



VIABLE SWEETPOTATO TECHNOLOGIES IN AFRICA (VISTA–Mozambique)

YEAR 5, QUARTER 3 PROGRESS REPORT

1 April–30 June 2019

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Principal Authors: Wellington Jogo, Temesgen Bocher, Eliah Munda, and Maria Andrade

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Contact Information

International Potato Center–Mozambique

P.O. Box 108

3100 Nampula, Mozambique

Tel: +258 87 9079462

Mob: +258 84 6375065

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ACRONYMS

| | |
|-------|--|
| CBO | Community-based organization |
| CIP | International Potato Center |
| DVM | Decentralized vine multiplier |
| HH | Household(s) |
| IIAM | <i>Instituto de Investigação Agrária de Moçambique</i> |
| IEC | Information, education, and communication |
| LVIA | Lay Volunteers International Organization |
| M&E | Monitoring and evaluation |
| OFSP | Orange-fleshed sweetpotato |
| SDAE | District Services of Economics Activities |
| TC | Tissue culture |
| USAID | United States Agency for International Development |
| USG | United States government |
| VISTA | Viable Sweetpotato Technologies in Africa |
| Y5Q3 | Year 5, quarter 3 of the VISTA project |

EXECUTIVE SUMMARY

The executive summary presents the technical progress against the targets of the Viable Sweetpotato Technologies in Africa (VISTA) project for year 5, third quarter (Y5Q3) (1 April–30 June 2019). VISTA is a 5-year project (1 October 2014–30 June 2019) with funding from the United States Agency for International Development (USAID) under the Feed the Future Program. The project is led by the International Potato Center (CIP) and is implemented in partnership with government of Mozambique partners.

The project targets are to reach 65,100 households (HH) directly and 260,050 HH indirectly. The main focus of the project during the Y5Q3 reporting period was on project phase-out activities, including strengthening the capacity of government and development partners to sustain and scale out the orange-fleshed sweetpotato (OFSP) program beyond the VISTA project. To this end, during the reporting period, the project **directly engaged four Instituto de Investigação Agrária de Moçambique (IIAM) Nampula staff—two agronomists, a nutritionist, and a communications specialist**—to implement VISTA project activities. In addition to strengthening the capacity of the national program, this move was helpful in augmenting the capacity of the remaining lean project staff to successfully implement project close-out activities.

On 29 May the project hosted a group of 18 visitors, including 11 US Congressional staffers who traveled to Mozambique for a visit organized by CARE USA. The objective was to provide them a firsthand look at the impacts of US investments in agricultural research and development on rural livelihoods. The project team hosted the visitors at Teterene locality in Meconta District and showcased the project's nutrition activities through drama theater, a demo of child-growth measurements by the nurse from the local health facility, a display of OFSP-based products, and a demo of their preparation. The delegates actively participated in each of the activities.

During the reporting period, **76 decentralized vine multipliers (DVMs)** from the eight intensification districts were given a 2-day refresher training course on sweetpotato agronomy in Nampula. The objective was to refresh their skills on sweetpotato seed multiplication as they continue multiplying vines beyond the life of the project.

In addition to the DVM training, the project trained **six agronomists, two from IIAM and two each from the NGOs World Vision and Lay Volunteers International Organization (LVIA)**. The project strategically targeted these development organizations as a means of ensuring continued OFSP production in some VISTA districts, since they are also working in those areas. Through the skills acquired from this training, the two organizations have cascaded down the training to beneficiaries in their intervention districts of Monapo, Nacala, and Mussoril.

As part of an effort to build the capacity of the national agriculture research systems for sustainability, the project **trained four recently graduated tissue culture (TC) technicians** from the national research center IIAM. The objective was to equip IIAM laboratory technicians with technical skills to produce clean sweetpotato foundation material through TC, which can be further multiplied on-station or supplied to DVMs. This would enable DVMs to regularly replace their material and ultimately be able to further multiply and supply clean planting material directly to farmers or sell to institutional buyers.

The two Mother trials that were established late in the districts of Moma and Larde were harvested during the reporting period. Following the protocol, farmers participated in the harvesting and evaluation of the 22 sweetpotato varieties. In Larde District, the 'Cecilia', 'Delvia', 'Erica', 'Esther', 'Gloria', 'Ininda', 'Ivone', 'Lourdes',

‘Melinda’, and ‘Sumaia’ varieties performed well. However, the results for Moma showed poor performance for all varieties, including the local variety, presumably because the trial was established on poor soils.

