

# Scaling project – 2020 Annual Report

**Project title:** Market-driven scaling up and adoption of potato in Africa through a technology package combining market-driven, climate resilient, novel potato varieties with a seed system innovation

**Project start and end date:** January 2019 - December 2021

**Project leader:** Monica Parker Senior Scientist at International Potato Center (CIP). E-mail: [M.Parker@cgiar.org](mailto:M.Parker@cgiar.org).

**Project lead organization:** International Potato Center (CIP): [www.cipotato.org](http://www.cipotato.org), [www.rtb.cgiar.org](http://www.rtb.cgiar.org).

## **Implementing Partners:**

- Farm Input Promotions Africa (FIPS-Africa)
  - Not-for profit business
- Kenya County Governments of Elgeyo-Marakwet, Kiambu, Meru, Nakuru, Nandi and Uasin Gishu
- Self Help Africa (SHA)
  - NGO focused on scaling the innovation: technical training and data monitoring
- Kachwekano Zonal Agricultural Research and Development Institute (KaZARDI), Uganda
- Buginyanya Zonal Agricultural Research and Development Institute (BugiZARDI), Uganda
  - ZARDI's are part of the National Agricultural Research Organisation (NARO) and carry out agricultural research for the different agro-ecological zones in Uganda
- District and Sub-county Agricultural Offices of Kisoro, Rubanda, Kanungu, Kabale, Mbale, Kapchorwa and Kween, Uganda

**Countries of intervention:** Kenya and Uganda

**Total budget:** USD 820,103

**Date of submission:** March 2021

## Progress and results

### Outputs

*Summarize the level of achievement of each output and briefly present the key milestones completed.*

*Refer to the list of deliverables reported for more details (see Annex 1).*

#### **COVID Interruptions to project implementation**

The main season of project field activities was planned for March to August 2020, at the beginning and during the height of COVID-19 restrictions. Thus the main activities to reach farmers with new varieties and cuttings was delayed to the following season beginning September-October 2020 with harvest in January-February 2021. This resulted in delaying activities to obtain farmer feedback on varieties and cuttings until the harvest thus was not completed as per the original workplan.

Activity delays also delayed documenting the scaling process and developing diverse business cases for the innovation package along the use pathway. With the loss of the main season of project activities, documenting the results has been delayed until the following season of resumption of activities is completed.

#### **Output 1: Market relevant product profiles for potato varieties**

Approximately 16,000 farmers in Kenya and Uganda were exposed to new project-targeted varieties through rooted apical cuttings (RACs) and seed tubers (Annex 1). These farmers will be surveyed on variety preferences and cuttings using phone-based platforms, the surveyed farmers depend on the farmer having a phone and the phone number being compatible with the system used by the survey service providers.

SMS-USSD and voice-over based surveys were developed in each Kenya and Uganda, respectively, with communications service providers<sup>1</sup> to obtain feedback on varieties and RACs directly from farmers. It is hypothesized that more farmers can be reached using this survey method, and data is automatically entered into a database making this more efficient than in-person based surveys with field agents. In Kenya the SMS survey is in English and Swahili, while in Uganda the voice over survey is in three local languages (Rukiga, Rufumbira, Lumasaaba). In Uganda, the average cost per farmer is estimated 1 USD for the voice survey over two sessions, while in Kenya the average cost per farmer is estimated 0.60 USD for the USSD survey over three sessions. Noting these are costs based on sending surveys out to the targeted number of farmers—the response rate will determine to rate per response.

Developing the USSD survey-system was a more complicated process than foreseen but the investment in the development process can be applied to other USSD/voice over-based surveys. The capacity development to develop the service product was appreciated by the service providers as this enhanced their service delivery and provided a service provider for further collaborations whose product is better established to provide future services.

#### **Output 2: Business cases and production guidelines for producing apical cuttings**

In Kenya, it was not anticipated that the small-scale nurseries would produce certified rooted apical cuttings (RACs) following national regulations. Seven small-scale nurseries were licensed by the Horticultural Crops Development Authority, who licenses all nurseries in Kenya<sup>2</sup>. Kenya Plant Health Inspectorate Service (KEPHIS), responsible for seed certification, will begin certifying RACs when the nurseries are ready, February-April 2021.

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<sup>1</sup> Kenya - SMS-USSD service provider = Wasiliana <https://wasiliana.com/>, survey [Short code SMS - Questions Kenya.pdf](#):  
Uganda - voice-over service provider Mteja: <https://mteja.io/about-us>, survey : [Survey Script Farmer feedback Uganda.pdf](#)

<sup>2</sup> [HCDA Licenses Kenya Cuttings Nurseries](#)

In Kenya, small-scale seven nurseries business continues to grow, with production and sales increasing significantly from year 1 to year 2 (Table 1 and Indicator Table 4). Each nursery earned an average income of 3,000 USD in 2020 from selling RAC to the project and 18,000 RAC to a total of 719 farmers at an average of 237 cuttings per buyer and cost of 25 USD. Following the producing seed on-farm guide for farmers<sup>3</sup>, each farmer could produce 1,000 kg of seed after two seasons of multiplication, sufficient to plant 0.5 ha at a seed value of 600 USD.

**Table 1. Overview of production of apical cuttings by small-scale nurseries in Kenya**

	# Mother plants <sup>a</sup>	# cuttings produced <sup>a</sup>	cuttings/mother plant <sup>a</sup>	Cuttings sold to project <sup>b</sup>	Cuttings sold to farmers <sup>b</sup>
2019	1,348	39,298	29		
2020	9,307	152,473	16	48,667	198,418

<sup>a</sup> This is from six nurseries

<sup>b</sup> This is from seven nurseries

In Uganda, the small-scale nurseries continue to progress in investing in, production and marketing of cuttings), with production and sales increasing significantly from year 1 to year 2 (Table 2 and Indicator Table 4). Each nursery earned an average income of 3,000 USD in 2020 from selling RAC to the project and 5,250 RAC to a total of 39 farmers at an average of 673 cuttings per buyer and cost of 135 USD. Following the producing seed on-farm guide for farmers<sup>4</sup>, each farmer could produce 2,800 kg of seed after two seasons of multiplication, sufficient to plant 1.4 ha at a seed value of 1,680 USD.

**Table 2. Overview of TC plantlets received and purchased + production of apical cuttings by five small-scale nurseries and KaZARDI in Uganda**

	# TC plantlets received by project	# TC plantlets purchased	Total # TC plantlets	# cuttings produced	Multiplication rate (# cuttings produced per TC plantlet)	Value of TC plantlets purchased by nurseries	Cuttings sold to project	Cuttings sold to farmers
2019	780	1,220	2,000	19,928	9.96	333 USD (UGX 1,220,000)	35,862	500
2020	5,556	8,484	14,040	211,299	15.05	2,314 USD (UGX 8,484,000)	76,553	26,227

The main concern is the productivity rate of producing RACs from TC plants, varying from 5.8 to 29 (Table 3). While the threshold rate is unknown, nurseries should target a minimum 20-30 RACs per TC plant, with Stokman Rozen Kenya achieving 30-80 RACs per TC plant. **The unit sales price of a RAC is affected by this low productivity, being much higher in Uganda, ranging from 0.25-0.30 USD, compared to 0.08-0.15 USD in Kenya.** In Uganda, the cost of RACs is less than minitubers, which could drive down demand. Discussions are on-going with nurseries to refine production and unit costs, which are expected to reduce once productivity increases, and private purchases in 2020 were encouraging. Improving productivity to drive down production costs will hopefully make RACs more competitive, which are already appreciated for high yields.

