SEED SECTOR DEVELOPMENT FOR SOUTH SUDAN (SSD4SS) PROJECT:

End of Programme Evaluation

Kingdom of the Netherlands

AGRA
Growing Africa's Agriculture

Prepared by TANGO International, Inc

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Acronyms

AATF	African Agricultural Technology Foundation
AGRA	Alliance for a Green Revolution in Africa
ARC	Agricultural Research Corporation
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
CEO	Chief Executive Officer
CGIAR	Consultative Group on International Agricultural Research
CIAT	International Center for Tropical Agriculture
CIMMYT	International Maize and Wheat Improvement Center
COBAMA	Community-based Market Oriented Seed Production Associations
EKN	Embassy of the Kingdom of the Netherlands
FAO	Food and Agriculture Organization
FGD	Focus group discussions
HGBF	Howard G. Buffett Foundation
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IITA	International Institute of Tropical Agriculture
KALRO	Kenya Agricultural and Livestock Research Organization
KEPHIS	Kenya Plant Health Inspectorate Service
KII	Key informant interviews
MAFS	Ministry of Agriculture and Food Security
M&E	Monitoring and Evaluation
MSc	Masters of Science
MT	Metric tons
MTR	Mid-Term Review
NARO	National Agricultural Research Organization
NCE	No-Cost Extension
NEAT	National Effort for Agricultural Transformation
OECD-DAC	Organization for Economic Co-operation and Development-Development Assistance Criteria
OPV	Open-pollinated variety
QDS	Quality declared seeds
RH	Relative humidity
SEMIs	Seed Enterprise Management Institute
STASS	Seed Trade Association of South Sudan
TANGO	Technical Assistance to NGOs
ToC	Theory of Change
TOR	Terms of Reference
TOT	Training of trainers
UNDP	United Nations Development Programme
VBA	Village-based agents
WFP	World Food Programme
ZEAT	Zonal Effort for Agricultural Transformation

Executive Summary

The Seed Sector Development for South Sudan (SSD4SS) project was funded by the Dutch government through the Embassy of the Kingdom of the Netherlands (EKN) for a four-year period beginning the end of 2013 through the end of 2017. Due to severe deterioration of the political and safety situation in South Sudan during this timeframe, project implementation was disrupted, making it difficult for timely implementation of activities and achievement of target milestones. At the recommendation of a mid-term review (MTR) conducted in early 2017, a two-year no-cost extension (NCE) was awarded (2018-2019).

Overall, the main objective of the project is to increase income and reduce poverty by promoting the development of a seed system in South Sudan that delivers new crop technologies to farmers in an efficient, equitable, and sustainable manner. The project's specific objectives are to:

- Objective 1: develop capacity for research, seed production and certification through short- and long-term training of crop and seed technical specialists;
- Objective 2: support Ministry of Agriculture and Food Security (MAFS) crop improvement research, seed production and certification activities, and improve seed testing laboratory infrastructure;
- Objective 3: develop the seed sector in the production and dissemination of high-quality seed of the new, improved crop varieties;
- Objective 4: organize, train and support farmer groups to produce seed as out-growers for seed companies and for local distribution;
- Objective 5: create awareness of the developed crop varieties among farmers and other stakeholders through awareness-raising activities including on-farm demonstration plot;
- Objective 6: organize the private seed sector into a National Seed Trade Association; and
- Objective 7: ensure effective project implementation and monitoring

Evaluation Purpose

The purpose of the performance evaluation is to examine what worked and what did not, to identify strategies for improving future programming, stakeholder engagement, and relevant interventions, and to provide learning and accountability to donors, the government of South Sudan, and South Sudan's smallholder farmers. The key objectives of the evaluation are to:

1. Ascertain results (outputs, outcomes, impact) and assess the effectiveness, efficiency and relevance of specific development intervention
2. Provide findings, conclusions, and recommendations in respect to implementation strategies as specified in the project document
3. Highlight lessons learned during the no-cost implementation period.

The evaluation seeks to assess the degree to which the SSD4SS project achieved its objectives, its effectiveness in achieving its outcomes and objectives, whether its achievements are sustainable over the long-term, and what, if any, lessons learned can be used for future programming. The evaluation is framed by a set of primary evaluation questions centered on relevance, beneficiary satisfaction, effectiveness, efficiency, and sustainability.

Methodology

The evaluation was conducted February 3-12, 2020 and consisted of a desk review of project documents (e.g., proposals, annual reports, results tracking, assessments), other documents related to the seed

sector in South Sudan, and qualitative field work. Qualitative data collection involved purposive sampling of the project's beneficiaries, interventions, and geographic scope. Key informant interviews (KII) and focus group discussions (FGDs) were conducted with out-growers, seed company representatives, plant breeders, the Ministry and Agriculture and Food Security (MAFS), the donor, and agro-dealers (see Annex B). The qualitative study was structured to gather participant perspectives on the extent to which they felt activities have been achieved; any gaps or challenges the project experienced over the course of the two years; the effectiveness of project interventions and targeted groups; quality of services provided; and the projected sustainability of project interventions and outcomes. The final data set consisted of a total of 41 key informants or focus group discussion participants, with 14 females and 27 males.

Some challenges arose during the evaluation and included: i) short timeframe in which to conduct the study; ii) small number of focus group discussions and key informant interviews (e.g., in only two areas in which the project operated); iii) limited access to project background documents; iv) absence of non-participating farmers in focus groups; and v) difficulty separating results specific to different phases of the SSD4SS project as well as previous work conducted by AGRA.

Findings

Overall, the SSD4SS project was well-designed and implemented, and highly effective at meeting its expected outputs.

Objective 1: Capacity building of crop and seed technical specialists. Data suggest that the project had a high degree of achievement under this objective. Twenty-six (20 male; 6 female) seed company personnel were trained through the SEMIs and 55 (44 males; 11 females) were trained by the University of Juba. Six MSc students were supported, with three graduated at the time of the evaluation. Sixty seed inspectors were trained, 40 of which have been mobilized across the country.

Training under this objective utilized a Training of Trainers (TOT) model, which resulted in a core group of "trainers" who could then provide training to additional seed sector specialists (e.g., other seed company staff) in South Sudan. Insights from KIIs suggest this was a highly successful approach; participants felt they had greatly expanded their knowledge base regarding the entire seed production process and/or seed business management/entrepreneurship, depending on which learning modules they attended.

Seed company staff and out-growers were also trained by the University of Juba. Training focused on basic agronomy, seed technology, and seed business principles. Under the NCE, 260 participants were targeted and training manuals produced. Short courses were delivered by a team of instructors from the University of Juba. Overall, most of those interviewed considered this training to have been of great benefit, though qualitative data suggest that trainings could be more comprehensive. That is, training should include all aspects of seed production and processing. In particular, people felt they needed more focus on field pest management of diseases and insects, such as fall army worm.

Objective 2: Capacity building of the MAFS. AGRA has supported a number of South Sudan crop breeding efforts (e.g., rice, maize (OPVs), cowpea, groundnut) through the SSD4SS. Under the NCE, support was provided to on-going breeding programs of bean, hybrid maize, and sesame. Funds were provided to MAFS plant breeders in order to support ongoing research and breeding activities designed to produce improved varieties of priority crops for public release. As a result of project support, 10 varieties of improved crops were released during the NCE; three groundnut varieties were released in 2018 (i.e., developed during the earlier phase of the project) and in 2020, three bean and four hybrid maize varieties were released. Overall, 32 varieties of improved crops have been released through the SSD4SS project.

Over 22 MT of high-quality foundation seed was produced by the MAFS and one of the project-supported seed companies (Gumbo Glow), increasing access by seed companies and their out-growers.

Based on qualitative data, there was widespread appreciation among breeders for the support they had received from the project, including exchange visits to the National Agricultural Research Organization (NARO) in Uganda and the Kenya Agricultural and Livestock Research Organization (KALRO). In particular, breeders indicated such visits were critical to their research programs in that the visits not only facilitated their ability to source materials from other countries, but were important for forming and maintaining relationships with other plant breeders, with whom they could exchange information and ideas. Links to breeders in regional and international research institutions will add value to South Sudan's research programs and breeding materials.

Also under this objective, a refurbished container unit donated by the MAFS was equipped and operationalized as a national seed-testing laboratory. Staffed with personnel trained under Objective 1 (i.e., Building capacity for seed testing and inspection services at the MAFS), the lab will conduct tests for germination rate, moisture content, purity, and diseases. As the national seed testing laboratory, it is somewhat small and underequipped but nonetheless represents a significant achievement and step forward in terms of developing formal quality seed testing capacity and services in South Sudan.

Generally, however, the MAFS itself remains under-resourced, its irrigation infrastructure in need of repairs or further development, and lacks proper and sufficient equipment, cold-storage, etc. Thus, while its research capacity regarding crop breeding and seed production has perhaps been enhanced, other aspects of its overall capacity for research, production, and release of improved varieties (e.g., infrastructure, institutional processes (e.g. planning, learning, policies), financial resources, human resources) could still limit their ability to produce and disseminate improved varieties that will benefit South Sudan's farmers.

Objective 3: Developing the production and dissemination capacity of the seed sector. Activities under this objective focused primarily on seed companies but also agro-dealers. Seed companies received grants to increase production, both by expanding their own fields and by supporting out-growers. In all, 12 seed companies were supported. According to all of the KIIs with whom the evaluation team met, this support was hugely important to the seed companies. The grants allowed them to open up new land for their own production and for out-growers, to purchase quality foundation seed, and to contract with out-growers – both groups and individuals. One of the unexpected outcomes was that out-growers produced more high-quality seed than many seed companies could comfortably purchase. Lack of sufficient storage space was a critical concern for seed companies and out-growers alike. KIIs with out-growers revealed that in some cases, seed companies were unable to buy the contracted seed in a timely manner because they lacked sufficient space to store it. This left out-growers "sitting on" the seed they produced and harvested months earlier, with no guarantee of when it would be purchased or at what price. Although project activities focused on aggregation, seed bulking, etc. during the last half of 2019, seed storage space remains a challenge.

Support was also provided to seed companies to improve their chances at securing bids through FAO's procurement process. FAO has agreed to purchase up to 25 percent of their total annual seed requirements (approximately 8,000 MT) through local purchase, which provides project-supported seed companies with the opportunity to sell up to 2,000 MT through this initiative. FAO has contracted with one seed company to deliver 500 MT of maize seed in 2020. At an anticipated price os USD 890 per ton, the contract is worth approximately USD 445,000.

Seed companies were also supported with business development services (BDS) and received training and mentoring by a business development consultant and secondees, who had either attended the SEMIs training or worked for the MAFS, on seed production and best practices for optimizing financial operations. When asked specifically about the value of such training, KIIs indicated it was very valuable; some noted that they were in fairly good financial condition based in part on the BDS training they had received. Although several companies felt they might need to reduce their staff in 2020, one company had plans to expand their operations.

In order to help ensure availability of agricultural inputs to farmers, business training was provided to agro-dealers and village-based advisors (VBAs). Agro-dealers were also supported to develop and provide small seed packs and demonstrations to farmers, which is an important way of disseminating new varieties that farmers can experiment with before investing their limited resources. Approximately 18,000 farmers received seed demonstration packs. In all, 12 new agro-dealerships were established and 74 agro-dealers were trained in basic technical knowledge about inputs and enterprise management and linked to VBAs. KIIs with agro-dealers in Juba suggest positive improvements in their business outreach and great hope for the future; generally, they agree that there is much interest and demand for high-quality seeds, fertilizers, and pesticides. However, they also identified several challenges, including the problems created by free seed initiatives implemented by NGOs. NGOs typically accept the lowest bid for seed, which often means they contract with "hand-bag" companies – those who operate under the radar with no physical address or business. Such companies often deal in "fake seed"; they purchase grain and repackage it as seed, often at lower prices than those offered by agro-dealers.

Objective 4: Support to farmers and out-grower groups. As part of this objective, out-growers received season-long training in the field, beginning in the second season of 2018. A total of 208 out-growers (101 females; 107 males) in Juba and Magwi received practical, hands-on training in seed production, including understanding and negotiating contracts with seed companies.

Qualitative insights suggest that training needs to be more comprehensive, including soil fertility and insect/disease control, as well as more follow-up by trainers, seed company field managers and community-based agricultural extension advisors. One of the lessons learned from the earlier phase of the project was that farmers "required continuous supervision and regular trainings to produce quality seeds." While the NCE took positive steps toward addressing this, the basic lesson remains true; farmers need continuous training to help sustainably build their capacity for producing high-quality seed for South Sudanese markets. More support is also needed in terms of accessing and understanding climate information as well as small business management and marketing.

In order to increase out-grower access to capital for production purposes, a Matching Grant scheme was developed and implemented as part of this objective. Funds were provided to three seed companies for land clearing and preparation, with the money to hire tractors or labor provided to out-growers as a "loan" that would be deducted during buy-back of the seeds produced. The scheme utilized a block farm production model with a goal of producing 120 MT of maize, sorghum, groundnut, and cowpea seed. A total of 400 out-growers across three seed companies (i.e., MASCO, Green Horizon, Seed Grow) accessed loans through the project's matching grant activity to help with production costs.

Objective 5: Awareness and commercialization of developed crop varieties. Activities under this objective consisted primarily of providing small seed pack demonstrations and developing digital training materials (i.e., videos) to enhance awareness and uptake of improved varieties. More than 10,000 seed packs demonstrations were conducted and an equal number of seed packs distributed. Small, portable "projectors" were used to show the training videos at the village-level, helping to reach a wider audience

and to provide follow-up to hands-on trainings conducted as part of the project. Videos were seen by 80,000 farmers, facilitated by seed companies in Yambio, Rumbek, Renk, Mawi, Juba and Torit.

Objective 6: Establishment of a national seed trade association. The project helped support establishment of the Seed Traders Association of South Sudan (STASS), whose mission is to coordinate and oversee development of the seed industry in South Sudan for sustainable agricultural and economic development. As of May 2019, there were 17 seed companies and 15 agro-dealers listed as members, though not all are current in terms of their membership fees.

STASS is well placed to help ensure progress made under SSD4SS continues. In particular, they can help nurture the relationship between seed companies and seed markets such as FAO, WFP, and NGOs engaged in “seeds and tools” programming. In addition, they are focused on working with FAO to reduce their reliance on bringing seed into the country and distributing it free to farmers. Free seed, in the form of humanitarian aid or development programming, does not typically help farmers solve their agricultural challenges (CIAT et al. 2011).

Another key area of focus for STASS is to lobby with the MAFS to conduct seed certification and to monitor seed imports. Several pieces of seed legislation have been drafted but have not yet been enacted into law (i.e., Seed Policy, Seed Bill). Although legislation exists, the seed laws undergirding the inspection and certification process have not been enacted. In essence, this leaves seed producers, breeders, and seed companies with seed that is “certified” without any legal authority. In turn, this limits the ability of the seed industry in South Sudan to reach its fullest potential. STASS is in a unique position to lobby the government regarding seed policy and regulations, including importation of seed.

Sustainability. The SSD4SS project has created a very solid foundation for the seed sector in South Sudan. Capacity of local institutions and seed sector stakeholders has been enhanced, including plant breeders, seed companies, agro-dealers, and smallholder farmers. A Training of Trainers (TOT) model has helped expand knowledge and skills within the University of Juba and seed companies that will help sustain progress. Production of improved varieties of priority crops such as maize, sorghum, groundnuts, and beans has increased. The volume of improved seeds sold by seed companies has increased. Research and development of improved varieties adapted to the South Sudan context has increased, with improved varieties released to the public. Partnerships and networks between the private sector and public institutions are in place and/or strengthened. The national Seed Traders Association of South Sudan (STASS) serves as an umbrella organization, organizing, coordinating and lobbying for seed companies with the government, NGOs, and UN entities. There is tremendous potential for sustained growth of the seed sector, in particular through procurement of bids with FAO, WFP and NGOs. Given there is a new, fragile government, price volatility and inflation, and lack of many basic services and infrastructure across the country, it is likely that the main avenue for continuing to build on the successes of SSD4SS lies with linking seed companies – and by extension smallholder farmers – to the UN and NGO systems of seed procurement. Although increasing, seed sales to farmers are not likely to be sufficient to support a robust seed sector for years to come. In the meantime, FAO and WFP programs to procure locally produced seed provides a viable pathway for supporting and helping to stabilize the fledgling industry. While it is clear that the gains achieved with project support are significant and lay the foundation for a strong seed industry in South Sudan, what is essentially two or three years of support is not enough time to ensure the fledgling industry takes root and can support itself long enough to become “autonomous and self-financing”.

Conclusions and Recommendations

Insights from KIIs and FGDs, as well as evidence available to the evaluation team at the time of the evaluation, suggest that the SSD4SS project was highly effective at achieving expected outputs. Implemented under less than ideal conditions, including insecurity and armed conflict, the project was focused and likely implemented as efficiently as it could be under the circumstances. It was clear from interviews that AGRA has a solid reputation in South Sudan and that the project is designed to address a critical need. Although progress was slower during the "first phase" of the SSD4SS project, cumulative results from September 2017 through December 2019 suggest that the project's success built on previous AGRA efforts, including those prior to 2013. Together, AGRA's interventions have helped create a solid foundation for the seed sector.

The evaluation team agrees with a number of recommendations from the MTR even though they were meant as recommendations for the NCE. In particular, we feel the following should be continued – and potentially expanded – as necessary elements in any future programming:

- Development of a decentralized national seed quality assurance mechanism;
- Strengthening of STASS and its umbrella role in the procurement process with UN agencies and international NGOs and other aspects of the seed sector;
- Support to SEMIs and the University of Juba to train seed company staff, out-growers and MSc students; and
- Strengthen collaboration between the seed sector, multilateral organizations such as FAO, WFP, and international NGOs, and donors, and promote local sourcing and purchase of seed from South Sudanese registered seed companies (i.e., not hand-bag companies).

Based on insights from qualitative interviews with seed companies, MAFS, plant breeders, out-growers, agro-dealers, secondees, and AGRA staff, the following recommendations are offered for consideration by AGRA for future programming.

- **Add value-addition activities.** In any next phases, AGRA should consider activities that add value to the crops being supported through the project. Value-added production, processing, and marketing should be promoted, including for example, peanut butter, sesame butter, corn meal, cooking oils (e.g., sesame, peanut, sunflower) and flours (e.g., sorghum, cowpea). Value addition provides markets for farmers and farming communities beyond just that of seed. Livelihood diversification, particularly into off-farm income generating activities, helps spread the risks to livelihood security based only on farming (Nelson et al. 2016). Such value chain activities can also be combined with activities around savings, including the formation or strengthening of savings groups such as Village Savings and Loans Associations (VSLA). Combining income-generating and VSLA activities has been shown to contribute to household resilience in a number of studies, and in particular for women, who often lack assets or decision-making authority over household income (Smith et al. 2015).

- **Expand training.** Following on insights from KIIs and recommendations from the MTR, some changes to training activities are recommended. Training for out-growers should be more comprehensive in nature and include more information and guidance on prevention and treatment of common crop diseases and insects (e.g., fall army worm), soil fertility management, etc. For example, training on Integrated Pest Management (IPM) should be prioritized in order to better manage insects and diseases and to prevent overreliance on chemicals that are harmful to the environment, animals, and people. Training should include accessing climate information to help farmers plan and operationalize their plantings to minimize negative impacts of climate variability and change. Although trainings were generally well-timed to the planting season, consideration should be given to

conducting sequential trainings to take advantage of non-planting times of the year followed by focused mini- or refresher courses timed with the field season. Continued training of seed inspectors is also needed in order to build sufficient in-country capacity for seed quality assurance/testing services.