To create demand for OFSP, the VISTA project conducted market-level promotion campaigns during market days at major markets in three districts: Monapo (Municipal Market), Murrupula (Nihessiue Market), and Meconta (Namialo Market). **More than 5,000 people attended** the promotion events. Activities carried out during these events included drama by a theatre group demonstrating the health benefits of improved dietary practices; display and tasting of OFSP-based products; distribution of an OFSP recipe book, recipe leaflet, and flyer; disseminating messages on the nutrition value of OFSP; and sales of OFSP roots and vines on the spot.

The messages disseminated during the promotion events focused on the nutritional and health benefits of OFSP, recipes that integrate OFSP with locally available foods, and the importance of consuming OFSP and other nutritious foods for children under 5 and pregnant and lactating women. Additionally, the event **disseminated messages to demystify some misconceptions that are major barriers for nutrition behavior change**, such as the belief that orange-fleshed foods like mango, papaya, and OFSP can cause gastrointestinal problems in children, a belief quite prevalent in most of the project’s intervention districts.

During the 5-year period VISTA was implemented, the sweetpotato yield and production data the project collected were heavily reliant on farmer recall during HH surveys. However, such recall data are unreliable as farmers might not accurately recall production and area planted. This is particularly so when the survey is done long after harvest, and more so in communities where literacy levels are low and farmers do not keep records. To obtain reliable sweetpotato production data, **the project designed and implemented a HH survey of sweetpotato production that adopted a crop-cut approach** to estimate sweetpotato yields. Additionally, the survey had a nutrition module, which collected data on dietary diversity based on 24-hour recall and frequency of intake of vitamin A-rich foods in the last 7 days.

The survey started on 19 June and was expected to end on 30 July 2019. So far, 398 HH have been interviewed, out of a total target sample of 450 HH.

1. PROJECT OVERVIEW

Viable Sweetpotato Technologies in Africa (VISTA)—Mozambique is a 5-year project (1 October 2014–30 June 2019) funded by the United States Agency for International Development (USAID). It is being implemented by the International Potato Center (CIP), in collaboration with government partners, including the *Instituto de Investigação Agrária de Moçambique* (IIAM), the District Services of Economics Activities (SDAE), and the District Services of Health and Women and Social Action, along with NGOs, community-based organizations (CBOs), and education and research institutions.

Initially the project was designed as a 7-year project, which included a 2-year pilot (1 October 2014–30 September 2016) and a 5-year expansion phase (1 October 2016–30 September 2021) that involved scaling out the orange-fleshed sweetpotato (OFSP) project from 6 to 16 districts—11 in Nampula Province¹ and 5 in Zambézia Province.² However, owing to funding cuts, the project duration was reduced to 5 years, from 1 October 2014 to 30 June 2019. Accordingly, the project targets, budget, and work plan were adjusted. Additionally, intervention districts were reduced from 16 to 8,³ and the target number of direct beneficiary households (HH) reached with nutritious OFSP planting material was revised down to 65,100, including the 22,500 reached in the initial 2-year pilot.

VISTA is part of USAID’s Feed the Future Program in Mozambique. The project contributes to the key agriculture and nutrition objectives of the program, including increased and equitable growth in the agriculture sector and improved consumption of vitamin A-rich foods by young children and pregnant and lactating women. VISTA monitors Feed the Future Program indicators for agricultural production, nutrition, incomes, and gender.

The overall goal of the project is to expand production and use of nutritious OFSP among HH with children under 5 and women of reproductive age. In addition to the 65,100 direct beneficiary HH, the project is expected to reach 260,050 HH indirectly with OFSP planting material, knowledge, and skills through farmer-to-farmer diffusion.

VISTA has the following specific objectives:

1. Increased production of OFSP among at least 65,100 direct and 260,050 indirect beneficiary HH through use of productive, locally adapted varieties, quality planting material, and sustainable agricultural practices. This will be achieved through (1) multiplication of planting materials of five improved OFSP varieties, (2) farmer-led varietal demos, (3) marketing and distribution of quality planting materials of preferred varieties, (4) farmer training in sweetpotato agronomy and vine conservation technologies, and (5) operational studies to determine factors affecting production of OFSP among resource-poor HH.

2. Increased consumption of OFSP by children under 5 years of age and women in at least 65,100 beneficiary HH vulnerable to malnutrition. This will be achieved through (1) nutrition training of staff from government and NGOs, with a focus on micronutrient-rich foods; (2) nutrition education in at least 400 communities in target districts; (3) development and promotion of recipes for HH-level OFSP use as a healthy food for all; and (4) broad education campaigns on nutrient-rich foods, including OFSP, through the government health sector.

¹ Angoche, Larde, Malema, Meconta, Mecuburi, Mogovolas, Moma, Monapo, Murrupula, Nampula city, and Rapale.

