm: at IIAM Maputo for pre-acclimatization and the other in Umbeluzi with greater capacity than the old one, thus allowing to acclimatize more numbers of plants at any given time.
- Acquisition of reagents and other consumables allows IIAM to undertake virus cleaning and enhanced multiplication of improved varieties in-vitro. With greenhouses rehabilitation, there was 300+% in capacity, from 3,000 plants to 10,000, allowing IIAM to increase the number of seedlings per unit of time.
- Impact on seed technology transfer is notable: Multiplication protocols have been established and training has been successfully carried out with IIAM and partner staff. The IIAM technical staff have been trained to correctly perform the calibration of laboratory equipment.
- Procedures for the production and certification of cassava seed and the material used in the training has been made available to seed producers.

3.9 Sustainability

- Market-led adoption of project interventions, especially with regards to seed systems, is a key sustainability pathway. Adoption of project cropping systems has been satisfactory. Field interviews show that market availability was the major determinant of adoption of legume crops. Closely linked with market availability is market value of the legume crops.
- In **Mozambique**, IIAM plans to continue to multiply via tissue culture, but operational costs are high. IIAM plans to sell the material at discounted prices to associations and

cooperatives of seed producers. This is in addition to continued dissemination of the advantages of using improved and disease-free varieties. IIAM is also looking for new donors to continue multiplication efforts for cassava. The IDSST project has ended but the field multiplication is continuing under PROCAVA in Mozambique.

- Since for cassava there is as yet no private company that can multiply cassava seed, the strategy is to train farmers (emergent farmers) to produce seeds and then can sell it on to other farmers.
- The government of Mozambique continues to provide office space for the development of research activities, still funds breeding activities and breeder seed with limited funds. PROCAVA, which is the successor project for PROSUL in Mozambique, is now promoting Chinhembwe, Amarelinha, Umbeluzi-2, and Tapioca.

3.10 Project Challenges

- Farmers still face problems accessing high quality planting material: the seed volumes distributed was not enough to reach all the producers. In addition, quality seed is not available locally on-demand, as it is produced by government institutions such as DARS and IIAM on demand and requires a lot of logistics to reach the communities.
- One challenge identified by key stakeholders in target communities (government extension officers, village-based agents, and agrodealers) is that the number of demonstration sites was far too small to create massive awareness of the technologies being promoted in the target farming communities. For instance, each extension planning area (or their equivalents in Mozambique and Ethiopia) needed about 20 to 30 mother demo sites for optimum farmer awareness of technologies under promotion.
- In addition, the spatial characteristics of the mother demo sites were below the standard size, meaning that they ended up looking like research trial plots. Many of the demo plots were hence not powerful enough to showcase the IDSST theory of change and story to farmers. Data on baby demos was scant but the number was equally small.
- Budget and time were huge constraints: the six sub-projects all started late, meaning that the national agricultural calendars were typically not in sync with project timelines.
- Varietal problems still persist. For instance, in Mozambique, Chinyembwe is an old variety, good for yields, farmers like it more, but has problems with disease susceptibility, esp. cassava mosaic.
- Some farmers in parts of the project area in Mozambique are still holding the contaminated Chinyembwe. Out of the six varieties planned, two were not realized: Clone 3 and Umbeluzi 2. Varieties are still new to the farmers, still undergoing acceptance by the farmers.

- Linkages with private sector done for banana, but cassava has challenges as there is no much interest from the private sector. For cassava, there is no yet private company that can multiply cassava seed.
- The SMEs in the cassava value chain were expected to carry on with projects interventions, thereby ensuring a functional supply of plantlets from tissue culture – this has not been achieved.
- In-vitro multiplication program commenced without matrices in the laboratory, which is why it took a long time in the cleaning and introduction phase of matrices to be multiplied.
- Lack of incentives for product processing: This challenge persists because there are still few factories or processing units, with the introduction of technologies the production has increased with the market tonnage of cassava now approaching monthly volumes of 300 tons, but the existing processing units have remained the same.

3.11 Key lessons learnt

- PPP model was useful: IIAM, KULIMA, and UEM were sound partners.
- IIAM deserves plaudits for the choice of two (out of the four) varieties of cassava for multiplication.
- Tapioca is high-yielding, liked by the corporate world: Amarelinha has good carotene content, while Clone 4 is high-yielding and has high DM.
- SHFs like Tapioca: good yields, good performance in terms of pest and disease resistance and drought tolerance, since one of the constraints SHFs face was the use of disease sensitive varieties that caused low yields.
- DADTCO, largest buyer of cassava, prefers Chinyembwe – high starch content, also preferred by fresh consumers.
- Amarelinha is still not going to scale at industry – high fibre content, not appreciated by industry, needs to be consumed 6-9 months, production is still low.
- Choice of experienced cassava producers is important, in the light of project timeline. Producers have some knowledge about cassava production, but they lack technical knowledge about increasing production and productivity using new technologies (improved varieties and application of fertilizers combined with good agricultural practices).
- Project required at least three years, perhaps even longer. This is a standard lesson across all the three countries.

4.0 MALAWI

4.1 Introduction

Using the general basket of funds, AGRA funded three sub-grants in Malawi to complement the longstanding Sustainable Agricultural Production Program (SAPP) in creating a sustainable seed system to increase uptake of high-quality seed of improved legume varieties (soya bean, common bean, cowpea, pigeon pea and groundnuts). The objective of the interventions was to increase the availability and accessibility of high-quality legumes seed and use of appropriate agronomic practices among farmers in the project areas of Lilongwe and Nkhotakota districts.

4.2 Project Stakeholders

The key project stakeholders in Malawi were as follows:

- The Department of Agricultural Research Services (DARS): was involved in the production of early generation seed (EGS) in partnership with MUSECO, a private seed company
- Multi-Seed Company (MUSECO): a private company that was tasked by AGRA with the production and distribution of early generation legumes seed, in partnership with DARS.
    - The choice of MUSECO was seminal.
    - Until recently, when MUSECO ventured into the production of EGS for non-traditional crops, the private sector has not been actively involved in the seed value chain activities for rice, common beans and soybeans.
- Rural Market Development Trust (RUMARK): a private sector player that was responsible for capacity building of agrodealers and linking agrodealers to farm input suppliers to increase supply of quality farm inputs
- Agricultural extension officers, drawn from Ministry of Agriculture field offices (Extension Planning Area and their administrative sub-divisions, "sections", supervised by community-based extension workers, formally known as agricultural extension and development officers, AEDOs).
    - AEDOs worked with a network of lead farmers (progressive and innovative farmers).
    - Agrodealers also supplemented agricultural extension service delivery through their in-house staff.
- Farmers, being both the project target and largest stakeholder segment.

4.3 General observations

AGRA's key interest in reviewing the IDSST project, as expressed in the project evaluation inception meeting, is to have a clear understanding of how the project model performed on delivery of expected outputs and outcomes. AGRA also seeks to learn key lessons generated by the project which could feed into the design of future similar interventions. Field data collection is ongoing.

Based on the feedback from producers of early generation seed (DARS and MUSECO) and the agrodealer network (RUMARK and its partner agrodealers), there is a lot to suggest that the project was highly relevant, but structural problems stood in the way of achievement of greater results and impacts.

4.4 Project relevance

The project was **highly relevant**.