- **Build government capacity at the local level.** Overall, the SSD4SS model of training agricultural extension agents through seed companies is an innovative and interesting model and should be encouraged. However, given the uncertainty of the future for most seed companies – at least those who participated in KIIs or FGDs during the evaluation – it is not clear how sustainable this approach will ultimately prove to be. Several seed companies indicated they will be cutting back on staff, which could potentially reduce the presence of such agents within out-grower communities. Likewise, the project has built regional capacity for seed quality services, though these services are woefully under-resourced and likely under-staffed. Nonetheless, the frameworks exist under which additional efforts should be focused. More emphasis needs to be placed on building decentralized capacity of the government, especially at the payam and boma levels.

- **Coordination with UN and NGO initiatives.** The SSD4SS project is not the only seed production activity currently operating in South Sudan. There are tremendous opportunities for linking with other humanitarian and development initiatives. In particular, the seed and/or grain markets represented by FAO and WFP present huge opportunities, with the recently awarded FAO contract to MASCO for 500 MT of seed as a case in point. KIIs with representatives from FAO suggest that they are enthusiastic for such a relationship to succeed while also remaining realistic about challenges (e.g., lower than expected yields or harvests, transportation costs, storage capacity). Although the evaluation team was not able to meet with representatives from WFP, we passed two Purchase for Progress (P4P) warehouses while conducting interviews in the Magwi/Torit area of Central Equatoria. KIIs with representatives from Green Horizon Seed Company noted that they purchase maize as grain from out-growers in Magwi and sell to WFP. They did not, however, indicate whether this was through the P4P initiative. Nonetheless, there is tremendous potential for linking out-growers to this program also.

  Other NGOs operate out-grower schemes as well, both within and beyond the SSD4SS project's geographic scope. Where areas of operation overlap, there appears to be little coordination among activities. For example, Caritas (Luxemburg) has trained out-growers around Torit, where several SSD4SS-supported seed companies work. Not only was Caritas not aware of the SSD4SS project in the area, they had lost seed procured for their project when it was "mistakenly" sold to MASCO. Additionally, FAO has trained approximately 5,000 farmers since 2008, creating a large pool of potential out-growers. According to one KII, FAO has recently begun discussions with seed companies, regarding working with FAO's farmers to help support seed production. Thus, there appears to be significant production potential for quality seed within the country that could be better coordinated in order to minimize competition and maximize results.

- **Decentralize financial management/disbursement of project funds.** As noted in qualitative interviews and the MTR, the South Sudan country office should have more direct responsibility for financial management of project funds. This will help reduce delays in payments of grants to seed companies and student stipends due to red tape and logistical constraints dealing with the Head Office in Nairobi and create more buy-in by in-country staff. The evaluation team agrees with the MTR that the country office does not necessarily need to be larger, per se, but should be staffed with enough people to allow for the efficient operationalization and management of future projects. This should include financial management, with clear oversight by Nairobi.

- **More rigorous TOC and M&E with outcome measures.** In future programs, care needs to be taken to fully develop a step-wise TOC that demonstrates for program staff, donors, and implementing partners how project activities will lead to behavior change and improved outcomes, which in turn will ultimately lead to improvements in a higher-level goal, such as increased income, reduced poverty, improved food security, etc. Development of such a TOC will also allow for development of a rigorous and complete results framework and list of measurable indicators for outputs, outcomes, and higher-level objectives.

Though it is still too early to determine with any degree of certainty, the SSD4SS project is likely to have long-term positive impacts on the seed industry in South Sudan, regardless of whether it ever becomes completely autonomous and self-financing. Ultimately, it is important for donors to consider the advantages of continuing to fund programs that are making progress in real time (particularly in adverse conditions) and that lay a solid foundation for future progress yet still require effort and resources to have long-term sustainable impact. Building a robust and equitable seed system takes time; it will not be accomplished in what was ostensibly an intensive three-year project. The SSD4SS project is worthy of continued funding – either from its current donor or others – so that the South Sudanese people can reduce their dependence on external assistance in order to achieve an appropriate level of food and livelihood security by their own initiative.

Introduction

Funded by the Dutch government through the Embassy of the Kingdom of the Netherlands (EKN), the Seed Sector Development for South Sudan (SSD4SS) project builds on AGRA's overarching mission to "transform African agriculture into a productive, efficient, competitive and sustainable system that assures food security and lifts millions out of poverty." Previously supported by the Howard G. Buffett Foundation (HGBF) and USAID South Sudan, AGRA's work in South Sudan has focused on improvements to the seed value chain to enhance agricultural productivity of smallholder farmers, especially women and youths. Originally, the SSD4SS project was supported by the EKN from November 2013 to December 2017. However, political instability and security concerns from armed conflict hindered implementation of project activities both at the end of 2013 and again in July of 2016. Based largely on a Mid-Term Review (MTR) conducted in early 2017, a no-cost extension (NCE) was awarded for a period of two years, ending in December 2019.

Overall, the main objective of the project is to increase income and reduce poverty by promoting the development of a seed system in South Sudan that delivers new crop technologies to farmers in an efficient, equitable, and sustainable manner. The project's specific goals are to:

- develop capacity for research, seed production and certification through short- and long-term training of crop and seed technical specialists;
- support Ministry of Agriculture and Food Security (MAFS) crop improvement research, seed production and certification activities, and improve seed testing laboratory infrastructure;
- develop the seed sector in the production and dissemination of high-quality seed of the new, improved crop varieties;
- organize, train and support farmer groups to produce seed as out-growers for seed companies and for local distribution; and
- create awareness of the developed crop varieties among farmers and other stakeholders through awareness-raising activities including on-farm demonstration plots.
- organize the private seed sector into a National Seed Trade Association
- ensure effective project implementation and monitoring

The NCE is aligned with the project's original goal and objectives, although some changes were inevitable; e.g., some of the activities implemented over the two-year period of the NCE were "reassessed and reformulated" based on recommendations from the MTR, for example, stronger focus on in-country capacity building (AGRA 2017). To avoid potential differences between the two phases, the end of project evaluation is cumulative in that it captures results between 2017 and 2019 but relies more heavily on the activities, outputs, outcomes, and indicators as presented in documentation produced and reported during the NCE (2018-2019), rather than those produced during the "first phase" (2013-2017). This is in line with the TOR (Annex A), which states that "the evaluation will study the work of SSD4SS from 2017 to 2019."

Purpose and objectives of the evaluation

The purpose of the evaluation is to provide learning and accountability to donors, the government of South Sudan, and South Sudan's smallholder farmers. The evaluation also provides an opportunity to closely examine what worked and what did not, and to identify strategies for improving future programming, stakeholder engagement, and relevant interventions.

The key objectives of the evaluation are to:

4. Ascertain results (outputs, outcomes, impact) and assess the effectiveness, efficiency and relevance of specific development intervention
5. Provide findings, conclusions, and recommendations in respect to implementation strategies as specified in the project document
6. Highlight lessons learned during the no-cost implementation period.

Overall, the evaluation will be guided by ethical considerations of openness, broad participation of key stakeholders, integrity and honesty of the process, reliability, and independence to ensure valid and trustworthy findings and conclusions.

AGRA's theory of change (TOC) for agricultural development in Africa – and by extension the SSD4SS project's TOC – hinges on the ability of farming communities to achieve significant gains in productivity and food security by gaining access to improved adapted technologies, most notably, improved seed, which has frequently played a catalytic role in agricultural transformation at the farmer level (AGRA 2013). In other words, AGRA's goal is to promote a strong, viable seed industry based on independent private sector players. In the long-term, the seed industry will be autonomous and self-financing. In South Sudan, the SSD4SS project is the vehicle for this transformation.

The evaluation seeks to assess the degree to which the SSD4SS project achieved its objectives, its effectiveness in achieving its outcomes and objectives, whether its achievements are sustainable over the long-term, and what, if any, lessons learned can be used for future programming. Thus, key research questions to be addressed explore what worked, what did not work, and what was learned that could be used to improve future programming, including but not limited to:

- Did the project help build a robust seed distribution system for locally produced seeds of improved crop varieties? Why or why not?
    - How has private sector and government capacity changed as a result of the project?
    - What constraints remain to be addressed?
- How has the availability of improved seed varieties changed as a result of the project?
- Are farmers adopting improved varieties that are well-adapted to their particular growing conditions? Why or why not?
    - How do farmers identify which varieties are best suited to their particular growing conditions?
- What mechanisms allow for farmer-to-breeder communication/input regarding what farmers like and do not like about individual improved varieties?
    - What constraints exist for breeders in addressing farmer preference?
    - What constraints to addressing farmer preference exist elsewhere in the seed value chain?
- How has the practice of farm saved seed changed as a result of the project?
    - Are farmers replenishing seeds of improved varieties or purchasing new each time?
- Have yields and/or income increased for smallholder farmers as a result of the project?
    - How have agro-dealers and other seed value chain actors benefitted?

The evaluation also employs the Organization for Economic Co-operation and Development-Development Assistance Criteria (OECD-DAC) evaluation criteria[1] of project relevance, effectiveness, efficiency, impact and sustainability.

Evaluation criteria	Evaluation questions
Design/relevance	- Is the choice of activities appropriate to the needs? - To what extent were the objectives, planned activities and planned outputs consistent with the intended outcome and impact? - What changes have occurred since the time the project was designed? - To what extent are the project objectives still valid?
Effectiveness	- To what extent were the objectives achieved? - What was the short or intermediate-term (intended or unintended) outcome of the project? - To what extent was the selected target group reached? - What were the major factors influencing the achievement or non-achievement of the objectives?
Efficiency	- Were activities cost-efficient? - Were objectives achieved on time? - Was the project implemented in the most efficient way compared to alternatives?
Impact	- What intended and unintended consequences occurred (e.g., equal opportunities for women and men, improvement of social and economic infrastructure, poverty reduction, cross sectoral impact or other relevant cross-cutting issues)? - What real difference did the activity bring about for smallholder farmers? (What would have happened without the activity?) - How many people were affected directly and indirectly?
Sustainability	- To what extent are the positive impacts or changes from the project likely to continue? - What measures were implemented in order to support sustainability? - What were the major factors which influenced the achievement or non-achievement of sustainability of the project?

Evaluation Methodology

The evaluation integrates primary data collected through qualitative research methods with secondary data from program documents, reports, assessments, etc. Qualitative data is then triangulated with desk review findings for better interpretation of outcomes and impacts. The evaluation team consisted of two TANGO international researchers and two national consultants, and was gender-balanced (two men and two women). Both national consultants are currently employed in the Ministry of Agriculture, one at the national level and one at the state level. Training/orientation was provided for the evaluation team members at the initiation of fieldwork, involving a review of the tools to ensure that team members understood how each topic was to be approached, discussed, and analyzed; and team member roles, responsibilities, and logistics, including key principles around confidentiality of information and participant consent.

Data Collection

Fieldwork for the qualitative data collection was conducted February 3 – 12, 2020. The evaluation team visited two sites in the state of Torit in order to gather evidence of project outcomes and assess the potential for sustainable impacts. Four data collection methods were used: focus group discussions (FGDs); key informant interviews (KIIs); direct observation; and desk review. Data collection used

[1] https://www.oecd.org/dac/evaluation/daccriteriaforevaluatingdevelopmentassistance.htm.

purposive sampling and semi-structured FGD and KII protocols with various project stakeholders, including seed sector providers (e.g., agro-traders, out-growers (individuals and COBAMAs), local market grain traders, seed company staff), researchers (e.g., breeders), seed technicians, students trained through the project, MAFS staff, and smallholder farmers. Annex B provides a list of all KIIs and FGDs conducted as part of the evaluation. This section describes these methods, team composition, and data analysis methods.

Sample Selection: Sampling was purposive and based on the following criteria:

- Diversity of project stakeholders – to provide different perspectives of performance and results
- Diversity of interventions – to provide insights regarding what worked and what did not
- Logistical considerations – accessibility in terms of physical location (e.g., passable roads), feasibility given the limited time available, and security

SSD4SS staff purposively selected stakeholders based on the above criteria and arranged times and dates of interviews. Logistical issues and the short timeframe allowed for fieldwork necessitated dropping field visits to Yambio and Renk, both of which had been originally discussed. The detailed fieldwork schedule – developed by SSD4SS staff – is presented in Annex C. It should be noted that purposive qualitative data collection, particularly within short timeframes, is inherently non-representative (Bernard 2017). Moreover, respondents who participated in FGDs and were willing to share their views may not be representative of all project participants, or may be different in key observable or unobservable ways.

Key Informant Interviews: The team conducted 22 key informant interviews (KIIs) with partners and programme stakeholders (7 females, 15 males) to better understand the factors affecting the effectiveness and sustainability of the program, and to inform future investments in the seed value chain and food security (details in Annex B). Interviews followed a semi-structured format to allow for follow-up questions and flexibility in the discussion. The KII protocol was structured to gather participant perspectives on the extent to which they felt activities have been achieved; any gaps or challenges the project experienced over the course of the two years; the effectiveness of project interventions and targeted groups; quality of services provided; and the projected sustainability of project interventions and outcomes (see Annex D for KII protocols).

Focus Group Discussions: The team conducted only three key focus group discussions (FGDs) with a total of 19 participants (12 male and 7 female). Focus groups involved out-grower groups and crop breeders with the MAFS and University of Juba. Semi-structured instruments with questions organized by the evaluation team were used to guide the discussion; questions in a topical outline are fairly general and are intended to be used to initiate conversation and stimulate discussion (see Annex D).

At the beginning of every KII or FGD, an introduction and explanation of the purpose of the evaluation was provided to the interviewee(s), stressing confidentiality and the importance of obtaining useful information that reflects reality, and obtaining consent from participants.

Direct observations: The team made observations and site visits to out-grower fields, seed storage facilities, agro-dealer shops, seed processing facilities at Palotaka, a seed testing laboratory, and seed company offices.

Desk review: The purpose of the desk review was to identify key findings and explanatory factors from project reports and internal M&E data relating to the outlined evaluation questions. Examination of key documents before data collection assisted in the design of some of the evaluation questions. This

secondary information (e.g., annual reports, results tracking tables, project documents, related studies) was also used as a source of triangulation for qualitative data provided by KIIs.

Qualitative Data Analysis

The information gathered by the evaluation team was analyzed at multiple points during the evaluation and reporting process. Hand-written notes of FGDs and KIIs were transferred to digital matrices provided to all team members, which were organized according to key themes and evaluation questions, reflecting sections of the report template. Notes were summarized using standard content analysis techniques, summarizing common trends and patterns, and to specifically identify examples of perceived strong areas of probable sustainability, unexpected outcomes, and impacts.

Quality Assurance Mechanisms

TANGO builds quality assurance into all phases of an evaluation, from the proposal phase through report-writing and editing. The evaluation team maintained regular communications, both internally and with South Sudan-based SSD4SS staff as appropriate, though fieldwork was mostly problem-free – or at least required no additional assistance from AGRA. Over the course of the evaluation, TANGO used several techniques to help ensure high quality data:

Training and orientation with researchers: TANGO trained two national qualitative researchers and one international researcher, emphasizing the standard for complete and detailed questioning and note-taking. The researchers received orientation on the tools and the concepts therein, and discussed in advance the most accurate and consistent contextualization of those concepts.

Supervision: The TANGO consultant provided oversight and guidance throughout data collection, including periodic review of team member notes.

Data management: Typically, all team members were present for each KII or FGD. Thus, qualitative data was collected by all four team members, providing some ability to triangulate across the four consultants. Although one team member usually initiated the interview, all team members participated in asking questions. Soft copy matrices were saved and backed up on password-protected cloud folders.

Validation/Debrief Workshop

The evaluation team provided a debriefing session to South Sudan-based AGRA staff and representatives from the Head Office in Nairobi on February 13, 2020. The purpose was to present the team's preliminary findings and to explore questions or concerns about the study process, data quality, and findings.

Challenges

Evaluations are seldom perfect and as is often the case, several challenges presented themselves over the course of this evaluation. These are described in more detail below.

Project documents. The evaluation team had difficulty accessing many of the project's documents. Although the team was provided with a link to AGRA's SSD4SS Dropbox, none of the team members were able to open more than a few files, perhaps because many of the files were shown as .msg documents. After converting the .msg documents to .pdf, they were still unable to be opened in Adobe Reader, which indicated an error had occurred and the file was not retrievable. Although AGRA had no problems opening their own documents, the evaluation team did. This issue was never resolved for the team and was particularly frustrating as it meant the evaluation team had not been able to read – prior to field work – many of the project documents describing annual activities and results, particularly from the

earlier phase of the project . Even at the time of writing this report, none of the previously unavailable project documents have been accessible by the team. After discussing the issue at the validation workshop (February 13, 2020) held in Juba prior to the TANGO team leaving South Sudan, some additional documents were provided which helped inform findings presented in the report. Overall, our lack of access to some project documents did not compromise the evaluation; such access would simply have provided the team with a clearer understanding of the project activities, constraints, and cumulative results sooner rather than later.

Additionally, not until after the presentation of the draft report through teleconferencing with the larger AGRA team based in Nairobi (March 12, 2020) did the evaluation team have access to comprehensive results for the 2017 – 2019 timeframe (see Annex E) emphasized in the evaluation's TOR (see Annex A). While the evaluation team is very appreciative of AGRA's push to provide the final results, their late availability has made it somewhat challenging to address questions and clear up confusion regarding some results. Small inconsistencies in reported achievements occur between some project documents,[2] some of which are not entirely clarified with the comprehensive results, which themselves have small inconsistencies. Overall, data suggest good achievement of targets but would be more straightforward and easier to understand with fewer inconsistencies and errors. Inconsistency in units – metric tons (MT), kilograms (kg), acres, hectares (ha), and feddans – used in annual reporting and other documents make it difficult to rapidly compare results.

Limited timeframe. The timeframe for conducting the evaluation was particularly short, which had consequences for the length of time available for field work. For example, the team was only able to conduct KIIs and FGDs in two areas of the country where the project worked, namely Magwi and Torit. Unfortunately, it was not logistically possible within the 14 days scheduled for field work to visit more distant project locations such as Yambio, Renk, etc. Budget constraints also limited the evaluation in terms of how much could be done and with whom, in conjunction with the need to conduct the evaluation and finalize the report within a very specific – and short – timeframe.

Limited number of KIIs and FGDs. Not only did the shortened timeframe affect where the evaluation team could go, it also affected who the evaluation team could interview as a key informant or focus group. A number of key actors are not included in the evaluation either because they were not available when the team was in-country or they were located too far away. Some interviews might have been arranged via Skype or other telecommunications methods. Unfortunately, this was not considered as an option during development of the field schedule. The potential limitation of a smaller sample size is bias; the sample is not representative of the larger population, in this case, all project beneficiaries. The small sample size does not invalidate the findings, however. Rather, care should be taken in extrapolating the findings to a larger or broader population.