² Gilé, Alto Molocue, Gurué, Mocuba, and Nicoadala.

³ Murrupula, Monapo, Meconta, Mecuburi, Nampula city, Alto Molocue, Mocuba, and Gurue.

3. Increased agricultural incomes among at least 10,000 HH from sales of OFSP roots, vines, leaves, and processed products in local and urban markets and commercial processing. This will be achieved through (1) training farmers and traders to improve handling, packaging, and transport of fresh roots and leaves; (2) facilitation of OFSP market days (two per target districts) to increase visibility of OFSP and other nutritious foods grown locally; (3) production and promotion of OFSP puree for use in school and community demos and educational activities; (4) technical and management support for use of OFSP puree in commercial food processing, specifically in local bakeries; and (5) demand-creation and consumer awareness campaigns for healthier diets that include OFSP.

2. PROJECT MANAGEMENT

2.1 Scaling Down of CIP Operations in Nampula

During the 5 years of project implementation, the VISTA team operated from two project offices, the main office in Nampula city and a second office in Alto Molocue, which was mainly serving the five target districts in Zambezia province. As reported in the last quarter (Y5Q2), the Alto Molocue office was closed at the end of March 2019. During Q3 activities in the five districts that were served by that office were taken over by government agriculture and health officials (SDAE and District Services of Health and Women and Social Action) whose capacity has been strengthened during project implementation, with technical backstopping from the remaining project staff in the Nampula office. Thus, during the reporting period the project was operating with a skeleton staff of eight—two agronomists, two monitoring and evaluation (M&E) staff, one nutritionist, two finance and administration staff, and the project leader—based in Nampula. Support was provided from the CIP country office in Maputo and the regional office in Nairobi. The main focus of the project during the reporting period was on project phase-out activities, including strengthening the capacity of government and development partners to sustain and scale out the OFSP program beyond the VISTA project. To this end, during the reporting period the project directly engaged four IIAM Nampula staff (two agronomists, a nutritionist, and a communications specialist) in implementation of VISTA project activities. In addition to strengthening the capacity of the national program, this move helped augment the capacity of the remaining lean project staff to successfully implement project close-out activities.

Despite the official closure of the VISTA project on 30 June, institutionally CIP made a strategic decision to maintain its presence in Nampula, albeit at a very low scale of operation. Thus, CIP will continue engaging with its partners in the two northern provinces and mobilizing resources to continue its work in the future.

2.2 Engagement of National Staff from IIAM in VISTA Project Activities

The direct engagement of the four abovementioned IIAM staff in implementing VISTA agronomy and nutrition activities that began in Q2 continued into Q3. During the reporting period the IIAM and CIP agronomists jointly managed sweetpotato planting material in the greenhouse and on-station OFSP multiplication fields. Similarly, the IIAM nutritionist worked jointly with the CIP nutritionist in designing and implementing market-level OFSP promotions during market days in Monapo, Murrupula, and Meconta districts and in evaluating preferences of OFSP for leaf consumption in the districts of Meconta, Murrupula, and Nampula city. The IIAM communications specialist worked closely with the VISTA team in developing nutrition promotion materials such as a recipe book, banner, leaflet, and flyer.

2.3 Field Visit to VISTA Site by US Congressional Delegates

On 29 May the project received 18 visitors, including 11 US delegates who traveled to Mozambique for a visit organized by CARE USA, to get a firsthand look at the impacts of US investments in agricultural research and development on rural livelihoods (Photo 1). The delegation included congressional staffers from Kansas, Maine, New York, Wisconsin, and from the Senate Foreign Relations Committee. The group of visitors also included representatives from the Congressional Research Services, the Bill & Melinda Gates Foundation, the Farm Journal Foundation, and a media representative from Devex. In April the VISTA project nutrition team spent a lot of time working with the women's group in Teterene locality in Meconta District in preparation for the May visit. The VISTA team and the Teterene community members, including the VISTA women's group, received the visitors in the afternoon of 29 May with songs. The CARE team introduced the visitors to the community, and the VISTA project leader gave an overview of the project. Then the women's group performed a short play demonstrating the nutrition behavior change activities of the VISTA project. This was followed by a demo by the community health center nurse on child-growth assessments that are regularly done at the clinic. The women's group members displayed different OFSP-based products, including puree, bread, cake, juice, biscuits, sweets, and leaves. In addition to observing the OFSP products, the delegates were involved in preparing the products and child-growth measurements.



Photo 1. Delegates participate in different activities during the VISTA project site visit.