Interviews with key stakeholders in the country across the seed value chain suggest that the demand far exceeds supply, and that lack of EGS supply is the critical issue leading farmers to informal markets. This suggests that the project design and the idea to focus on improving the delivery of quality seeds and investing in soil systems was appropriate and well thought out.

Furthermore, the quality of the crops for which there is a vibrant business is compromised by the lack of capacity for the SSU. The project rapidly increased customer base and business volume for agrodealers and other agro-input players. One of the key challenges farmers face in Malawi is access to high quality improved seed. The project was designed to address this challenge through multiplication of improved legumes seed by MUSECO in partnership with DARS, creating farmer awareness of new seed varieties and strengthening agrodealer capacities to distribute the improved seed varieties through business training and linkages to both farmers and farm input suppliers.

The domestic and regional market for cowpeas and pigeon peas has been quite low. This is reflected in low adoption of these crops. Though MUSECO saw some upward kink on demand for cowpeas from 2020. This though was not reflected in stocks at agrodealer shops. This shows that the demand is still quite low. Another driver of adoption reported by RUMARK was agro-ecology. The project had imposed the five legumes in both districts. RUMARK had focused on promotion of soyabean and groundnuts. However, the reality is that both crops (and remaining 3 legumes) are not adapted to Nkhotakota District across the board – just a few pockets, e.g., Mwansambo EPA.

4.5 Project impact

Increase in consumer interactions between farmers and agro-input dealers. As a result of the PPP struck between DARS on one side and MUSECO and RUMARK on the other hand, there was an appreciable increase in the availability of improved foundation seed for farmer uptake. MUSECO reported that 4 percent of their total seed outlay was directly attributable to IDSST interventions. The partnership helped increase private sector access to foundation seed directly from DARS. In the project's lifespan, 26 MT of legume breeder seed, 30 MT of legume pre-basic seed, 358 MT of legume basic seed, and 170 MT of certified legume seeds were produced.

One striking observation was that all interviewed agrodealers, both small (the so-called "retail" agrodealers) and large (also known as "hub" agrodealers) reported that business meetings or platforms RUMARK had implemented, bringing farmers and agrodealers together,

dramatically increased agrodealers customer base. Agrodealers reported that the project was a "selling point" for their businesses. Thus, the project accelerated business growth. Two cases in point illustrate this are as follows. In Nkhotakota District, Agwenda agrodealers more than doubled the sales outlets from 5 in 2018 to 11 in 2020. In Lilongwe District, Chikwendeni agrodealer dramatically increased sales outlets from 2 in 2017 to 12 in 2020.

The project **rapidly disseminated yield enhancing technologies**. In addition to inoculant awareness, farmers were taught yield enhancing agronomic practices at demonstrations plots and during field days as well as regular farmer meetings with lead farmers, Government and agrodealer agricultural extension officers. Throughout Malawi today, more than 29,000 smallholder farmers were exposed to the potential yield increases and enhanced resilience of the 14 new legume varieties popularized by the IDSST project through mother and baby demonstration plots. The achievements are likely to continue being backstopped by the 328 seed grower entities who were trained by the IDSST project, as well as by the 38 community seed grower groups who were linked to commercial seed companies.

Stimulating agrodealers to offer farm input loans. In addition to increasing availability of farm inputs (legume seed varieties), the project, contributed to farmers access to farm inputs through farm input loan programs implemented by agrodealers who participated in the project. Again, a good illustration was from two hub agrodealers, Agwenda in Nkhotakota District and Chikwendeni in Lilongwe District. Agwenda reported that they provide seed loans to 1,650 women and fertilizer loans to 200 women. Chikwendeni agrodealers reported that 10% of their seed sales and 5% of their fertilizer sales are based on in-house credit sales. Cash sales were quite significant. For instance, for Chikwendeni, farmer farm input cash purchases were 40% of seed sales (of which, 20% was the cash for Government subsidy farm inputs) and 70% of fertiliser sales. Overall, 75 percent of all agrodealers interviewed for this evaluation study confirmed increases in sales over the last three years, indicating that they had increased the number of sales outlets in the same period. Asked to give more details of how this expansion was possible, the agrodealers mentioned that they had close relationships with the network of village-based advisors, known as VBAs.

AGRA built on the farmer-to-farmer agricultural extension system to come up with the network of VBAs, also called community based agribusiness advisors (CAAs) to demonstrate to fellow farmers in their communities improved crop varieties, fertilizer blends and good agronomic practices (GAP). CAAs have further been trained on establishment and management of village savings and loan groups (VSLs). Some agrodealers, such as Agriculture Direct, have embraced the CAA concept and are reaping colossal mutual business benefits. A business case study for this is presented below.

Agriculture Direct as an agribusiness started in 2007 and currently has 11 shops. On 12 June 2021, the CSDI evaluation team visited one of his shops, located at Nathenje, in the outskirts of Lilongwe City. This shop has been operated since 2010. The team was hosted by one of the private agricultural extension workers employed by Agriculture Direct, Mr. Kenneth Singini.

The Nathenje shop has a network of 50 CAAs, of which 19 are active on promotion of VSLs. These reach out to a total of 5,000 farmers. The agrodealer delivers farm inputs in farming communities for free. With regard to future plans, the agrodealer intends to add commodity trading portfolio. They intend to build a warehouse to support this business. In addition, they would like to groom CAAs into fumigation business as not every farmer can buy a sprayer and chemicals.

As a result of the market stimulation, the general consensus of agrodealers and government extension workers was that smallholder farmers' yields have been improving over the project period. (*See Table 5 below*.) This is attributable in part to the close relationships existing between agrodealers and farmers, triangulated through the VBAs. The agrodealer trains VBAs on agronomy, VSL and fumigation. They receive free input packs from the agrodealer for demonstration plots. They also received branded promotional materials such as T-shirts. For instance, the Agriculture Direct extension agent visits his cohort of farmers more regularly than the government extension agents, according to farmers interviewed for the evaluation. In addition to new and better genetics, the yield increase was further attributed to application of such technologies as inoculant to soya bean production and farmer adoption of appropriate plant spacing, increasing plant population.

Table 3: Profiles of Key Crops in Kasitu EPA (Nkhotakota) - (source: CSDI consultants' key informants interviews)

Crop	% Farmers Growing		Use of Crop (Home consumption/ Sale/ Both)	Area Grown per Farm Family (ha)	Average Yield		Average Revenue per annum	
	Before Project	Current			Before Project (MT/ha)	Current (MT/ha)	Before Project (K)	In 2019/2020 (K)
	95	99	Consumption (90%)	0.6	2.7	3.0	NA	NA
Cassava	85	90	Consumption (90%)	0.5	20	25	NA	NA
Groundnuts	60	70	Sale (90%)	0.3	0.7	0.9	50,000	100,000
Soya Bean	20	50	Sale (90%)	0.1	0.3	0.5	17,500	30,000
Beans	30	50	Sale (90%)	0.2	0.9	1.0	125,000	200,000

Stimulating farmer demand for farm inputs. Another important observation was that the project did deliver its catalytic power to stimulate farmer demand for improved legumes seed, but this has not resulted in an overwhelming increase in seed production. As a result, the seed companies had not as yet multiplied adequate quantities of seed to meet farmer demand. The purchasing power of farmers is still low, although demand has been increasing marginally. Unlike maize, where farmers have to buy fresh hybrid seed every season, legume seed can be recycled for two to three seasons without experiencing significant drop in yields. This lowers incentives for medium to large scale seed companies to multiply seed of the legume crops for food, nutrition and income for smallholder farmers. Adding to the government's limited budgetary resources, to a large extent legume breeding and the availability of early generation seed of improved legume varieties have been project and donor driven. Another important point is information dissemination by way of demonstration sites. It should be noted that all agrodealers reported that the demonstration sites were far lower than what they would have desired. In most cases, there were one to two demonstration sites per agrodealer catchment area. Their preference was over 10 demonstration sites per catchment area to adequately cover the farming community.

