Progress report on a TC module

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

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List of abbreviations

AGT	Agro Genetic Technologies
ASSP	Agriculture Sector Strategic Plan
AVSI-SKY	Association of Volunteers in International Service-Skilling Youth for Employment in Agriculture
BOCY	Better Outcomes for Orphans and Vulnerable Children and Youth in Eastern and Northern Uganda project
BugiZARDI	Buginyanya Zonal Agricultural Research and Development Institute
CD	Community Dialogues
CIP	International Potato Center
CUSP	Civil Society in Uganda Support Program
DFCU	Development Finance Company of Uganda
DLS	Diffused Light Store
EC	Economic Commission
EDF	European Development Fund
EGS	Early Generation Seed
EU	European Union
FFBS	Farmer Field and Business School
GAPs	Good Agricultural Practices
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
Ha	Hectare
IDDS	Individual Dietary Diversity Score
IFDC	International Fertilizer Development Center
IITA	International Institute of Tropical Agriculture
ISSD	Integrated Seed Sector Development
KASPPA	Kapchorwa Seed Potato Producers Association
KWESPPA	Kween Seed Potato Producers Association
MAAIF	Ministry of Agriculture, Animal Industry, and Fisheries
MIFA	Mengya Integrated Farmers Association
mt	metric tons
PCN	Potato Cyst Nematode
PNSP	Promotion of Nutrition-Sensitive Potato Value Chains in East Africa
QDS	Quality Declared Seed
REACH	Resilient Efficient Agribusiness Chains

RHITES-E	Regional Health Integration to Enhance Services-East
UPP	Uganda Potato Platform
USAID	United States Agency for International Development
VSLA	Village Savings and Loan Association
WASWAPA	Wanale Seed and Ware Potato Association

1. Brief description

Title of TC module	**Promotion of Nutrition-Sensitive Potato Value Chains (PNSP) Uganda**
Sector	Agriculture, Nutrition
Program	**Promotion of Nutrition-Sensitive Potato Value Chains (PNSP) in East Africa**
Module objective (Outcome)	Improved productivity, sector coordination, and dietary diversity.
Reporting period:	10/2018 to 09/2019
Changes in the project intervention areas of the module during the reporting period	☐ significant ☐ medium ☒ minor
Changes in the donor landscape during the reporting period	☐ significant ☐ medium ☒ minor
	Several projects have commenced in 2019, including the GIZ Civil Society in Uganda Support Programme (CUSP) project (institutional capacity building), International Potato Center (CIP) (promotion of apical cutting technology), and Self-Help Africa (support to seed multipliers).
Module objective and achievement of objectives	The project has three objectives: **Objective 1**: Increase productivity of 8,000 small-scale potato producers. **Objective 2**: Strengthen coordination in the potato value chain. **Objective 3**: Improve the dietary diversity of vulnerable groups in Eastern Uganda. Objective 1 will be achieved in terms of the number of farmers trained, given that over 50% of the targeted farmers are now registered and 3,307 (41%) are trained. The adoption of good agricultural practices (GAPs) has improved significantly, although productivity gains have only improved marginally since 2018. The main bottleneck is still access to quality seed, and when coupled with soil fertility issues, this provides significant yield variations in the project intervention areas. The mean average productivity has improved to 12.5 mt/ha from 10.4 mt/ha in 2018; however,

	significant geographical variations have emerged. Productivity is much higher in Kween (15.08 mt/ha) than in Kapchorwa (11.5 mt/ha) and Mbale (11 mt/ha). Although the project's baseline survey was conducted in Kween, the addition of Mbale and Kapchorwa presents a more realistic picture for the Elgon sub-region as a whole. Figures from 2018 also show similar geographical variations among Kween (11.1 mt/ha), Kapchorwa (10.4 mt/ha), and Mbale (9.8 mt/ha). The productivity leap in Kween may be the result of the adoption of GAPs, which have a greater impact where soil conditions are more suitable. Kween has soils that are friable in nature and conducive to tuber enlargement. Objectives 2 and 3 are on track at this stage.
Risk assessment	**Declining soil fertility:** Farmers are increasing their use of fertilizer but are not currently using the recommended NPK fertilizer. This, coupled with the lack of use of organic matter and overcultivation, may remove key nutrients from the soil and lead to a loss in soil fertility. These losses are particularly pronounced in the Mbale and Kapchorwa districts. **Disease pressure:** Currently, only 8% of farmers practice crop rotation for a minimum of two seasons, and none of the farmers practice fallowing. Ideally, land would be left fallow for three seasons to avoid the buildup of disease pressure in the soil or a non-Solanum crop would be planted for the same period. Again, this could be one of the causes of the high incidence of bacterial wilt and other soil-borne pathogens that is stagnating productivity. **Access to certified seed:** The randomized survey sample revealed that access to certified seed was at zero. Without access to clean seed, farmers may not be able to improve their productivity to the levels required, as the seed they use/recycle is highly degenerated.
Proposals for module adjustment	None at this stage. Further discussion with GIZ on the productivity figure and the strategy for achieving it must take place in early 2020.