2.4 Collaboration with World Vision

The World Vision office in Nampula collaborated with CIP–Nampula in developing a concept note for a small research grant to evaluate the impact of a World Vision–led school-feeding program implemented in selected districts of Nampula. The submitted concept note was accepted, and the research will begin after VISTA closure. CIP staff will provide technical support based on a CIP and World Vision memorandum of understanding that is now being processed. This collaborative research effort, if successful, will generate a critical evidence base on the impacts of OFSP intake on not just nutrition outcomes but also on child education that will be useful for evidence-based advocacy for increased investment in OFSP interventions.

2.5 Field Visit with the USAID VISTA Activity Manager and End of Project Stakeholder Workshop

On 20 June the USAID activity manager, VISTA project manager, and agronomist visited the Murrupula District SDAE office and project beneficiary fields (sweetpotato seed producers and root producers) in Murrupula District. During the visit the SDAE officials provided perspectives on how the project has been collaborating with SDAE and the impact the project has had as well as challenges that need to be addressed.

The VISTA project conducted a half-day end-of-project stakeholder workshop on 21 June 2019 at Hotel Milenio in Nampula (Photo 2). The objective of the workshop was to present to stakeholders the main achievements, challenges, and lessons learned from the project and their implications for ongoing and future program design and implementation. Twenty-three participants attended the meeting, including six CIP staff, one representative of the NGO Lay Volunteers International Organization (LVIA), one IIAM representative, 12 SDAE directors from project intervention districts, one representative of the provincial agriculture directorate (Nampula), one consultant, and a USAID activity manager. The VISTA project manager presented the achievements against the targets for all three project components. The districts' directors of agriculture who were present indicated that they were satisfied with the project's achievements in their respective districts, especially the impact they observed on communities under their jurisdiction. As a result, they committed to continue promoting OFSP in their districts. The project presented the varietal evaluation results with district-specific recommendations based on productivity and taste preference by farmers. Finally, the results of the impact assessment study evaluating the nutrition impact of VISTA were presented by the M&E coordinator. The results showed that the project resulted in significant improvements in dietary practices, including dietary diversity, intake of vitamin A-rich foods, and food security.

Photo 2. Participants of the VISTA project close-out workshop in Nampula.

3. ACTIVITY PROGRESS BY PROJECT OBJECTIVES

3.1 Agricultural Component

Achievements under VISTA Objective 1: Increased production of OFSP among at least 65,100 direct and 260,050 indirect beneficiary HH through use of productive, locally adapted varieties, quality planting material, and sustainable agricultural practices.

The main Feed the Future indicators under this objective are:

- EG: 3.2-1: Number of individuals who have received United States government (USG)–supported short-term agricultural sector productivity or food security training
- EG: 3-1: Number of HH benefiting directly from USG intervention
- EG: 3.2-17: Number of farmers and others who have applied improved technologies
- EG.3.2-18: Number of hectares of land under improved technologies
- EG.3.2-20: Number of for-profit private enterprises, producer organizations, and CBOs that applied improved organization-level technologies

Most of these indicators are linked to OFSP vine distribution that occurred at the beginning of the rainy season in January/February. As such, the project achievements for most of the indicators are as reported in the previous quarter (Y5Q2). However, during Q3, the project conducted two trainings that are linked to indicator EG 3.2-1, which are reported below.

3.1.1 Refresher training of decentralized vine multipliers (DVMs) and agronomists

Outputs relative to indicator EG: 3.2-1: Number of individuals who have received USG-supported short-term agricultural sector productivity or food security training

During the reporting period, 76 DVMs from the eight intensification districts were given a 2-day refresher training course on sweetpotato agronomy in Nampula. The objective of the training course was to refresh



their skills on sweetpotato seed multiplication as they continue multiplying vines beyond the life of the VISTA project. During the training DVMs got practical experience in establishing clean planting material in the greenhouse, a skill they can apply in multiplying clean planting material in net tunnels established on their farms with support from the project (Photo 3).

Photo 3. DVM practical learning experience in the greenhouse in Nampula.

In addition to the DVM training, the project trained six agronomists, two from IIAM and two each from the NGOs World Vision and LVIA. The project strategically targeted these development organizations as a means of ensuring continued OFSP production in some VISTA districts, since they are also working in those areas. Through the skills acquired from this training, the two organizations have spread the training to beneficiaries in their intervention districts of Monapo, Nacala, and Mussoril. The trained agronomists have continued to provide technical support to farmers in their respective districts, particularly the DVMs that were established by the VISTA project. The same agronomists have been instrumental in linking farmers to vine markets. The two trained IIAM agronomists acquired skills that they are applying in maintaining OFSP multiplication on-station in the greenhouse and in the open field. Through this effort, the district services of agriculture are assured of a supply of clean sweetpotato planting material from the research station.