**Table 3. productivity rate of producing cuttings from TC plants by the large-scale nursery Agromax, five small-scale nurseries and KaZARDI**

Agromax Ltd	Average multiplication rate (# RACs produced out of 1 TC plantlet)	Average operational production cost 1 RAC (UGX)
2019A	8.1	-
2019B	19.4	304.7

<sup>3</sup> [Rooted apical cuttings for on-farm seed production for potato farmers Kenya deliverable 21670](#)

<sup>4</sup> [Rooted apical cuttings for on-farm seed production for potato farmers Uganda deliverable 21670](#)

2020A	10.1	413.6
2020B	TBD	TBD

Nursery	Average multiplication rate (# RACs produced out of 1 TC plantlet)	
	2019	2020
Small-scale	13.1	12.2
KaZARDI	5.8	21.6

The approximate 530,000 RACs produced in Kenya in 2020 can produce approximately 24,500 tonnes of seed after three seasons of bulking, sufficient to plant 12,000 ha, compared to the same starting point using minitubers would produce 14,000 tonnes of seed after three seasons of bulking, sufficient to plant 7,000 ha<sup>5</sup>.

The approximate 300,000 RAC produced in Uganda in 2020 planted on an initial 6 ha can produce approximately 14,000 tonnes of seed after three seasons of bulking, sufficient to plant 7,000 ha, compared to the same starting point using minitubers would produce 8,000 tonnes of seed after three seasons of bulking, sufficient to plant 4,000 ha.

### Output 3: Business cases and production guidelines for producing seed from apical cuttings

Two seed businesses in Kenya received their seed merchant license from KEPHIS authorizing the production of certified seed. One of these seed businesses started seed production as a youth, who just aged out of this category in 2019. These seed merchants use RACs and produce the seed of the project targeted varieties, with the Nandi Potato Cooperative Society having purchased 40,000 RACs in 2020 as starter material for certified seed at an approximate value of 4,000 USD.

Seed sales from leveraging on AVCD project from 50 small-scale informal seed business in Kenya was 244 tonnes valued at 104,900 USD. The total invested by seed businesses was USD 37,000 making annual income of 130,000 USD, or 2,600 USD per seed business considering sales from ungraded seed as ware potato, noting that 88% of seed business produce on less than 0.45 ha.

In Uganda, productivity of seed production averaged 4.5 tubers per RAC, this is very low. In the Whatsapp groups, yields surpassing 25 tubers, up to 60 tubers per RAC are communicated. Performance of seed producers producing seed from RACs are being monitored through logbooks and will be surveyed in 2021 on their seed businesses<sup>6</sup>, results from which will inform the business models.

With the disruptions in the first season of 2020 (March-August) delayed seed production and data collection, thus the business cases are delayed to 2021.

### Project output 4: Methods for effective scaling new of varieties and cuttings

Critical to scaling is correct deployment and use of the innovation package. Demand for seed potato is very high resulting in creating high demand for the innovation among users and enablers for RACs contribute to filling the gap. The accelerated pace of scaling out the innovation resulted in incorrect use of the innovation, particularly in the production of cuttings more resembling stem cuttings rather than the targeted high-yielding apical cuttings. This is being corrected through various capdev events and communication channels in Kenya such as national Whatsapp groups and National Potato Council of Kenya [newsletters<sup>7</sup>](#).

Stakeholder engagement and investments are being monitored to develop evidence to contribute to case studies focusing on specific scaling interventions and relating to scaling readiness of the country of intervention. All evidence collected is from the users and enablers of the innovation so presents the reality

<sup>5</sup> Assuming 13 and 7.5 tubers/cutting or minituber, remultiplied at 46,777 tubers/ha and seasons 2 and 3 at 13 t/ha

<sup>6</sup> Questionnaire used to survey informal seed businesses producing seed from cuttings [Questionnaire seed multipliers Cuttings Uganda](#)

<sup>7</sup> [Stem versus apical cuttings link](#), deliverable 24110

of scaling the innovation in the actual operating environment – as there was minimal R4D prior to deployment to the private sector. The country case studies will be presented in 2021 deliverable 22571.

In Uganda, to recognize apical cuttings as starter material for the production of certified seed, the Ugandan Authorities have integrated apical cuttings in the Uganda Seed Potato Certification Protocol. Active involvement of the national research program (ZARDI's) as well as district local government extension staff in the promotion of the RAC technology at farmer level (trainings, harvest field days, workshops, agricultural shows) ensures capacity development at multiple levels of enablers and stakeholders.

Close monitoring of production data and investments made by nurseries and seed businesses is on-going, and from which business models will be developed.

## Outcomes

*Present a quantitative assessment of the results achieved and explain any difference with the expected targets. Refer to the project proposal for the complete list of research and development outcomes.*

Tables 4 - 6 summarise the achievements towards development and research outcomes against targets, with Table 6 disaggregating the achieved numbers by women and youth of the relevant indicators. Note that the indicators were refined, some were broken into two indicators, one was deleted to enable the project to accommodate to the PMU expected deliverables that were clarified after the project document, partner agreements and commitments were completed.

**Table 4:** Overview of progress towards the development outcomes of the potato PO2.4 project - Scaling potato varieties and apical cuttings

Development Outcome	Indicator	Kenya achieved	Uganda achieved	Overall achieved	Project target
1. At least 50,000 potato farmers, among which 30% are female farmers, will be reached in Kenya and Uganda with high quality seed of new varieties	I-1: Number of farmers exposed to new varieties	2019: 1,952 2020: 12,139 Scaling Fund 17,779 AVCD project	2019: 1 2020: 1,787	33,657	50,000
	I-2: Number of farmers providing variety feedback	2020: 400	0	0	5,000
	I-3: Number of farmers reached with cuttings	2019: 712 2020: 6,844	2019: 0 2020: 1,773	9,329	5,000
2. 30 private seed business* have the combined technical and resource capacity to annually produce and sell 500,000 cuttings, and to annually produce at least 1,000 tonnes seed from cuttings	I-4: Number of nurseries that produce cuttings	3 large-scale 6 small-scale nurseries	1 large-scale 5 small-scale nurseries 2 public research stations	4 large-scale 11 small-scale nurseries 2 public research stations	3 large-scale nurseries 10 small-scale nurseries
	I-5: Number of seed businesses that produce seed from cuttings	30 seed multipliers 2 seed merchants	54 seed multipliers (21 SW-Uganda, 33 E- Uganda)	84 seed multipliers 2 seed merchants	44 seed multipliers
	I-6: Quantity of cuttings and (certified) seed annually produced	2019: 414,814 cuttings <ul style="list-style-type: none"> <li>366,118 cuttings by large-scale nursery</li> <li>48,696 cuttings by small-scale nurseries</li> </ul> 2020: 611,649 cuttings <ul style="list-style-type: none"> <li>305,268 cuttings by large-scale nursery</li> <li>306,381 cuttings by small-scale nurseries</li> <li>Seed tubers produced in 2020: 512 tonnes</li> </ul>	2019: 60,713 cuttings produced: <ul style="list-style-type: none"> <li>Large-scale nurseries 40,785 cuttings</li> <li>Small-scale nurseries 14,941 cuttings</li> <li>Public research stations 4,987 cuttings</li> </ul> Seed tubers produced in 2019: 7,243 kg  2020: 253,368 +??: <ul style="list-style-type: none"> <li>Large-scale nurseries 25,687+?? cuttings</li> <li>Small-scale nurseries 119,524 cuttings</li> <li>Public research stations 108,157 cuttings</li> </ul> Seed tubers produced in 2020: 8,045 kg	1,340,544 + ?? <ul style="list-style-type: none"> <li>737,858 + ?? cuttings by large-scale nurseries</li> <li>489,542 cuttings by small-scale nurseries</li> <li>113,144 cuttings by Public research stations</li> <li></li> </ul>	No target set – responded to project capacity