Absence of non-participating farmers in FGDs or KIIs. In an ideal world, the evaluation team would have interviewed smallholder farmers who were not supported as out-growers through the project. Because the project did not directly engage with farmers other than as out-growers, SSD4SS staff did not feel it would be possible to identify non-participating smallholder farmers – through the seed companies – with whom we might have conducted FGDs. Ultimately, this is a key constituent in the pool from which it will be determined whether South Sudanese farmers are adopting and benefitting from improved varieties released through a strengthened seed value chain. Anecdotes by out-growers suggest their neighbors

[2] For example, the Interim Status Update Summary (1 January – 30 June 2019) reports that 16 MT of foundation seed was produced while the Annual Narrative Report for the same time period indicates that 17 MT was produced.

are keenly interested in the project and the improved seed varieties. Unfortunately, their voices are missing in the current evaluation.

Co-mingling of results. AGRA has been working in South Sudan for some time, since at least 2011, and is well-known. Even in project documents, it is often difficult to separate results from the NCE phase of the SSD4SS project not only with the previous phase (which was also funded by the EKN) but also with previous work by AGRA (e.g., with support from HGBF and USAID). Attempting to disentangle information from KIIs and FGDs that might have actually occurred during a previous phase or project was also difficult, made more so by the inability of the team to access project documents that might have helped clarify annual activities and outputs over the life of the activity (LOA). For example, there was some confusion about the MSc training component of the project during some interviews because the reference regarded breeders who had been supported at the University of Makerere in Uganda, which had occurred prior to initiation of the SSD4SS project in 2013. Again, this did not diminish the project's achievements or compromise the evaluation. Rather, it simply made it more challenging for the evaluation team to have a straightforward and clear understanding of what the project did and when, in terms of focusing the evaluation on activities and results over the 2017-2019 timeframe.

Evaluation Findings

Targeting

As described in AGRA's original proposal to the EKN (2013-2017), targeting was aligned with the National Effort for Agricultural Transformation (NEAT) and the Zonal Effort for Agricultural Transformation (ZEAT), both of which targeted the Green Belt Zone, including the Greater Equatoria States and parts of Western Bahr el Ghazal State. This is the primary focus of the SSD4SS project NCE as well. Targeting at other levels of the project (e.g., seed companies, out-growers, plant breeders) primarily follows on earlier efforts by AGRA in seed sector development and also relies on the MAFS to identify appropriate candidates for the MSc program, seed technical training, and crop breeding support.

Data from qualitative interviews suggests that most project participants felt targeting was effective. It was clear, however, that there is much more interest than was targeted. This was especially true for farmers interested in training provided to out-growers. One key informant who was involved as a trainer (e.g., of seed company managers, out-growers) indicated that 50 percent more farmers were trained than targeted (200 targeted and 307 trained) and 67 seed company managers were trained rather than the 60 that had been targeted. One person suggested that *"they [AGRA] weren't reaching all the places they could reach"* but also recognized that no single project can "do it all".

Objective 1: Capacity building of crop and seed technical specialists

The goal of this objective is to develop capacity for research, seed production and certification through both short- and long-term training of crop and seed technical specialists. It is comprised of four activities:

- Building capacity of seed companies through training at the University of Nairobi's Seed Enterprise Management Institute (SEMIs);
- Building capacity of seed technicians and seed businesses through the University of Juba;
- MSc training of South Sudanese applicants at the University of Nairobi in plant breeding, seed science, agronomy or biotechnology; and
- Building capacity for seed testing and inspection services at the MAFS

Accomplishment of the objective is theorized to increase capacity within the South Sudanese seed sector for understanding how to produce high-quality seed as well as increasing the capacity of seed companies

to produce it. Ultimately, such improved capacity will help ensure the availability of high-quality seed of improved varieties for use by smallholder farmers as well as improving their productivity.

As of the January – June, 2019 annual report, eight seed company personnel (5 males, 3 females) had been trained through the SEMIs program and a grant awarded to train an additional 16 seed sector practitioners by the end of 2019. Using a Training of Trainers (TOT) type of model, this training was expected to result in a core group of "trainers" who would then provide training to additional seed sector specialists (e.g., other seed company staff) in South Sudan. Insights from KIIs suggest this was a highly successful approach; participants felt they had greatly expanded their knowledge base regarding the entire seed production process as well as seed business management/entrepreneurship, depending on which learning modules they attended. A total of nine modules were available; participants attended those most relevant to their line of work in South Sudan. The curriculum for seed production involved both theory (i.e., classroom study) and practical application (i.e., hands-on), including field preparation, planting, weeding, crop isolation techniques, harvesting, germination testing, purity trials, disease identification, etc.

For one SEMIs graduate, she was able to use the skills she learned to open two businesses in South Sudan; a translation business and an agro-veterinary business that provides seeds and agricultural inputs. In particular, her English was lacking prior to attending the University of Nairobi and her studies suffered during the first semester. However, improvements in her English as a result of the program enabled her to open a business translating for local clients, including US embassy staff and local forces. Her translation business relies on a team of four staff and was involved with translating documents from English to Arabic for the recent peace process. According to her, *"it [the training] was life changing."*

The project also supported seed company staff and out-growers with training conducted by the University of Juba. Geared to out-growers and seed company staff, training focused on basic agronomy, seed technology, and seed business principles. Under the NCE, 260 participants were targeted and training manuals produced. Short courses were delivered by a team of instructors from the University of Juba. Overall, most of those interviewed considered this training to have been of great benefit, though there was some thought by trainers that trainings need to be more comprehensive. That is, training should include all aspects of seed production and processing. In particular, people felt they needed more focus on field pest management of diseases and insects, such as fall army worm.

KIs from the University of Juba suggested that changes to the SSD4SS budget process were needed in that budgets should either restrict the university from taking out overhead (36 percent) or include overhead as a separate line item so that their operational funds are not reduced by the overhead amount. Unfortunately, neither the problem nor the solution may be quite this straightforward. Institutional overhead – and allowance or restrictions of such by donors – is often complicated and may simply be something projects must endure. Nonetheless, this perspective should be heard and at the very least, the issue should be thoroughly communicated to and understood by beneficiaries in future programming.

KIs from the university felt that they should also have received some training or skills building in terms of their capacity as trainers for the project. Exposure to other seed sector actors both within South Sudan (e.g., within the MAFS) and with regional seed specialists/institutions in Kenya and Uganda would have benefitted them as well and helped to build capacity within the university system.

Six students were enrolled in MSc programs (e.g., plant breeder and biotechnology, crop protection, agronomy) at the University of Nairobi through support provided by the SSD4SS project (AGRA 2019a). Three had successfully completed their degrees and graduated by the end of 2018. The remaining three were finishing their studies at the time of the evaluation (February 2020). Of the three individuals who

completed their degrees and returned to South Sudan, one was subsequently seconded to a seed company supported through the project. Another returned to her job with the MAFS and was recruited as one of the two national consultants on the evaluation team. As she was the only available person who had attended the MSc program in Nairobi with support from the project (e.g., three of the students are still in Nairobi), the evaluation team availed itself of her insights through a KII.

Data for the September 2017 – December, 2019 time period suggest that the project had a high degree of achievement under this objective. Twenty-six (20 male; 6 female) seed company personnel were trained through the SEMIs and 55 (44 males; 11 females) were trained by the University of Juba. Six MSc students were supported, with three already graduated and 60 seed inspectors were trained, 40 of which have been mobilized across the country.

Objective 2: Capacity building of MAFS

This objective focuses on supporting the MAFS in crop improvement research, foundation seed production, and improving the seed certification process and seed testing laboratory infrastructure. Four types of activities were implemented under Obj. 2:

- Building the capacity of the MAFS to conduct crop research and breeding programs resulting in development and release of improved varieties of priority crops for South Sudanese farmers;
- Supporting exchange visits for South Sudan breeders to regional institutions;
- Building the capacity for production of quality foundation seeds both within the MAFS and the private seed sector; and
- Supporting the establishment of a seed quality assurance system.

Under Objective 2, operational funds were provided to MAFS plant breeders in order to support ongoing research and breeding activities designed to produce improved varieties of priority crops for public release. Although AGRA has supported a number of South Sudan crop breeding efforts in the past (e.g., rice, maize (OPVs), cowpea, groundnut), support under the NCE was provided to on-going breeding programs of bean, hybrid maize, and sesame. Breeders were able to acquire relevant germplasm (e.g., parental lines of hybrids) from collections in neighboring countries (e.g., Ethiopia, Uganda), including international crop research institutes (e.g., CIMMYT, ICRISAT), the National Agricultural Research Organization (NARO) in Uganda and the Agricultural Research Corporation (ARC) in Sudan. Germplasm was evaluated in multi-locational trials and promising lines fast-tracked through a participatory screening process with farmers. In all, the MAFS produced over approximately 0.71 MT of bean foundation seed, 1.8 MT of sesame foundation seed, and 10 MT of maize foundation seed.

According to project documents, it was expected that four hybrid maize varieties would be released in the second half of 2019 (October), as well as four varieties of bean (August) and four improved varieties of sesame (October). According to interviews with MAFS and University of Juba plant breeders, most of the improved varieties developed with SSD4SS support remained under review by the variety release committee at the time of the evaluation (three groundnut varieties had been released in May 2018).[3] A March 6, 2020 business news report announced the release of seven SSD4SS-supported crop varieties, "For the first time in history, farmers in South Sudan will be able to grow four different hybrid maize varieties customized for their country's environs."[4] Along with the four hybrid maize varieties, three common bean varieties were released, both efforts had been supported by AGRA. It should be noted that

[3] A number of varieties have also been released under previous AGRA initiatives.
[4] https://www.busiweek.com/south-sudan-farmers-get-more-hybrid-maize-varieties/.

by the end of 2017 (i.e., prior to initiation of the NCE), 22 improved crop varieties had been released through the MAFS with project support (AGRA 2018a).

Support provided through the SSD4SS project under this objective also included exchange visits for plant breeders from the MAFS and University of Juba. According to KIIs and project results documents, an exchange visit to NARO in Uganda occurred in 2018 and to the Kenya Agricultural and Livestock Research Organization (KALRO) in 2019. There was widespread appreciation among breeders for the support they had received from the project, including exchange visits. In particular, breeders interviewed during the course of the evaluation indicated such visits were critical to their research programs in that the visits not only facilitated their ability to source materials from other countries, but were important for forming and maintaining relationships with other plant breeders, with whom they could exchange information and ideas. Links to breeders in regional and international research institutions (e.g., NARO, CIMMYT, ICRISAT, IITA, ASARECA), for example through collaborative research programs, will add value to South Sudan's research programs and breeding materials (CIAT et al. 2011).

Several constraints or limitations were noted by KIIs. In particular, breeders indicated that support provided through the project did not allocate any funds specifically for them to develop demonstration plots and to organize field days to help sensitize and educate farmers about the benefits of improved varieties. Although demonstration plots were supported through other aspects of the project, breeders felt they needed more control of their demonstrations in order to ensure the timely transfer of relevant technologies and information. In particular, the breeder-farmer relationship is strengthened through such demonstrations. Trust and open communication between breeders and farmers is necessary so that breeders can learn about farmers' experiences with trials of improved varieties and their taste, cooking and other preferences.

They also noted the lack of cold storage capacity within the MAFS – or country at large – as a constraint; easy access to relevant crop genetic resources for use in breeding programs requires medium-term storage of germplasm under appropriate conditions. The CGIAR's crop gene bank protocols for active collections (i.e., medium-term storage of seed for use in breeding or distribution to users) suggest temperatures between 0°C and 10°C with a relative humidity (RH) of 25-35 percent to ensure seed viability for more than 20 years.[5] Importantly, seed moisture content – highly influenced by RH – is at least as important, if not more so, than low temperature. Irrigation infrastructure was also considered a high priority need.

Breeders also commented on the need for better capacity in managing the crop improvement research system itself. That is, they felt that there is still need for "higher-level" managerial support beyond individual breeders being able to manage their own research programs. Rather, strengthening the research program through improved management of the research system as a whole in order to achieve ministry goals as outlined in the Comprehensive Agricultural Development Master Plan (CAMP) is needed. In particular, KIIs stressed the need for better capacity within the ministry for establishing crop-specific research priorities, working as a team (even while working on different crops), systematizing processes and committees for all crops, etc. From their perspective, enactment of the seed act policy that is currently still "waiting" in parliament would be a helpful step forward, even though government funding for ministry activities is likely to remain problematic.

[5] https://cropgenebank.sgrp.cgiar.org/index.php/crops-mainmenu-367/maize-mainmenu-361/conservation-mainmenu-376/seed-bank-mainmenu-465/storage-mainmenu-389.

The third activity supported under this objective involves strengthening the capacity of the MAFS, as well as that of seed companies, to produce high-quality foundation seed. Under the NCE, two grants were awarded – one to the MAFS and one to Gumbo Glow seed company – to increase the availability of foundation seed. As a result of these grants, a total of 22.5 MT[6] of foundation seed was produced (see Annex E) and, according to project documents, sold to three South Sudan seed companies – KEREPI, Afroganics, and Seed Grow – for further multiplication (AGRA 2019a). Additionally, the MAFS conducted training for community-based seed out-growers and staff from five seed companies (Seed Grow, Green Horizon, Gumbo Glow, Pro Enterprises, and KEREPI Seed Company), and developed over 60 acres on which they can produce foundation seed of maize, sorghum, groundnut, rice, beans, cowpea and cassava. Gumbo Glow established approximately 23 acres for production of cowpea, sorghum, and groundnut foundation seeds, built a storage warehouse capable of storing 30 MT of seed, and upgraded its irrigation capacity. Taken together, these achievements help increase access to foundation seeds by companies and out-growers alike, paving the way for increased production of certified seed for use by farmers throughout South Sudan.

Types of Seed

Breeder Seed: Seed that is directly controlled by the originating or sponsoring breeder or institution; first generation seed.

Foundation Seed: Progeny of breeder or foundation seed, production of which adheres to formalized criteria for maintaining genetic purity and integrity; second generation seed used to produce registered seed.

Registered Seed: Another multiplication of foundation seed; third generation seed used to produce certified seed.

Certified Seed: Progeny of breeder, foundation or registered seed, production of which adheres to formalized criteria for maintaining genetic purity and integrity.

Quality Declared Seed: Community-based seed production system that does not require full formal inspection by a national seed inspection system; is an alternative to seed certification for countries with limited resources.

Lastly, support was provided to the MAFS for developing their seed quality assurance system. A refurbished container unit donated by the MAFS was equipped and operationalized as a national seed-testing laboratory. Specialists from KEPHIS helped identify appropriate equipment (e.g., germination chamber, microscopes), supervised installation, and provided training. Staffed with personnel trained under Objective 1 (i.e., Building capacity for seed testing and inspection services at the MAFS), seeds will be tested for germination rates, moisture content, purity, and diseases. The evaluation team observed the seed lab first hand; it is a stand-alone, temperature-controlled unit away from potential sources of contamination, has a germination chamber and other equipment (e.g., microscopes, weighing scales), and enough counterspace for working. There is a small attached storage room where supplies are stored. As the national seed testing laboratory, it is somewhat small and underequipped but nonetheless represents a significant achievement and step forward in terms of developing formal quality seed testing capacity and services in South Sudan.

Objective 3: Developing the production and dissemination capacity of the seed sector

This objective includes a number of activities, all of which support seed companies in their ability to produce high-quality seed of improved varieties. Generally, seed companies: 1) received grants for increasing production of seed, 2) were trained in the FAO procurement process (e.g., aggregation, tendering, bidding), 3) visited seed companies in Uganda and Kenya, 4) received training and mentoring

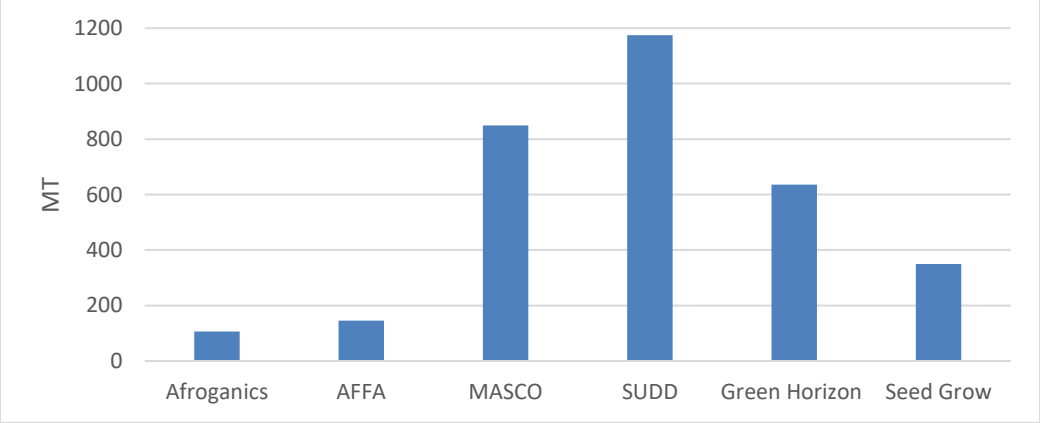
[6] Based on updated results provided to TANGO on March 17, 2020.

in business development services (BDS), and 5) received technical advice and mentoring from SSD4SS-supported secondees. Also under this objective, agro-dealers were trained and linked to seed companies.

Prior to the NCE, SSD4SS supported ten seed companies, all of which continued to be supported in one way or another under the NCE. The January – June 2019 report shows that five seed companies (Green Horizon, KEREPI, AFFA, GAIS, Magwi Seed Company (MASCO)[7]) received grants to increase seed production. Two additional seed companies (Afroganics, SUDDS) were also provided with grants to increase seed production. In project documents, these two companies were differentiated from the first five in that they were considered "newly established". Based on KIIs with both companies, it is not clear that either were actually "newly established" in terms of their formation as a company – either as part of the NCE or its "first phase"[8] – but they were "new" to the SSD4SS project. The addition of these two companies may have been motivated by interest in expanding the geographical coverage of the project (e.g., Afroganics in Torit), as recommended in the Mid-Term Report (MTR) (Gildemacher and Gideon 2017). Regardless, all seven companies received support in the form of a grant – either new or continuing – that helped cover the costs of production of various improved crop varieties. As a result, farmers have increased access to high-quality seed of improved varieties. Based on data provided by AGRA, Figure 1 shows the amount of certified seed produced by seed companies as a result of project support.[9] Thus, farmers in the state of Torit (Afroganics), Maridi country (AFFA), Magwi and Ayaci counties (MASCO), Upper Nile (SUDD), Kajokeji county (Green Horizon), and Juba (Seed Grow) had increased access to certified seed of maize (including hybrid maize), sorghum, groundnuts, cowpea, beans and sesame as a direct result of the project.