2. Status of the module within the donor landscape

2.1 Status of the module within the strategic reference framework (country, European Union, and national strategies for implementing the 2030 agenda)

The project is aligned with the National Development Plan, the Development Strategy and Investment Plan, and the follow-on Agriculture Sector Strategic Plan (ASSP) 2015/16-2019/20 on the basis that potato offers significant economic opportunities to farmers. The project complements the ASSP, especially in the areas of seed sector development and marketing of ware potato. Potato is now recognized as one of the 12 priority crops of the Ugandan government. The development of a new ASSP began in 2019 and will be finalized in 2020.

At the European Union (EU)/Economic Commission (EC) level, the 14th European Development Fund (EDF; 2014-2020) recognizes the fundamental importance of agriculture to the Ugandan economy and in reducing poverty in the country as a whole. Though the EDF's primary areas of focus are northern Uganda and Karamoja, it also acknowledges the impact of agriculture on a national level. The project is also aligned with the EC perspective that nutrition should be tackled from an agricultural and food security standpoint.

2.2 Other development measures in the specific area of intervention of the module

Donor	Area of intervention / project objective	Synergies achieved at the results levels (outcome and impact)
USAID/ RHITES-E project	Strengthen integrated health service delivery in: nutrition, maternal/child health, HIV, etc.	Exchanged information on the possible areas of collaboration, particularly on integration of nutrition and health services into the Farmer Field Business School (FFBS). Improved the nutrition status of women and children through an increase in nutrition knowledge, dietary diversity, and adoption of healthy behaviors.
AVSI-SKY project	Build skills in agriculture among youth.	Provided linkages to locally available experts in horticulture that can support the FFBS further. Increased production, access, and consumption of diverse foods through improved production skills and income.

Donor	Area of intervention / project objective	Synergies achieved at the results levels (outcome and impact)
USAID/BOCY	Empower households with vulnerable children and youth in several aspects, such as nutrition, education, and health.	Improved nutrition status of vulnerable children and youth. Shared experience on the integration of nutrition into the farmer field days and establishment of kitchen gardens in vulnerable households.
REACH–Uganda	Rice and potato market systems development.	Exchange of experiences, use of a network of business experts, and co-funding of training where applicable.
ISSD Plus	Improve access to high-quality seed services to smallholder producers.	Involved in training of seed potato multipliers. Now profiling four potato associations, which comprise 33 individual seed multipliers for registration as quality declared seed (QDS) producers.
CIP	Collaborative research to strengthen the capacity of seed multipliers to produce quality seed.	Built capacity of 33 seed multipliers to produce mini-tubers from rooted apical cuttings.
CUSP	Strengthen governance and build capacity in leadership within established potato farmer associations and other related organizations.	Provided a grant for leadership and governance capacity building for the Elgon Regional Potato Platform. The Uganda Potato Platform (UPP) is in discussions with CUSP for possible support and collaboration.
Private tissue culture laboratories AGT	Production of in vitro seedlings and rooted apical cuttings; support to the establishment of screenhouses.	Supplied rooted apical cuttings and mini-tubers to the seed multipliers under the farmer group associations.
IITA	Research on pests and diseases for improved production.	Disease surveillance report shows existence of potato cyst nematode (PCN). Set up 13 PCN pilot control sites in the Elgon region.
Self-Help	Collaborative research to strengthen the capacity of seed	Building capacity of 22 farmers to produce mini-tubers from rooted apical cuttings in Kapchorwa

Donor	Area of intervention / project objective	Synergies achieved at the results levels (outcome and impact)
Africa	multipliers to produce quality seed.	and Mbale districts.
EnDEV	Promoting fuel-efficient cooking stoves.	Ongoing discussion including integration of fuel-efficient cooking stoves into the cookingdemonstrations.

