Utilising Sweetpotato for Nutrition and Development Inhambane Province

Six-Month Project Technical Report

January–June 2019

Submitted to:
Irish Aid

Submitted by:
International Potato Center (CIP)

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Acknowledgments

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CIP thanks all partners, direct or indirect, for their significant contributions to continue with the project and effective implementation during the first 6 months of 2019.

Special thanks to all CIP technical experts and colleagues for their continuous advice and commitment to supporting the project over its implementation. Finally, we thank all the beneficiaries. It is for them that we measure our achievements and our hope to eliminate food insecurity and improve the nutrition of all households in Inhambane Province.

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ACRONYMS

CHWs	Community health workers
CIP	International Potato Center (*Centro International de la Papa*)
DVM	Decentralised vine multiplier
FCS	Food consumption score
GoM	Government of Mozambique
HDDS	Household dietary diversity score
HH	Household(s)
IDDS	Individual dietary diversity score
LGAs	Local government authorities
M&E	Monitoring and evaluation
OFSP	Orange-fleshed sweetpotato
SDAE	*Serviço Distrital de Actividades Economicas*
SETSAN	*Secretariado Tecnico de Segurança Alimentar e Nutricional*
SO	Specific objective
SWOT	Strengths, weaknesses, opportunities, threats analysis
WDDS	Women's dietary diversity score

EXECUTIVE SUMMARY

Chronic malnutrition remains an important development challenge in Mozambique, despite the sustained efforts by the Government of Mozambique (GoM), partners, and donors such as Irish Aid to address this constraint. Mozambique is among the African countries with the highest malnutrition rates: chronic malnutrition prevalence is 44%, and women of childbearing age and children in the first 2 years of life are particularly affected (SETSAN 2014; Li et al. 2003).[1] Although the northern provinces of Mozambique are considered high production areas, they also have the highest prevalence of malnutrition: Cabo Delgado (50%), Nampula (50%), and Niassa (44%).[2] The southern provinces have the lowest prevalence, but Inhambane Province still has 31% chronic malnutrition.[3] Recognising the importance of malnutrition and micronutrient deficiencies, the GoM has prioritised the improved food and nutrition security national plans and programmes. To date, however, progress in tackling key nutrition indicators such as child stunting and vitamin A deficiency has been less than ideal. One of the approaches that the GoM has recommended is food-based approaches to fight malnutrition, which promotes the production and consumption of biofortified crops, such as vitamin A-rich orange-fleshed sweetpotato (OFSP), that have great potential and offer an opportunity for improving micronutrient intake for the poor, agriculture-dependent households (HH).[4]

It is in this context that the International Potato Center (CIP) and its partners are leading the "Utilising Sweetpotato for Nutrition and Development in Inhambane Province" project to strengthen the capacity of local authorities in planning and accountability, production, utilisation, and consumption of OFSP. Funded by Irish Aid, the project seeks to ensure increased consumption of OFSP by HH with pregnant women and children under 5 years. In 2018 CIP specifically implemented the lessons from Niassa and supported stakeholder efforts to have access to nutritious OFSP varieties through capacity building in planning and delivery of technical services among government staff. In addition, CIP worked with government, private sector, and NGOs to collect ideas for a future 4-year intervention. In 2019 CIP proposed to develop these ideas further and lay the groundwork to support scaling-up of production and utilisation of vitamin A-rich OFSP for improved food and nutrition security beginning in 2020.

CIP's 2019 continuation interim "design phase" continues. It is being implemented by CIP and partners in four districts in Inhambane Province (Massinga, Mabote, Govuro, and Vilankulo) from January 1st to December 31st 2019. From June 25th 2019 an external evaluation and audit evaluated the Niassa and Inhambane project to determine its impact in Niassa and the implementation of lessons from Niassa in Inhambane. The project aims to (1) strengthen the capacity of local government and NGO service providers in Niassa and Inhambane in planning, implementation, and evaluation of agriculture and nutrition interventions in order to overcome malnutrition and poverty; (2) strengthen the contribution of OFSP to food security and dietary diversity for pregnant women and children under 5 in the target communities in Niassa and Inhambane; and (3) increase opportunities for HH in Niassa and Inhambane to increase their family incomes through sale of OFSP and OFSP-based products.