> "They [AGRA] did a wonderful job."
>
> - KII, Magwi

Figure 1. Total amount of certified seed produced by project-supported seed companies.[10]



According to all of the KIIs with whom the evaluation team met, this support was hugely important to the seed companies. The grants allowed them to open up new land for their own production and for out-growers, to purchase quality foundation seed, and to contract with out-growers – both groups and

[7] MASCO received two separate grants; one was a renewal of a previous grant.
[8] KIIs suggest that SUDDS was originally formed as a farmer-based cooperative in 2010 in Upper Nile state and became a registered company at the national level in 2017. According to them, they had their own financing and first engaged with AGRA in 2018, as a result of contacts with FAO and World Vision (WV). According to Afroganics staff, the company was originally founded in 2002 in Yei and relocated to Juba in 2007, where they were also registered.
[9] Seed produced by SUDD is reported as "quality seed".
[10] No data were available regarding the amount of certified seed produced by GAIS, another project-supported seed company.

individuals. Based on the Interim Status Update Summary for the January – June 2019 period (AGRA 2019b), this resulted in a total of 1,400 hectares under seed production during this timeframe.[11]

One seed company key informant acknowledged that support from the SSD4SS project helped them get reestablished after the 2016 conflict, which forced the company to relocate. As they were unable to utilize the full amount of their two-year grant (2015-2017) from the first phase of the project, they were awarded a "renewal" under the NCE. The first tranche of support they received allowed them to recruit staff, many of whom had fled into Uganda or Kenya. They were also able to purchase larger quantities of quality foundation seed, conduct field days, train community-based agricultural extension workers to work with their out-growers, and fulfill their buy-back agreements with out-growers. According to MASCO, they benefitted from participation in the SSD4SS project in the following ways:

- The AGRA grant helped MASCO to recover and relocate
- AGRA paid MASCO staff and enabled them to employ more
- Capacity was enhanced
- Exposure visits were arranged and immense experience gained

Seed company key informants were unanimous in their praise of the support they received through the project (and from AGRA generally). They were also unanimous in terms of where they felt support was insufficient. In particular, they all indicated that there was not enough budgeted for buying seed back from out-growers nor for purchasing quality foundation seed (foundation seed was commonly purchased from Uganda or Kenya). The importation of foundation seed from neighboring countries is expensive and many seed companies were struggling with the costs. In large part this was due to the larger than expected interest by farmers; seed companies needed to purchase larger quantities of foundation seed than anticipated. Although a "good" problem to have, limitations to the amount of seed they can procure and subsequently make available to farmers also limits their production. Likewise, most seed companies found that their out-growers were producing more seed than they could afford to buy back. The guaranteed buy back process involves negotiating prices at purchase, i.e., the price at which seed companies will buy out-grower produced seeds is not fixed ahead of time. Nonetheless, the buy-back agreement reflects a 10 percent increase over the market price, primarily to motivate farmers as out-growers for the seed companies. Thus, both the farmers and seed companies are provided with "guaranteed" markets.

Although this system was widely applauded by seed companies as well as out-growers, KIIs with out-growers revealed a potential concern. The evaluation team was able to visit several seed stores of both seed companies and out-growers. Common to both was lack of sufficient storage space. The project supported activities related to aggregation of seeds (e.g., seed stores, warehouse acquisition, seed bulking, fumigation, pallets and shelving) over the Sept – Dec 2019 time period. Although 6400 MT of seed were aggregated as a result of these activities, storage remained problematic in some areas for both seed companies and out-growers. When the evaluation team visited Magwi and Torit, the lack of available space for some seed companies meant that they were not purchasing farmer-produced seed. In these instances, out-growers were left holding most of the potential risks in terms of loss of seed quality and quantity from rain, heat, disease, and predation as well as the risk of lower market prices whenever their seeds are actually purchased. Two out-growers with whom the team spoke were still "sitting on" the seed they had harvested and processed at the end of 2019, with no indication of when it would be purchased. Additionally, there was widespread agreement among seed companies that the grants should

[11] This does not match the sum of hectares reported for the seed company grants provided under this objective in the Annual Report narrative (January – June 2019).

allow for the purchase of equipment and infrastructure, in particular, seed processing equipment and storage facilities (i.e., warehouses).

Support was also provided to seed companies to improve their chances at securing bids through FAO's procurement process. FAO participated in AGRA stakeholders' workshops to explain their procurement process and has agreed to purchase up to 25 percent of their total annual seed requirements through local purchase. With FAO's annual seed need of approximately 8,000 MT, seed companies have the opportunity to sell up to 2,000 MT through this initiative.

Although seed companies apply individually for FAO tenders, the bidding is coordinated by the national seed trade association (see below). As no single seed company yet produces enough seed to fulfill the total FAO contract for 2020 of approximately 1,700 MT (including 300 MT of sorghum 120 MT of cowpea, 400 MT of groundnuts), companies work together to aggregate their seed. FAO contracted with MASCO to deliver 500 MT of maize seed in 2020. At an anticipated price of USD 890 per ton, the contract is worth approximately USD 445,000.

Interviews with FAO representatives indicate that they also consider local purchase as a win-win strategy in that it reduces their costs (e.g., of seed imports, transportation) while supporting the local seed sector. In order to help facilitate the tender process with local seed companies, FAO has made several adjustments to their procurement requirements, including separating national from international bids and allowing purchase of Quality Declared Seeds (QDS). Both allow for South Sudanese seed companies to compete in a different arena than with international seed companies.

According to the January – June 2019 annual narrative report, seed company personnel from 12 seed companies conducted exchange visits with three seed companies in Uganda in 2018 as a result of project support. The visit allowed for forging new relationships with peers in the Ugandan seed sector and learning new knowledge regarding production, productivity and seed quality. A second exchange visit – to Kenya – was planned for late 2019, though it is not clear from available project documents that it took place (see Annex E).

Under this objective, the project also supported seed companies with business development services (BDS). Training, mentoring and coaching on seed production and best practices for optimizing financial operations were provided to eight seed companies (i.e., MASCO, Afroganics, Seed Grow, PRO Enterprises, Gumbo Glow, AFFA, SUDD, and Green Horizon). When asked specifically about the value of such training, KIIs indicated it was very valuable; some noted that they were in fairly good financial condition based in part on the BDS training in financial

Seed "Merry-go-round"

Note: Names have been obscured to protect involved parties.

During field work, the evaluation team learned that "B" NGO, supported with funds from a UN agency, purchased "X" MT of maize seed for their own "out-grower" activities. Without permission, NGO staff sold the maize to "Y" seed company, who has a contract to provide the UN agency with 500 MT of maize. Total maize production by "Y" seed company is significantly less that 500 MT.

UN agencies and international NGOs engaged in "free seed" programs represent a potentially lucrative market for South Sudanese seed companies. Ultimately, repurchasing over and over again the same seed only in a different package will not help build or strengthen the seed sector.

The evaluation team makes no judgement about "Y" seed company. Rather, this recounting serves to underscore the need for better coordination and collaboration among all relevant seed sector actors in order to fully realize a well-developed and sustainable seed industry in South Sudan.

and general business management they had received. Although several companies felt they might need to reduce their staff in 2020, one company had plans to expand their operations.

Both secondees and seed companies who had benefitted from a SSD4SS-sponsored secondee agreed it was an extremely beneficial "partnership". Secondees received advanced training in seed production through the MSc. training component (Objective 1) or worked for the MAFS, and seed companies improved the quality of the seed they produced based on advice provided by the secondees. One secondee interviewed as part of the evaluation indicated she had helped the company develop a better production plan, shift to hybrids for some crops, and begin seed production in Magwi rather than just Juba, where it is difficult to produce quality seeds. In Juba, they were producing approximately 40-50 MT of seed – of all types. In contrast, their total production in Magwi is approximately 200-250 MT, though some of the increase is a result of more land being cultivated.

Finally, activities conducted as part of this objective included business training for agro-dealers in order to help ensure availability of agricultural inputs to farmers. A grant was awarded to Agricultural Marketing Development Trust (AGMARK) to provide training for agro-dealers and village-based advisors (VBAs), as well as to develop and provide small seed packs and demonstrations to farmers. Providing farmers with small packages of seed is an important way of disseminating new varieties that farmers can experiment with before investing their limited resources. Over 10,000 farmers received seed demonstration packs. According to the Interim Status Update Summary (1 January – 30 June, 2019), as many as 74 (out of 60 targeted) agro-dealers were trained in basic technical knowledge about inputs and enterprise management and linked to VBAs and 12 new agro-dealerships established. Agro-dealers benefitted through start-up capital and registration, and networking with seed companies, which allows them greater access to quality- seeds produced locally. KIIs with agro-dealers in Juba again suggest positive improvements in their business outreach and great hope for the future tempered by structural constraints.

Generally, agro-dealers agreed that there is much interest and demand for high-quality seeds, fertilizers, and pesticides. Many source their seeds from neighboring counties, such as Uganda and Kenya. Visits to several agro-dealer shops in Juba confirm that most vegetable seed is sourced from Simlaw-Kenya, East African Seeds, or Equator seed companies, among others. According to several agro-dealers, they source some seeds locally, including small "bags" of local vegetables. Importing seed is expensive and the customs process fraught with uncertainty. According to one agro-dealer, customs officers at the border (e.g., with Uganda) often take large samples for testing, reducing the quantity of the consigned seed. Customs payments are unstable, typically increasing every time. Such unpredictability affects business.

One agro-dealer interviewed by the team indicated that taxes are extensive and very high; his company pays taxes to more than 10 government institutions. According to him, the company pays as much as USD 1,600/month to various government entities, with the local shop only able to pay USD 200 of this fee. The remaining USD 1,400 is paid by their mother company. Over a one-month period, the shop's sales do not cover their expenses; they have laid off four staff (from a total of seven). At the same time, they are optimistic about 2020 and hope to be a leading agro-business in the country.

Insights from agro-dealers also suggest that free seed initiatives implemented by NGOs are problematic for their businesses. NGOs typically accept the lowest bid for seed, which often means they contract with "hand-bag" companies – those who operate under the radar with no physical address or business. Such companies often deal in "fake seed"; they purchase grain and repackage it as seed, often at lower prices than those offered by agro-dealers. This is a significant issue in South Sudan and puts at risk the fledgling seed industry. Several agro-dealers suggested the government has a large role in addressing this issue

by helping to educate partners to deal with agro-dealers and avoid “hand-bag” companies, as well as to better regulate seed coming into the country.

Objective 4: Support to farmers and out-grower groups

This objective primarily involves two activities:

- Building capacity of out-growers to produce high-quality seed
- Providing access to financial resources for out-growers

Under this objective, a grant was awarded to Pro Enterprises Limited to conduct in-the-field training for out-growers beginning in the second season of 2018. As a result of this activity, a total of 208 out-growers (101 females; 107 males) in Juba and Magwi received practical, hands-on training in seed production, including understanding and negotiating contracts with seed companies. Pro Enterprises also provided mentoring and oversight to the out-growers over the course of the production season.

As noted under Obj. 1, there was some thought by KIIs and FGDs that training needs to be more comprehensive. In particular, there needs to be more coverage of field management, including soil fertility and insect/disease control, as well as more follow-up by trainers, seed company field managers and community-based agricultural extension advisors. One of the lessons learned from the July – December, 2017 annual report (AGRA 2017) was that farmers “required continuous supervision and regular trainings to produce quality seeds.” While the NCE took positive steps toward addressing this, the basic lesson remains true even at the end of the two-year NCE. Farmers need continuous training to help sustainably build their capacity for producing high-quality seed for South Sudanese markets. More support is also needed in terms of accessing and understanding climate information as well as small business management and marketing.

One of the expected results of this activity was better linkages and contractual arrangements between the seed companies and out-growers. The ultimate success – for both parties – of such contractual agreements depends, in part, on trust between the parties. Such trust will take time to build but a clear understanding of the relationship and its contours is necessary for building that trust. KIIs with out-growers suggest that trust-building is a work in progress but there is much enthusiasm and optimism.

Lack of capital limits the ability of smallholder farmers generally, including out-growers, to produce either large quantities or good quality seed. In order to increase out-grower access to capital for production purposes, a Matching Grant scheme was developed and implemented as part of this objective. Based on an assessment of seed company capacity, matching grants were provided to three seed companies (Seed Grow, MASCO, Green Horizon) with the capacity to match SSD4SS funds with their own. Funds were primarily used for land clearing and preparation, with the money to hire tractors or labor provided to out-growers as a “loan” that would be deducted during buy-back of the seeds produced. The scheme utilized a block farm production model with a goal of producing 120 MT of maize, sorghum, groundnut, and cowpea seed. Results in Annex E indicate that a total of 400 out-growers across three seed companies (i.e., MASCO, Green Horizon, Seed Grow) accessed loans through the project’s matching grant activity to help with production costs.

Objective 5: Creation of awareness and commercialization of developed crop varieties

This objective involves two components designed to increase awareness of improved varieties among smallholder famers and to support their commercialization.

The first activity was implemented in conjunction with activities described under Objective 3 that focus on agro-dealer development. Under Objective 5, AGMARK organized and conducted as many as 10,000 small pack demonstrations and distributed an equal number of small packs. As reported in the January – June 2019 summary of results, 183 VBAs were trained. VBAs represent the link between smallholder farmers and seed companies, and help to bring both extension services and improved access to seed of improved varieties to the farmer.

ADOPTION

Measuring adoption – or disadoption – of new technologies can be complicated. Farmer decisions about whether to use/drop a variety are complex and dynamic. Rarely do they decide simply to permanently adopt/disadopt a variety. Rather, they must also decide how much area to cultivate, how it will impact labor and other resource constraints, etc.

To measure adoption of improved varieties, it must first be determined whether adoption is considered a discrete, binary measure (i.e., farmers either adopt or do not adopt) or a continuous measure. Should a farmer be considered an "adopter" if s/he grows both improved and local varieties? Should a farmer be considered a disadopter if s/he stops growing a variety for a few years but grows it again at some point? Farmers often grow more than one variety of a crop – both within and across years – and may gradually increase/decrease the area cultivated with new varieties over time. Decisions made in one year may affect decisions in other years. Thus, adoption or disadoption may be best measured as the share of land allocated to new varieties out of the total land cultivated.

Doss. 2006.

The second activity funded under this objective involved enhancing awareness and uptake of improved crop varieties among smallholder farmers. A grant was awarded to Digital Green to provide – and film – trainings and field visits that can then be used to produce training videos. Small, portable "projectors" allow for village-level use of the videos, helping to reach a wider audience and to provide follow-up to hands-on trainings conducted as part of the project. According to project documents (see Annex E), these videos were seen by 80,000 farmers, facilitated by seed companies in Yambio, Rumbek, Renk, Mawi, Juba and Torit.

The evaluation team was not able to interview anyone from AGMARK or Digital Green, though we were able to see first-hand the projector used in the trainings. At least one KII with a seed company representative mentioned the appropriateness and benefit of the videos for training, and had used them for their own out-growers.

In the long-run, a key measure of this objective is adoption of improved varieties by farmers. Although "adoption" by project-supported out-growers has increased, it is way too early to determine whether adoption is increasing among smallholder farmers more broadly. As mentioned in the limitations section, some type of farmer survey – especially with those not engaged with the SSD4SS project – will provide the best measure of adoption across South Sudan.

Seed company, agro-dealers, and out-growers with whom the team spoke as part of the current evaluation all felt that adoption is still relatively low among smallholder farmers, at least in those areas in which the project operated. In general, farmers tend to grow their local varieties rather than improved varieties. This remains true – to some degree – even among project-supported out-growers, some of whom grow improved varieties for income but still grow local varieties for home consumption. Nonetheless, there is fast growing interest among farmers generally in improved varieties, especially once they experience with their own eyes the advantages of improved varieties. Farmer decision-making around what crops to grow and what type of seed to use can be complex and depend on many factors beyond control of a four-year development project (see box). Although use of farmer-saved seed remains high generally, more farmers are likely to adopt improved

varieties as they become more available and accessible. Field days, crop demonstrations, small seed packs, radio advertisements, etc. will help interest continue to grow.

Objective 6: Organization of the private seed sector into a national seed trade association

This objective is narrowly focused around the task of helping to launch and support a national seed trade association in South Sudan. Such an entity has existed for a number of years under different names. According to the current chairperson, the Seed Trade Association of South Sudan (STASS) was registered (or re-registered) in 2018. In contrast, project documents suggest that the objective has been realized by the operationalization of the Association of Seed Actors in South Sudan (ASASS). According to the January – June 2019 annual narrative report, a government-suggested name change was implemented as part of its establishment. Regardless of name, the association was indeed established and is operational. STASS was the only name used in KIIs conducted as part of this evaluation (i.e., no key informants used ASASS), thus, STASS is used throughout this report.

According to STASS, its mission is to coordinate and oversee development of the seed industry in South Sudan for sustainable agricultural and economic development.[12] It is comprised of seven executive members, all from local seed companies. The Members include local or international producers and importers, agro-dealers, institutions or agencies engaged with seed systems (e.g., NGOs, research institutes), and foreign-based seed companies. As of May 2019, there were 17 seed companies and 15 agro-dealers listed as members. Unfortunately, not all are current in terms of their subscription (USD 50) and annual (USD 500) fees; out of the 17 members, only seven or eight companies are up-to-date in their fees.

> "Without AGRA, we [STASS] would still be in the briefcase."
>
> - KII, Juba

According to STASS, current limitations within the seed sector in South Sudan include generally poor seed (i.e., lack of high-quality seed), limited numbers of agro-dealers in some areas, lack of a "nationally authorized" certification process, limited interest in hybrid varieties and lack of awareness about improved varieties generally (e.g., farmers tend to use saved seeds), and the presence of "fake seeds" (e.g., grains packaged as seed). There is also the issue of "free seed" initiatives used by humanitarian and development actors that complicates attempts to develop production capacity of improved varieties by farmers.

According to one KII, one of STASS's key areas of focus is to work with FAO to *"stop bringing seed into the country."* Free seed, in the form of humanitarian aid or development programming, does not typically help farmers solve their agricultural challenges (CIAT et al. 2011). Successful introduction of new varieties requires good access to technical advice and follow-up services and should be carefully monitored, which may be difficult during an emergency response. In development programs, free distribution of seed can help introduce farmers to new varieties, but may also contribute to dependency, at least in some cases. The evaluation team heard from a number of key informants that some farmers in their areas were "just waiting" for seeds from NGOs.

Another key area of focus for STASS is to lobby with the MAFS to conduct seed certification and to monitor seed imports. AGRA supported development of a seed regulatory strategy for South Sudan, which provides guidance to the government on quality seed regulation. Several pieces of seed legislation have been drafted but have not yet been enacted into law (i.e., Seed Policy, Seed Bill). Lack of formally enacted legislation constrains the ability of the MAFS (i.e., through the department of research) to

[12] https://fscluster.org/sites/default/files/documents/stass_presentation_to_atwg_14052019.pdf.

regulate seed production in South Sudan because it has no legal framework or operational policy under which it can enforce the law (Onsando 2020). Currently, legislation exists, technicians have been trained and are conducting field inspections, and a functional seed lab has been equipped yet the seed laws undergirding the inspection and certification process have not been enacted. In essence, this leaves seed producers, breeders, and seed companies with seed that is "certified" without any legal authority. In turn, this limits the ability of the seed industry in South Sudan to reach its fullest potential. STASS is in a unique position to lobby the government regarding seed policy and regulations, including importation of seed.

STASS is also collaborating with CIMMYT and the African Agricultural Technology Foundation (AATF) to promote maize hybrids within the seed sector (NGOs currently promote maize OPVs). Other areas of focus include helping to strengthen the agro-dealer presence in certain areas and establishing partnerships with vegetable seed companies.

Relevance

This section discusses whether – or to what degree – the activities implemented as part of the SSD4SS project were appropriate; i.e., did the project address the needs? Review of secondary data and data collected from KIIs suggest that it was highly relevant. A baseline study helped ensure that the project was designed to address specific challenges in the seed industry in South Sudan.