3. Developments in the area of intervention

3.1 Analysis of problems and potentials (related to the module)

Problem Analysis:

Seed: There has been no significant change in the central problems of the lack of access to good quality seed potato and poor seed service delivery in the country. In the annual PNSP household survey, no farmer reported using either certified or quality declared seed (QDS). This is unsurprising given that the early generation seed (EGS) development process (tissue culture and mini-tuber production) in the project area is still in its infancy, and the efforts of seed multipliers will take time to mature (at least two seasons). As such, the project has now trained 33 individual seed multipliers to produce QDS. These individual seed producers will be formally registered under their respective seed potato production associations: Wanale Seed and Ware Potato Association (WASWAPA), Kween Seed Potato Producers Association (KWESPPA), Mengya Integrated Farmers Association (MIFA), and Kapchorwa Seed Potato Producers Association (KASPPA). The producers' details have been forwarded to the Integrated Seed Sector Development (ISSD) project for initial profiling and submission to the Seed Inspection and Certification Department for issuance of QDS certificates. In addition, Local Subsidy Agreements have now been signed with three of the associations, which will stimulate the production of EGS through the establishment of screenhouse units.

Markets: Access to organized market structures remains a key constraint, and farmers are forced to sell their harvest immediately at low farm-gate prices to take care of immediate needs. The project has conducted market development meetings and workshops with processors (Psalms Food Industries Limited) and traders (Mama Irish), which have the potential to be off-takers for the FFBSs. The project's efforts to reestablish the regional platform will also potentially strengthen market policies in the area of operation.

Storage: Initial findings from research conducted by CIP have revealed that access to quality storage can provide some price improvements for farmers through delayed selling of ware potato. At present, farmers are not benefiting from this opportunity because current ware storage designs do not prevent the deterioration of potatoes, as they tend to let in pests/vermin and excess heat. The project has not yet intervened in improving access to

storage; however, it can now make more informed decisions on the best technique and approach to use.

Roads: Most roads leading to and from potato production areas are low quality and become impassable in the rainy season. Vehicles transporting potatoes often get stuck, and given that the packaging materials are poor, the perishable potatoes are often damaged, which affects their marketability. However, the International Fertilizer Development Center (IFDC) Resilient Efficient Agribusiness Chains (REACH) project is in the process of rehabilitating the Kween-Benet (26 kilometers) feeder road; when completed in early 2020, this will enable year-round transportation of potatoes (both seed and ware) from the major potato-producing area in Kween District.

Gender and decision making: In areas where gender norms are prevalent, such as Kween, women's participation in decision making at the household level may be limited. This could derail the empowerment of women, a key element in improving family nutrition. This is being addressed through the engagement of nutrition champions to promote changes in these behavioral norms, although this is known to be a long-term change process.

Declining soil fertility: As identified under the risk section, declining soil fertility may be the result of the use of incorrect fertilizer, overcultivation, and limited use of organic matter. Improvement in these practices needs to be reinforced through the training curriculum. In addition, more direct collaboration will be required with regional agro-dealers supplying recommended fertilizers.

Disease pressure: The absence of fallowing and the practice of crop rotation for only one season could be the cause of bacterial wilt. This can be addressed through reinforcement of the message regarding the benefits of proper crop rotation during the training program. In addition, better water control measures to avoid contamination from field to field can be promoted. In the longer-term, better access to bacterial wilt-tolerant varieties, such as Rwangume, and promotion of *Crotalaria* (a legume that controls wilt and improves soil fertility) could be explored.

4. Achievement of objectives and changes to risks

4.1 Assessments of objectives, target groups, results hypotheses, and indicators

Module Objective: To improve productivity, sector coordination, and dietary diversity

Indicators	Values	Is target value achievable within the term?	State of implementation, issues, milestones, etc.
Module Objective Indicator 1 The average productivity of 8,000 small-scale farmers (30% women) has increased by 40%.	*Baseline value*: 12.5 mt/ha *Target value*: *k: 8,000* *p:* 17.5 mt/ha *Actual value*: *k:* 3,307 *p:* 12.5 mt/ha	Yes	The reported mean yield is an improvement from 2018 and is now equal to the baseline figure. This could be attributable to the increased adoption of GAPs in 2019, especially by the farmers that the project trained in 2017.
Module Objective Indicator 2 Out of the defined measures/activities (a), the number (u) of the recommendations/strategies that have been adopted within the public-private dialogue platform for national sector coordination are being implemented.	*Baseline value*: 0 *Target value*: a: 15 u: At least 7 *Actual value*: a: 0 u: 0	Yes	There has been no change in this area. The project has not yet supported the national-level platform given that the platform has been supported by REACH. From 2020 onward, the project will support specific initiatives that are identified by UPP from the generation of the strategic plan. Some logistical support could also be provided to the platform to support general coordination activities, such as the quarterly steering committee meeting.