Technology adoption. There were a number of drivers of technology adoption by farmers. The major one was market availability. Although the project had included five legumes (soya bean, common bean, cow pea, pigeon pea and groundnuts) for promotion, farmer adoption gravitated to legume crops that had a readily available market, viz soya bean and groundnuts. This was also reflected in stocks at agrodealer shops. Both crops have a significant domestic market – there are a number of agro-processing off-takers producing edible oil from these crops.

4.6 Project Impact and effectiveness

Agrodealer business growth and expansion. Agrodealer partnerships catalysed under IDSST has helped to transform smallholder farmers into profitable 'business units' in most of the districts covered. With improved distribution channels, agents affiliated with IDSST are counting increased business opportunities and higher incomes as a result. Such business

models play a critical role in ensuring food security targets are met and transform agriculture into profitable ventures.

Figure 1: Agwenda agrodealer, one of the agro-input suppliers working with IDSST in Malawi, with project support increased his outlets from just 1 in 2014 to 11 by the end of 2020. The project period has seen dramatic expansion of distribution outlets, starting in 2018 and climaxing in 2020. Agrodealers reported that RUMARK, an IDSST grantee, was a respected and powerful brand in agrodealer business. Hence any agrodealer business that had certification and endorsement of RUMARK won farmers' appeal.

Farmer friendly technology dissemination mechanisms. The project disseminated yield enhancing technologies largely through mounting farmer managed demonstration plots and field day events at those sites. It was also reported that the promotion of soya bean varieties in the project areas also brought an awareness of the inoculant technology and its suppliers amongst both farmers and agrodealers.

Unprecedented farmer demand. With regards to feedback obtained from field interviews, more than 80 percent of key informants interviewed for this evaluation that the project had the right "items on the menu" but was beleaguered by over-stimulating farmer demand such that effective demand outstripped supply of the improved legume seeds. This alone is enough reason for pursuing the continuity of the project to satisfy the unmet farmer demand.

Table 4: Project performance in Malawi

Table 5: Key performance indicators for IDSST's operations in Malawi

Output/outcome	Target	Actual	Remarks
Number of beneficiaries	15,000	29,270	Surpassed
Legume breeder seed produced	21MT	25.6 MT	Surpassed target
Legume pre-basic seed produced	31MT	30.242 MT	About target
Legume basic seed produced	54MT	358.473 MT	Surpassed
Legume certified seed produced	500MT	169.769 MT	Way low
Seed grower entities trained	220	328	From Lilongwe, Nkhotakota, Blantyre, Balaka and Chiradzulu
Community seed grower groups linked to commercial seed companies	6	38	Surpassed
Number of extension events to create awareness of technologies	3200	3202	On target
Number of extension officers trained from public and private sector to support the delivery of good agronomic practices	20	23	Slightly above target
Number of village-based agents distributing seed	260	440	Surpassed
Number of soil maps and area specific formulations produced	5	5	On target
Number of seed company personnel trained on promotion of improved varieties	55	29	Below target
Number of Seed out growers and community seed multipliers trained	200	231	Surpassed

Productivity improvement. The consensus of agrodealers was that yield and farmer incomes have been steadily improving over the project period. In addition to new and better genetics, the yield increase was further attributed to application of such technologies as inoculant to soya bean production and farmer adoption of appropriate plant spacing, increasing plant population. However, they also indicated that in certain cases yield would be affected by erratic rainfall pattern.

4.7 Project challenges

Inadequate farmer coverage and penetration. Two key instruments for effective farmer coverage and penetration were demos (including field days) and regular farmer meetings. All agrodealers interviewed were dissatisfied with both number of demos mounted and number of farmer meetings involving agrodealers and extension workers. They generally recommended that future similar project interventions should ensure a large number of demonstration sites and regular farmer meetings.

A seemingly peripheral role of government extension workers and inadequate motivation. The feedback from agrodealers does not capture a lot of contribution of Government extension workers. However, most of the agrodealers acknowledged the significant contribution of lead farmers and village-based agents (lead farmers who were collecting farm input orders from farmers in remote areas and conveying these to agrodealers).

On the surface, it may seem that the contribution of Government extension workers was peripheral or at best dotted. This is understandable as they are usually overstretched with the burden of high farmer: extension worker rations, typically over 2,000 farmers per extension worker, against the standard of up to 750 farmers per extension worker. But since lead farmers are trained and mentored usually by Government extension workers, the contribution of Government extension workers can be traced from the effectiveness of lead farmers and village-based advisors.

Inadequate agrodealer capacity and missing project components. It is also recorded that agrodealer business was equally stimulated to handle more products and had received instrumental capacity building training, including business management and product handling. But they were undersupplied in terms of legume seed being promoted. There were two types of agrodealers – hub and retail agrodealers. The hub agrodealers had the advantage of accessing credit facilities from farm input suppliers.

According to the interviews conducted, the market for the products they handled, both seed and fertilizer, could not be met by credit facilities offered by farm input suppliers. They needed to be linked to financial service providers and needed such instruments as credit guarantee. The project design did have linkages to financial institutions. This limited further growth of "hub" agrodealer business. Thus, the project underutilized opportunities for both agrodealer and farmer business growth. On the other hand, the "retail" agrodealers unanimously said they had huge market potential but did not have the financial capacity to purchase farm inputs at wholesale and volume discounted prices from farm input suppliers. The project did not have an intervention to resolve this plight. Additionally, retail agrodealers complained that the project did not have a mechanism of linking and recommending them to wholesale input suppliers to access their credit facilities. This has limited the growth of retail agrodealers in terms of both expanding sales outlets and quantities of farm inputs distributed.

4.8 Project sustainability

Based on interviews conducted so far, there is strong evidence on sustainability of the project interventions as follows:

- Market and business opportunities. The interventions are likely to be continued by key stakeholders (farmers, seed companies and agrodealers) due to the demonstrated opportunities. Farmers have seen a strong market opportunity to grow soya bean and groundnuts. Agrodealers see a large and growing market for farm inputs, seed and fertilizer. Seed companies under-delivered seed due to high demand stimulated hence there is a significant trigger for increased seed production. MUSECO further reported that in their business portfolio, project financing was a very small contribution.

Therefore, phasing out of the project does not have a significant impact on their future growth and development. However, RUMARK is purely dependent on external support. This is a threat to training of new agrodealers.