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1. SETSAN. 2014. Relatorio de Estudo de base de seguranca alimentar e nutricional de 2013.
Li, H., Stein, AD., Barnhart, HX., Ramakrishnan, U., and Martorell, R. 2003. Associations between prenatal and postnatal growth and adult body size and composition. *Am J Clin Nutr.* 77(6): 1498–1505.
2. SETSAN. (ibid).
3. SETSAN. (ibid).
4. Forsman, CF. 2014. Fortification of staple foods in Mozambique. Mozambique Support Program for Economic and Enterprise Development (SPEED). USAID report. Maputo, Mozambique.

This report summarises the activities during the first semester 20189 in Inhambane Province. The following activities were carried out:

- A detailed work plan was developed in alignment with the project, extended up to the *Serviço Distrital de Actividades Economicas* (SDAE) technicians after the presentation of 2018 results and lessons.
- Capacity building was carried out and 206 technicians, decentralised vine multipliers (DVMs), and volunteers (101 women) were trained in participatory planning, data collection, OFSP multiplication and production, and nutrition.
- Coordination meetings were held in four districts to present the 2018 results and the lessons learnt and to develop a plan to be implemented by the SDAE partners.
- OFSP varietal retention by farmers, dietary behaviour change, and sweetpotato-cropping systems surveys were conducted in four districts. Forty-seven SDAE technicians who were trained in data collection and participated at the data field collection of 274 HH took part.
- An awareness campaign was conducted in 54 communities as both the first intervention to inform the community about the importance of OFSP and as the first step in the community selection process.
- One net tunnel and one irrigation pump were installed during the project's first 6 months. The other installation and the Triple S (storage in sand and sprouting) will continue in July 2019.
- OFSP vines were distributed to 3,290 HH (58% women) from January to June 30th 2019, where 44% are headed by women; 57% of HH conserved OFSP in lowland according to the survey results. A total of 1,500 HH (59% women) received OFSP vines from April to June 2019 for multiplication and conservation.
- About 4,600kg of OFSP vines were distributed, primarily the 'Sumaia', 'Delvia', 'Irene', 'Namanga', 'Cecilia', and 'Alisha' varieties.
- An investor conference in March, Mozambican Women Day and Massinga City Day in April, Independence Day in June, and the Mozambican president's visit in Inharrime were the events during this reporting period in which DVMs participated.
- Participatory training on nutrition through culinary demos was conducted in one community at each district. Participating were 37 SDAE technicians, five nutritionists at health centres, and 78 community volunteers. Six SDAE technicians already conducted this training in their respective communities with 140 HH participating.

The project supported all communities of direct intervention to produce OFSP vines year-round, and to conserve OFSP planting materials to be ready for planting in the rainy season.

1. INTRODUCTION

Vitamin A-rich, nutritious orange-fleshed sweetpotato (OFSP) varieties are an effective tool for improving nutrition and food security in Mozambique. The International Potato Center (CIP) implemented the "Nutritious Orange-fleshed Sweetpotato for Niassa" project from 2012 to 2016, with financial support from Irish Aid. The project reached 28,000 households (HH) and demonstrated that OFSP production and consumption can lead to increased food security, healthier diets, and increased incomes for poor and vulnerable populations in the province. In response to this success, stakeholders, including provincial and district governments, committed to making OFSP universally available in the province to help reduce food insecurity, malnutrition, and poverty.

OFSP is now well established in Niassa and is therefore considered one of its main crops, as explicitly mentioned in Objective 4 of the *Multi Sectorial for Chronic Malnutrition Action Plan (Plano de Acção Multi-sectorial para a Redução da Desnutrição Crônica)*, led by the technical secretary for food security and nutrition (*Secretariado Tecnico de Seguranca Alimentar e Nutricional* (SETSAN). Now planting material of OFSP varieties is multiplied in all the districts of Niassa Province under the government initiative after the project left to Inhambane to start a similar programme. With additional support CIP intends to return to Niassa to work on markets.

CIP temporarily closed its Niassa office; all staff were moved to Inhambane Province in mid-April 2018. CIP is continuing a 2-year implementation project (ie, "Utilising Sweetpotato for Nutrition and Development in Inhambane Province") to support demand for OFSP in Inhambane Province and to implement the lessons learnt from Niassa. During this second year CIP continued to strengthen the capacity of provincial and district institutions to plan, implement, and evaluate agriculture and nutrition interventions to overcome malnutrition and food insecurity.

2. PROJECT BACKGROUND

2.1 OVERALL OBJECTIVE OF THE PROJECT

The purpose of this interim phase is to enable local government authorities (LGAs) and private sector stakeholders to make better investments in nutrition-sensitive agriculture, using OFSP as an entry point.