Indicators	Values	Is target value achievable within the term?	State of implementation, issues, milestones, etc.
Module Objective Indicator 3 The diversity (d) of the food of 7,000 people (p), of whom 40% are women aged 15-49, has improved, measured through the *Individual Dietary Diversity Score* (IDDS).	*Baseline value*: 3.1 *Target value*: d: 3.6 p: 7,000 *Actual value*: d: 3.8 p: 1,638	Yes	An assessment was conducted among the FFBS participants only, as community dialogue has only been done on a a limited basis so far.
Output A Indicator **Indicator A.1**: 8,000 potato smallholders (30% are women) apply 70% (u) of 25 "Good Agricultural Practices for sustainable potato production" (p), as defined by the project (crop rotation, adaptation to climate change, use of quality seed potatoes, etc.), in two successive planting times (z = 2).	*Baseline value:* • GAPs applied: 11 • Application of GAPs: 42% • Number of target group reached: 0 • Women reached (in %) out of the target group reached: 0% *Target value:* • GAPs applied: 18 of 25 • Application of GAPs: 70% • Number of target group reached: 8,000 • Women reached (in %) out of the target group reached: 30% (2,400) *Actual value:* • GAPs applied: 18 of 25 • Application of GAPs: 70% • Number of target group reached so far: 3,307 farmers • Women reached (in %) out of the target group reached: 67% (2,237)	Yes	Good level of adoption of GAPs at 70%, or 18 of 25. Training is on track: 1,920 FFBS members (489 male, 1,431 female) were trained on GAPs during the reporting period. Cumulatively, 3,307 FFBS members were trained on GAPs, which is 41% of the target.

Indicators	Values	Is target value achievable within the term?	State of implementation, issues, milestones, etc.
Output B Indicator **Indicator B.1:** At least 10% of the 8,000 potato farmers (at least 30% female farmers) in the project region have been trained to use seed potatoes that comply with national quality criteria.	*Baseline value:* • % of farmers reached who use seed potatoes complying with national quality standards (in %): 0% • Share of women reached (in %): 0% *Target value:* • % of farmers reached who use seed potatoes complying with national quality standards (in %): 10% (800 farmers) • Share of women reached (in %): 30% out of the 800 (240) *Actual value:* • % of farmers that use seed potatoes complying with national quality standards out of the farmers reached (in %): 0%	Yes	There has been no improvement in this area in 2019. Developments are taking place in EGS and seed multiplication, which will generate improved results in 2020 and 2021. This will be done through completion of three screenhouses currently under construction and establishment of two additional ones. In addition, better linkages must be established between seed producer organizations and project farmers for supply of clean seed.
Indicator B.2: 70% of the 800 potato farmers trained (at least 30% female farmers) indicate that the marketing opportunities for their products have been improved because of the formation of farmer organizations.	*Baseline value:* • Number of trained farmers: 0 • Share of female farmers trained (in %): 0% *Target value:* • Number of trained farmers: 800 • Share of female farmers trained (in %): 30% (240 women)	Yes	The marketing module training was an addition to the project. Training on marketing just started in October 2019.

Indicators	Values	Is target value achievable within the term?	State of implementation, issues, milestones, etc.
	Actual value: • Number of trained farmers: 0 • Share of female farmers trained (in %): 0%		
Output D Indicator **Indicator D.1**: Stakeholders along the complete potato value chain, including 30% women, who have adopted a total of 7 recommendations/ strategies (e) in the frame of the public-private dialogue platform for national sector coordination.	*Baseline value:* • Number of adopted recommendations/strategies: 0 • Number of participated stakeholders (absolute): 0 • Participation of women (in %): 0% *Target value:* • Number of adopted recommendations/strategies: 7 • Number of participated stakeholders (absolute): 22 • Participation of women (in %): 30% *Actual value:* • Number of adopted recommendations/strategies: 0 • Number of participated stakeholders (absolute): 22 • Participation of women (in %): 18%	Yes	Roadmap developed for the regional platform only. No recommendations adopted yet at the national level that can be attributed to project. This will be addressed in 2020 through support to specific initiatives identified by UPP from the generation of the strategic plan. Some logistical support could also be provided to the platform to support general coordination activities, such as the quarterly steering committee meeting.
Indicator D.2: 70% of the stakeholders (i), 30% of whom are women, evaluate the national exchange of	*Baseline value:* • Number of stakeholders who participated at platform meetings: 0	Yes	At present, 100% of stakeholders rate the platform as good or very good. This will be

Indicators	Values	Is target value achievable within the term?	State of implementation, issues, milestones, etc.
learning as good or very good.	• Women that participated (in %): 0% • Stakeholders who evaluated the national exchange as good or very good (in %): 0% *Target value:* • Number of stakeholders who participated at platform meetings: 22 • Women that participated (in %): 30% • Stakeholders who evaluated the national exchange as good or very good (in %): 70-100% *Actual value:* • Number of stakeholders who participated at platform meetings: 22 • Women that participated (in %): 18% • Stakeholders who evaluated the national exchange as good or very good (in %): 100%		evaluated on a more frequent basis going forward, given that the activities of the platform will intensify.
Output C Indicator **Indicator C.1**: Knowledge concerning family nutrition of 13,000 people (p), 30% of whom are women aged 15-49, who were reached through all information formats of the project has increased by one step on a	*Baseline value:* • 5-tier scale (1-low to 5-high): 2 • Number of target group reached: 0 • Women aged 15-49 reached (in %): 0%	Yes	Knowledge level is very high. One main information format (FFBS only) has been used so far.