Development Outcome	Indicator	Kenya achieved	Uganda achieved	Overall achieved	Project target
	I-7: Sales or profit per seed business	2019: USD 38,142 <ul style="list-style-type: none"> <li>• 36,612 USD by largescale nursery</li> <li>• 1,530 USD by six small-scale nurseries</li> </ul> 2020: 55,604 USD <ul style="list-style-type: none"> <li>• 33,248 USD sold by large scale nursery</li> <li>• 22,356USD sold by seven small-scale nurseries</li> </ul>	Total value of RACs sales in 2019 UGX 19,206,063 (USD 5,330): <ul style="list-style-type: none"> <li>• Large-scale nurseries UGX 19,206,063 (USD 5,235)</li> <li>• Small-scale nurseries UGX 350,000 (USD 95)</li> <li>• Public research stations UGX 0 (USD 0)</li> </ul> Total value of RACs sales in 2020 UGX 101,318,550 (USD 27,606): <ul style="list-style-type: none"> <li>• Large-scale nurseries UGX 42,323,400 (USD 11,532)</li> <li>• Small-scale nurseries UGX 56,445,150 (USD 15,379)</li> <li>• Public research stations UGX 2,550,000 (USD 695)</li> </ul> Total value of sales of seed tubers by small-scale nurseries in 2020: UGX 18,049,500 (USD 4,922)	126,682 USD <ul style="list-style-type: none"> <li>• 86,627 USD by largescale nursery</li> <li>• 39,360 USD by six small-scale nurseries</li> <li>• Public research stations USD 695</li> </ul>	No target as project is determining the sales/profit in operational environment
	I-8: Number of farmers buying RAC, seed from RAC and new varieties	2019: 68 2020: 943	2020: 39	1,050	No target set – responded to stakeholder demand
	I-9: Quantity of cuttings sold	2019: 390,476 cuttings <ul style="list-style-type: none"> <li>• 366,118 cuttings by large-scale nursery</li> <li>• 24,358 cuttings by small scale nurseries</li> </ul> 2020: 553,353 <ul style="list-style-type: none"> <li>• 306,268 cuttings by large-scale nursery</li> <li>• 247,085 by small scale nurseries</li> <li>• 136,042 cuttings bought by project</li> <li>• 417,311 cuttings bought independently from project</li> </ul>	2019: 36,362 <ul style="list-style-type: none"> <li>• 35,862 cuttings bought by project:</li> <li>• 500 cuttings bought independently from project</li> </ul> 2020: 102,780 cuttings + agromax ?? <ul style="list-style-type: none"> <li>• 76,553 cuttings bought by project</li> <li>• 26,227 cuttings bought by 39 farmers or seed businesses independently from project</li> </ul>	1,082,971 cuttings + agromax ??	No target set – responded to stakeholder demand

**Table 5:** Overview of progress towards the research outcomes of the potato PO2.4 project - Scaling potato varieties and apical cuttings

Research Outcome	Indicator	Kenya achieved	Uganda achieved	Overall achieved	Project target		
1. Farmer institutions, national programs, businesses, NGOs and other stakeholders raising awareness of the new varieties and RAC	I-10: Number of stakeholder workshops	2019: 15 2020: 10	2019: 4 2020: 6	35	No target set – responded to stakeholder demand		
	I-11: Number of awareness creating events				No target set – responded to stakeholder demand		
2. Public and private institutions transferring knowledge in producing cuttings and producing commercial and on-farm seed from cuttings by seed businesses and farmers	I-12: Number of trainings lead by partners, public and private institutions	2019: 52 (partner)  2020: 303 • 177 (public extension) • 126 (partner)	2019: 2 2020: 88	445	No target set – responded to stakeholder demand		
	I-13: Number of farmers trained in RAC, new varieties	2019: 799 2020: 13,363	2019: 0 2020: 2,017			16,179	10,000
	I-14: Number of cuttings distributed to farmers and seed multipliers	2019: 120,968 cuttings: • Seed multipliers 71,555 • Rural farmers 49,413  2020: 126,645 to rural farmers	2019: 33,462 2020: 75,175			356,250	240,000
3. Private-private/public partnerships to support satellite nursery systems	I-15: Number of private/public-partnerships	3*	0	3	4		

\*Grace Rock Farms/Kiambu county, Taita Papa/Taita county, SRK/FreshCrop Ltd



*Indicate what was the project contribution in institutionalizing capacities to foster the scaling process (what organizations/groups are capable of taking this forward beyond the scaling project – in terms of knowledge, interest, and means to do so; with some supporting evidence for claiming this).*

In Kenya 3 years after the initial introduction of apical cuttings when the project started, the technology was already operating without support from an R4D intervention. Stakeholders, enablers and private sector were investing in the technology. The project focused on expanding user, enabler and stakeholder capacity development in the innovation package, and collect and report monitoring data. The capdev expanded at a wide scale among diverse users and enablers at all levels of the use pathway to lead interventions to increase use of the innovation package.

In Uganda, KaZARDI and BugiZARDI are part of the national research program, they have introduced the RAC technology in the portfolio of their activities, both institutions have now the capacity and also do play a key role in further capacity building of small-scale nursery managers, seed multipliers, potato farmers and other stakeholders

Extension staff of the local government of the districts of project intervention have been trained and actively involved in the promotion of the RAC technology and on-farm seed saving to potato farmers, in Uganda district local governments play a key role in offering extension services to the farming community

Development of production and business management skills of private nursery managers who have started selling RACs independently from the project (e.g.: 1 seed business in Kisoro district purchased and planted 8,000 RACs)

The main implementing partner/Scaling Champion in Uganda - Self Help Africa promotes the RAC technology in the context of other projects (co-)managed by the NGO.

Farmer-friendly training materials have been developed to promote further the RAC technology among a wider potato value chain stakeholder community.