The three specific objectives (SOs) and main activities of this phase are:

SO 1: Strengthen the capacity of LGAs and NGOs for planning, implementation, and monitoring, using a participatory "planning-implementation-learning cycle" approach on OFSP value chains in Inhambane Province

1.1 Capacity of stakeholder programming and coordination activities in the OFSP value chain developed

- 1.1.1 Conduct participatory training for technicians in planning, implementation, data collection, and monitoring and evaluation (M&E)
- 1.1.2 Conduct participatory training for technicians, DVMs, and school teachers in OFSP production techniques, management, and coordination
- 1.1.3 Facilitate stakeholder coordination activities in the OFSP value chain at all levels

1.2 Stakeholder M&E in the OFSP value chain at all levels facilitated

- 1.2.1 Joint M&E surveys/studies on OFSP varietal retention by farmers, dietary behaviour change, and sweetpotato-cropping systems in Inhambane together with SDAE technicians
- 1.2.2 Conduct yield assessment
- 1.2.3 Facilitate development and dissemination of clear M&E indicators to be used for project planning, implementation, and M&E of government OFSP programmes

SO 2: Strengthen the contribution of OFSP to food security and dietary diversity of pregnant women and children under 5 in the target communities

2.1 Intervention communities in Inhambane identified in September and October 2018 sensitised

2.1.1 Develop training material for nutrition-based agriculture

2.1.2 Conduct awareness campaign about OFSP advantages

2.1.3 Select the interested communities and prioritise pregnant women and HH with children under 5 years

2.2 OFSP planting material multiplied and conserved during the dry season

2.2.1 Introduce and establish net tunnels, irrigation pumps, and Triple S (storage in sand and sprouting) in selected communities

2.2.2 Support farmers in conserving OFSP-planting material during the dry period

2.2.3 Produce planting material for distribution and sales

2.2.4 Establish demo plots at each new decentralised vine multiplier (DVM) and in one school per district

2.3 Planting material of preselected varieties distributed to 10,000 smallholder HH with children under 5 and/or pregnant women

2.3.1 List the interested beneficiaries during the awareness campaign

2.3.2 Distribute OFSP vines to the interested beneficiaries preceded by vine conservation and nutrition sensitisation

2.3.3 Participate in diverse events for OFSP awareness and vine distribution

2.4 Consumption of OFSP as an affordable source of vitamin A promoted to community with emphasis on pregnant women, children under 5, and at primary schools in the target districts

2.4.1 Conduct participatory training on nutrition

2.4.2 Organise culinary demos and contests

SO 3: Increase the opportunities for improving HH income from sale of OFSP roots and leaves and OFSP-based products in Inhambane

3.1 Traders and vendors in at least two local markets per district improved availability of and access to OFSP

3.1.1 Identify potential OFSP traders and vendors interested at different levels

3.1.2 Conduct a participatory market analysis at the local market—that is, strengths, weaknesses, opportunities, threats (SWOT) analysis

3.1.3 Train traders and vendors and implement pilot marketing activities

3.1.4 Support HH and associations in year-round production of OFSP

3.2 At least 50% of trader and vendor participants generate at least $200 income from sales of OFSP (roots and leaves)

3.2.1 Conduct production and market surveys to evaluate the availability of and access to OFSP

3.2.2 Monitor the quantity and price of roots and leaves sold over the year

2.2 TARGET AREA/GROUP

The principal target groups have been poor, rural women and their young children (aged 6–59 months) in four districts in Inhambane Province (Massinga, Mabote, Govuro, and Vilankulo) (Fig. 1).