Indicators	Values	Is target value achievable within the term?	State of implementation, issues, milestones, etc.
five-tier scale (s).	*Target value:* • 5-tier scale (1-low to 5-high): 3 • Number of target group reached: 13,000 • Women aged 15-49 years reached (in %): 30% (3,900 women aged 15-49 years) *Actual value:* • Five-tier scale: Knowledge level is at 4.4 out of 5 • Number of target group reached: 3,142 people (755 male, 2,387 female) • Women aged 15-49 years reached: 917 women (56%)		
Indicator C.2: 80% of the people who have participated in "Community Dialogues" (CD) (at least 40% women aged 15-49) indicate that they make use of their acquired knowledge.	*Baseline value:* • People that participated in CD/FFBS module: 0 • Share of people that participated in CD/FFBS module and indicate an application of the acquired knowledge (in %): 0% • Share of people that participated in CD/FFBS module and indicate an application of the acquired knowledge (in %): 0% *Target value:* • People that participated in CD / FFBS module: 7,000 • Share of people that		Survey conducted to assess the extent of the application of acquired knowledge.

Indicators	Values	Is target value achievable within the term?	State of implementation, issues, milestones, etc.
	participated in CD/FFBS module and indicate an application of the acquired knowledge (in %): 80% (5,600) • Share of females that participated in CD/FFBS module and indicate an application of the acquired knowledge (in %): 40% of the 80% (2,240 women aged 15-49 years) *Actual value:* • People that participated in CD/FFBS module:) reached within the FFBS: 1,638 people (295 males and 1,343 females reached) • Share of people that participated in CD/FFBS module and indicate an application of the acquired knowledge (in %): 77% applied acquired knowledge (1,261 people) • Share of females that participated in CD/FFBS module and indicate an application of the acquired knowledge (in %): Of 1,343 females reached, 76% (1,020) applied acquired knowledge		

Module Objective Indicator 1: Increase productivity of small-scale potato producers.

Output A: Small-scale potato producers apply Good Agricultural Practices for sustainable potato production.

- **Indicator A.1**: 8,000 potato smallholders (30% women) apply 70% (u) of 25 GAPs for sustainable potato production (p), as defined by the project (crop rotation, adaptation to climate change, use of quality seed potatoes, etc.) in two successive planting times.

Under **Activities A.2 and A.3**, the 30 facilitators trained have now established 180 learning sites and registered a total of 4,227 farmers, 3,307 of whom have been trained in GAPs. As a result of this training and technical backstopping, farmers are now practicing 18 out of 25 (or 70%) GAPs, which is a significant improvement over two agricultural seasons. Increased efforts now need to be made to reinforce some of the key GAPs that are not being practiced, particularly the use of clean seed, correct fertilizer, and crop rotation.

In addition, 13 PCN pilot control sites were established in season 2019A under the management of 13 farmers in collaboration with the International Institute of Tropical Agriculture (IITA) and the Ministry of Agriculture, Animal Industry, and Fisheries (MAAIF). IITA completed the analysis and confirmed the presence of PCN in the Sebei sub-region. This could be contributing to the lower than expected yields; therefore, it is important that the efficacy of the “wrap and plant” technology (a PCN prevention technique) is further established going forward.

Under **Activity A.6** (“Promotion of credit systems for potato input package purchase”), the project facilitated a meeting between farmers and the Development Finance Company of Uganda (DFCU) Bank, Solar Now Uganda, and Bulganya input dealers. Three business linkages were created, including one between seed producers and DFCU Bank. As a result, three seed producer associations have registered and applied as beneficiaries for the Agricultural Credit Facility with DFCU.

Output B: Business relations between potato farmers and the upstream/downstream sectors have improved.

- **Indicator B.1:** At least 10% of the 8,000 potato farmers (at least 30% female) in the project region that have been trained use seed potatoes that comply with national quality criteria.
- **Indicator B.2:** At least 50% of the 8,000 potato farmers (at least 30% female) that have been trained indicate that marketing opportunities for their products have been improved because of the formation of farmer organizations.

In 2019, there was no improvement in access to or use of clean potato seed by project farmers. This can be explained by the limited availably of QDS or certified seed in Uganda (where there is an annual seed gap of 17,000 mt), coupled with the time frame for longer term investments in the localized seed system (detailed below) that have started in the project area and will take time to mature.