(Evidence: MEL - Capdev PO2.4 Scaling Fund cuttings nurseries and seed businesses, county and district government extension)

*Present other effects (positive or negative) that were not foreseen beforehand (e.g. new partnerships which came into existence that also have a positive contribution to other things than scaling that particular innovation; changes in the policy environment that show increased government interest in particular crops, integrated agricultural/livelihood approaches, etc.; unexpected negative environmental trade-offs of intensification practices; unexpected social or gender-related biases related with components of the innovation package or scaling strategy).*

CIP provided temporary authorization of use of CIP-owned potato varieties in Kenya (Unica, Wanjiku, Chulu, Lenana, Nyota and Konjo)<sup>8</sup> while the matter of variety ownership is finalized with the national program Kenya Agriculture and Livestock Research Organisation (KALRO), which is in partnership with the Syngenta Foundation for Sustainable Agriculture (SFSA). This agreement will set precedence for such agreements to guide ownership of varieties with other national programs.

In Uganda, interventions under SEWOH GIZ advisory project are supporting the Ministry of Agriculture to update seed regulations and certification protocols for potato, which RACs are being integrated into this process to officially recognize the innovation following the Scaling Fund and GIZ project support to validate apical cuttings.

<sup>8</sup> [CIP Potato Variety Authorisation Letters](#)



Apical cuttings are being used as starter material for the production of minitubers by the small-scale nursery owners, this will decrease production costs and increase volumes of minitubers produced for internal production and sales to seed businesses.

Agromax uses apical cuttings to produce potato outside the traditional production zones, more specifically in the Karamoja region in Northeastern Uganda.

## Impact

*Present a qualitative and, as far as possible, quantitative assessment of the contributions toward the expected impact (e.g. indications that achieved outcomes contributed and will contribute to changes in livelihood, food and nutrition security, business opportunities, resilience to climate shocks, sustainable management of resources) and explain any difference with the expected targets. Refer to the project proposal for the initial impact statement.*

Of the 1,387 farmers buying seed potato produced from RACs from the 50 small-scale seed businesses in Kenya, 35% were women and 13% youth, supporting inclusive access to seed. The number of youth buying seed is higher than the average number of youth farmers, in the AVCD project, youth accounted for 8% of the total farming population the project engaged with.

In Kenya, this project allowed to accelerate scaling the technologies that had already springboarded from previous interventions. Users and enablers of the innovation package were already engaging without R4D intervention. This project has allowed the increase the scope of engagement to three further counties and solidify county engagement in five counties already identified in the project (deliverables 22602, 22603 and 23056).



## Documentation and reflections on scaling and Scaling Readiness

Under this section we would like to capture (1) some strategic and key outputs of the scaling strategy development, implementation and monitoring using Scaling Readiness, and (2) reflections on the use of Scaling Readiness as a roadmap for more impactful scaling of RTB innovation. We will follow the logic of the 5 Steps of Scaling Readiness.

More detailed compliance with the Scaling Readiness implementation is captured through the compliance matrix.

### Step 1: Characterization

#### Innovation package

- *Describe the innovation package as defined in the project proposal.*

At the beginning of the project the innovation package consisted of the core technology – resilient potato varieties packaged as apical cuttings or seed derived from apical cuttings with two levels of use: production of cuttings by a nursery followed by production of seed from the cuttings by seed multipliers. The apical cuttings technology accelerates the time to when a new variety can be available for farmers compared to seed production from minitubers. If in the form of cuttings, a new variety can be available within months of release, if as tubers, seed can be available within 12-15 months of release.

At the beginning there is a core nursery producing cuttings to support the project and to assess if a business opportunity. Trained seed multipliers produce seed from the cuttings. Resilient varieties are distributed to farmers either as traditional seed tubers derived from cuttings or as cuttings to raise awareness and for farmers to try the new varieties and cuttings. As interventions progress, the innovation package diversifies to producing cuttings in decentralized nurseries, and farmers buying cuttings to produce seed on-farm in seed plots as they already have behavior of saving seed on-farm.

- *Explain which were the main changes that have been made in the innovation package and the reasons/ processes that have determined these changes.*
- *Explain whether and how the innovation package's core and complementary innovations were (re) defined*

There have been no changes to the innovation package as from the original plan. Change in scaling strategy occurred as a result of demand for the innovation and the ability of the project to respond, as described below.

- *Explain whether and how the innovation package was updated/ tailored for the different locations where the Scaling Fund project has activities*


The innovation package was tailored to each country depending on the infrastructure in place at the beginning of the project. The package was updated as relate to licensing nurseries, production of certified seed and authorization to commercial specific varieties to comply with regulations in Kenya.

- *Explain if and how the changes have enhanced or will enhance the scaling potential and /or the technical, economic, social and environmental viability of the innovation package.*

The changes will allow the innovation to comply with and be officially recognized by national regulations

- *Explain whether and how the Scaling Fund project characterized the scaling context (other projects, stakeholder networks, etc.) in the locations where scaling is aspired.*

#### Remarks/ comments/ feedback on Step 1:



*Provide short update on how Scaling Readiness was applied and supported the characterization of the innovation and scaling context.*

Scaling readiness was applied to articulate the innovation scaling project. It gave structure by helping identifying the 4 key characteristics of our scaling project: (1) objectives and focus, (2) the innovation that the project is trying to scale, (3) the context in which scaling is to take place, (4) the stakeholders and their networks. Identifying those 4 key characteristics was essential to define a suitable scaling strategy.

In general the innovation was fitting into an existing seed system, thus the infrastructure was already in place to support integrating the innovation onto existing infrastructure. The innovation is a complimentary source of starter material for seed, thus the system of obtaining and multiplying starter material is in place – the innovation just provides an alternative starter material.

The new varieties also provide farmers with incentives to purchase seed as this the main way to obtain the new material which has resilience and production benefits.

## Step 2: Diagnosis

### Identification of bottlenecks for scaling for each of the locations

- *Explain how the innovation package was assessed for (i) innovation readiness and (ii) innovation use for the different locations where scaling is aspired.*
- *Explain who assessed the (i) innovation readiness and (ii) innovation use of the different core and complementary innovations in the package*

The innovation package of core and complementary components and readiness versus use were assessed by holding participative stakeholder workshops in each country. The workshops were held towards the end of the project recalling the state of each component at the beginning of interventions and the current state. The results of the workshops are in the figures below.

- *Explain whether the identified bottlenecks differed across the locations where scaling is aspired*
- *Explain whether the identified bottlenecks differed from those that were identified in the Scaling Fund project proposal.*

The deliverable 16708 highlights the shift in readiness versus use in the direction the upper right-hand part of the graph suggesting the innovation components are becoming more ready and used.