- An existing network of community-based extension workers (lead farmers and village-based agents). Previous public and private investments, including by AGRA, have developed the network of community-based extensions workers. This resource is available, mostly on voluntary basis. Agrodealers interviewed confirmed that these do not impose any overheads on their businesses yet very instrumental to their business growth.
- Acquired knowledge, skills and market linkages. The project has left behind knowledge and skills among key stakeholders, agronomic knowledge among lead farmers and business management and market linkages agrodealers and farmers. These will continue to drive the delivery of farm inputs, seed and fertilisers, to farming communities in the project areas. Most of the hub farmers have sales outlets in other districts. This means the project will have spillover effect to other districts as well.
- Seed pricing and irrigation. It was felt that for further adoption of the promoted legumes, it is imperative that seed prices should be reduced as most farmers are unable to afford the current market prices. Farmer organizations should explore multiplying and distributing seed to their members to bring seed prices down. Promotion of solar powered irrigation should be introduced in future to stimulate increased production of legumes in both summer and winter periods.
- Differentiated capacity building and refresher courses of agrodealers. Hub agrodealers see the need for tailor made capacity building, as their businesses grow for sustainability. Not the one size fit all training modules. For instance, need to have robust accounting systems, which are expensive to buy from the market. In addition, the project did not provide refresher courses. These are needed for continuity.

5.0 ETHIOPIA

5.1 Introduction

One sub-grant was awarded to Self-Help Africa in Ethiopia in 2019: this was a fourteen-months grant that was immediately beset by a number of problems. The project had planned to reach 30,000 through field days, and by way of distribution of improved seeds and blended fertilizers. This ambitious number was in the end reduced to 12,000 farmers – which has largely been achieved. The project was noted for significant investments made in raising awareness on soil fertility and integration with improved seed systems. Through various dissemination mechanisms, from demonstration plots to starter packs to video extension, IDSST has created a measure of sustained demand for certified seed, ISFM technologies, and good agricultural practices. With the improved fertilizer application practice, some farmers in Ethiopia have reported improved crop output and enhanced gross margins.

5.2 IDSST Project Elements in Ethiopia

The project's overall goal in Ethiopia was promoting soil fertility technologies through capacity building of Farmer Training Centers in PASIDP target regions. The project interventions implemented included the following:

- Engagement of FTCs as centres for knowledge hub and dissemination of project technologies to farmers
- Dissemination of information on blended fertilizers
- Development of ISFM modules
- Deployment of soil test kits
- ISFM promotion
- Linking farmers to agrodealers
- Establishment of demo farms

5.3 Project Relevance

The project was highly relevant for the four regions that were originally targeted in IDSST's operations for Ethiopia. The legumes subsector face serious challenges of availability of improved seed: in Ethiopia, for instance, twelve legume species are grown.

Hence the project was relevant and well-designed.

5.4 Key Performance Indicators for Ethiopia

Table 7 below highlights the performance of the project with regards to the achievement of project indicators in Ethiopia.

Table 6: Key performance indicators for IDSST operations in Ethiopia

Performance of the IDSST project in Ethiopia: selected KPIs			
Indicator	**Original target**	**Achieved**	**% Achieved**
Number of DAs reached	88	80	91
Number of FTCs capacity strengthened	44	40	91
Number of farmers reached	36080	23550	65
Number of DAs trained	44	40	91
Number of lead farmers trained on ISFM	220	196	89
Number of SHFs trained	9680	11746	121
Number of soil test kits supplied	44	44	100
Number of demo plots established	176	236	134
Number of agro-dealer groups established and trained in business management	11	9	82
Number of young people engaged in agro-dealerships and trained to run the agrodealer businesses	44	39	89
Number of farmer field days conducted	18	17	94
Number of farmers participating in field days	1800	1676	93
Number of SHFs reached with seeds and fertilizer	30000	12000	40
Number of publications	5	5	100
Average performance of the project			***91***

5.5 Challenges with project implementation in Ethiopia

The project commenced operations in late June 2019, coinciding with the planting season. This effectively meant that the crop growing period was lost in 2019. There was no preparation to do anything in order to take advantage of the main crop growing seasons in 2019 in any of the four regional states in Ethiopia that the project targeted. The second year of project implementation saw the team seize the opportunity to take advantage of the 2020 planting season was fully used – but a hiccup arose as the project was to finish in May of the same year. A no-cost extension was granted to allow the project cease operations as of September 2020

As a result, the Self-Help Africa team did not have the chance to see the impact of the technologies that they promoted. This is because the typical harvesting period starts November and ends by January. An important observation in Ethiopia therefore was that the project timelines were not in sync with the agricultural planting calendar.

In addition, COVID-19 restrictions on farming systems in Ethiopia played a major part in stifling project activities in many of the four regional states. This was compounded by the ongoing civil insurrection in Tigray, one of the project states, which ended in a proclamation of a state of emergency. This put a stop to any hope of project implementation in this state, in the interest of public safety.

5.6 Project Impact and Effectiveness

Despite the serious project challenges in Ethiopia, a measure of success can be noted. IDSST interventions were well designed to identify the best soil fertility management technologies

available for Amhara, Oromia and Southern Nations and Nationalities People Regions (SNNPR) to scale them for maximum impact among project beneficiaries. When selecting a technology for transfer, IDSST team in Ethiopia first identified technologies that had proven successful in similar agro-ecologies and social environments elsewhere. The team effectively used the results of adaptive trials conducted within Ethiopia, and which had been designed to scientifically confirm a range of theoretically beneficial varietal, fertilizer, soil amendment, and conservation agriculture practices across, and replicated these in the three regional states where the project was finally implemented.

As a result, approximately 12,000 farmers now stand on the threshold of being potentially able to benefit from the deployment in Farmer Training Centres (FTCs) of soil texture kits and NPK soil test kits. This is on the assumption that the test kits would continue operating successfully in the absence of financial support from the project. Coupled with the training of government-employed Development Agents on soil mapping, soil atlas interpretation, fertiliser applications, and on soil testing equipment handling and analysis techniques, the way is open for agricultural transformation in Ethiopia.

The project was successful in demonstrating to farmers 100 percent yield increases using improved practices including the lime technology in barley cropping system in Amhara region. The yield increases are also attributable to the successful adoption of bio-fertilizers and blended fertilizers. While soil test kits were supplied in Ethiopia and FTCs trained on their use, there was no information on the utility of the kits by farmers. However, the improvement metrics showed that the attainable crop legume yields are still quite low in Ethiopia.

The project depended on the agrodealer network to distribute farm inputs (legumes seed, fertilizers, etc.). Despite overstimulating farmer demand for farm inputs, the agrodealer network was not effectively included in the project. Nine agrodealer units were established, run by young people. The agrodealer start-ups were not linked to financial institutions to obtain credit to scale out IDSST beyond their own savings. On the other hand, 39 agrodealers were trained to improve the adoption of ISFM technologies and linked to the ISFM technologies supply chain in the regional states. This is in addition to the farmer cooperatives who were co-opted into the project.

The project has been successful in entrenching effective seed and soil technologies among smallholder farmers in Ethiopia. The project has been fairly successful in reducing transaction costs with soil sampling in parts of Oromia, Amhara and SNNPR. As in most of Africa, only public institutions provide such soil sampling services, often with high fees and considerable delays. To address this, the project introduced soil testing services in the regions through equipping the FTCs. Through IDSST intervention, forty FTCs are now fully equipped and upgraded to carry out soil tests and make tailored recommendations to 12,000 smallholder farmers.

5.7 Project Challenges

Budget and time were huge constraints: the project started late, and the first planting season was lost, and SHA team had no chance of observing the impact of activities (via harvest and

yield numbers). Agricultural calendar was not in sync with project timelines. The project had little resources available to motivate DAs.

In addition, COVID-19 restrictions had serious impact on IDSST project in Ethiopia. The security situation in Tigray meant that the farmers in the regional state were not reached under this project.