A 2010 assessment of seed system security found both that seed security of farmers in South Sudan was fairly good – at the time – but that it remained particularly vulnerable (CIAT et al. 2010). In particular, the study highlights institutional and infrastructure challenges, as well as the negative effects of the excessive amount of free seed distributed by development and humanitarian partners, which can create dependency and undermine farmers' longer-term seed system security. One of the key recommendations emerging from the study was for "immediate and significant investment in small farmer-driven variety development, seed production and distribution, and agricultural marketing systems." The study stressed that priority be given to eliminating labor shortages or constraints and limited purchasing power (i.e., through income generation) of smallholder farmers; smallholder farmers should be directly involved in variety screening for performance and cooking/taste preferences through participatory variety selection (PVS); a more sustainable and decentralized model of seed production was needed; and that value-added production, processing and marketing should be promoted. In all, over 30 recommendations were presented, including around variety introduction, seed production and agro-enterprise models, formal/informal outlets and markets for agricultural inputs, emergency seed aid, and the special role of rural women as regards seed security.

It is clear that the SSD4SS project design included activities to address a number of the issues outlined and recommendations made in the 2010 seed system security study. In particular, the project's focus on improving capacity for seed production at all levels – smallholder farmers, the private sector, and the government – helps build the entire system while contributing to decentralization as recommended in the study. A matching grant model was initiated to help provide capital to smallholder farmers in meeting labor constraints; women were prioritized as out-growers, with an emphasis of women's group formation; seed fairs, vouchers, and small seed packs helped introduce farmers to and create awareness of new varieties; demonstration plots, multi-location trials, and participatory variety selection helped build trust and improved communications between farmers and breeders; support to seed companies outside of the Green Belt helped to expand seed production capacity in and for other agro-ecological zones; and support to the MAFS for establishing a seed testing laboratory and training technicians is an important step forward in terms of establishing a formal process for seed certification in South Sudan.

Insights from KIIs support the finding of a high degree of relevance in the design of the SSD4SS project as well. Seed sector actors interviewed during the evaluation agreed on the need for strengthening the seed sector in South Sudan, as well as on the huge untapped potential for producing high-quality certified seed.

Although most seed companies indicated they had "been established" through their own means, they all acknowledged that they would not be where they are today without support from the project. With the support of AGRA, one company was able to relocate after the 2013 conflict and re-establish themselves in a more secure part of the country. Out-growers were equally appreciative of project support, in particular of their links to markets through their contracts with seed companies. Acknowledging their interest in "farming as a business" (FaaB), learned through the project, one out-grower group in Magwi, *Tic enkwo* (Work is Life), has plans to transition to a formally recognized cooperative.

> "We want to uplift farmers from subsistence to commercial."
>
> - FGD, Magwi

While the project design gets high marks for relevance (also underscored in the MTR), it should be noted that it lacked activities around two key areas, both of which were discussed in the 2010 study of seed security and by KIIs and FGDs during the evaluation: value addition and market access. A number of farmers noted the potential opportunities around value-added products, including cooking oils (e.g., peanut, sunflower, sesame), peanut butter and sesame butter/paste, and flour (e.g., maize, sorghum, green gram). One seed company representative indicated that traders from Sudan often crossed into northern South Sudan to purchase seed, which they take back to Sudan for processing, and then return to northern South Sudan where it is sold, often to the same farmers from whom they purchased the raw materials. Other seed companies have expanded – or are interested in expanding – into value-added products such as peanut butter and flour. As noted in the 2010 study, "Value-added seed production, processing and marketing should be supported and encouraged among seed-producing groups or associations." Support to processing activities, including mechanized cleaning, grading, packaging and labelling is needed.

The issue of markets is somewhat mixed. The project provides a "guaranteed" market to out-growers through their contractual arrangements. This is a win-win situation for both the out-growers and seed companies. However, farmers are keenly aware of their potential vulnerability in terms of reliance on only "one market outlet", including in the price offered as well as the timing of purchases. Needless to say, there was interest by some interviewed out-growers in exploring other markets.

One of the OECD-DAC criteria regarding relevance is whether the project's objectives are still valid. According to a seed sector study conducted in 2018 (Key2Market 2018), "The main constraints in the Agricultural Sector in Sudan, derived from Farmer and Trader perspective in addition to government strategic planning analysis, can be summed up as inadequate agricultural infrastructure, limited access to financing of small farmers, insufficient implementation of laws and policies, limited access to markets, weak adoption of improved inputs, limited use of mechanization, which together lead to low yields and decreased productivity." Based on KIIs and FGDs, this is a fairly accurate assessment of South Sudan's seed sector even at the time of the evaluation, several months after cessation of most activities under the SSD4SS project. Overall, the project's design was highly relevant based on identified constraints and remains relevant. Future programming should build on successes and achievements, while potentially adding some new elements (e.g., value addition).

Effectiveness

Program effectiveness refers to whether or not a program achieved its stated goals and objectives, including targeting, and what factors contributed or limited their achievement. Based on project

documents, including annual reports and results tracking data, the project appears to have been highly effective, at least in terms of its targets. Many targets were exceeded (e.g., number of out-growers, seed technicians, and others trained) and just over one-half of the project's expected outputs had been reached or nearly so at the end of June 2019; 14 expected outputs (out of 26) had a one-year rating of 80 percent or more completion (2019b). Based on direct observation by the evaluation team, an additional six outputs had been accomplished by the time of the evaluation in early February 2020. Areas of shortfall include the number of demonstrations established (50 percent of target) and the number of farmers accessing videos promoting the use of improved seeds (80 percent). However, the actual numbers for both outputs are very large – more than 10,000 demonstrations established and 80,000 farmers accessing the videos. Thus, it is difficult to characterize the shortfall as "ineffective".

Cumulative data for September 2017 - December 2019 recently provided to the evaluation team again suggests high achievement of targets for outputs. Some grantees had slightly more success achieving certain outputs than others but overall, few targets that were controllable (i.e., under the control of the project or grantee) were missed. Some production targets were underachieved but such results are often due to climate, insects, disease, etc. and are not necessarily under the (complete) control of the project or individuals. Scheduling of field days, number of pamphlets or leaflets produced, etc. represent bona fide shortfalls in reaching targets, although the numbers are not large and the instances of non-achievement are few. Overall, the project achieved most all of its targets in terms of its expected outputs.

It is, however, more difficult to assess whether the project actually achieved some of its stated objectives or its higher-level goal. First, four of the project's stated objectives are about building capacity – of the MAFS, of crop and seed technical specialists, of smallholder farmers, and of private seed companies. Using training and other educational opportunities (e.g., advanced degree programs) is an important and key method to improve capacity, and the project obviously used such methods to great advantage. In this regard, the project did well in achieving its targets in numbers of people trained.

However, improved skills and knowledge are only part of what constitutes "capacity". That is, capacity involves not only intellectual or physical capability (e.g., skills) but also infrastructure, institutional processes (e.g. planning, learning, policies), financial resources, human resources, etc. For example, the project has contributed greatly to the development of a cadre of well-trained plant breeders within the MAFS. However, the MAFS itself remains under-resourced, its irrigation infrastructure in need of repairs or further development, and lacks proper and sufficient equipment, cold-storage, etc. Thus, while its research capacity regarding crop breeding and seed production has been capacitated, it is not exactly clear whether crop-specific technical knowledge was all that was needed in order for the ministry to continue engaging in research, production, and release of improved varieties that will benefit South Sudan's farmers. To be clear, this is not a criticism of the project or its achievements. Rather, it is an observation that in order to truly assess project effectiveness – and ultimately, impact – the project needs measures of expected outcomes, not just outputs.

Changes in capacity are difficult to monitor and evaluate, in part because improved capacity often involves "soft skills", such as leadership, values, or ability to learn and adapt (INTRAC et al. 2016). In the example of the MAFS, how does improved research capacity by breeders support improved ways of working or results within the ministry (e.g., increased numbers of varieties released)? What internal processes, resources, policies, etc. might also be needed in order to release more varieties? What intermediate outcomes are necessary in order to use improved technical capacity in ways that result in release of more improved varieties? Discussions with plant breeders suggested a bottleneck as regards the committee responsible for verifying/authorizing crop variety releases. Thus, the ministry may have good technical capacity to develop improved varieties but more limited capacity for releasing them – and in a timely manner – to the public. Future programming needs to look beyond building technical skills

within the ministry to include other processes that contribute to the ministry's overall capacity to develop and release improved varieties of priority crops for South Sudanese farmers.

Second, better measures of capacity are needed than the few output measures indicated in project documents. The NCE includes a good example of relevant measures of enhanced seed company capacity in seed production and seed business management under Objective 3 (AGRA 2017). According to the document, "enhanced capacity for seed production and seed business management by 10 South Sudanese private seed companies," will be expressed through:

- A 30% increase in yield compared to 2015-2016;
- Doubling of seed turn-over compared to 2015-2016;
- Doubling of profit margins by seed companies compared to 2015-2016;
- Staff turn-over reduced by one-half; and
- Tripling of local seed sourcing by FAO.

These are all clear and well-defined ways of measuring seed company capacity. In this sense, they are lower-level outcomes (e.g., intermediate outcomes) that lead to higher-level outcomes (e.g., enhanced capacity). Regardless of terminology, however, they are measurable indicators for enhanced capacity. Yet data (e.g., company staffing, profits) are not collected for most, with the possible exception of seed sourcing from FAO and yield. How then can the project determine whether it has achieved its expected outcomes in the absence of measurable indicators?

Similarly, there are no specific indicators identified to measure other outcomes listed in the table, including:

- Yield potential of registered improved maize, sesame and bean varieties 50% higher than pre-existing popular varieties. (Obj. 2)
- Average yields of adopters of high-quality seed of maize, beans and sesame increased by average 30% compared to local seed. (Obj. 3)
- 25% and 50% of seed produced by seed companies produced through out-growers in 2018 and 2019 respectively. (Obj. 4)
- Yields of adopters of high-quality seed on average 30% higher than that of non-adopters. (Obj. 5)
- The seed trade association is established and covering at least 40% of its running costs through member contributions. (Obj. 6)

If the project expects yield potential of improved maize to be 50 percent higher than popular varieties or seed company profit margins to double, then indicators around the yield potential of maize and seed company profits are needed. The bottom line is that the performance indicators used in the table are primarily all outputs, which are necessary but not sufficient for measuring outcomes and ultimately, impact. It is important to develop a theory of change (TOC) that links outputs and changes in capacity to outcomes, including behavior change, and higher level goals. Such a TOC – and eventual results framework – should involve more than just the number of people trained, pamphlets produced, demonstration plots established, radio shows broadcast, crosses made, varieties released, or field days held.

In addition, the project has no rigorous measures of achievement around its overarching goal. According to both the original proposal and the NCE, the overarching goal of the project is to "increase income and reduce poverty among smallholder famers across South Sudan by promoting the development of a seed system that delivers new crop technologies, especially improved seeds, in an efficient, equitable, and sustainable manner." The project focuses almost entirely on measuring outputs related to the "how" of

their goal statement, "...by promoting the development of a seed system in South Sudan …." While seed company representatives with whom the team spoke believed that farmers' incomes had increased due to project activities, most farmers interviewed indicated it was too early to tell whether – or how much – their household income would improve. For example, some out-growers supported by the project have only planted and harvested a single season (either first or second season). Additionally, some seed companies had not purchased out-grower seed at the time of the evaluation (early February 2020), whereas the seed had been harvested in November/December, 2019. To be clear, the expectation is there, as is the project logic (i.e., improved production capacity, particularly at the smallholder farmer level, combined with links to seed companies will lead to increased household income). It seems the main issue may be that insufficient time has elapsed to allow for such a determination. It should be noted, however, that other out-growers may have different perspectives than the few interviewed, e.g., others may feel that their household income has increased dramatically. Nonetheless, for at least some out-growers it is somewhat premature to determine the effect of the project on household income.

The evaluation team would like to be clear. We do not dispute that the SSD4SS has been effective per se. We simply note that there are no meaningful and rigorous ways to measure achievement of its higher level goal or outcomes – or at least they are not apparent to us. In our estimation, AGRA should take steps to ensure they can document in rigorous detail the type, breadth and depth of their achievements at the output, outcome, and higher-levels in future programs; their achievements are noteworthy and should be reflected in project results.

Efficiency

Issues of efficiency revolve around how resources are used in programming. For example, the likeliness or degree to which a program delivers results in a cost-effective and timely manner. The end of performance evaluation did not specifically include analysis of financial records or conduct any type of cost-benefit analysis. Instead, we are relying on the MTR, direct observation and data collected from KIIs during the evaluation.

Overall, we agree with assessments of efficiency presented in the MTR. The SSD4SS office in Juba is small, as is staffing, given the size of the intervention. At the same time, as most of the project's implementation was conducted through grants to seed companies, the MAFS, or the Universities of Juba and Nairobi, there was little need for a large staffing structure. We were not able to assess the degree to which the project shifted from using international to national consultants (as recommended in the MTR) but there may have been little choice. KIIs suggest that trainings – whether production or business oriented – were of high quality.

Insights from KIIs suggest some issues around timeliness of payments, which appears to be largely a result of AGRA's internal processes and the fact that financial requests were handled primarily in Nairobi. Secondees, in particular, indicated there were times they self-financed their work with seed companies because of delays in payments. Secondees are on unpaid leave from their places of employment (e.g., MAFS) and therefore do not have a secondary source of income. Interviews with individuals who attended either the SEMIs trainings or MSc programs in Nairobi did not appear to have the same experience. No instances of delays in living allowance or school fees were mentioned in the few interviews conducted with those attending either activity.

According to other KIIs, grants were also at times delayed. In some instances, such delays resulted from delays in reporting by seed companies; money is released only after review of grantee reports. At other times, however, the delays were the result of internal processes; reports are heavily reviewed within the Nairobi office. For example, the reports are sequentially reviewed by financial, M&E, and management

staff (not necessarily that order), adding considerable time before money is released. At the very least, reports could be simultaneously reviewed by different units to reduce the time required for review. A final review – likely by management – to bring the various elements into a cohesive document would still be necessary, but is likely part of the current process. The bottom line is that many of the SSD4SS activities are time-sensitive; e.g., farmers must prepare their fields in time for planting. Such time-sensitive activities can be negatively impacted by late payments and have cascading effects on subsequent parts of the seed production process.

> "A lot of activities were squeezed into a very short period of time."
>
> - KII, Juba

Overall, the two-year time frame of the NCE required money to be spent quickly and efficiently. Though there was some sense by a small number of interviewees that activities were "rushed", the project appears fairly efficient in its use of funds to achieve positive results. Improvements in the internal processes controlling release of funds should be considered in any future programs, and should include decentralization of disbursement responsibilities to the country level.

Beneficiary Satisfaction

Project participants expressed a high degree of satisfaction with project activities and results and believed the activities were highly relevant. These sentiments are reflected in discussions throughout this report. Out-growers greatly appreciated the learning and skills-building they received. Most all thought they would continue practicing what they had learned through the project even after its end. Likewise, seed company representatives – as well as agro-dealers – felt they had benefitted not just in technical terms but also in terms of business and financial management.

Those interviewed expressed a strong sense of pride, accomplishment, and ownership. More farmers than were trained were eager to engage with the project and are benefitting from neighbors who did participate. In Magwi and Torit, the evaluation team observed widespread and strong branding of the project in shirts, hats, and signage. Agro-dealer shops visited by the team in Juba also displayed signage with the AGRA logo. While such branding may contribute to people's identification with the project, it may also create an expectation that every activity should be accompanied by project-branded clothing or other accessories. In fact, most out-growers we spoke with during the evaluation indicated they thought the project should do more to provide tools (e.g., hoes), gum boots, and rain gear.

Gender Considerations

As noted in the seed system security study (2010), women play a key role in household food security, seed security, and general well-being. Many households are female-headed. Even in male-headed households, however, women may be responsible for storage of seeds and grains. Thus, it is important to ensure some degree of gender balance in the project's activities.

> "Workers in the fields are women, owners of the fields are men."
>
> - KII, Magwi

According to the SSD4SS proposal document, the project targets women in all its activities and as beneficiaries of its grants. Female students have received MSc degrees from the University of Nairobi, women's out-grower groups have been formed, women serve as chairpersons or other roles in out-grower groups, one seed company has a female CEO and one is owned by a woman, female breeders within the MAFS have been supported, and females have been seconded to coach and mentor seed companies. Though men dominate in terms of beneficiaries, the project has notable female presence among its beneficiaries.

Interestingly, no individuals interviewed during the evaluation indicated they had received any gender training as part of the project's activities. This is somewhat surprising given that seed companies supported by the project received gender training and developed gender plans for their activities (AGRA 2018b). This discrepancy may simply be the result of small sample sizes, bad memories, or misunderstanding by interviewees and/or the evaluation team. When asked, AGRA indicated that gender training was part of the SEMIs training, which means it was limited to seed company staff. Although there is good representation of women at all levels of activity within the project, future initiatives should more overtly consider activities that focus on gender dynamics within agricultural systems and the rural economy more generally, as well as intra-household dynamics around decision-making.

Unintended Outcomes

The main unexpected outcome was that farmers produced "too much" relative to the amount of available storage capacity by seed companies. Some seed companies have little storage capacity of their own and rely on renting space. Unfortunately, there was either a complete lack of available physical space for rent or prices were high due to competition for the limited space. For some seed companies, the lack of sufficient storage space, coupled with heavy rains in 2019, resulted in the loss of good quality seed; one company reported they lost as much as 30 percent of their seed.

For a project intent on developing the seed production capacity of the nation's seed sector, the amount of storage space available nation-wide should have been figured into the project design. It is entirely possible that it was considered but the unexpected "overproduction" by out-growers simply swamped the system. Nonetheless, lack of space in which to safely store the produced seed is a significant concern and risk to maintaining momentum from project achievements.

Sustainability

This section provides insights from FGDs and KIIs regarding the longer-term sustainability of outcomes resulting from the SSD4SS project, including examination of exit strategies, their strengths and weaknesses, as well as beneficiary perceptions.

Overall, the project's basic strategy for long-term sustainability rests with building capacity of seed sector actors at the national and local levels. Plant breeders, agronomists, seed technicians, and others with advanced degrees or seed sector-specific training now make up staff within the MAFS and the University of Juba. Through BDS and the mentoring by seconded experts, knowledge in both technical and business aspects of producing seed – including development of out-grower schemes – now resides within nearly a dozen local seed companies, a number of whom are taking full advantage of their increased capacity. Smallholder farmers across the Green Belt and elsewhere now have the capacity for producing and earning income from production of high-quality seed, and for being more active participants in the development and introduction of improved varieties best adapted to South Sudan's agro-ecological conditions. Agro-dealers have improved business capacity and are linked to both seed companies and smallholder farmers. All in all, this provides a solid foundation for sustainability. Notwithstanding the discussion regarding building capacity (see Effectiveness), there are a few weak points in the project's sustainability strategy, including government capacity at the local level (e.g., boma-based agricultural extension agents).

Much of the project's focus was on building capacity through sponsorships to SEMIs and advanced degree programs at the University of Nairobi. While it has indeed had a positive effect on the seed sector, especially within the MAFS and seed companies, reliance on external funding is not a sustainable strategy for continuing to build capacity within South Sudan. Rather, improved capacity for providing the types of education – including SEMIs style curricula – is needed within the country itself. This means

investing in existing or new universities, research institutions, laboratories, and other places of learning that focus on the seed sector. Even with the recent peace agreement, a new government will take considerable time to get its bearings. The MAFS is woefully under-resourced and requires that the new government exert the political will to redirect resources where they are needed and to pass and enact several pieces of existing seed sector legislation (e.g., Seed Act). Although NGOs are unlikely to be well-positioned to support a new government, the FAO, WFP, UNDP and other UN development and humanitarian actors may be better positioned to support national policy efforts that strengthen the enabling environment in which the seed industry could flourish.