The project has mainly focused on the development of two key aspects of the seed system: the production of mini-tubers through the planned establishment of screenhouses with seed associations (**Activity B.2**) and building the capacity of a local network of seed producers that can multiply seed from basic to pre-basic to QDS (**Activity B.3**).

Under **Activity B.2**, agreements have been signed with three seed producer organizations for the establishment of screenhouse units for the localized production of mini-tubers. After close consultation with GIZ on the procedures for activating the Local Subsidy Agreement, due diligence visits were made to four seed producer associations to determine their capacity to manage the subsidy. The three associations with adequate capacity were MIFA, WASWAPA, and KASPPA. Each screenhouse will be able to produce enough mini-tubers that, through further multiplication (three stages), can produce approximately 130 mt of clean seed per annum (after an initial 18-month establishment phase). If adopted by the screenhouse owners, the rooted apical cuttings technology promoted by CIP will enable higher mini-tuber productivity.

Under **Activity B.3** ("Support the professionalization of seed potato producers/associations through seed technology and seed business training"), the project has established a network of 33 local seed producers that will multiply the EGS from the screenhouses. During the reporting period, an additional 17 seed producers were trained in the agronomy of seed production, and the 16 trained in 2018 were further trained on business development and seed marketing (**Activity B.5**).

In addition, the project collaborated with Agro Genetic Technologies (AGT) on development and knowledge transfer of seed multiplication. Sixteen seed producers visited AGT to learn about the process of early generation seed development and, in turn, purchased mini-tubers and pre-basic seed from AGT to practice multiplication on their own farms. One innovation that emerged from the exposure visit was the construction of a screenhouse from local materials by one seed producer (picture below). The individual has now procured 120 in vitro seedlings from AGT laboratories and planted them to produce rooted apical cuttings and then mini-tubers. The effectiveness of this local screenhouse will be assessed over time in terms of its conduciveness for mini-tuber production.

Seed production can also be improved through better access to water. Six seed multipliers procured portable irrigation equipment from Solar Now at a subsidized rate, and four of these are currently in operation.

Local screenhouse, an innovation established at Benet sub-county, Kween District

Under **Activity B.4** ("Support seed producers' storage infrastructure improvement (DLS)": The three Local Subsidy Agreements mentioned above will also cover the establishment of three diffused light stores (DLSs) capable of storing 150 mt of seed each. The project intends to establish additional DLSs in the area but has been constrained by the procurement guidelines of GIZ, which does not allow the purchase of materials under the training budget line. Going forward, Local Subsidy Agreements may need to be established with individual seed multipliers for further provision of DLSs given the scarcity of additional associations in the area that have the capacity to handle this component.

The production of good quality seed also goes hand in hand with a proper quality assurance system. Under **Activity B.6** ("Improve the local availability of independent seed quality assurance services") the project, in collaboration with Seed Inspection Services of MAAIF and Buginyanya Zonal Agricultural Research and Development Institute (BugiZARDI), trained 16 seed multipliers on QDS requirements and regulations and the field inspection process. The 16 seed producers are now linked to Seed Inspection Services. The next step will be to start their registration process as certified seed producers.

Supporting the marketing systems of farmer business schools was added as an activity in 2019, under **Activity B.7**. A marketing module was included in the training curriculum, and the rollout started in October 2019. In addition, a business development meeting was held between producers and buyers with the aim to stimulate more organized marketing systems. Linkages were established with two off-takers (Psalms Food Industries Limited and Mama Irish), with 20 mt of potato already supplied by KASPPA to Psalms Food Industries Limited at

above the market price. This relationship now needs to be strengthened through regular and consistent supply, which will require year-round production.

Under **Activity B.1**: The project's collaboration with BugiZARDI has so far been limited. After some discussion, it was thought that the project should not support the establishment of a laboratory facility at the station due to cost and sustainability issues. The longer-term approach would be to support established private tissue culture labs, such as Agromax and AGT.

Module Objective Indicator 2: Strengthening coordination of the potato value chain.

Output D: Public-private potato sector dialogue is strengthened at national and regional levels.

- **Indicator D.1:** The stakeholders along the entire potato value chain (including 30% women) have adopted seven common recommendations/strategies in the public-private dialogue platform for national sector coordination.
- **Indicator D.2:** 70% of the stakeholders (including 30% women) evaluate the national exchange of learning as good or very good.

Under **Activity D.2**, the national potato platform has been officially registered as the Uganda Potato Platform (UPP). IFDC's REACH-Uganda project has continued to support the activities of the UPP; therefore, the need for resource contribution from the PNSP project in this process has been limited. It is anticipated that this will change in 2020 with reduced REACH support and some specific recommendations/strategies emerging from the platform that can be supported by the PNSP project.