6.0 MOZAMBIQUE

6.1 Project Relevance

In **Mozambique**, the project focused on enhancing the production and marketing of cassava. Cassava is the principal starch in Mozambique, which accounts for 30 percent of calories. Most processing in Mozambique is artisanal, to eliminate cyanogenic glycosides in the 90 percent of production from pest-resistant bitter varieties. Only 6 percent of production in 2011 was used commercially for non-food, two-thirds for feed and one-third for starch. Low levels of productivity for cassava compared to elsewhere and poor transportation are the main barriers to the development of a processing industry. Unit costs of production range from US$0.09 to US$0.30 U.S. cents per kg.[12]

Producers would need to achieve 15 tons/hectare to be commercially viable, compared to average yields between 5 and 9 tons/hectare in Mozambique.[13] To achieve this, a network of service providers is required to operate in smallholder areas to deliver improved inputs and extension. There is also need for the promotion of farmers' associations for better access to service providers, in tandem with research pest- and disease-resistant planting material of cassava sweet varieties and greater availability of market intelligence for smallholder farmers. In addition, previous studies have recommended capacity-building for processing, and the introduction of legal norms to prevent processors from polluting.

The IDSST project design covered most of the structural recommendation enumerated above for the reinvigoration of the cassava sector in Mozambique.

6.2 Project Elements in Mozambique

The overall theme of IDSST project interventions in Mozambique was the promotion of cassava production through easing access to quality inputs and capacity building. The three sub-themes were: (a) Developing business skills of emergent and commercial farmers, (b) Increasing cassava propagation and multiplication through capacity building of personnel in the cassava micropropagation value chain, in addition to fast-tracking the availability of clean plant material, and (c) Increasing productivity of cassava through increased use of inputs and access to markets. The project elements to achieve these were characterised by:

- Increasing cassava propagation at IIAM
- Capacity augmentation for producers and processors
- Infrastructure upgrades at the national agricultural research institution, IIAM

[12] See World Bank, 2019. The Cassava Value Chain in Mozambique. Accessed on July 7, 2021, at https://openknowledge.worldbank.org/bitstream/handle/10986/31754/The-Cassava-Value-Chain-in-Mozambique.pdf?sequence=5&isAllowed=y

[13] See World Bank, 2019. The Cassava Value Chain in Mozambique. Accessed on July 7, 2021, at https://openknowledge.worldbank.org/bitstream/handle/10986/31754/The-Cassava-Value-Chain-in-Mozambique.pdf?sequence=5&isAllowed=y

- Development of modules for dissemination of project technologies
- Connecting producers to markets

6.3 Project Impact and Effectiveness

More than one hundred cassava varieties are grown in Mozambique. Most of Mozambique's sweet cassava is produced in Inhambane, but most national production is in the northern regions. Ninety percent of Mozambique's overall production consists of bitter varieties that are more resistant to pests and diseases, but contain cyanogenic glucosides that need to be eliminated though post-harvest processing for safe consumption as food or feed. Mozambique's average cassava yields are low relative to West Africa. The project benefitted from close relationship with IFAD's PROSUL project. A number of farmers trained by PROSUL with the use of demonstration plots were able to pilot the three main drought tolerant, pest resistant and high yielding cassava varieties on 96 hectares of land. The evaluation study was made aware of trials involving more than 300 smallholder farmers in four districts in Gaza and Inhambane province

Cassava research impact has an increasing trend in last few years, mainly due to the emergent adding value initiatives, such as beer manufacturer SAB miller. In the past five years, IIAM in collaboration with organisations such as IFAD, AGRA and IITA has released 14 improved varieties of cassava, with some of these varieties yielding10 to 16 tons per ha. The varieties are also at the same time tolerant to diseases such as CBSD. Among the released varieties, six high yielding ones were disseminated in Gaza, Inhambane and Nampula (Chinhembwe, Eyope, Okhumelela, Likonde, Nomtjapela and Nikwaha), involving IIAM, IFDC with support from AGRA.

More than 90 percent of interviewees reported that generally, in project areas, productivity has improved over time – especially for the cassava-growing areas in Mozambique (Inhambane and Gaza). The project has pushed through 336,340 cassava seedlings and 172,000 plantlets of the varieties CHINHEMBWE, UMBELUZI 2 and TAPIOCA. The total number of farmers reached by the project stands at 11,000 (against a target of 15,000): this is 73 percent achievement, much of this underperformance being attributable to insufficient project time.

Table 7: Key performance indicator I for IDSST operations in Mozambique

Indicator	Original target	Achieved	% Achievement
Number of training materials developed	7	7	100
Number of extension officers trained from public, private sectors to support delivery of good agronomic practices	28	28	100
Number of CAES trained	180	154	86
Number of Farmer Field Schools supported	300	154	51
Number of community agribusiness entrepreneurs supported and linked to markets	180	154	86
Number of communication materials produced	4	14	350
Number of cases studies documented	7	26	371
Number of radio bulletins broadcasted	36	22	61
Number of new crop varieties promoted through IIAM support	9	4	44
Average volume of fertilizers sold by trained agro-dealers in the project target area	-	-	-
Number of beneficiaries of IFAD loan support under this grant	7,500	2,514	34
Number of cassava cuttings produced	83,000,000	333,540	0
Adoption of improved technologies (%)	50	25	50
Farmers accessing markets due to linkages from CAES (%)	50	20	40
Number of mother demo-plots established	180	154	86
Number of baby demo-plots established	3,600	2,585	72
Average performance			96

The IDSST project's most important impact has been the introduction of three varieties of cassava crops that were cleaned from diseases and disseminated to farmers, namely CHINHEMBWE, UMBELUZI 2, and TAPIOCA. Data from 2,800 demonstration plots show an increase in varietal yields of cassava: from 4-8 ton/ha under farmer practice to a yield of 15-20 ton/ha under farmer-managed research trials. Farmers perceptions, following years of training, are focused on the taste of the cultivars promoted. In addition, farmers also look at cyanide content, average yield, disease performance and pubescence. Farmers´

perception is also determined by market dynamics, and especially the farmers view that market interlocutors such as DADTCO do not pay the right price to cover their costs. As a result, the low levels of productivity for cassava compared to elsewhere and poor transportation are the main barriers to the development of a processing industry in Mozambique, although initial steps have begun under IDSST to rectify this. As in Malawi, production of breeder seed, pre-basic and basic seed was on track, but there was significant slippage on production of certified seed.

Table 8: Key performance indicator II for IDSST operations in Mozambique

Indicator	Original target	Achieved	% achievement
Number of enterprises along focus input development and supply value chains operating optimally	30	31	103
Number of new enterprises supported and operating along the focus value chains	50	0	0
Number of certified cassava seed producers in implementation area	30	16	53
Number of training events held to build capacity of farmers and other value chain actors along focus value chains	5	20	400
Number of seed business individuals who have received short-term agricultural sector training	30	59	197
Number of extension service personnel trained (extension agents and CAES)	128	143	112
Number of farmers and other value chain actors participating in extension service events	15000	11122	74
Number of processors producing certified cassava derivatives	90	31	34
Numbers of SMEs linked to structured markets	35	18	51
Average performance			114

Capacity enhancement BM training for CAEs has highlighted importance of organizing into associations to be able to negotiate prices, facilitate the flow of products, attract other types of investments to set up processing units. Mozambique sub-projects noted for strong performance on knowledge management, with 40 knowledge products developed (including case studies) and 22 radio broadcasts aired. As a result, farmers have acquired knowledge of when and how to apply fertilizers, their importance and advantages, and where to buy them. This would have significant impact, leapfrogging infrastructure, sustainability and national COVID-19 restrictions. In addition, farmers' capacities to choose varieties and manage their fields have been enhanced by the IDSST project.