Additionally, the national seed trade association (STASS) is well placed to help ensure progress made under SSD4SS continues. In particular, they can help nurture the relationship between seed companies and seed markets such as FAO, WFP, and NGOs engaged in "seeds and tools" programming. As previously mentioned, FAO has committed to purchasing up to 25 percent of their annual seed need from national seed companies. Currently, that translates to approximately 2,000 MT of seed for FAO. WFP's Purchase for Progress (P4P) program represents another large market opportunity for local seed companies. There is much to work out – and much that can go wrong – in order for such a partnership to be successful, but STASS has a key role to play. In turn, a small coordination fee (e.g., 2 percent of the contract value) would help support STASS.

> "We [agro-dealer] probably won't survive without the NGO market."
>
> - KII, Juba

As part of the NCE, AGRA commissioned a study of project-supported seed companies to assess their overall status in terms of longer-term sustainability (Africa Turnaround Ltd 2019). The tools used (SCOPE SME Basic and SCOPE SME Pro) were developed by SCOPEinsight, a leading provider of assessments dealing with the level of professionalism of farmer organizations and agribusinesses. In all, eight seed companies were assessed; the basic tool was used for seven of the companies while the eighth (Seed Grow) was assessed with SCOPE SME Pro. Taken together, the average ranking across all eight companies was "maturing organization". However, three companies were ranked as professional. In particular, these companies tended to score higher in financial and internal management, as well as awareness, mitigation, and management of external risks (e.g., biological, environmental, climatic). The highest scores – across all eight companies – were for the organization's engagement with relevant entities in the seed sector (e.g., NGOs, technical experts, business service providers, financiers, government), which is undoubtedly attributable, at least in large part, to the SSD4SS project. Across the seven companies, the lowest marks were for sustainability, defined in the study as the degree to which a company manages its impact on society and the environment. While this definition of sustainability differs slightly from the OECD-DAC criteria definition, they are not unrelated. Companies are not likely to be sustained over the longer-term if their social and environmental impacts are negative or harmful.

Overall, the results of AGRA's work over the course of the SSD4SS project (i.e., since 2013) have created a very solid foundation for the seed sector in South Sudan. Capacity of local institutions and seed sector stakeholders has been enhanced, including plant breeders, seed companies, agro-dealers, and smallholder farmers. A Training of Trainers (TOT) model has helped expand knowledge and skills within the University of Juba and seed companies that will help sustain progress. Production of improved varieties of priority crops such as maize, sorghum, groundnuts, and beans has increased. The volume of improved seeds sold by seed companies has increased. Research and development of improved varieties adapted to the South Sudan context has increased, with improved varieties released to the public. Partnerships and networks between the private sector and public institutions are in place and/or strengthened. The national seed organization, STASS, serves as an umbrella organization, organizing, coordinating and lobbying for seed companies with the government, NGOs, and UN entities. There is

tremendous potential for sustained growth of the seed sector, in particular through procurement of bids with FAO, WFP and NGOs.

Given there is a new, fragile government, price volatility and inflation, and lack of many basic services and infrastructure across the country, it is likely that the main avenue for continuing to build on the successes of SSD4SS lies with linking seed companies – and by extension smallholder farmers – to the UN and NGO systems of seed procurement. Although increasing, seed sales to farmers are not likely to be sufficient to support a robust seed sector for years to come. In the meantime, FAO and WFP programs to procure locally produced seed provides a viable pathway for supporting and helping to stabilize the fledgling industry. In our estimation, donors should recognize the achievements – as well as the potential – and continue to support successive efforts to build a robust seed sector in South Sudan. The stage is set; seed companies appear on the verge of "success" but continued support will be necessary to fully establish the industry as autonomous and self-financing.

Lessons Learned

Several lessons learned emerged from interviews with stakeholders as well as triangulation of their insights with project reports and data. These are presented below.

Training. One repeated theme articulated by both trainers and trainees with whom the evaluation team spoke was the need for on-going training, particularly for out-growers but also for seed company staff and community-based agricultural extension workers. The need for regular supervision and training was also identified as a key insight in the July-December, 2017 report. As one key informant noted, many of the concepts being taught were new to out-growers, who needed time to really understand the concepts and let them sink in. One key informant who was involved as a trainer indicated that training for the institutional trainers should also be considered. For example, trainers from the University of Juba, who trained seed company personnel and out-growers, received no training or other type of professional development through the project. One of the expected end-of-project outcomes defined in the NCE is "a South Sudanese educational system capable of training seed sector practitioners." According to KIIs, grants were provided to teachers at the University of Juba for developing curricula and conducting trainings for seed company staff and out-growers. While all good, such support does not by itself result in an ***educational system*** capable of training seed sector practitioners.

> "Training should be more than a one-time deal."
>
> - KII, Juba

Another key informant suggested the need to time the training events so that they occur before the specific task needs to be done. For example, training on planting practices (e.g., row spacing) should be conducted several months before planting occurs but refresher courses should be held in conjunction with planting activities. In other words, the seasonal hands-on activities that served as training events should be preceded by more thorough training a month or more prior to the activity itself, which serves instead as a refresher.

Lastly, the block model of seed production used by out-growers provides a good opportunity for training groups of out-growers in terms of logistics and the practicality of training on specific topics. For example, training around seed processing (e.g., threshing, cleaning, sorting) may be more effective by facilitating the exchange of ideas and experiences among out-growers while being more efficient in terms of promoting group threshing, winnowing, sorting, etc. either by hand or use of manually-powered seed threshers, sorters, etc. made available on a group basis.

Certified seed. Throughout project documents, several terms are used to describe the seed that is being produced as a result of support from the project; certified, foundation, or high-quality seed. The NCE

states that the eight seed companies supported during the first phase of the SSD4SS project (2013-2017) were "producing certified seed of different food crops" across various locations by the end of 2017. The document goes on to elaborate that more work needs to be done to make companies more effective and efficient at producing and making available "quality seed", which presumably includes but may not be limited to certified seed.

Expected project results include increased production of foundation seed by plant breeders within the MAFS and of certified seed by seed companies (including through their out-growers). Insights from KIIs and FGDs, as well as project reports, suggest that foundation seed production by breeders and certified seed production by seed companies and out-growers has been greatly increased, particularly under the NCE. Yet, according to a seed strategy report for South Sudan supported by AGRA (Osando 2019), the absence of the seed law (i.e., Seed Bill and Seed Policy) "makes seed regulation enforcement impossible." Draft seed handling guidelines inform the seed certification process, under the Directorate of Research in the MAFS. While the guidelines inform seed import/export inspection, permitting, tendering, transportation and other aspects of seed regulation, "there are no specific guidelines to monitor seed field inspections during seed multiplications, seed processing and marketing in place." Nor does South Sudan participate in any OECD Seed Schemes, which are guided by international rules and regulations, including for field inspections, etc.

NATIONAL SEED BILL

The National Seed Bill was first drafted in 2012 and revised in 2013. Still awaiting approval in 2020, the bill integrates the Harmonized East African Seed Standards, Regulations and Procedures (HASSREP), which includes a comprehensive framework for development of the seed sector. Once operational, the bill provides the laws and regulations for governing seed systems in South Sudan.

Seed certification is important as an approval process for seed production in the formal seed sector, somewhat less so in the informal sector. It provides for seed quality assurance (e.g., in the form of a certificate) based on inspection, grading and testing by an authorized body. For seed to be certified, a set of required protocols must be met. The process involves four phases: 1) verification of seed source; 2) field inspections by staff from the inspecting agency at specific intervals during the production cycle; 3) sampling and testing of processed seed; and 4) tagging and sealing of seed containers.

Alabi. 2019.

In large part due to AGRA's efforts, including through the SSD4SS project, all the elements are in place; guidance, trained staff, seed laboratories, and inspectors and technicians have been conducting field inspections and quality control measures. All that is missing is enactment of the law. While the policy and bill exist, there is – as of yet – no legal framework under which seed certification activities are operating. Thus, the project should take care in declaring that the project has, in fact, increased the production and availability of **certified** seed in the country. Results around "certified seed" are questionable without a national law that establishes a seed regulatory process and operationalizes it (i.e., provides funds and other resources). This also applies to foundation seed, which must be grown (and "certified") under similar conditions as certified seed.

As one workaround to the certification issue, FAO has relaxed certain procurement criteria by allowing purchases of QDS. QDS provides for a form of external quality assurance that also reduces the burdens of more rigorous conventional seed certification, particularly in contexts where available human and physical resources for quality control are limited and in contexts of instability and conflict (Alabi 2019). According to Alabi, the QDS system "is designed to provide quality control during seed production which is less demanding on government resources than seed certification but is adequate to provide good quality seed both within countries and in international trade." While seed

produced by SSD4SS-supported seed companies and out-growers may be of higher quality than QDS seed produced and regulated by communities, it still falls somewhere short of “certified” in the absence of the seed law. Additionally, there are slight caveats to – or gaps in – the seed certification process in at least some places in South Sudan. For example, inspectors may only conduct one field inspection when multiple visits are required. Passage and enactment of the law will help strengthen the quality and delivery of the seed inspection and testing capacities enhanced with project support.

In the absence of a ratified seed bill and the full operationalization of seed inspection services nationally, the high-quality seed that is produced with support from the SSD4SS project may be more appropriately considered high-quality QDS. Alternatively, AGRA could promote “South Sudan certified” as ABC (All But Certificate). That is, the seed is produced under the standard quality control guidelines required by the pending bill even though the law has yet to be authorized. This should not be considered as failure, or lack of achievement in terms of the project’s objectives. This is an ***extremely*** important step in the process and merits high praise and acknowledgement. Thus, the project should promote its achievements in increasing production and availability of improved seed and limit its use of “certified seed” until such time as it has been certified under an authorizing body. Promoting the transition to certified seed can still be leveraged for future programs, as the bill should ultimately be enacted.

Policy. As previously mentioned, several key policies remain to be enacted in parliament that have a direct impact on the seed sector. The evaluation team does not pretend to understand the nuanced – nor overt – issues regarding international support to the government of South Sudan. However, the fact remains that progress along certain fronts (e.g., seed certification) will continue to be limited until legal frameworks and policies are in place and enforced. Neither AGRA nor other NGOs are well-placed to have impact at a national policy level. Nonetheless, future programming initiatives need to carefully consider the implication of such limitations in developing their objectives and expected outcomes.

Monitoring & Evaluation (M&E). An additional objective of the project involved ensuring effective monitoring and evaluation, which was achieved through M&E training workshops for seed companies. The evaluation team did not directly address this objective as it was not included as one of the results areas in the TOR. Nonetheless, several issues were noted and should be considered in future programming.

Much of the SSD4SS project involved providing grants to a number of different seed companies, which suggests the need for unified ways of collecting and reporting data. Monitoring and reporting can be complicated by what are essentially multiple implementing partners each potentially with their own way of collecting and reporting data. Thus, it was imperative that the project include M&E guidance and activities.

According to project results, two M&E workshops were conducted, with representatives from all 12 seed companies in attendance (see Annex E). Rough compilation of final results by grant provided to the evaluation team shows the degree of uniformity in indicators used by the various companies. It is clear that the project spent time and effort standardizing M&E among the grantees. At the same time, it is also clear where improvements might be needed. For example, units of measure should be standardized across all grantees and should be reported as part of the indicator so that there is no uncertainty as to whether a measure is MT or kg, or whether a data point is kg or number of seed packets. More clarity around some indicators is also needed, for example, distinguishing between the “Amount (MT) of foundation procured and distributed to farmers” (grant 2018 SS 002 to MASCO) and the “Volume (MT) of foundation seed distributed to selected seed companies and farmer groups within the target area (grant 2015 PASS 034 to MAFS).” Should we assume these measure the same thing? Still other grantees have two indicators: MT of high quality foundation seed produced (per crop) and MT of high quality foundation

seed sold (per crop). Is “distributed” different than “sold”? If so, that suggests different grantees were doing different things relative to provision of foundation seed, which should be more obviously reflected in the indicators.

These are fairly straightforward examples of somewhat small inconsistencies. Overall, the project has built a fairly good monitoring system for its grantees. Small but important improvements, however, can help streamline aggregation and reporting of results. In particular, such improvements can contribute to real-time adjustments, or adaptive management, of project activities in response to on-the-ground changes in context (e.g., violence, conflict).

Conclusions and Recommendations

Insights from KIIs and FGDs, as well as evidence available to the evaluation team at the time of the evaluation, suggest that the SSD4SS project was highly effective at achieving expected outputs. Implemented under less than ideal conditions, including insecurity and armed conflict, the project was focused and likely implemented as efficiently as it could be under the circumstances. It was clear from interviews that AGRA has a solid reputation in South Sudan and that the project is designed to address a critical need. Although progress was slower during the “first phase” of the SSD4SS project, cumulative results from September 2017 through December 2019 suggest that the project’s success built on previous AGRA efforts, including those prior to 2013. Together, AGRA’s interventions have helped create a solid foundation for the seed sector.

The evaluation team agrees with a number of recommendations from the MTR even though they were meant as recommendations for the NCE. In particular, we feel the following should be continued – and potentially expanded – as necessary elements in any future programming:

- Development of a decentralized national seed quality assurance mechanism;
- Strengthening of STASS and its umbrella role in the procurement process with UN agencies and international NGOs and other aspects of the seed sector;
- Support to SEMIs and the University of Juba to train seed company staff, out-growers and MSc students; and
- Strengthen collaboration between the seed sector, multilateral organizations such as FAO, WFP, and international NGOs, and donors, and promote local sourcing and purchase of seed from South Sudanese registered seed companies (i.e., not hand-bag companies).

Based on insights from qualitative interviews with seed companies, MAFS plant breeders, out-growers, agro-dealers, secondees, and AGRA staff, the following recommendations are offered for consideration by AGRA for future programming.

- **Add value-addition activities.** In any next phases, AGRA should consider activities that add value to the crops being supported through the project. Value-added production, processing, and marketing should be promoted, including for example, peanut butter, sesame butter, corn meal, cooking oils (e.g., sesame, peanut, sunflower) and flours (e.g., sorghum, cowpea). Value addition provides markets for farmers and farming communities beyond just that of seed. Livelihood diversification, particularly into off-farm income generating activities, helps spread the risks to livelihood security based only on farming (Nelson et al. 2016). Such value chain activities can also be combined with activities around savings, including the formation or strengthening of savings groups such as Village Savings and Loans Associations (VSLA). Combining income-generating and VSLA activities has been shown to contribute to household resilience in a number of studies, and in particular for women, who often lack assets or decision-making authority over household income (Smith et al. 2015).

- **Expand training.** Following on insights from KIIs and recommendations from the MTR, some changes to training activities are recommended. Training for out-growers should be more comprehensive in nature and include more information and guidance on prevention and treatment of common crop diseases and insects (e.g., fall army worm), soil fertility management, etc. For example, training on Integrated Pest Management (IPM) should be prioritized in order to better manage insects and diseases and to prevent overreliance on chemicals that are harmful to the environment, animals, and people. Training should include accessing climate information to help farmers plan and operationalize their plantings to minimize negative impacts of climate variability and change. Although trainings were generally well-timed to the planting season, consideration should be given to conducting sequential trainings to take advantage of non-planting times of the year followed by focused mini- or refresher courses timed with the field season. Continued training of seed inspectors is also needed in order to build sufficient in-country capacity for seed quality assurance/testing services.

- **Build government capacity at the local level.** Overall, the SSD4SS model of training agricultural extension agents through seed companies is an innovative and interesting model and should be encouraged. However, given the uncertainty of the future for most seed companies – at least those who participated in KIIs or FGDs during the evaluation – it is not clear how sustainable this approach will ultimately prove to be. Several seed companies indicated they will be cutting back on staff, which could potentially reduce the presence of such agents within out-grower communities. Likewise, the project has built regional capacity for seed quality services, though these services are woefully under-resourced and likely under-staffed. Nonetheless, the frameworks exist under which additional efforts should be focused. More emphasis needs to be placed on building decentralized capacity of the government, especially at the payam and boma levels.

- **Coordination with UN and NGO initiatives.** The SSD4SS project is not the only seed production activity currently operating in South Sudan. There are tremendous opportunities for linking with other humanitarian and development initiatives. In particular, the seed and/or grain markets represented by FAO and WFP present huge opportunities, with the recently awarded FAO contract to MASCO for 500 MT of seed as a case in point. KIIs with representatives from FAO suggest that they are enthusiastic for such a relationship to succeed while also remaining realistic about challenges (e.g., lower than expected yields or harvests, transportation costs, storage capacity). Although the evaluation team was not able to meet with representatives from WFP, we passed two Purchase for Progress (P4P) warehouses while conducting interviews in the Magwi/Torit area of Central Equatoria. KIIs with representatives from Green Horizon Seed Company noted that they purchase maize as grain from out-growers in Magwi and sell to WFP. They did not, however, indicate whether this was through the P4P initiative. Nonetheless, there is tremendous potential for linking out-growers to this program also.

  Other NGOs operate out-grower schemes as well, both within and beyond the SSD4SS project's geographic scope. Where areas of operation overlap, there appears to be little coordination among activities. For example, Caritas (Luxemburg) has trained out-growers around Torit, where several SSD4SS-supported seed companies work. Not only was Caritas not aware of the SSD4SS project in the area, they had lost seed procured for their project when it was "mistakenly" sold to MASCO. Additionally, FAO has trained approximately 5,000 farmers since 2008, creating a large pool of potential out-growers. According to one KII, FAO has recently begun discussions with seed companies, regarding working with FAO's farmers to help support seed production. Thus, there appears to be significant production potential for quality seed produced within the country that could be better coordinated in order to minimize competition and maximize results.

- **Decentralize financial management/disbursement of project funds.** As noted in qualitative interviews and the MTR, the South Sudan country office should have more direct responsibility for financial management of project funds. This will help reduce delays in payments of grants to seed companies and student stipends due to red tape and logistical constraints dealing with the Head Office in Nairobi and create more buy-in by in-country staff. The evaluation team agrees with the MTR that the country office does not necessarily need to be larger, per se, but should be staffed with enough people to allow for the efficient operationalization and management of future projects. This should include financial management, with clear oversight by Nairobi.

- **More rigorous TOC and M&E with outcome measures.** In future programs, care needs to be taken to fully develop a step-wise TOC that demonstrates for program staff, donors, and implementing partners how project activities will lead to behavior change and improved outcomes, which in turn will ultimately lead to improvements in a higher-level goal, such as increased income, reduced poverty, improved food security, etc. Development of such a TOC will also allow for development of a rigorous and complete results framework and list of measurable indicators for outputs, outcomes, and higher-level objectives.

Though it is still too early to determine with any degree of certainty, the SSD4SS project is likely to have long-term positive impacts on the seed industry in South Sudan, regardless of whether it ever becomes completely autonomous and self-financing. Ultimately, it is important for donors to consider the advantages of continuing to fund programs that are making progress in real time (particularly in adverse conditions), lay a solid foundation for future progress, and require sustained effort and resources to have long-term sustainable impact. Building a robust and equitable seed system takes time; it will not be accomplished in what was ostensibly an intensive three-year period. The SSD4SS project is worthy of continued funding – either from its current donor or others – so that the South Sudanese people can reduce their dependence on external assistance in order to achieve an appropriate level of food and livelihood security by their own initiative.