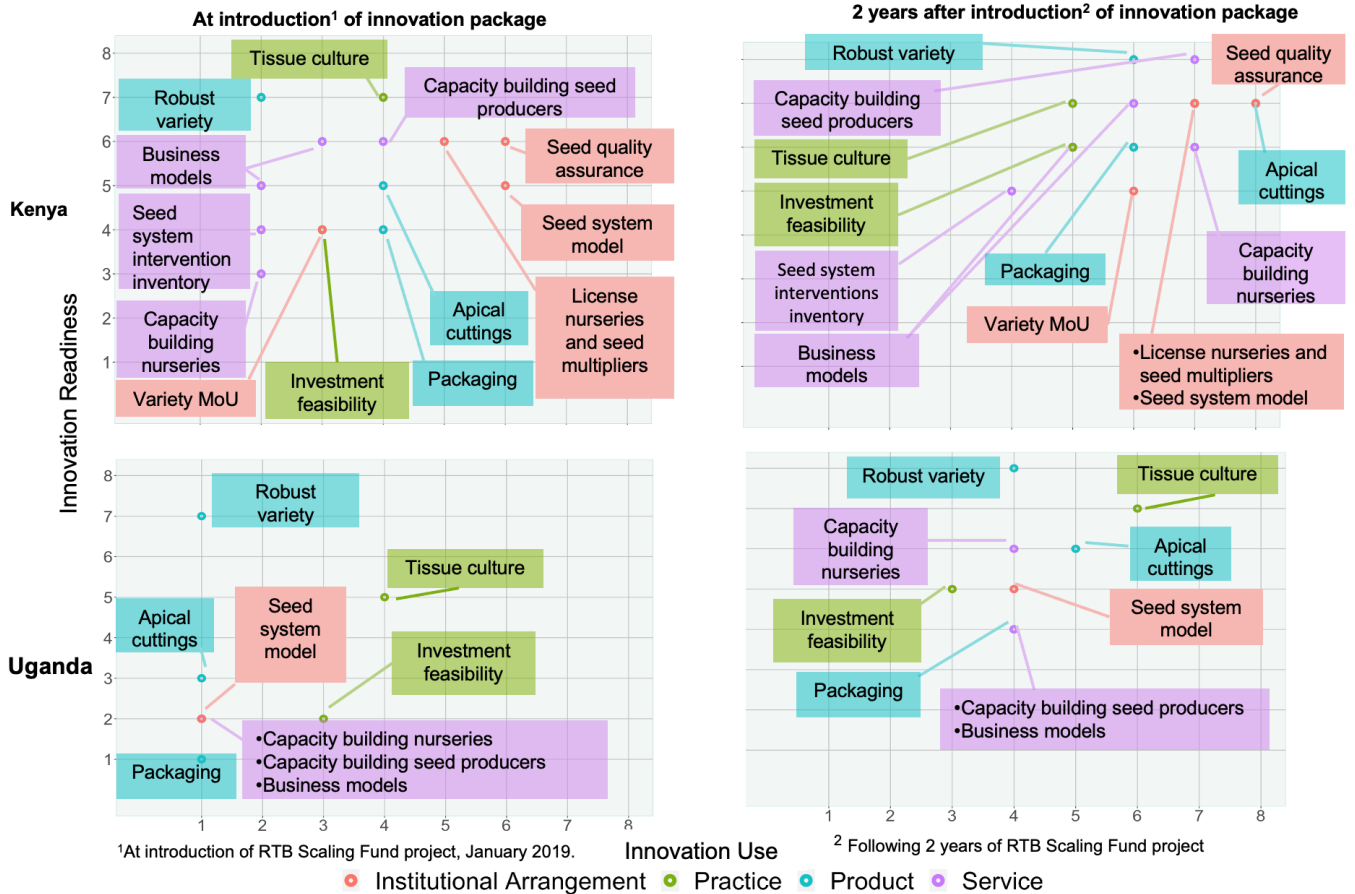
The two countries were at differing stages based on the scaling readiness in the countries. In Kenya the innovation was transitioning from semi-controlled to uncontrolled environment at the beginning of interventions with private sector leading production systems and partners supporting the scaling process, while the innovation package was just introduced in Uganda.

The main bottleneck in Kenya was widespread demand accelerating uptake of the innovation cuttings without R4D support which resulted in incorrect production of cuttings, and this was not foreseen before project interventions.

The main bottle necks in Uganda at the beginning of the project were building market demand for a new technology, hence were not specific. Some bottlenecks from Kenya, ex regarding packaging were considered in Uganda as this would also apply there. The main bottleneck that arose in Uganda during implementation is the unit price of cuttings as described in Output 2, which was not foreseen in the proposal.



**Readiness versus Use of innovation package of apical cuttings and robust potato varieties**



The scores represent contributions from partners Kenya: National Potato Council of Kenya (platform), Stokman Rozen Kenya (private business), Farm Inputs Promotions Africa (NGO) and International Potato Center; and Uganda: KaZARDI and BugiZARDI (NAROs), Agromax (private sector), Self Help Africa (NGO) and International Potato Center

**Remarks/ comments/ feedback on Step 2:**

*Provide short narrative update on how Scaling Readiness was applied and supported the diagnosis of bottlenecks for scaling.*

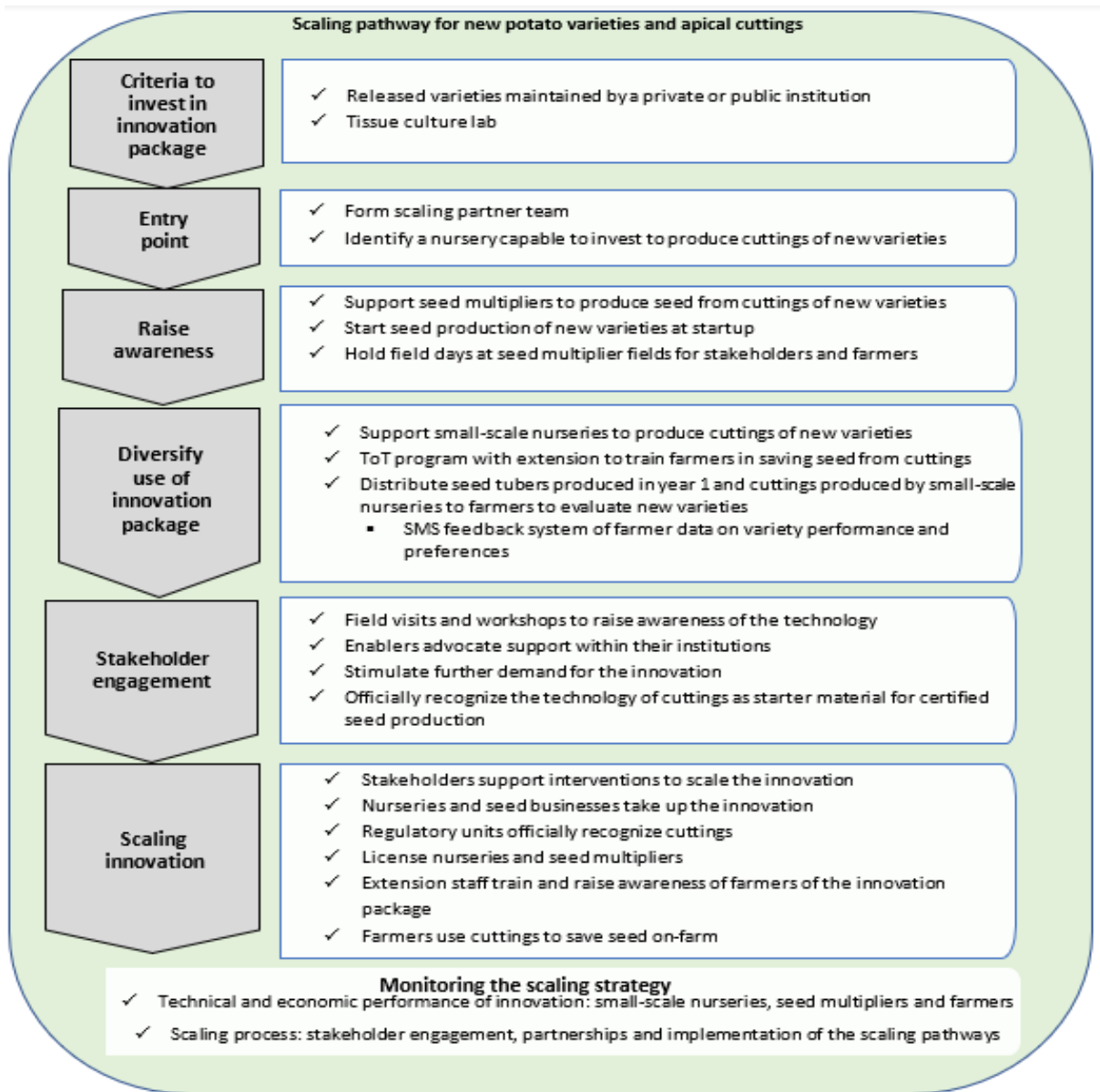
Bottlenecks were diagnosed thanks to integrated partnerships where the communication is maintained through formal and informal channels (project specific and general stakeholder workshops, WhatsApp groups and other communication channels). Those communication channels provided direct information from the field about the challenges that the stakeholder (nurseries/ farmers) face. CIP being integrated into the existing seed system stakeholder networks which the innovation package leverages and the strong involvement of key partners in the scaling project allowed to efficiently recognize the bottlenecks that needed to be tackled in order to improve the scaling intervention.