Cassava production bottlenecks still persist. They include lack of adequate EGS demand forecasting system, with poor quantification of pre-basic and basic seed needs and varieties in each cropping season. This is compounded with poor EGS distribution system, headlined by limited handling, poor storage facilities and transportation system from the production areas to the users. In addition, the sector is bedeviled by poorly performing platforms for demand

creation (awareness-raising about the improved varieties and their benefits) in the production areas and limited value addition.

Table 9: Key performance indicator III for IDSST operations in Mozambique

Indicator	Original target	Achieved	% Achievement
Numbers of cuttings of new improved varieties produced	172,000	172,000	100
Percentage change of cassava cuttings of new varieties reaching farmers	40	15	38
Number of new crop varieties promoted through NARS	6	6	100
Increased adoption of improved varieties in target area (percentage)	50	15	30
Number of NARI personnel and others trained to enhance deliver input technologies	38	128	337
Average performance			**121**

6.4 Project Efficiency and Value for Money

The project had limited resources in terms of budget and time. In total, IDSST project invested in sub-projects in Mozambique $585,351, which was spread across three grants. The per capita cost of reaching one farmer was $19 – which is way below the AGRA's precedent-setting benchmark of $40 per capita. This raises questions on whether there were meaningful engagements between the three sub-project teams and the farmers. However, it is also worth nothing that during the entire IDSST operation the per capita cost of reaching one farmer was nearly standard across the three countries – at an average of $18 (this is from a total project outlay of $1,073,189 which was able to achieve a reach of 60,320 farmers).

The improved varieties churned out by IIAM possess desirable characteristics for the smallholder farmers: resilient to adverse climatic conditions (droughts) and pests and diseases attacks. The project established irrigation system for germplasm: at IIAM Maputo for pre-acclimatization and the other in Umbeluzi with greater capacity than the old one, thus allowing to acclimatize more numbers of plants at any given time. Furthermore, the use of research stations such as Nhacoongo and Maniquenique have enabled further multiplication of planting material and its delivery to smallholder farmers, reducing distances and increasing access.

Acquisition of reagents and other consumables allows IIAM to undertake virus cleaning and enhanced multiplication of improved varieties in-vitro. With greenhouses rehabilitation, there was 300+% in capacity, from 3,000 plants to 10,000, allowing IIAM to increase the number of seedlings per unit of time. Multiplication protocols have been established and training has been successfully carried out with IIAM and partner staff.

Calibration of laboratory equipment was performed correctly. Procedures for the production and certification of cassava seed and the material used in the training has been made available

to seed producers. There was means that there was significant complementary investment to the IDSST's investment in infrastructure for germplasm.

6.5 Project Sustainability

IIAM plans to continue to multiply via tissue culture, but operational costs are high. The institute plans to sell the material at discounted prices to associations and cooperatives of seed producers. This will complement the dissemination of the advantages of using improved and disease-free varieties.

IIAM looking for new donors to continue multiplication efforts for cassava. While the IDSST project ended, IIAM has confirmed that the field multiplication is continuing under PROCAVA, which is the successor project to the defunct PROSUL.

Since for cassava there is as yet no private company that can multiply cassava seed, the project's Mozambique strategy was well thought out: to train farmers (emergent farmers) to produce seeds and then can sell it on to other farmers. On the other hand, the government of Mozambique still continues to provide office space for the development of research activities, still funds breeding activities and breeder seed with limited funds.

During the project implementation there has been significant engagement and involvement of district agricultural services (SDAE) with their field officers participating in dissemination of technologies, demonstration plots and having been trained. This is an asset that the project has left which in collaboration with IIAM researchers and the PROCAVA will secure continuity on the cassava value chain intervention. In addition, the certification of cooperatives that are linked to markets in bigger cities will continue pushing for quality cassava production and with that the continued uptake of technologies and income generation.

Meanwhile, PROCAVA is now promoting Chinhembwe, Amarelinha, Umbeluzi-2, and Tapioca.

6.6 IDSST Challenges in Mozambique

Farmers still face problems accessing high quality planting material: material distributed was not enough to reach all the producers, and they can only have it gradually, with the harvests of the demonstration fields established in the medium and long term. The material is not available locally, as it is produced by IIAM on demand and requires a lot of logistics to reach the communities. It is suggested that local demonstration plots be established with IIAM monitoring/technical assistance.

Budget and time were significant constraints: the sub-projects all started late, meaning that the agricultural calendar was not in sync with project timelines.

Varietal problems persist: Chinyembwe is an old variety, good for yields, farmers like it more, but has problems with disease susceptibility, esp. cassava mosaic. Some farmers are still holding the contaminated Chinyembwe.

Out of the six varieties planned, two were not realized: Clone 3 and Umbeluzi 2. Varieties are still new to the farmers, still undergoing acceptance by the farmers. Linkages with private sector done for banana, but cassava has challenges as there is not much interest from the private sector. For cassava, there is no yet private company that can multiply cassava seed.

The SMEs in the cassava value chain were expected to carry on with projects interventions, thereby ensuring a functional supply of plantlets from tissue culture – this has not been achieved. In-vitro multiplication program commenced without matrices in the laboratory, which is why it took a long time in the cleaning and introduction phase of matrices to be multiplied.

Lack of incentives for product processing: This challenge persists because there are still few factories or processing units, with the introduction of technologies the production has increased, but the existing processing units have remained the same.

6.7 Key lessons learnt in Mozambique

The PPP model in Mozambique had resourceful partners: IIAM, KULIMA, and UEM were sound partners. IIAM deserves plaudits for the choice of two (out of the four) varieties of cassava for multiplication. Tapioca is high-yielding, liked by the corporate world: Amarelinha has good carotene content, while Clone 4 is high-yielding and has high DM.

Smallholder farmers like Tapioca: good yields, good performance in terms of pest and disease resistance and drought tolerance, since one of the constraints smallholder farmers face was the use of disease sensitive varieties that caused low yields. DADTCO, largest buyer of cassava, prefers Chinyembwe – high starch content, also preferred by fresh consumers. Amarelinha is still not going to scale at industry – high fiber content, not appreciated by industry, needs to be consumed 6-9 months, production is still low.

Choice of experienced cassava producers is important, in the light of project timeline. Producers have some knowledge about cassava production, but they lack technical knowledge about increasing production and productivity using new technologies (improved varieties and application of fertilizers combined with good agricultural practices).

The IDSST project required at least three years, perhaps even longer. This is a standard lesson across all the three countries.