References

Africa Turnaround Ltd. 2019. Seed company competitiveness and sustainability assessment, South Sudan: Final Report.

AGRA. 2019a. SSD4SS Annual Report: 1 January – 30 June, 2019.

AGRA. 2019b. Seed Sector Development for South Sudan (SSD4SS): Interim Status Update Summary. 1 January – 30 June, 2019.

AGRA 2018a. Seed Sector Development for South Sudan (SSD4SS). Report July to December 2017.

AGRA. 2018b. Gender Training Report: South Sudan Grantees – Juba. July 25-27, 2018.

AGRA. 2017. Seed Sector Development for South Sudan (SSD4SS) No-Cost Extension (2018-2019). Project Proposal.

AGRA. 2013. Seed Sector Development for South Sudan (SSD4SS) project proposal.

Alabi O. 2019. Good Quality Seed Production Guide for Smallholder Farmers. A field guide for extension workers in South Sudan. Available at: https://fscluster.org/sites/default/files/documents/good_quality_seed_production_guide_-aesa-fao_19_06_2019.pdf.

Bernard HR. 2017. Research Methods in Anthropology: Qualitative and Quantitative Approaches. Lanham, MD: Rowman & Littlefield, Publishing Group.

CIAT, FAO, MAF-GoSS, AAH-I, ACTED, ADRA, AMURT, CRS, DRC, NPA. 2011. Seed System Security Assessment, Southern Sudan. November-December 2010. Funded by the European Commission Humanitarian Aid Department and the Office of Foreign Disaster Assistance, United States Agency for International Development. Juba, Southern Sudan: FAO and CIAT.

Doss C. 2006. Analyzing technology adoption using micro-studies: limitations, challenges and opportunities for improvement. Agricultural Economics 34(3): 207-219.

Gildemacher P and G Gideon. 2017. Seed Sector Development for South Sudan: Mid Term Evaluation. Amsterdam: KIT.

INTRAC, TANA, and DANIDA. 2016. Tracking Capacity Change. https://www.intrac.org/wpcms/wp-content/uploads/2016/10/Tracking-Capacity-Change.pdf.

Key2Market. 2018. Sudan Seeds Sector Study. April 2018. Available at: .file:///C:/Users/Suzanne/Downloads/SUDAN+SEED+SECTOR+RESEARCH+-+FINAL+REPORT+MAY+2018+AMENDED%20(1).pdf

Nelson S, Frankenberger T, Langworthy M, Finan T, and T Bower. 2016. The effect of livelihood diversification on recovery and shock impact in Ethiopia, Kenya and Uganda. Report prepared by The Technical Consortium, a project of the CGIAR. Technical Report Series No 2: Strengthening the evidence base for resilience in the Horn of Africa. Nairobi, Kenya: A joint International Livestock Research Institute (ILRI) and TANGO International publication. https://www.fsnnetwork.org/effect-livelihood-diversity-recovery-and-shock-impact-ethiopia-kenya-and-uganda-0.

Onsando JM. 2020. Seed Regulatory Strategy for South Sudan Report.

Smith L, Frankenberger T, Langworthy B, Martin S, Spangler T, Nelson S, and J Downen. 2015. Ethiopia Pastoralist Areas Resilience Improvement and Market Expansion (PRIME) Project Impact Evaluation. Baseline Survey Report. Volume 1: Main Report. January 2015. Available at: https://www.agrilinks.org/sites/default/files/resource/files/EthiopiaPRIMEVol1final.pdf.

Annex A: Terms of Reference

TERMS OF REFERENCE FOR THE END OF PROGRAM EVALUATION FOR SEED SECTOR DEVELOPMENT FOR SOUTH SUDAN
JUNE 2019

1. Background
AGRA was founded in 2006 with a mission to trigger a uniquely African Green Revolution that transforms smallholder agriculture into a highly productive, efficient, competitive, and sustainable system to promote food security and lift millions out of poverty. AGRA's first Strategy (2007 – 2015) was anchored around four integrated programmatic areas, namely; Soil Health Program (SHP), Program for Africa's Seed Systems (PASS), Market Access Program (MAP) and Policy and Partnerships. AGRA invested over $700 million in these programs that helped to develop tools and systems for an African agricultural transformation. The lessons and experiences of this phase have helped shape the new strategic focus of AGRA for 2017-2021 that aims to *Catalyze and Sustain an Inclusive Agricultural Transformation in Africa to increase Incomes and improve Food Security of at least 30 million smallholder farming households* with a set of targeted catalytic downstream and systemic investments coupled with government engagement made through its alliance of partners.

In South Sudan, AGRA's work focuses on the "seed value chain" to enhance agricultural productivity among smallholder farmers. From November 2013 – end of 2017, the embassy of the kingdom of Netherlands funded the seed sector development for South Sudan. The project was however unable implement the activities to completion. This was largely attributed to deteriorating political stability in the country at the time and thereby rendering the project team incapable to operate. A mid-term review implemented early 2017, to asses' project performance against target, recommended a no cost extension of the project for 2 years to allow the project to pursue the initial objective and a revision of deliverables.

In line with recommendations of MTR AGRA restructured the South Sudan program to focus on in country capacity building and delegating more responsibilities to the national office and national partners to enable efficient implementation. AGRA developed a robust seed distribution system for locally produced seed through agro dealers.

Project goal
To increase income and reduce poverty among smallholder farmers across South Sudan by promoting the development of a seeds system that delivers new crop technologies, especially improved seeds to farmers in an efficient, equitable and sustainable manner.

Key cumulative achievements of the Seed Sector Development for South Sudan include:

- *16 grants were awarded with a total value of $2,364,047. A total of $1,372,851 of the grants was already expended representing 58% expenditure rate.*
- *12 seed production companies have been supported in seed production and capacity building.*
- *1,700 MT of certified seeds produced.*

- *There were 3 on-going breeding grants, of which 2 are new grant awarded this year. These included, maize hybrid production and Sesame Breeding*
- *4 capacity building Grants awarded to University of Juba, Pro Enterprises, AGMARK, Digital Green, Business Development Services (BDS) and KEPHIS*
- *A total of 6 MSc students have been enrolled at University of Nairobi. All of the have now successfully completed and have been seconded to the project to offer advisory services to seed companies.*
- *3 groundnut varieties were officially released in South Sudan.*
- *139 (84M, 55F) out growers trained on seed production the University of Juba (UoJ).*
- *208 (101M, 107F) farmers were trained and taken through practical exercises in seed production*
- *Lab equipment procured and arrangements for transportation and installation of seed lab as well as training support for seed testing and inspection service has been initiated.*

2. The Purpose and objectives of the evaluation

AGRA is accountable to the donor who availed funds for the implementation of the project to the government of South Sudan and the South Sudanese smallholder farmers among other stakeholders on the deliverables agreed upon at the start of implementation. The purpose of this evaluation is therefore in line with the standard practice of learning and accountability functions of evaluations. This evaluation results will therefore:

- Be important to AGRA when considering the next phase of this project
- Be a sure way of accounting expenditure incurred to the donor and stakeholders
- Provide an opportunity to look at what worked and what did not and strategies for improvement in future engagement with stakeholders
- Help AGRA to ‘improve on existing or developing new tools of intervention

The objective of this evaluation will seek to

1. Ascertain results (outputs, outcome, impact) and assess the effectiveness, efficiency and relevance of the specific development intervention
2. Provide findings, conclusion and recommendations in respect to implementation strategies as specified in the project document.
3. Highlight lessons learnt during implementation period.

The evaluation will be guided by the following ethical considerations: openness, broad participation of key stakeholders, integrity and honesty of the process; reliability and independence to ensure valid and trustworthy findings and conclusions.

The evaluation is primarily intended for AGRA to help to respond to the identified existing gaps, the primary stakeholder (Small holder farmers in South Sudan), and the donor to ascertain the relevance of the set outcome and impact and to the secondary stakeholders (partners on the ground for complementary roles).

3. Project Results Area

The guideline to describe the context and the evaluation questions are listed below and are mentioned to provide a general reflection. This list is not exhaustive and it is recommended to develop and add specific questions. The contractor/ evaluation team is invited to comment on the TOR before and during the kick off meeting for clarity.

3.1 Objective 1: To develop capacity for research, seed production and certification through short term and long term training of crop and seed technical specialists

One of the major challenges for seed companies in South Sudan and across the continent is lack of capacity which, as defined by the World Bank, 'entails the ability to identify and analyse problems, make rational choices and implement actions designed to achieve set objectives (World Bank, 1996). Seed companies do not only need one-off training, but continuous on-the-job capacity building and coaching to develop their skills as seed entrepreneurs.

To realize a strong commercial seed sector, training is required at different levels, from grassroots to seed producer level up to the level of larger seed companies. The project will invest in developing and using domestic training capacity in seed technology and seed business.

Project Outcomes

- 10 South Sudanese seed companies with the capacity to respond in an economically sustainable manner to market demand for quality seed;
- South Sudanese educational system capable of training seed sector practitioners;
- Seed quality assurance capacity available in Lakes, Western Bahr Ghazal, Western Equatoria and Central Equatoria states;
- Academic knowledge and regional network of South Sudanese seed sector service providers strengthened.

3.2 Objective 2: To support MAFs crop improvement research, seed production and certification activities

The need for new and improved varieties in South Sudan cannot be overemphasized. Emerging disease threats, pests, climate change and drought demand continuous development of new adapted varieties that address these threats. AGRA's experience has shown that support for breeding programmes ultimately pays off as farmers get to improve yields through development and release of new varieties that are well adapted to their specific environments.

To make these new improved varieties available to commercial seed companies, foundation seed needs to be produced, through public institutes or by the seed companies themselves.

To safeguard the quality of the foundation seed and of seed produced by commercial seed companies, effective seed quality assurance services are needed. Breeding projects are financed for operational funds related to breeding activities, and a modest motivation fee or stipend for the breeder on the ground. This is not a double payment for the breeder, but a motivation fee to ensure commitment and quality results as a result of this investment.

Project Outcomes

- Re-invigorated maize, bean and sesame breeding programs capable of sourcing germplasm from international (CGIAR) and regional research organizations;
- MAFs and university breeders with proven capacity for fast-tracking variety selection and registration
- Foundation seed of improved, well adapted, varieties of maize, sesame and beans available to seed companies in South Sudan
- Yield potential of registered improved maize, sesame and bean varieties 50% higher than pre-existing popular varieties
- Independent seed quality assurance services available in Lakes, Western Bahr Ghazal, Western Equatoria and Central Equatoria states, and used by at least 8 seed companies

3.2 Objective 3: To develop the seed sector in the production and dissemination of high-quality seed of new improved crop varieties.

Production of high-quality adapted seed is the basis of a thriving sustainable seed system. AGRAs experience developing seed systems across the continents has taught us that private seed companies are best placed to produce good quality seed. Private seed companies are motivated by the opportunity to earn profits and continually expand their market share as multiplication, packaging, and distribution units for improved seed. Seed company development requires a mixture of training and on-the-job support. Under objective 1 seed companies are assisted through the training of their staff and out-growers.

Under this objective, the activities aim at supporting the development of the seed companies themselves as robust and knowledgeable profit-making enterprises, able to service the market with affordable high-quality seed.

Project Outcomes

- Enhanced capacity for seed production and seed business management by 10 South Sudanese private seed companies, expressed through:
- Area planted with locally produced hybrid maize increased to 72,000 ha, using 1,800 tonnes of seed in 2018 and 2019.
- Average yields of adopters of high-quality seed of maize, beans and sesame increased by average 30% compared to local seed.
- Farmers distance to inputs to purchase seed and fertilizer reduced by half. Farmers access high quality seed, and increase confidence in improved varieties

3.4 Objective 4: To organize, train and support farmer groups to produce seeds as out-growers for seed companies

Seed Companies rely on out growers for seed production and well trained knowledgeable out-growers are a big asset especially for developing seed companies. Under activity 1.2 AGRA will collaborate with the University of Juba to offer basic crop production and seed courses at the university. Out-growers are a main target audience for these courses. In addition to classroom and field training in the form of a shot course, they need further support to establish as a commercial seed out-grower.

Selection of the out-growers will be done by the seed companies, who will choose their most progressive and better skilled out-growers to benefit from training and support. The support will also include facilitating and brokering the contracting process.

Project Outcomes
- 25% and 50% of seed produced by seed companies produced through out-growers in 2018 and 2019 respectively
- Credit scheme for seed out-growers running routinely through at least 4 seed companies

3.5 Objective 5: To create awareness and commercialize the developed crop varieties

A major element of increasing the use of high-quality seed by smallholder farmers is the convincing demonstration of its benefit. As such, demonstrations are an essential component of any strategy for variety promotion and uptake. Demonstration of the benefit of high-quality seed is proposed using two different methods
.
Project outcomes
- The volume of quality seed used doubled compared to 2015-2016
- Yields of adopters of high-quality seed on average 30% higher than that of non-adopters

3.6 Objective 6: Support for the National Seed Trade Association of South Sudan (NSTA)

As the South Sudan Seed sector continues to develop and take shape, there is need to for an association that represents the interests of the various stakeholders, especially the seed companies in matters of policy, and advocacy for the development and free movement of seed. Currently, South Sudan has 11 seed companies, eight of these are currently under SSD4SS funding, and there is a consensus that the country is ready for a Seed Trade Association.

Project outcomes
- Seed trade association established, which is covering at least 40% of its running costs through member contributions
- Seed trade association has the proven ability to identify ad address seed policy issues on behalf of its members
- Seed trader association recognized as a seed authority by the South Sudan government

4. Scope of the evaluation

The evaluation will explore the extent to which Seed Sector for South Sudan work achieved stated goals, objectives and demonstrated impact. The evaluation will study the work of SS4SS from 2017 to 2019.

The evaluation should focus on the program interventions and with site visits conducted and data collected in South Sudan in the target. A statistically representative sample of grants/projects will be selected and assessed through site visits across the focus Regions.

As appropriate, a sample of smallholder farmers who benefitted will also be selected and data collected to assess change. The evaluation will take into consideration program limitations and implementation conditions in South Sudan and the influence they may have had on success.

5. Evaluation Methodology

This evaluation will aim to assess and document overall difference that AGRA South Sudan project has made, how effective it was against set outcomes, whether outcomes of the work are sustainable and lessons that can be learnt for future programming.

5.1 Expectation on this evaluation

The evaluation is expected to use a mixed methods approach that should collect/use qualitative and quantitative data to provide insights into the overall changes that the AGRA SS4SS has caused. The evaluation is expected to collect/use data from a wide range of stakeholders including smallholder farmers that benefitted directly or indirectly, seed companies and government of South Sudan officials

The Evaluation is supposed to bring out key issues relating to programme relevance, effectiveness in addressing issues identified at inception, efficiency in delivering agreed up on objectives, impact to the target group and sustainability beyond funding by asking and responding to the following questions as outlined in the DAC Criteria on evaluations: http://www.oecd.org/dac/evaluation/daccriteriaforevaluatingdevelopmentassistance.htm

1. Relevance
    - Was the plan the right thing?
    - Was the right thing done?
    - To what extent were the objectives, planned activities and planned outputs consistent with the intended outcome and impact?
    - Were there differences between the time when the programme/project was designed and today?
    - To what extent were the objectives of the project/programme still valid?

2. Effectiveness
    - To what extent were the objectives achieved/are likely to be achieved?
    - What was the short or intermediate-term medium term (intended or unintended) outcome of the programme/project?
    - To what extent was the selected target group be reached?
    - What were the major factors influencing the achievement or non-achievement of the objectives?

3. Efficiency
    - Were activities cost-efficient?
    - Were objectives achieved on time?
    - Was the programme or project implemented in the most efficient way compared to alternatives?

4. Impact
- What happened as a result of the programme or project? (Intended and unintended impacts, equal opportunities for women and men, improvement of social and economic infrastructure, poverty reduction, cross sectoral impact or other relevant cross-cutting issues).
- What real difference did the activity bring about for the beneficiaries? (What would have happened without the activity?)
- How many people were affected directly and indirectly?

5. Sustainability
- To what extent did the positive impacts or changes of the programme/project (are likely to) continue?
- What measures were implemented in order to support sustainability?
- To what extent did the benefits of a programme or project persist after donor funding ceased?
- What were the major factors which influenced the achievement or non-achievement of sustainability of the programme or project?

The evaluation team to collect this data including may use various methods:
- Sample farmer household surveys across different categories of farmers to assess changes that have happened as a result of the project.
- Key informant interviews to collect qualitative information using structured and semi-structured interviews on key evaluation questions that should complement any quantitative analysis or data that will be collected/used.
- Focus group discussions to collect information from stakeholders that should help evaluators identify changes/trends or conclusions on any key issues under consideration.
- Secondary data collection from program documents e.g. project performance reports, delivery approach studies, mid-term evaluation. Secondary information will also be collected from official sources including national statistics. The evaluators may also conduct literature reviews on market systems development to inform how markets and trade respond to evaluation questions and measure changes.

The evaluation will use different methods to analyze the data that will be collected from different sources. The evaluation must ensure it triangulates data from various sources to improve validity of results. The evaluation will be expected to propose and use a clear data quality assurance mechanism to ensure results can be clearly interpreted. In addition, the consultant will be expected to secure free informed consent for evaluations and provide assurances that personal data provided by the stakeholders shall be safeguarded.
The consultant shall be expected to define a detailed evaluation design with methodology for approval by AGRA. They may use the impact matrix presented in annex 1 as a guide.

6. Evaluation Deliverables/outputs
The consultant shall be expected to submit to AGRA a set of key reports in the course of undertaking the evaluation. Any payment shall be made contingent to review and approval of reports by AGRA. The consultant will submit the following key reports:

1. Detailed Evaluation Design Report – This shall be prepared and submitted within two weeks after the signing of the contract. The consultant will prepare this after reviewing key technical documents and after discussion with AGRA. This will serve as an inception report and shall focus on the understanding of the Terms of Reference and scope, the relevant evaluation design, theory of change and impact pathway, key evaluation questions to be addressed, analytic framework for outcomes and impact assessment, methods of data collection, the work-plan and budget for the evaluation. The inception report shall be reviewed by AGRA within 5 days after submission, and shall have to be approved before proceeding to the next phase.

2. Progress Brief - While there is no formal progress report required during the assignment implementation, between inception and Draft report submission, the consultant(s) shall be expected to regularly (bi-weekly) share with AGRA, key emerging issues and trends to avoid surprises or misconceptions by either party.

3. Draft Evaluation Report – This shall be prepared and submitted to AGRA Management towards the end of the assignment for AGRA to provide feedback (comments, questions and inputs). In addition, the consultant will be required to make a personal presentation of the Draft Report to a wider AGRA audience for validation.

4. Final Evaluation Report – This shall be no more than 20 pages (excluding annexes), and submitted to AGRA on, or before the expiry of the assignment contract through the Head of M&E. Any valid extension may be mutually agreed between the Consultant and AGRA, provided it carries no extra cost to the latter.

The following will also be expected from the Consultant:
a) A master copy of the final evaluation report suitable for reproduction, and four copies, in full color and bound, as well as soft copies;
b) Submission of the final report, after incorporating the comments/inputs on the presented draft report. The final report shall include actionable recommendations;
c) All data-sets and questionnaires used during the assignment shall be a property of AGRA, and shall be the responsibility of the consultant to securely deliver them to AGRA, protecting personally identifiable information (PII).