Under **Activity D3**, specific support to the recommendations/strategies developed by the platform have so far been limited. Now that the platform is more established, it is anticipated that more relevant strategies will be generated by the platform and facilitated by the project.

One staff member participated in a global potato working group in Nairobi to develop a Uganda potato roadmap on three key issues. The completed roadmap was submitted to GIZ as part of the potato improvement plan under the Global Potato Value Chain Working Group.

At the project implementation level under **Activity D.4**, the project has continued to support the transformation of district-level potato business clusters into a legally registered regional potato platform. A total of six Elgon Regional Potato Platform coordination meetings have been held. So far, 75% of the activities under the Year 1 roadmap have been completed by the platform stakeholders.

Under **Activity D.5**, an innovation by a platform member was the establishment of a local screenhouse after an exposure visit to AGT. In addition, the platform conducted a data collection exercise on potato production in the three project districts, which has been adopted by the local governments.

Module Objective Indicator 3: Improve the dietary diversity of vulnerable groups in Eastern Uganda.

Output C: The population in the project area (especially women aged 15-49) applies their newly obtained knowledge to family nutrition.

- **Indicator C.1**: The knowledge concerning family nutrition of 13,000 people (p), 30% of whom are women aged 15-49, reached through all information formats of the project (mViazi, dialogue and coordination platforms, etc.) has increased by one step on a five-tier scale (s).
- **Indicator C.2**: 80% of the people who have participated in CDs (at least 40% women aged 15-49) indicate that they make use of their acquired knowledge.

Activity C.1: Campaign design, review, and adaptation of training and promotion materials in collaboration with relevant district nutrition coordination committees.

Under this activity, two dialogue-promotion materials were developed: a large dialogue flipchart and small dialogue guide cards. These are intended to complement the nutrition training manual that is to be used mainly as a reference. A total of 135 dialogue-triggering materials were disseminated among the FFBS facilitators and district officials across the three districts of Mbale, Kapchorwa, and Kween. The materials included 35 nutrition training manuals, 30 large dialogue guide flipcharts, and 90 smaller dialogue guide cards.

Under **Activity C.2** ("Training of nutrition diversity trainers"), 30 FFBS facilitators received three trainings and were mentored on key areas, including kitchen garden management during dry spells, peer-to-peer support in kitchen garden establishment, cooking demonstrations, community outreach, and group cohesion.

Also, 61 people were trained as cooking demonstration trainers: 24 FFBS facilitators (19 male, 5 female) and 37 health workers (14 male, 23 female) in the respective sub-counties in which the project operates.

Under **Activity C.3** ("Integration of community and household nutrition dialogue across gender, and home gardening in potato FFBS implementation"), a total of 1,638 farmers (295 male, 1,343 female) were reached. Nutrition dialogues were conducted across all 90 FFBSs, covering the six modules: basic principles of nutrition, infant and young child feeding, dietary diversity, agriculture for nutrition, gender and nutrition, and behavior change. The increase in knowledge at 4.4, beyond the target of 3, can be attributed to this, but it should be noted that the assessment was conducted among the FFBS participants only; therefore, it may not give a complete picture of the community.

In addition, a total of 90 kitchen garden demonstration sites (30 in 2018 season B and 60 in 2019 season A) were established across the three districts of Mbale, Kapchorwa, and Kween. Most of the FFBS beneficiaries have now been able to adopt the kitchen garden technique. As per the annual PNSP survey, coverage of the individual kitchen gardens was at 76%, with 71.8% of the individual households growing at least three types of vegetables out of the six promoted.

The quick adoption can be linked to the peer-to-peer support approach in the transfer of kitchen gardening skills, low implementation cost, and intense dialogue on the benefits of the kitchen gardens. Furthermore, the project conducted follow-up visits to the respective demonstration sites to draw lessons for corrective action from the first cohort. One key lesson was that location of the kitchen gardens is important for sustainability during dry spells. Kitchen gardens closer to the home are easier to maintain using residual water in the dry seasons. This was implemented in the subsequent season (2019A) and could be linked to the high adoption and sustainability up to the time of the survey. Finallly, the project provides start-up seed for the demonstration sites and encourages the sharing of seedlings among the FFBS participants.

Cooking demonstrations (31) were also rolled out within the FFBS this year. A total of 972 farmers (241 males, 731 female) were reached. According to the follow-up exercises, a few of the improved recipes have been adopted. The increase in the Individual Dietary Diversity Score (IDDS) by 0.7, as indicated in the annual survey, could be linked to this.