6.0 WORK PLAN FOR THE EVALUATION

Activities and deliverables	Mar. 10-17	Mar. 22-26	Apr. 1-10	Apr. 11-17	Apr. 18-24	Apr. 25-30	May 1-5	May 6-Jun. 30
Phase 1: Desk review and baseline design								
Inception report								
Review of project documents								
Introductory meeting 1 at AGRA HQs in Nairobi (global)								
Follow-up meeting 1 with M&E team								
AGRA approval for data collection tools								
AGRA introductory letters to IDSST stakeholders								
Phase II: Fieldwork								
Evaluation in Malawi								
Evaluation in Mozambique								
Evaluation in Ethiopia								
Auxiliary data collection and gap filling measures								
Phase III: Data analysis								
Data analysis in Nairobi								
Data integrity checks								
Phase IV: Reporting								
Draft report submission								
AGRA review								
Recasting and final report submission								

ANNEX I: KEY EVALUATION QUESTIONS

Questions (extracted from TORs)	Target group (Respondents)	Method	Areas to focus on
Relevance			
i. Overall: assess the design and focus of the project	Partners (including governments, farmer associations, private sector players)	KII	Suitability of piloted ISFM technologies for the agro-ecologies in the target countries, process development, grantee capacity building impacts, identify outstanding M&E issues
ii. To what extent did the project achieve its overall objectives?	Beneficiaries (smallholder farmers)	Survey and FGD	Adoption levels, yield increases, production increases, linkages into national agricultural planning frameworks, smallholder farmers' role in IDSST interventions, determine the key impact messages from farmers and agribusinesses, identify outstanding M&E issues
iii. What and how much progress has been made towards achieving the overall outputs and outcomes of the project?	Ministries of Agriculture staff Project beneficiaries	Survey and KII	Impact of IDSST interventions on lives and livelihoods, the involvement of national governments, the involvement of smallholder farmers, feedback loops and how they were managed
iv. To what extent did farmers adopt improved technologies promoted by the project?	Smallholder farmers Triangulated with KIIs	Survey and KII	Adoption levels, yield increases, production increases, determine the key impact messages from farmers
v. What were the key drivers of adoption rate of improved technologies by farmers?	Smallholder farmers	Survey and KII	Levels of adoption and replication of key IDSST-supported suite of technologies and practices, determine and disaggregate the drivers of adoption (or lack thereof)

	Triangulated with KIIs		
vi. What was the effect of adoption rate of improved technologies on farmer's yields, incomes at household level?	Smallholder farmers Triangulated with KIIs	Survey and KII	Adoption levels, yield increases, production increases, impact on household economy, retail numbers on revenue increases at household level
vii. What was the relationship between yield, household food security and income?	Government ministries, smallholder farmers, agribusinesses	FGDs and KIIs	Develop an integer that displays a relationship between annual farming incomes, yield increases and food security, with powers of attribution and/or contribution by IDSST interventions
viii. Were the inputs and strategies identified, and were they realistic, appropriate and adequate to achieve the results?	IDSST staff, IFAD staff, AGRA staff, partners	KIIs	In-depth questioning of the project's theory of change and overlay with results and impacts Identify the barriers at household, institutional and policy levels
ix. Was the project relevant to the identified needs?	Farmers, ministries, association of farmers	KIIs and FGDs	Questions on overall relevance and the framing of interventions; determine the efficiency of the delivery of IDSST messages to smallholder farmers, understand the role of sustainability framework in continuity and perpetuity Establish what strategies, innovations, mechanisms, and support were most effective in increasing adoption of IDSST technologies in the target countries
Effectiveness			
i. Was the project effective in delivering planned results?	Farmers, government officials, project partners	KIIs, FGDs	To establish to what extent the IDSST project was effective in achieving the intended outcomes, in the short, medium and long term

			Also, to look at the extent to which the project contributed to producing worthwhile results (outputs, outcomes) and/or meeting each of its main objectives
ii. Was the project effective in training NARI officials to promote and deliver improved technologies to farmers?	NARI officials	KIIs	The level of technology transfer and capacity building achieved
iii. Was the project effective in supporting research institutions and seed companies to produce and distribute breeder, foundation and certified seed to farmers	NARI officials Breeders Seed companies	KIIs	Depth of relationship with NARIs, seed companies
iv. Was the project effective in creating awareness of improved varieties and fertilizer technologies to farmers?	Smallholder farmers	Survey and FGD	Appropriate survey questions designed to produce answers Discussions with farmers to ferret out changes in their use of improved varieties and fertilizer technologies
v. Was the project effective in capacity building extension officers to deliver good agronomic practices to farmers?	Ministry extension staff	KIIs	Levels of capacity building needs assessment report, project progress report, t vi. How effective were the strategies and tools used in the implementation of the project triangulating this with farmers' own perceptions on competence of extension staff
vi. To what extent did the project's M&E mechanism contribute in meeting project results	IDSST documentation review	Secondary data review	
vii. How effective were the strategies and tools used in the implementation of the project?	IDSST staff	IDSST documentation review Secondary data review	Link previous needs assessment studies with performances reports to determine improvement in service delivery at the NARIs supported by IDSST, etc.
viii. How effective was the use of radio and brochures to disseminate information on improved technologies?	Farmers, agricultural extension staff	Survey, KII, FGDs	Key informant interviews to be conducted directly with agricultural extension staff, as well as farmer responses via survey

ix. How effective was the use of demonstration plots in showcasing improved varieties and training farmers	Farmers, agricultural extension staff	Survey, KII, FGD	Key informant interviews to be conducted directly with agricultural extension staff, as well as farmer responses via survey
x. How effective were seed companies in producing and delivering breeder and foundation seed to farmers?	Seed companies, farmers	KIIs, FGDs	Efficiency of production, delivery mechanisms, feedback from farmers
xi. How effective government officials were in providing extension to farmers?	Agricultural extension staff	KIIs	Scoping existing capacities, review of baseline report, review of final consolidated progress report, triangulation
xii. How effective was the project in support to IFAD's investments in countries?	Respective government ministries	KIIs	Effectiveness of partnerships, sustainability mechanisms put in place
xiii. How effective has the project been in responding to the needs of the beneficiaries, and what results were achieved?	All project partners	KIIs, FGDs	Impact scoping questions
xiv. What are the future intervention strategies and issues to be considered for scale up or next phase?	All project partners	KIIs, FGDs	Questions on sustainability
Efficiency			
i. Was the process of achieving results efficient? Specifically did the actual or expected results (outputs and outcomes) justify the costs incurred? Were the resources effectively utilized?	Consultant (Evaluation)	Data analysis and synthesis	We propose to use the DAC criteria for evaluating development assistance, to determine the level of developmental efficiency – this would involve creating a logic that measures costs incurred in the project vis-à-vis achievements, establishing possible inefficiencies via duplication
ii. Did project activities overlap and duplicate other similar interventions (funded nationally and/or by other donors?	Governments supported		
iii. Are there more efficient ways and means of delivering more and better results (outputs and outcomes) with the available inputs?	Consultant (Evaluation)	Data analysis and synthesis	
iv. Could a different approach have produced better results?	Consultant (Evaluation)	Data analysis and synthesis	