3.1.2 Training of IIAM technicians on production of OFSP tissue culture plants

During the reporting period, the project trained four recently graduated tissue culture (TC) technicians from the national research center, IIAM (Photo 4). The objective of the training was to equip IIAM laboratory technicians with technical skills for producing clean sweetpotato planting material through TC. It is hoped that through this training the national research program will be able to produce and supply clean planting material to DVMs, government programs, institutional buyers (which are mostly local and international NGOs implementing OFSP projects in Nampula and Zambezia), and ultimately farmers.



Photo 4. Practical agronomy training session with six extension workers at IIAM in Nampula.

3.1.3 Participatory OFSP variety evaluations in Moma and Larde districts

Participatory variety evaluations for nine VISTA project districts were conducted in Q2, and the results from the evaluations were reported in the Y5Q2 report. However, as trials in the two districts of Moma and Larde were planted late due to late onset of rains, the trials were only ready for harvesting in Q3. Accordingly, the harvesting and evaluation for these two districts was done during the reporting period. Following the protocol, farmers took part in the harvest and yield measurement of the 22 sweetpotato varieties and compared the yields with their local variety. Results from Larde District show that the best-performing varieties above the yield of the local variety were ‘Cecilia’, ‘Delvia’, ‘Erica’, ‘Esther’, ‘Gloria’, ‘Ininda’, ‘Ivone’, ‘Lourdes’, ‘Melinda’, and ‘Sumaia’. During the evaluation exercise, participating farmers collected vines of varieties of their choice for further multiplication based on the yield performance they observed.

In Moma the varietal performance was generally low compared with other districts. Yields for almost all the varieties except ‘Erica’ were below 1 t/ha. Despite the low productivity, farmers still chose ‘Alisha’, ‘Erica’, and ‘Namanga’, as they see potential in these three varieties. The soils on which the trials were established may not have been suitable, as evidenced by the fact that even the local variety did not perform well. Some varieties, such as ‘Bita’, ‘Esther’, ‘Lawrence’, ‘Lourdes’, ‘Melinda’, ‘Tio Joe’, and ‘Victoria’, had problems becoming established in Moma; therefore, no yield data could be obtained (Fig. 1).

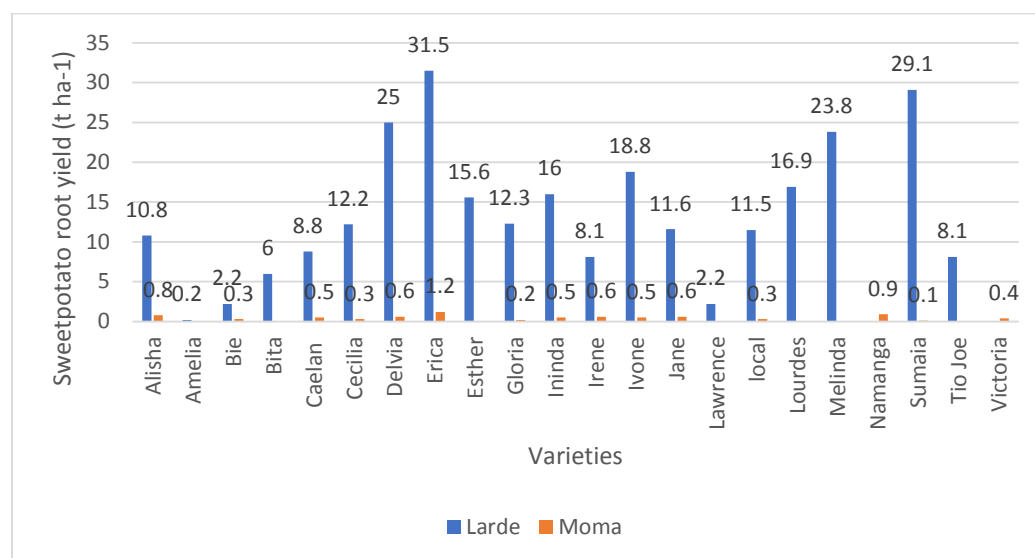


Figure 1 Performance of 22 OFSP varieties in Moma and Larde districts.

3.2 Nutrition Component

Achievements under VISTA Objective 2: Increased consumption of OFSP by children under 5 years of age and women in at least 65,100 beneficiary HH vulnerable to vitamin A deficiency and other forms of malnutrition.

The main Feed the Future indicators under this objective are:

- HL.9-1: Number of children under 5 (0-59 months) reached by USG-supported nutrition programs
- HL.9-2: Number of children under 2 (0-23 months) reached with community-level nutrition interventions through USG-supported programs
- HL.9-4 Number of individuals receiving nutrition-related professional training (RAA) through USG-supported programs

Similar to the Feed the Future indicators under the agriculture component, most of the activities linked to the above indicators were implemented during the rainy season. As such, the project achievements for most of the indicators are as reported in Q2. However, a number of nutrition activities that support these indicators were implemented during Q3 and are reported below.