**Step 3: Strategize**

**Scaling strategy**

- Present the scaling strategy defined at the beginning of the project

The potato project has two scaling strategies based on the scaling readiness in the countries. In Kenya the innovation was transitioning from semi-controlled to uncontrolled environment at the beginning of interventions with private sector leading production systems and partners supporting the scaling process, while the technology was just introduced in Uganda. In Kenya, the general stakeholder community is using the technology package, including nurseries producing cuttings, seed multipliers and farmers producing seed from cuttings; and the seed certification regulatory body KEPHIS recognized cuttings as starter material to produce certified seed. Thus the strategy in Kenya was scaling out the technology package to develop capacity of new stakeholders and increase users. In Uganda, the strategy overall was to introduce the technology following similar pathway as in Kenya, applying learning to improve the scaling process. The strategy entailed clusters of activities by region, led by differing sets of partners with CIP coordinating and consolidating their work.





- Explain which strategic option was selected (substitute, outsource, develop, etc.) to overcome the bottlenecks for scaling in the different project locations

The main bottlenecks of overestimating the capacity of small-scale nurseries and the widespread demand accelerating innovation use at a faster pace than knowledge and incorrectly were not foreseen before project interventions (Table 7). The widespread demand accelerated at a faster pace than knowledge, there were still many unanswered questions resulting in incorrect practices due to the innovation of cuttings being released to and taken up by the wider stakeholder community very early in its development along the scaling readiness pathway. Correcting this by engaging with stakeholders with a role of developing capacity of users to ensure correct guidance and use.

While nurseries have good intentions to produce apical cuttings, many mismanage the process, unintentionally producing stem cuttings (rather than apical cuttings) from mother plants (previously described in Output 4), relating to the bottleneck of the widespread demand accelerating at a faster pace than knowledge, with unresolved technical matters resulting in incorrect practices due to the innovation of cuttings being released to and taken up by the wider stakeholder community very early in its development along the scaling readiness pathway. This is being corrected through various platforms to further develop capacity.

**Table 7. Strategic options selected to overcome the bottlenecks for scaling in the different project locations**

Bottlenecks	Strategic Proposed	Location
1. Overestimated the capacity of small scale nurseries	Develop	Kenya & Uganda
2. Demand greater than support capacity leading to the incorrect use of the technology	Develop bilateral technical backstopping, TOT and outsourcing	Kenya
3. insufficient business knowledge to make sales decision based on costs	Develop	Kenya & Uganda

- Explain how the decision of how to overcome the scaling bottlenecks was taken by the project and the key stakeholders.

Both the project management and the key stakeholders were rapidly convinced by the scaling strategy and the importance of apical cuttings in the potato seed system. Whilst liaising regularly with the nurseries it became clear that the RAC technology was adapted to Kenya and Uganda but it became also clear that one of the main bottlenecks was that the small scale nurseries, farmers and multipliers lacked know-how and needed to be better trained in order to fully benefit from the potential of the rooted apical cuttings technology. There was a clear demand for further technical support from the stakeholders which the project team responded to (Table 8).

**Table 8. Strategic options selected to overcome the bottlenecks for scaling in the different project locations**

Bottleneck	Strategic Proposed	Location	How the decision was taken
Overestimated the capacity of small scale nurseries	Develop	Kenya and Uganda	<ul style="list-style-type: none"> <li>- Producing cuttings requires nursery skills</li> <li>- Whatsapp groups to follow production enabled to share pictures of cuttings to which revealed the cuttings and mother plants were not of the right quality</li> <li>- Intensified use of the Whatsapp groups to more closely monitor production and give guidance and share in troubleshooting</li> </ul>



Demand greater than support capacity leading to the incorrect use of the technology	Outsource	Kenya	-capacity development of partners through whatsapp groups -offering virtual training sessions
insufficient business knowledge to make sales decision based on costs	Develop	Uganda	The unit cost for cuttings in Uganda is high, almost double that of Kenya. Productivity rates are still below those obtained in Kenya and nursery operators are still tracking costs to determine what the unit cost should be. The unit cost is currently based on a hunch and not true economic data. This is being addressed through analysing logbooks and meetings with nursery owners

- *Explain how the (re)assessment of the innovation package, identification of bottlenecks, selection of strategic options influenced resource allocation under the Scaling Fund project*

The second bottleneck of demand being greater than support to ensure correct use of the innovation opened several new opportunities to scale the innovation package beyond the original intentions.

- *Explain what new activities were invested in based on the assessment and decisions on strategic options.*

Rather than adding new activities, the scale of the planned activities increased due to demand from external stakeholders – particularly capacity development of enablers to further train more users of the technology.

### Partnership strategy

- *Present the network of partners that have been involved in the scaling projects. Explain how partners and partner modalities were identified.*


Since cuttings/new varieties is a new innovation package with several scaling approaches, CIP shares scaling champion responsibilities with project scaling champions, and consolidates work of Kenya and Uganda. CIP coordinates among partners and stakeholders, and provides technical backstopping to nurseries producing cuttings, particularly large-scale nurseries, due to the specific expertise required for this. Implementing partners to provide technical backstopping to small-scale nurseries. Partners should take over this technical backstopping role with continued capacity development.