v. How efficient were the management and accountability structures of the project?	Consultant (Evaluation)	Data analysis and synthesis	
vi. How did the project financial management processes and procedures affect project implementation?	Consultant (Evaluation)	Data analysis and synthesis	
vii. What are the strengths, weaknesses, opportunities and threats of the project's implementation process?	Consultant (Evaluation)	Data analysis and synthesis	
Sustainability			
i. To what extent are the benefits of the projects likely to be sustained after the completion of this project?	IDSST staff Governments Consultant (Evaluation)	Data analysis and synthesis	Establishing existence of a sustainability plan
ii. To what extent will the knowledge management product contribute to sustainability of the project outcomes?	Consultant (Evaluation)	Data analysis and synthesis	Analysis of knowledge products, their depth and breadth, dissemination frameworks, etc.
iii. What is the likelihood of continuation and sustainability of project outcomes and benefits after completion of the project?	Consultant (Evaluation)	Data analysis and synthesis	Establishing existence of a sustainability plan
iv. How effective were the exit strategies, and approaches to phase out assistance provided by the project including contributing factors and constraints?	Consultant (Evaluation)	Data analysis and synthesis	
v. Describe key factors that will require attention in order to improve prospects of sustainability of project outcomes and the potential for replication of the approach?	Consultant (Evaluation)	Data analysis and synthesis	
vi. How were capacities strengthened at the individual and organizational level (including contributing factors and constraints)?	Consultant (Evaluation)	Data analysis and synthesis	Needs assessment reports review, organizational capacity assessments conducted post-ante

vii. Describe the main lessons that have emerged?	Project beneficiaries Project partners Consultant (Evaluation)	KIIs Data analysis and synthesis	Broad-based interviews to identify, scope and characterize emerging results, outcomes, and impacts of the IDSST project
viii. What are the recommendations for similar support in future?	Project beneficiaries Project partners Consultant (Evaluation)	KIIs Data analysis and synthesis	

ANNEX II: LIST OF PERSONS INTERVIEWED FOR THE EVALUATION

Name	Organisation	Position	Location	Phone Number
Malawi				
Mr Mcloud Kayira	AGRA Malawi		Lilongwe	+265-999-415524
Mr Rex Baluwa	IFAD/SAPP	Programme Coordinator	Lilongwe	+265-888-874076
Ms Upile Ndilowe	IFAD/SAPP	Communications and Knowledge Management Officer	Lilongwe	+265-993-155272
Mr J. Mtupanyama	IFAD/Malawi	Consultant	Lilongwe	+265-995-604512
Dr Ibrahim Benesi	MUSECO	Executive Director	Lilongwe	+265-999-474456
Dr Lawrent Pungulani	DARS	Principal Scientist and SAPP Coordinator	Lilongwe	+265-991-142300
Dr Godfrey Chapola	Director	RUMARK	Lilongwe	+265-999-792070
McPherson Masangano	Programme Officer	RUMARK	Lilongwe	+265-999-473022
Mr Chris Edgar Lutepo	Chikwendeni Agrodealer	Managing Director	Lilongwe	+265-999-617393
Mr Maiza Mwaisondola	Maiza Agrodealer	Managing Director	Nkhotakota	+265-999-333713
Mr Sungeni Ng'onamo	Agwenda Agrodealers	Managing Director	Nkhotakota	+265-999-602005
Mr Philip Ilande	Changu Agrodealers	Managing Director	Lilongwe	+265-999-176116
Mr Julius Masebo	Masebo Agrodelaers	Managing Director	Lilongwe	+265-994-021943
Willy Chinseu	Progressive Agrodealers	Managing Director	Lilongwe	+265-999-726880
Lusubiro Ngonga	Flanders Project Malawi	Former ACE Warehouse Manager, Kasipa Cooperative, Nkhotakota	Kasungu	+265-998-966816
Mrs Chimwemwe Jere	Khasu Agrodealers	Managing Director	Lilongwe	+265-999-383312
Mr Yesani Manjawira	Kasipa Cooperative	President	Nkhotakota	+265-991-851332
Mr Mavuto Gomani	Kasipa Cooperative	Secretary	Nkhotakota	+265-991-554725
Mr Luka Gomani	Kasipa Cooperative	Chair – Marketing	Nkhotakota	+265-999-665317
Mr Julius Nkhoma	Ministry of Agriculture	AEDC, Mtosa EPA	Nkhotakota	+265-997-521330
Mrs Ethel Mwase	Ministry of Agriculture	AEDC, Linga EPA	Nkhotakota	+265-999-253110
Mr James Chagunda	Ministry of Agriculture	AEDC, Kasitu EPA	Nkhotakota	+265-992-653342
Mr Wildon Mchina	Ministry of Agriculture	AEDC, Mphonde EPA	Nkhotakota	+265-999-305530
Mr Godfrey Kamwaza	Ministry of Agriculture	AEDC, Chitekwere EPA	Lilongwe	+265-994-796199
Mr Emmanuel Pemba	Local Community	VBA/CAA, Chitekwere EPA (Ukonde Section)	Lilongwe	+265-993-067469

Lyson Davison	Local Community	VBA/CAA, Chitekwere EPA (Ukonde Section)	Lilongwe	+265-995-947685
Ms Fainess Chabira	Local Community	VBA/CAA (Chigodi EPA)	Lilongwe	+265-999-155493
Ms Sheila Keino	AFAP	Country Manager	Lilongwe	+265-995117410
Mr Kenneth Singini	Agriculture Direct Agrodelaer	Extension Officer	Lilongwe	+265-995-172919
Mrs Yacinta Chaziya	Agriculture Direct Agrodelaer	Nathenje CAA Committee Chair	Lilongwe	+265-999-781598
Mr Lekinala Saukani	Agriculture Direct Agrodelaer	Nathenje CAA Committee Vice Chair	Lilongwe	+265-999-668193
Mr Christopher Sandifolo	Agriculture Direct Agrodelaer	Nathenje CAA Committee Secreatry	Lilongwe	+265-995-259323
Committee members	Titukule Seed Multiplication Group	Chairperson	Chiradzulu	
Ethiopia				
Jemaneh Samson	AGRA	Program Officer	Addis Ababa	+251 968571391
Wubeneh Nega	AGRA	Country Manager	Addis Ababa	
Tilahun Amede	AGRA	Head, Resilience, Climate and Soil Fertility	Addis Ababa	
Wubshet Berhanu	Self-Help Africa	Country Director	Addis Ababa	+251 116 182556
Samuel Feyissa	Haramaya University	Lecturer	Haramaya	
Nuredin Asaro	PASDIP	Coordinator	Addis Ababa	
Fasil Kelemework	Self-Help Africa	Head of Programs	Addis Ababa	+251 116 620659
Zekarias Eshetu	Self-Help Africa			
Tefera Solomon	Ministry of Agriculture, Ethiopia	Director, Soil Fertility Directorate	Addis Ababa	
Mozambique				
Benvindo Verde	AGRA	M&E	Maputo	bverde@agra.org
Sofrimento Matsimbe	IIAM	Team leader for cassava program	Maputo	smatsimbe.mz@gmail.com
Maria Adosinda Fumo	KULIMA		Maputo	adosinda.fumo@gmail.com
Lucas Tivana	University of Eduardo Mondlane	Team leader	Maputo	
Virgilio Massango	IIAM	Researcher	Chimoio	massango.virgilio@gmail.com
Ricardo Josué	IIAM	Researcher	Maputo	ricamacia@gmail.com
Rogerio Chiulele	University of Eduardo Mondlane	Researcher	Maputo	chiulele.rogerio@gmail.com
Pureza Monjane	University of Eduardo Mondlane	Researcher	Maputo	purezabaptista@gmail.com
Lara Generoso		Agribusiness specialist	Maputo	larageneroso201@gmail.com
Constantino Cuambe		Agribusiness specialist	Maputo	ccuambe@gmail.com

Arlindo Mucone		Agribusiness specialist	Maputo	amucone@yahoo.com.br
Domenico Luizzi	KULIMA	Head	Maputo	kulima@tvcabo.co.mz