3.2.1 Product profiling for high-performing varieties

The participatory evaluation process reported in the agriculture component identified the best-performing varieties for yield and farmer preference in terms of taste and other sensory attributes (Photo 5). The top five varieties were ‘Melinda’, ‘Bela’, ‘Cecilia’, ‘Namanga’, and ‘Tio Joe’. During the training of health professionals

that was conducted on 18-19 March and reported in Q2, participants prepared five OFSP-based products—sweets (with coconut), porridge (with peanut), biscuits, juice, and bread—using these five varieties. Participants then evaluated the five products based on five sensory attributes: color, taste, aroma, consistency/texture, and aftertaste, in order to identify which variety is most preferred for each product. A 5-point Likert scale, starting from 1 (*dislike too much*) to 5 (*like too much*), was used for preference ranking of the products. The preparation of the products and preference ranking were done during Q2, but the data were analyzed during Q3.

For making juice ‘Tio Joe’ was the most preferred variety, followed by ‘Bela’; ‘Cecilia’ was the least preferred. In fact, ‘Tio Joe’ was the most preferred variety for all five products. Although ‘Cecilia’ was least preferred for juice, it was ranked second for bread and biscuits. ‘Namanga’ was the second preferred variety for porridge. The top performing variety in terms of yield was ‘Melinda’. However, this variety was not in the top 10 preferred for taste of boiled roots and was also, according to the product profile results, least preferred for biscuits, sweets, and porridge. Thus, of these top varieties, the four varieties that are preferred for taste in boiled form and also for different processed products are ‘Tio Joe’, ‘Cecilia’, ‘Namanga’, and ‘Bela’.



Photo 5. Nutrition training participants evaluating different OFSP processed products.

3.2.2 Designing information, education, and communication (IEC) materials for nutrition education

Nutrition education using OFSP as an entry point is at the center of the project’s behavior change communication and demand-creation strategy. Accordingly, the project’s nutrition education activities include two complementary approaches that focus on trainings and dissemination of IEC materials, either directly to beneficiary HH or to national agriculture and health staff at different levels, such as SDAE officials, nurses, promoters, and designers who then pass the information down to beneficiary HH. During the reporting period, through the strengthened project partnership with IIAM, the IIAM communication specialist, working with the CIP nutritionist, designed a poster on the nutritional value of OFSP, an OFSP recipe book, and recipe leaflets (Photo 6). These were distributed to people during market-level OFSP awareness campaigns conducted during market days.



Photo 6. OFSP recipe leaflet and booklet.

3.2.3 OFSP demand creation through market-level awareness campaigns

To create demand for OFSP, the VISTA project conducted promotion campaigns during market days at major markets in three districts: Monapo (Municipal Market), Murrupula (Nihessiu Market), and Meconta (Namialo Market). Activities carried out during the events included drama by a theatre group demonstrating the health benefits of improved dietary practices; displays and sample tasting of OFSP-based products; distribution of an OFSP recipe book, recipe leaflet and flyer; disseminating messages on the nutritional value of OFSP; and sale of OFSP roots and vines on the spot (Photo 7).

Nutrition messages disseminated during the promotion events focused on the nutritional and health benefits of OFSP, recipes that integrate OFSP with locally available foods, and the importance of consuming OFSP and other nutritious foods for children under 5 and pregnant and lactating women. Additionally, the event disseminated messages to debunk some misconceptions that are major barriers for nutrition behavior change, such as the belief that orange-fleshed foods like mango, papaya, and OFSP can cause gastrointestinal problems in children. This belief is quite prevalent in most of the project's intervention districts.

More than 5,000 people attended the three events, including men, women, boys, and girls. The OFSP product tasting was free, but participants also received products for correctly answering questions posed by the master of ceremonies on the nutritional benefits of OFSP, with priority given to young girls and boys.

In addition to promoting the different OFSP products, the event also promoted consumption of sweetpotato leaves, which are a good source of vitamins, minerals, protein, iron and fiber, all of which are essential for good health, especially for young children and women of reproductive age.

Sweetpotato roots were sold during the event, especially in the districts of Monapo and Meconta, where 470 kg of the 'Irene', 'Melinda', 'Melinda', 'Tio Joe', and 'Cecilia' varieties were sold for a total of 9,400 meticaís. Each buyer tasted two OFSP products of their choice and received the recipe leaflets and flyer.



Photo 7. Participants at the market day OFSP promotion in Monapo, Meconta, and Murrupula districts.