The core implementation team consists of partners to:

- support cuttings production in the satellite nurseries,
- train users in cuttings and distribution of promotional packs to apply the training:
  - seed multipliers to produce commercial seed
  - farmers to produce seed on-farm in small seed plots
- awareness creation, support market development,
- develop system to collect user feedback on innovation package,
- technically backstop field production of seed from cuttings, and
- data collection and organisation,
  - CIP provided partners with specific templates to collect and report data.

The scaling champions FIPS-Africa (Kenya) and SHA (Uganda) are responsible for the actual scaling activities to support users along the scaling pathway to apply the innovation package. They lead activities in the field, including field days, and provide organized data of activities.





**In Kenya**, the project works in two regions with different partnership strategies. FIPS-Africa lead activities in Meru county (central Kenya), and support the six satellite (small-scale) nurseries to produce cuttings. CIP invested in capacity development of FIPS-Africa in seed production and apical cuttings during previous interventions, thus have the skills to immediately scale out the innovation package upon project start up.

In Eastern Kenya (North Rift region) the project works through farmer producer organisations, seed businesses and county governments (partnerships and capacities developed in previous interventions) to produce seed of new varieties for members, thus providing services to member farmers, and creating market demand and opportunities for new varieties and cuttings.

**In Uganda**, SHA, Kazardi and Bugizardi lead activities to scale out the innovation package, working with 58 seed multipliers and district Ministry of Agriculture extension. CIP provides technical backstopping in cuttings production to Agromax, the large-scale producer of cuttings based in Kampala with satellite nurseries spread over Uganda, and the six small-scale nurseries trained by IFDC in minituber production, who also trained the seed multipliers in seed production.

- *Explain how partnerships are fit-for-purpose for overcoming the key bottlenecks for scaling*

The project partners have been selected because of their experience and their presence in the selected intervention areas. The partners had been trained to apical cutting production and utilization in previous interventions and had therefore already the knowledge as well as the capacity to:

- 1) support cuttings production in the satellite nurseries,
- 2) train users in cuttings and distribution of promotional packs to apply the training:
  - seed multipliers to produce commercial seed
  - farmers to produce seed on-farm in small seed plots
- 3) awareness creation, support market development,
- 4) technically backstop field production of seed from cuttings.

- *Describe if and how the network changed (for example new partners, changes in the roles, strengthened capacities).*


**In response to investments in cuttings by private sector and demands by county governments for seed system support**, CIP expanded the partnership strategy whereby CIP supports large-scale private sector nurseries investing in cuttings through technical backstopping and at the beginning stages, market assurances for cuttings by purchasing for project interventions.

To support private-public partnerships, CIP has defined an approach of supporting a (private) nursery to produce cuttings, and county governments train farmers to support marketing the nursery. CIP or partner engages with the county government to conduct farmer training through a ToT program as per the expansion strategy to support farmers using cuttings directly by saving seed on-farm. This will increase market options for cuttings as seed multipliers alone limit opportunities for small-scale nurseries and many farmers to benefit from the technology. This approach resulted in new public-private partnerships in Kiambu and Taita Taveta counties.

- *Present the key lessons learned in terms of partnership management and its importance for the scaling process.*

Scaling new technologies such as apical cuttings which have complex and technical pathways requires leadership capable of coordinating the partners and ensuring quality control in interventions. A key initial step in the scaling process is building the capacity of partners to correctly lead activities to support users of the innovation package. Particularly in the case of apical cuttings which were taken up by the external environment early in development with limited knowledge on the technology.

This report highlights developing capacity of partners to lead activities accurately with minimal R4D support as a key outcome. This investment by CIP to lead much of the field activities in year 1 to develop partner capacities has resulted in partners able to implement and monitor activities thus reducing CIP's role in the



field for year 2. In year 2, FIPS-Africa can lead more complex activities in Kenya to technically backstop nurseries producing cuttings, and support seed business to become licensed to produce certified seed.

The definition of scaling champion needs to be flexible, as in this project scaling occurs at two levels of scaling readiness. With differing kinds of roles depending on the available capacities, CIP absolutely needs scaling partners like FIPS and SHA who are active in the field, but do not have the higher-level capacity to capture the processes of scaling – they are the active doers of scaling processes. Higher institutions like CIP are better able to lead higher level studies and documentation. Ideally this leadership is handed over to high level institutional partners towards the end of complete innovation handover.

### **Remarks/ comments/ feedback on Step 3:**

*Provide short narrative update on how Scaling Readiness was applied and how this influenced the project capacity of strategizing towards overcoming key bottlenecks for scaling the innovation package?*

One of the characteristics of the rooted apical cuttings is that they mostly need to be produced in a decentralized way to reach as many potential users as possible. The characterization of the scaling project and especially the context in which the scaling up intervention is aimed meant that the project partners needed to have technical capacity and the knowledge to support training productions in remote satellite nurseries and train the users. The project relies heavily on the specialized partners and their capacity to reach nurseries, seed businesses and farmers in the intervention while providing specific training. The partners were chosen based on these criteria.

### **Step 4: Agree**

- *Explain how the draft Scaling Strategy was shared and discussed with the broader stakeholders in the different locations where the project is active*

To agree on the scaling strategy with the project partners, a series of informal workshops with the broader stakeholder community has been organized. During these meetings, the overall scaling strategy and the objectives of the scaling intervention were presented and the workplans of the partners were discussed and agreed upon. The scaling champions FIPS-Africa (Kenya) and SHA (Uganda) were directly involved in the design of the scaling strategy since they are responsible for the actual scaling activities to support users along the scaling pathway to apply the innovation package. Furthermore, they also lead activities in the field, including field days which is why it was essential that they were involved in the design of the scaling intervention from the beginning.


- *Explain whether and what changes were made to the location-specific scaling strategies (e.g. exploring new strategic options) based on stakeholder consensus seeking and negotiation*

There were no location specific changes in the scaling strategy. The scaling activities were expanded due to demand but following the same scaling path.

- Explain the implications of the changes to the location specific scaling strategies for the overall scaling ambitions of the project
- *Explain how the scaling strategy was operationalized into a scaling action plan.*

Partnership agreements with clear roles and responsibilities with some partners (FIPs and SHA). With public institution (Kenya – county governments, Uganda – BUGIZARDI, KAZARDI, district extension), the general collaborative nature of the existing relationships with CIP guided operationalizing the scaling strategy – and this was set according to activity workshops with the differing partners.

- Explain whether and how any reallocation of budget and roles were made and agreed upon with the main project partners and stakeholders

- 
- Explain how overall agreement on the scaling strategy and action plan were documented.

#### **Remarks/ comments/ feedback on Step 4:**

*Provide short narrative on how Scaling Readiness was applied and supported the stakeholder negotiations and development of the scaling action plan in the scaling fund project.*

The scaling was de facto already happening in the operating environment in Kenya, the project rather rationalized the already existing investments. In Uganda the Kenyan model is being replicated to scale up the innovation package.

#### **Step 5: Navigate**

- *Explain how scaling strategy and scaling action plan implementation was monitored*

In order to monitor the implementation of the scaling action plan, seed producers producing seeds from cuttings maintained logbooks on production costs, production and sales which were monitored by the scaling champions. Nursery producers producing cuttings maintained logbooks on production costs, production and sales which were monitored by CIP in Uganda and FIPs in Kenya. All partners leading activities on training and distribution kept records of the activity – meta, participant and distribution data on templates provided to them.