Another strategy for improving dietary diversity was the grassroots food diversity campaigns. Under **Activity A5**, the grassroots campaigns kicked off in the form of 15 mini-community outreaches during the reporting period. The exercise was intended to build capacity of the FFBS facilitators (trainers) and lead farmers to conduct the same. Showcasing kitchen gardening techniques, cooking demonstrations, testimony sharing, and nutrition education were some of the key activities conducted in the outreaches. The exercise was conducted in close collaboration with the district nutrition focal persons and sub-county health facilities who conducted nutrition assessment of children and pregnant women. A total of 448 community members (97 male, 351 female) were reached during the exercise.

This will be followed by recruitment of 30 nutrition champions among religious and cultural leaders at the sub-county level to increase the reach of messages and foster adoption of pro-nutrition norms in the communities.

4.2 Ensuring the sustainable effectiveness of the measures

Agreements with the three seed producer associations have been signed, which represents the start of local seed production by the private sector in the Elgon sub-region. The hope is that other local producer associations will spring up in the future once this business model is demonstrated in the area. The three associations that are recipients of the Local Subsidy Agreements have also committed their own resources to the interventions, which is intended to increase ownership of the process.

Some business linkages have been established with off-takers. These need to be strengthened so that they become regular markets for farmer groups where they can get price premiums for better quality produce. The project, in turn, needs to provide technical backstopping to these groups to ensure quality standards are met.

Some multiplier effects of the training on storage and post-harvest handling have emerged in Kween District. One seed multiplier, who was part of the 33 trained by the project, has established his own DLS. Similarly, Kween's District Local Government (DLG) was also part

of the training and plans to establish five DLSs on a cost-share basis with farmers. This indicates that farmers and DLGs are ready to adopt this improved storage technique for seed based on the knowledge provided from the training and study visits.

4.3 Module term and time schedule

Outputs	Main activities for the coming year	Timeframe/milestones for the coming year
Output 1	Train an additional 140 FFBSs on the full Agricultural curriculum. Promote and establish 10 ware potato storage facilities. Support production of EGS (3 existing and 2 new seed producer associations equipped with screenhouses). Promote and establish of 10 DLSs.	Jan-Dec 2020 Feb-April 2020 Jan-Dec 2020 June-Sept 2020
Output 2	Facilitate regional- and national-level strategies/activities and innovations (3 strategies/activities of UPP).	Continuous
Output 3	Train 140 FFBS on nutrition curriculum. Roll out the food diversity campaign using existing community structures and mass media. Establish 140 additional nutrition demonstration sites.	Jan-Dec 2020 Jan-Dec 2020 May 2020 and Nov 2020

4.4 Sustainability and risks in implementation

Risk	Rating*	Degree to which it can be	Risk management measure
Reducing soil fertility	3	3	Promotion of integrated soil fertility management, including recommended inorganic fertilizer.
Disease pressure	3	2	Continued promotion of crop rotation for two or more seasons. More emphasis on fallowing where possible.
Availability of certified seed	3	2	The seed gap is very large. Current interventions will reach maturity in 2021. Replication and scale up of the screenhouse model will be required, which requires more seed producer associations with the required capacity.

* Scores: 1 = low, 2 = medium, 3 = high, 4 = very high.

5. Overarching recommendations and lessons learned

5.1 Recommendations and reminders

During 2019, the project continued to use a training curriculum that integrates Agriculture and Nutrition. After season 2019A, it was realized that the number of contact sessions per facilitator (around 22) was too many per season for both facilitators and farmers to handle. After a review, the number was reduced to 16, with 10 on agronomy, four on nutrition, and two on cross-cutting issues (gender, behavior change communication). This is considered an optimal training package for the remainder of the project.

From the annual project survey, it is apparent that farmers are not using the correct fertilizer (NPK) and instead use a combination of diammonium phosphate (DAP) and calcium ammonium nitrate (CAN). This combination has a negative impact on soils in terms of increasing their acidity. It also lacks potassium, which is one of the three main macronutrients for soil health. Improving access to a genuine supplier of NPK will be critical for improving soil fertility, and therefore productivity, going forward. As such, the project will need to explore partnerships with one or more genuine agro-dealers based in the region and capable of extending their networks into the potato-growing areas (particularly Kween and Kapchorwa).

The adoption rate of kitchen gardens has been very high and could have contributed to the improvement in dietary diversity. Some of the produce from kitchen gardens is also sold and used to fund Village Savings and Loan Associations (VSLAs) for farmer groups. VSLAs can promote cohesion within groups and generate interest particularly among women. Going forward, it could be further supported by the project through formalization of the VSLA structure.

Annexes

A1 Map of Mt. Elgon sub-region and project districts of Mbale, Kapchorwa, and Kween