3.3 Marketing Component

Achievements under VISTA Objective 3: Increased agricultural incomes among at least 10,000 HH from sales of OFSP roots, vines, leaves, and processed products in local and urban markets and commercial processing

3.3.1 Linking project DVMs to markets

The 60 signposts that were designed and erected close to DVM multiplication plots in Q2 continued to be a major success in linking DVMs to vine buyers, using the name of the DVM and contact details shown on the sign. During the reporting period the project received several reports from project DVMs who were linked to institutional buyers through contact details obtained from the signs.

3.3.2 Creating market linkages during market-level promotion campaigns

As reported in section 3.2.3 of this report, the project conducted market-level OFSP promotion campaigns during market days in the districts of Monapo, Murrupula, and Meconta. In each of these districts, the project invited project DVMs, project beneficiary HH, and sweetpotato traders who were identified from the market assessment study conducted in Q2 to attend the promotion event. Having them all present during the event enabled value chain linkages to be established between DVMs, root producers, retailers, and consumers.

3.3.3 OFSP root sales on roadside markets

Because OFSP planting material was distributed to project beneficiary HH around February due to a delayed onset of rains, most sweetpotato varieties were not ready for harvest and marketing during the reporting period. However, a few early-maturing varieties, such as ‘Melinda’, were ready for harvest and were available at roadside markets, especially in the major sweetpotato growing regions of Murrupula and Meconta (Photo 8). In general, though, there was very limited marketing of OFSP roots during the reporting period.



Photo 8. Sweetpotato sales along the Murrupula-Maputo highway.

4. MONITORING AND EVALUATION

4.1 Crop-cut Yield Estimation Survey

During the reporting period the VISTA project M&E team designed and implemented an endline survey aimed at gathering sweetpotato production and consumption for a sample of project beneficiary HH. The production component of the survey estimated sweetpotato yields using the crop-cut method. The survey started on 19 June 2019 and was expected to end on 30 July. The survey was administered by 10 enumerators who participated in previous VISTA surveys and were given a 1-day refresher training focusing on the field implementation of crop-cut yield estimation methodology. Two field coordinators and M&E specialists facilitated and provided technical backstopping to the enumerators. The results of the survey will be ready by September and will be reported as part of the VISTA project completion report.

4.1.1 Crop-cut yield methodology

The main objective of the survey was to measure sweetpotato yields (both root and vine yield) under farmer management conditions through two consumption-related modules (i.e., dietary diversity based on 24-hour recall and intake of vitamin A-rich foods based on 7-day recall). Also, a Computer Assisted Personnel Interview app was developed using CSpro for Android and used for the data collection using tablets.

The crop-cut yield estimation component involved measuring and demarcation of a 6-m² area of an experimental plot, harvesting the vines and roots from this demarcated plot, and extrapolating the observed yields to 1 ha. After measuring and demarcating the plot to be harvested, the next step is to count the number of plants on the plot, then cut and weigh the vines to get the above-ground yield. The third step is to harvest the roots and separate them into commercial and noncommercial roots. Finally, both commercial and noncommercial roots are counted and weighed.

The advantage of crop-cut yield estimation, compared with the recall method, is that the area harvested is reliably known and therefore reduces the bias associated with area measurement errors and inability to recall quantities harvested by farmers. A major drawback of the method, however, is that it does not account for postharvest losses and therefore gives a best estimate of the yield but not the economic benefits that can be obtained.

4.1.2 Selection of HH for the survey

As the project team was interested in creating a panel data set to allow for estimation of the impact of the project, the HH for the crop-cut estimation needed to be a subsample of the HH previously interviewed in the 2018 survey. However, finding HH who were interviewed in 2018 and had fields ready for crop cut was not that easy, primarily because at the time of the crop-cut survey, most of the HH interviewed in 2018 did not have sweetpotato plots ready for harvesting because they received vines late due to the delayed onset of rains. Thus, the survey team had to contact all intervention and control HH who were interviewed in 2018 to find out if they planted OFSP and had plots ready for harvesting. After identifying these eligible farmers, the survey team administered the survey on these HH using a structured questionnaire designed and tested using CSpro and conducted the root harvest from the selected field. As of 20 July, crop cuts and HH interviews were conducted for 398 HH. The survey is ongoing until a sample of 450 HH has been reached.

4.1.3 Distribution of surveyed HH

The crop-cut survey collected data from both intervention and control HH who were growing OFSP during the survey period. Crop-cut yield estimation and complementary consumption data were collected from 10 project districts (7 in Nampula, 3 from Zambezia provinces). The distribution of HH interviewed so far is presented in Table 1.