7. Management and Reporting
During the course of the evaluation, the consultant will be required to report regularly on progress. Reporting shall be directly to the AGRA with Head of M&E and Knowledge Management or his alternate. Samuel Mbalu will do day-to-day coordination of the study from the AGRA side to ensure objectivity and credibility of the evaluation, an external consultant who made no prior commitment or major contribution to the project will conduct the exercise.

9. Timing
The evaluation is expected to be completed within 90 days effective from the date the contract is signed.

10. In-house Resources

Access to files, databases, financial records and other program related documents depending on the consultant's requirements will be availed. Access to relevant grantees, private sector companies and Program Officers will be organized.

11. Qualifications of the Evaluation Team

AGRA expects this evaluation to be conducted by a team of experts with experience in program evaluations, agricultural economics and agribusiness. The team leader will be expected to be a very skilled evaluator with deep understanding and experience of managing program evaluations. The team must include a member with experience in private sector food business. Particular qualifications and experience of the lead and team members include:

- PhD or Masters in Agricultural Sciences, Social Sciences, Economics or related field and at least 10 years of relevant experience for the team leader.
- A solid background and experience in agricultural development in Africa including in the output markets (food/feed) sector, the entire smallholder farmers participation in staple foods output markets in Africa;
- Technical knowledge of and recent experience with result-based management evaluation methodologies and project management.
- Proven and demonstrated ability to conduct program evaluations and provide strong strategic thinking on future direction.
- Experience in managing or supporting private sector food business in Africa.
- Experience in leading teams in field (training, field logistics, human relations, teamwork);
- Demonstrable ability and experience in research methodology;
- Excellent writing skills, with publication record in one discipline related to assignment
- Demonstrable analytical skills for analysing issues and formulating concrete recommendations to a wide range of stakeholder;
- Past related experience in agricultural systems, value chains, output markets and trade regulatory systems in sub-Saharan Africa; and
- Excellent English communication skills.

Each team will describe the size, qualifications and experience of team members and how this aligns with the evaluation needs.

12. Proposal

The proposal should include:

1. A detailed elaboration of issues to be addressed/covered;
2. A description of the evaluation plan (see annex 1) including details of the proposed methodology, sampling, study design; analysis and reporting and milestones for the evaluation and a timetable of activities;
3. Detailed budget;
4. Description of the pay schedule for the review;
5. **Past performance summaries** (at least three brief descriptions of past or current contracting mechanisms for efforts similar in size, scope and complexity to this tender) and list of references that demonstrate performance in conducting similar evaluations;
6. At least one copy of a **previous relevant report** and list of previous reports;

7. **CVs** conforming to the qualifications listed above for persons to manage and conduct the evaluation;
8. **Supporting documents including** mandatory institutional documents such as incorporation papers and most recent financial statements.

13. Submission of proposals

Technical and Financial proposals shall be submitted as separate documents. Financial proposals will not be opened until the conclusion of the technical evaluation and then only for those proposals that are deemed qualified and responsive.
The consultant will be selected through an open and competitive process and will be based on their proven experience, qualifications and ability to deliver a quality product in a timely and efficient manner.

14. Criteria for Evaluation

In deciding the final selection of qualified bidder, the technical quality of the proposal will be weighted at 70% on the basis of a criteria for evaluation. Only the financial proposal of those bidders who qualify technically will be opened. The financial proposal shall be weighted at 30% and the proposals will be ranked in terms of total points scored.

	Evaluation Criteria	Score (%)
a) Technical proposal	Team Composition	20%
	Does the proposed team have the required experts with the right experience for this assignment?	
	Does the team have an expert with experience in private sector food business?	
	Does the team have a leader with right skills that will manage the team and assignment?	
	Team Experience	20%
	Does the team possess proven ability to both assess past effectiveness and provide strong strategic thinking on future direction that could be useful for AGRA's integrated approach?	
	Does the proposal demonstrate clear understanding of output markets systems development in Africa?	
	Has team demonstrated understanding of relevant enabling environment issues for output market systems?	
	Do team members possess full working knowledge of English as well as excellent report writing skills?	
	Has the team demonstrated ability to generate high quality, rich, readable products on time and in line with expected deliverables?	

	Methodology	20%
	Is the evaluation methodology technically strong and comprehensive and is the interpretation of the TOR accurate?	
	Has team demonstrated that it is fully conversant with the principles and working methods of project/program cycle management and evaluations?	
	Past experience	10%
	Has the team successfully conducted similar evaluations in the past in Africa?	
b) Financial proposal	What is the proposed cost of assignment?	30%
	Is the proposed work plan schedule for delivery realistic and aligned to budget?	
	Has the team/company/institution demonstrated from past assignments that it has capacity to utilize the proposed budget and deliver on the assignment?	

Interested and suitable firms are invited to submit their Technical and Financial Proposals as separate documents by close of business on July 31, 2019 at 5:00 pm East Africa Time (GMT +3) to the following email address: procurement@agra.org.

Disclaimer

AGRA reserves the right to determine the structure of the process, number of short-listed participants, the right to withdraw from the proposal process, the right to change this timetable at any time without notice and reserves the right to withdraw this tender at any time, without prior notice and without liability to compensate and/or reimburse any party.

Clarifications

Questions and/or clarifications may be submitted to procurement@agra.org.

Annex B: List of Interviews

	Name	Entity	Title
Seed companies	Mary Elasto / Lawrence Lokujo	Green Horizon	CEO
	Francis Ayiga	STASS/Seed Grow	Chairperson
	Rahul Saharan	GAIS	Program manager
	Albino Gaw Dar	Sudd Enterprise	CEO/Program manager
	Obudra Francis	Seed Grow	Production manager
	Yasmin Ibrahim	Seed Grow	Secondee
	Liza Nelson	Green Horizon	Secondee
MAFS	Dr. John Kanisio	MAFS	Undersecretary Food Security
	Victor Benet	MAFS	Sorghum breeder
	George Tadu	MAFS	Cassava breeder
	Nancy Laku	MAFS	Groundnut breeder
	Susan Ayot	MAFS	Bean breeder
	Innocent Kitara	MAFS	Maize breeder
	Aqulino Lado	MAFS	Rice breeder
	Luka Atwok	MAFS	Maize breeder (Hybrid)
Agro-dealers	Bol Deng	Kilimanjaro Seeds	CEO
	Rosemary	Kilimanjaro Seeds	Store manager/sales
	Sumayah	Agro-Seeds and Fisheries	Sale manager
	Timon Wani	Golden Seeds and Veterinary Services	CEO
Magwi	Cosmas Oryem	MASCO	CEO
	Oloko James Robert	Individual out-grower/ Masco	
	Ochan David Anthony	Tic en kwo group	Ext agent/out-grower
Torit	Taban James	Afroganics	Agronomic advisor
	John Wani Thompson	Chase Hunger group/Afroganics	Chairperson
	Cizarina Ayuru	Molodo group/Afroganics	Chairperson
	Paska Hilifa	Out-grower/Afroganics	Individual farmer
University of Juba	Tony Ngalamu	U of J	Cowpea breeder
	Simon Baka	U of J	Out-grower trainer

Annex C: Fieldwork Schedule

Day	Date	Location	Activity	Team
Wed	29-Jan	Travel	SN leave Tucson	
Thu	30-Jan	Travel	SN arrive Kampala	
Fri	31-Jan	Kampala	**Visas – SN, KM**	
Preliminaries				
Sat	1-Feb	Juba	SN, KM arrive Juba	
Sun	2-Feb	Juba	Team mtg; brief mtg AGRA	All (team, AGRA)
Stakeholder Meetings in Juba				
Mon 3-Feb	9:30-10:30	Juba	Meeting w/Green Horizon	Tango/AGRA Team
	11:00-12:00	Juba	Meeting Minister/Undersecretaries MAFS	Tango/AGRA Team
	12:00-13:00	Juba	Seed Grow company Visit processing facility	Tango Team
	13:30-14:30	Juba	Meeting w/donor (Netherlands Embassy)	Tango Team
	15:00-17:00	Juba	Meeting w/University of Juba	Tango Team
Tue 4-Feb	9:00-11:00	Juba/Renk	Sudds Enterprises seed company	Tango Team
	11:00-13:00	Juba	Meeting Secondees (FGD); AGRA office	Tango Team
	14:00-15:00	Juba	Seed Trade Association and Seed Grow	Tango Team
Preparation for field Trip: (AGRA Car and Driver provided)				
Wed 5-Feb	Whole day	Juba-Magwi	Travel by road to Magwi	Tango Team
Thu 6-Feb	9:00 -11:30	Magwi	Meeting w/MASCO	Tango Team
	11:30 -13:30	Magwi	FGD w/out-growers (MASCO)	Tango Team
	14:30 -16:00	Magwi	Visit to Palataka	Tango Team
	16:00 – 17:00	Magwi	KII w/out-grower (MASCO)	
Fri 7-Feb	9:00-11:00	Torit	Meeting Afroganics Team (FGD); seed stores	Tango Team
	11:00 – 13:30	Torit	KII/FGD w/out-growers; seed store	Tango Team
	14:00 – 15:30	Torit	Visit to seed processing location	Tango Team
Sat 8-Feb	Whole day	Torit	Field visit (out-grower fields; FGD)	Tango Team
Sun 9-Feb	Whole day	Juba	Travel Torit to Juba	Tango Team
Stakeholder Meetings in Juba Continued				
Mon 10-Feb	9:00-12:00	Juba	Meeting Breeders in Juba; seed lab	Tango Team
	14:00-15:00	Juba	Meeting w/FAO	Tango Team
	15:00-17:00	Juba	Meeting w/SSD4SS	Tango Team
Tue 11-Feb	8:30 – 17:00	Juba	AGRO Dealers (KIIs)	Tango Team
Wed	12-Feb	Juba	Develop ppt for debrief	Tango Team
Thu	13-Feb	Juba	**Debrief/validation mtg** (team provides preliminary insights to AGRA to validate "findings")	
Fri	14-Feb	travel	Travel; return to US	

Annex D: Topical Outlines

SSD4SS Performance Evaluation
Key Informant Interviews

A. Government (e.g., MAFCRD, breeders, seed technicians,) and private seed sector stakeholders (e.g., agro-traders, out-growers, local market grain traders, seed companies)

Briefly describe your involvement with the SSD4SS program. Do you think it has achieved its objectives? Why or why not?

- Were the activities well suited to addressing the need?
- What constraints or limitations did the project face over the course of its implementation? How did the project address them? Why/why not do you think they were successfully addressed? If not, how can they be addressed?

For the changes you identified as resulting from the project, how sustainable do you think they are over the longer-term? Why/why not?

- What resources or actions might be required to sustain the changes? *[Probe re: technical support, inputs, marketing, political or social capital, relationships, etc.]*

How satisfied are you with changes resulting from the program?

- What do you think worked well? What did not? Why/why not? What could be improved?

How has your work or business changed as a result of the program (i.e., over the last seven years)?

- Are you better off as a result of the program? In what ways? [*Probe re: income]*
- How has the program impacted your household? Please describe.

How did the program affect smallholder farmers in South Sudan? (What would have happened without the activity?)

- In your opinion, who do you think benefitted most from the program?

How has the program communicated its exit strategy? *[Probe for their perception of what the exit strategy is]*

- Do you think the exit strategy will ensure long-term sustainability? Why/why not?
- What is the biggest risk to long-term sustainability of program results? How might the program have addressed this risk?

If you had any problem with program activity/staff, what did you do? Was the problem addressed to your satisfaction? Why/why not?

Are improved seeds that are adapted to local growing conditions more available now than before the program?

- Are smallholder farmers willingly adopting them? Why/why not?
- What might increase adoption by smallholder farmers?

In your opinion, did the project help build a robust seed distribution system for locally produced seeds of improved crop varieties? Why or why not?

- How has private sector and government capacity changed as a result of the project?

How have gender norms/cultural beliefs affected participation in the program?

- How have they affected program outcomes?
- Did the program provide any gender-based training?

B. Breeders, seed technicians (include A questions)

What mechanisms allow for farmer-to-breeder communication/input regarding what farmers like and do not like about individual improved varieties?

- How do farmers identify which varieties are best suited to their particular growing conditions?
- What constraints exist for breeders in addressing farmer preference?
- What constraints to addressing farmer preference exist elsewhere in the seed value chain?

How has the practice of farm saved seed changed as a result of the project?

- Are farmers replenishing seeds of improved varieties or purchasing new each time?

Have yields and/or income increased for smallholder farmers as a result of the project?

How have agro-dealers and other seed value chain actors benefitted?

C. AGRA Staff (include A and B questions)

What intended or unintended consequences occurred as a result of the program? *[Probe re: equal opportunities for women and men, improvement of social and economic infrastructure, poverty reduction, cross sectoral impact or other relevant cross-cutting issues]*

What changes to the way the program was implemented could make it more effective? More efficient? *[Probe re: cost of activities]*

- Were objectives achieved on time?

AGRA-Trained Students, out-growers, smallholder farmers

Have group briefly describe their involvement with the SSD4SS program. [*Probe re: how process worked, e.g., for students, selection of students, living arrangements in Nairobi, stipends/fees, placement back in SS (secondment), etc.]*

What is your understanding of the overall objective of the program? Do you think it achieved its objectives? Why/why not?

- What do you think worked well? What did not? Why/why not?
- What could be improved?

In your opinion, has the project helped build a robust seed distribution system for locally produced seeds of improved crop varieties? Why or why not?

- How has private sector and government capacity changed as a result of the project?

How sustainable do you think the program's achievements are over the long-term? Why/why not?

- What resources or actions might be required to sustain the changes? *[Probe re: technical support, inputs, marketing, political or social capital, relationships, etc.]*

How has your work or business changed as a result of the program (i.e., over the last seven years)?

- Are you better off as a result of the program? In what ways? [*Probe re: income]*
- How has the program impacted your household? Please describe.

If you had any problem with the program or staff, what did you do? Was the problem addressed to your satisfaction? Why/why not?

How did the program affect smallholder farmers in South Sudan? (What would have happened without the activity?)

- In your opinion, who do you think benefitted most from the program?
- Have yields and/or income increased for smallholder farmers as a result of the project?

Are improved seeds that are adapted to local growing conditions more available now than before the program?

- Are smallholder farmers willingly adopting them? Why/why not?
- What might increase adoption by smallholder farmers?

What mechanisms allow for farmer-to-breeder communication/input regarding what farmers like and do not like about individual improved varieties?

- How do farmers identify which varieties are best suited to their particular growing conditions?
- What constraints exist for breeders in addressing farmer preference?
- What constraints to addressing farmer preference exist elsewhere in the seed value chain?

How has the practice of farm saved seed changed as a result of the project?

- Are farmers replenishing seeds of improved varieties or purchasing new each time?

How have agro-dealers and other seed value chain actors benefitted?

What intended or unintended consequences occurred as a result of the program? *[Probe re: equal opportunities for women and men, improvement of social and economic infrastructure, poverty reduction, cross sectoral impact or other relevant cross-cutting issues]*

What changes to the way the program was implemented could make it more effective? More efficient?

How have gender norms/cultural beliefs affected participation in the program?

- How have they affected program outcomes?
- Did the program provide any gender-based training?

Annex E: Updated Results Provided to the Evaluation Team, March 16, 2020

Indicator	Results framework indicator or activity specific indicator?	Baseline 2013-2017	Targets Sept 2017 - Dec 2019	Result from reports received between Sept 2017 - Dec 2019	Source
# seed companies personnel trained (SEMIs)	Results framework indicator	44	24	26 (20 M; 6 F)	26 Participants have been trained on seed production and business skills at the SEMIS
# contract farmers trained; Number of seed company staff (UoJ)	Results framework indicator	43	260	1588 outgrowers trained	312 participants; 257 out growers; 154 (60%) male, 103 (40%) female. , 55 seed company personnel 44 (80%) males and 11 (20%) females.
# seed inspectors trained	Results framework indicator	0	60	60	40 seed inspectors have been mobilised. Ongoing logistical preparations.
# students trained MSc level	Results framework indicator	6 enrolled	6	6 (4 M; 2 F)	All the six students enrolled at UON graduated
# varieties released	Results framework indicator	22	10	32	3 groundnuts released in May 2018. 3 Bean varieties and four maize varieties were released in 2020
Volume (MT) of foundation seed produced	Results framework indicator	5	20	22.5	22.5 MT of foundation seed has been produced
# breeder exchange visits	Results framework indicator	0	2	2	3 breeders visited Namulonge NaCCRI and NaSARRI in

Indicator	Results framework indicator or activity specific indicator?	Baseline 2013-2017	Targets Sept 2017 - Dec 2019	Result from reports received between Sept 2017 - Dec 2019	Source
					Uganda in November 2018; 3 breeders visited Kenya 2019
Operational quality assurance laboratory	Results framework indicator	0	3	1	Lab established in MAFS. Seed lab equipment supplied
# seed companies operational after two years	Results framework indicator	8	10	12	12 seed companies are currently in operation.
Volume (MT) of improved seed sold in the project target area	Results framework indicator	926	1900	2500 MT	A total of 1,714 MT of seed was produced in 2018 and 2500 MT produced in 2019
# seed companies with FAO tenders	Results framework indicator	0	8	5	3 seed companies bid for the FAO procurement in 2018; 2 companies bid in 2019
Exchange visits for seed companies to Kenya and Uganda	Results framework indicator	0	2	1	Twelve (12) seed company practitioners from a total of 12 seed companies, visited peers in Uganda between 9th and 16th December 2018
# Agro-dealers established	Results framework indicator	0	50	74	Agmark has trained 74 agro-dealers to date
# out growers receiving	Results framework indicator	43	400	208 (101 F; 107 M)	208 farmers were trained and taken through practical

Indicator	Results framework indicator or activity specific indicator?	Baseline 2013-2017	Targets Sept 2017 - Dec 2019	Result from reports received between Sept 2017 - Dec 2019	Source
season-long infield training					exercises in seed production; 101 (48%) and 107 (52%)
# out growers accessing credit	Results framework indicator	0	200	400	200 accessing matching grants by MASCO; 100 Accessing Matching Grants by Green Horizon and 100 accessing Matching grants by Seed Grow
# demos established	Results framework indicator	6000	20000	10000	1500 farmer accessed learning through Seed Company demonstration plot and small packs mechanism in Yambio, Rumbek, Renk, Magwi, Juba and Torit
# farmers accessing video shows on use of improved seed; Number of customized training materials developed	Results framework indicator	0	100000	80000	80000 farmer accessed video messages through Seed Company dissemination mechanism in Yambio, Rumbek, Renk, Magwi, Juba and Torit
Establish a national seed trader association	Results framework indicator	0	1	1	A vibrant Seed Trade Association is self sustaining and regulating the sector in collaboration with MAFS
M& E training workshops	Activity specific indicator	1	2	2	2 M&E trainings were conducted in March 2018, and

Indicator	Results framework indicator or activity specific indicator?	Baseline 2013-2017	Targets Sept 2017 - Dec 2019	Result from reports received between Sept 2017 - Dec 2019	Source
					in November 2018 all seed companies in attendance
Seed stakeholders meeting	Results framework indicator	1	2	2	One stakeholder meeting took place in March 2018 and December 2019
End of project evaluation	Results framework indicator	0	1	1	Being concluded
Seed company sustainability assessment	Results framework indicator	0	1	1	Done