Monitoring was also conducted using surveys. Seed businesses were surveyed by enumerators in Uganda<sup>9</sup>. The USSD-voice over surveys monitor farmer preferences for varieties. A sample of 110 farmers without phone numbers or numbers incompatible with the service provider platform will be surveyed in person by public extension. A sample of 100 farmers will be directly monitored for cuttings yields on their farms by public extension. Both under guidance of the partners SHA and CIP.

In Kenya, in addition to the USSD survey for farmer feedback, a sample of 100 farmers will be monitored to collect yield and other data directly from their farms.

Whatsapp groups are also important continuous monitoring tools for partners, nurseries and seed producers. In total there are six groups under scaling fund with specific membership:

- UGANDA RAC Agromax
- Uganda monitoring RACs
- CIP-FIPs Potato Project
- Kiambu County
- Nakuru County
- CIP cuttings trial with SRK

With the covid19 crisis, it became complicated to visit the nurseries as well as the seed multipliers. The Whatsapp groups allowed continued monitor the progress of the scaling strategy. Technical backstopping could be performed very efficiently and both farmers and nurseries were able to receive advice and to share information on their activities and technical challenges.

To monitor the farmers and their use of cuttings, farmers were sampled to learn about their practices. Furthermore, there was large scale SMS survey to obtain feedback on the use of cuttings and varieties preference.

- *Explain what kinds of changes were made to the scaling action plan in terms based on monitoring and evaluation and learning*

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<sup>9</sup> Questionnaire used to survey informal seed businesses producing seed from cuttings [Questionnaire seed multipliers Cuttings Uganda](#)



The technical backstopping has been intensified in response to the information received through the monitoring.

- *Explain how principles of reflexive learning were implemented as part of the projects MEL strategy*

**Remarks/ comments/ feedback on Step 5:**

*Provide short update on how Scaling Readiness was applied and supported the monitoring, evaluation and learning in the scaling fund project.*

The innovation vs use table has been made at the beginning as well as at the end of the project. This allowed the project to have a clear view on how the innovation package as been scaled during the intervention period and gave the project a great insight on how the innovation package has been scaled during the project period.

## Financial update

Present financial data using the standard cost categories

Categories	Y1 Budget (USD)	Y1 Expenses (USD)	Y2 Budget (USD)	Y2 Expenses (USD)
Personnel	43,558	33,176	181,441	96,924
Collaborator Costs – CGIAR Centers				
Collaborator Costs – Others	119,616	119,616	198,095	170,161
Supplies and Services	29,493	39,876	49,098	64,568
Training / Workshop	19,238	19,238	61,676	13,407
Operational Travel	7,046	7,046	0	206
Depreciation				
Sub-total of Direct Cost	218,951	218,951	490,310	345,266
Indirect Costs/Institutional Overhead (15%)	32,843	32,843	94,139	56,624
<b>TOTAL – all Costs</b>	<b>251,794</b>	<b>251,794</b>	<b>584,449</b>	<b>401,890</b>

Present the level of co-investment mobilized

Categories	Main activities covered and geographical scope	Y1 Expenses (USD)	Y2 Expenses (USD)
GIZ Uganda	All activities in East Uganda	88,000	74,000
AVCD2 – Kenya	Nursery development in Taita Taveta	99,598	
Syngenta Foundation- Dissemination of climate smart potato varieties	Dissemination of new varieties	10,000	
Private nurseries and seed producers	Nursery production of cuttings and seed from cuttings, noting this data is missing much investment data	27,440	40,535
Public extension service	Staff time for training	5,000	5,000
<b>TOTAL – all co-investors</b>		<b>230,038</b>	<b>119,535</b>

## Annex 1. List of deliverables reported

Year	Output	Deliverable	Description	Status
2019	1. Market relevant product profiles for potato varieties	19840-Potato variety catalogue 2019 - Kenya	Variety profiles of varieties released in Kenya, including CIP material published in biannual variety catalogue	Completed
	2. Business cases and production guidelines for producing RAC	16985-Record books for producing RAC	-	Completed
	3. Business cases and production guidelines for producing seed from RAC	16986-Record books for producing seed from RAC	-	Completed
	Scaling readiness approach documented	16711-6-month reflection and learning reports produced and adjustment in plan of work and/or scaling strategy documented	-	Cancelled
2020	1. Market relevant product profiles for potato varieties	21664-Product profiles for 6 varieties	-	Cancelled
	2. Business cases and production guidelines for producing RAC	21666-Production of apical cuttings of potato: Management of mother plants and greenhouse production	-	Completed
		21667-Cleaning cocopeat for production of potato rooted apical cuttings	-	Completed
		24110-Distinguishing apical cuttings from stem cuttings for potato	-	Completed
	3. Business cases and production guidelines for producing seed from RAC	21669-Rooted Apical Cuttings of Potato - Good Practices for Planting, Maintenance, Harvesting and Storage of Tubers	-	Completed
		21670-Rooted apical cuttings for on-farm seed production for potato farmers	-	Completed
		22567-Rooted apical cuttings for seed potato production_ General presentation	-	Completed
		22601-Planting and management of potato rooted apical cuttings: a field guide	-	Completed
		24069-Leaflet on best practices of field multiplication of rooted apical cuttings to produce seed potato	-	Completed
		22602-Media articles demonstrating demand for apical cuttings of potato	-	Completed
	4. Methods for effective scaling new of varieties and cuttings	22603-Cecinta Nduru success story: farmer inspires better lives through quality seed potato	-	Completed
		23056-Apical Rooted Cuttings of Potatoes Revolutionized How Generation 1 Seed Potatoes are Produced: Example of Kenyan Farmer James Nderui	-	Completed
		Scaling readiness approach documented	16705-Innovation profile has been completed and is documented	-
		16706-Stakeholder profile has been completed and is documented	-	Completed
		16707-Diagnosis survey has been completed with at least 30 stakeholders and analysis of the results is documented including at least 80% of the key innovation components identified in the surveys	-	Cancelled



Year	Output	Deliverable	Description	Status
		16708-Innovation package described with core and complementary components clearly identified	-	Completed
		16709-Theory of scaling workshop has been conducted with a number of stakeholders that is representative of the diversity identified in the stakeholder profiles and is documented	-	Cancelled
		16710-Theory of scaling document produced using the suggested format	-	Completed
		21672-6-month reflection and learning reports produced and adjustment in plan of work and/or scaling strategy documented	-	Cancelled

## Annex 2. List of potato varieties

Kenya		Uganda	
Clone Number	Common Name	Clone Number	Common Name
CIP 393077.159	Konjo	CIP 393382.14	KACHPOT1
CIP 392797.22	Unica	CIP 393385.39	KACHPOT2 (Sherekea KE)
CIP 393079.4	Lenana	CIP 396038.107	NAROPOT 1
CIP 393371.157	Wanjiku	CIP 396280.82	NAROPOT 2
CIP 398190.200	Nyota	CIP 396034.103	NAROPOT 3
CIP 398208.704	Chulu		