Table 2 presents the percentage of HH interviewed in the crop-cut survey out of the number who were included in the 2018 endline survey. In Mocuba District, 67% of the HH interviewed in 2018 were included in the crop-cut survey, followed by Murrupula and Mogovolas, with 53% and 50%, respectively. The districts with high percentages are those where farmers had grown OFSP and had plots ready for harvest during the crop-cut survey. In districts with low percentages, such as Rapale, farmers either had already harvested their plots, or the plots were not ready for harvest during the time of the crop-cut survey.

Table 1. Distribution of surveyed HH by intervention and control districts

| District | Control | | Intervention | | | |
|--------------|---------------------|---------------------------------------|---------------------|---------------------------------------|------------|------------|
| | Interviewed in 2018 | % included in crop-cut survey in 2019 | Interviewed in 2018 | % included in crop-cut survey in 2019 | Total | % total |
| Nampula city | 0 | 0 | 15 | 100 | 15 | 4 |
| Meconta | 24 | 37 | 41 | 63 | 65 | 16 |
| Mecuburi | 1 | 4 | 26 | 96 | 27 | 7 |
| Mogovolas | 13 | 43 | 17 | 57 | 30 | 8 |
| Monapo | 21 | 53 | 19 | 48 | 40 | 10 |
| Murrupula | 25 | 44 | 32 | 56 | 57 | 14 |
| Rapale | 5 | 26 | 14 | 74 | 19 | 5 |
| Alto Molocue | 26 | 50 | 26 | 50 | 52 | 13 |
| Gurué | 14 | 27 | 38 | 73 | 52 | 13 |
| Mocuba | 10 | 24 | 31 | 76 | 41 | 10 |
| Total | 139 | 35 | 259 | 6 | 398 | 100 |

Table 2. Percentage of HH from 2018 survey interviewed in 2019 by district

| District | 2019 crop-cut survey | 2018 survey | % of 2018 HH included in the crop-cut survey |
|--------------|----------------------|--------------|--|
| Nampula city | 15 | 61 | 25 |
| Meconta | 65 | 193 | 34 |
| Mecuburi | 27 | 72 | 38 |
| Mogovolas | 30 | 60 | 50 |
| Monapo | 40 | 140 | 29 |
| Murrupula | 57 | 108 | 53 |
| Rapale | 19 | 101 | 19 |
| Alto Molocue | 52 | 192 | 27 |
| Gurué | 52 | 174 | 30 |
| Mocuba | 41 | 61 | 67 |
| Total | 398 | 1,162 | 34 |

5. CHALLENGES AND MITIGATION STRATEGIES

The project planned to train staff from the national program (IIAM) on TC at the start of the reporting period. However, the reagents required for the training were not locally available in Mozambique and had to be imported from Kenya through the CIP office in Nairobi. Even then, the procurement and shipping of the reagents took time, which delayed the implementation of the activity. As a result of this delay, the activity was implemented in July. As a result, the project did not have time to monitor whether the national program would start producing sweetpotato TC material before the project ended.

The crop-cut survey was planned to begin and end before the project ended. However, because most of the beneficiary HH received vines around February due to late onset of rains, few HH had plots ready to harvest before June. This delayed the start of the survey, causing its completion to go well after the project end date. Some districts, though, received rains earlier, and beneficiary HH from those districts had already harvested their plots by the time the survey team was dispatched. Initially, the project targeted to reach 600 HH but had to adjust the sample size to 450 in light of these challenges observed on the ground.

Middlemen who are contracted by institutional vine buyers continue to exploit project DVMs by purchasing vines at low prices and bulking them and selling to institutional buyers at higher prices. The project provided DVMs' contact details directly to the institutional buyers with the hope that these institutional buyers will secure vines directly from the DVMs. However, the project team realizes that because of the scattered nature of the individual DVMs, the high transaction costs could be a major barrier to institutional buyers directly sourcing vines from DVMs. Accordingly, the project also encouraged group multiplication and opening up bigger multiplication plots by farmer associations.

The project implemented the close-out activities with a skeleton staff after closing its Alto Molocue office and separating with several staff at the end of March. The project strengthened its partnership with IIAM by directly engaging IIAM staff, a nutritionist, and a communications specialist in VISTA project activities. This is a win-win arrangement. It strengthens the capacity of the IIAM staff, which enhances the sustainability of CIP's work. It also benefited the project in addressing its capacity gap, particularly in the area of communications. The two staff have contributed immensely in strengthening the nutrition and communication activities during the reporting period.

U.S. Agency for International Development

1300 Pennsylvania Avenue, NW

Washington, DC 20523

Tel: (202) 712-0000

Fax: (202) 216-3524

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