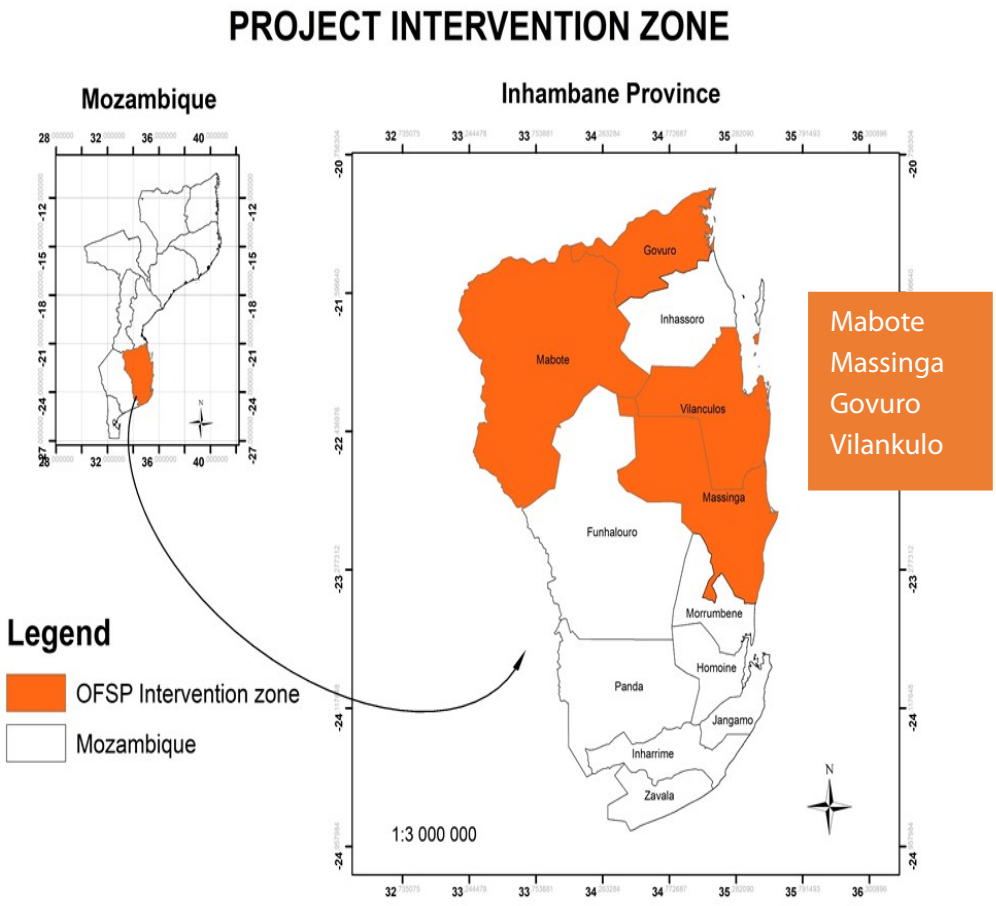

Figure 1. Intervention zones in Inhambane Province.

Attention was also given to other HH members who were considered influencers of adoption and behaviour change. These included men (influential community leaders, husbands) and mothers-in-law, who often have a considerable say in child-caring practices. This approach helped to ensure that all HH members understood the importance of investing in nutrient-rich crops and providing good child-caring practices. The project targets selected villages with at least 200 HH to ensure a strong impact at scale and for community-level intervention, and to contribute to reducing malnutrition at intervention level.

The target groups were involved in (1) participatory planning for planting of OFSP varieties, (2) capacity building, (3) nutrition education, and (4) HH participation during awareness campaigns.

2.3 Main Activities and Achievements for the First 6 Months of 2019

Table 1 summarises the main activities and achievements for the project "Utilising Sweetpotato for Nutrition and Development in Inhambane Province" during this reporting period.

Table 1. Main project activities planned and achievements made in first 6 months of 2019

Narrative	Indicators and Targets	Progress in First Six Months of 2019
Goal: To contribute to improved food security, nutrition, and rural income opportunities in Inhambane Province of Mozambique		
Purpose: To enable LGAs and private sector stakeholders to make better investments in nutrition-sensitive agriculture, using OFSP as the entry point		
Objective 1: Strengthen the capacity of LGAs and NGOs for planning, implementation, and monitoring using a participatory "planning-implementation-learning cycle" approach on OFSP value chain in Inhambane Province		
Outcome 1.1 Capacity of stakeholder programming and coordination activities in the OFSP value chain developed		• 206 technicians, DVMs, schoolteachers, and volunteers for nutrition trained in participatory planning, data collection, OFSP multiplication and production, and nutrition in 4 districts of Inhambane • 4 coordination meetings held in the 4 districts—2 in Massinga and Vilankulo and 1 each in Govuro and Mabote—during the first 6 months of 2019
Activity 1.1.1 Conduct participatory training for technicians in planning, implementation, data collection, and M&E	At least 40 technicians trained	• 48 technicians (16 women) in 4 districts of Inhambane trained in participatory planning, implementation, and OFSP vine multiplication and production • 49 technicians (17 women) trained in data collection
Activity 1.1.2 Conduct participatory training for technicians, DVMs, and schoolteachers in OFSP production techniques, management, and coordination	At least 40 technicians, 30 DVMs, and 8 schoolteachers trained	132 technicians, schoolteachers, and DVMs (48 women) trained in OFSP vine multiplication and production: • 44 technicians (13 women) trained in OFSP vine multiplication and production • 4 schoolteachers (all men) trained in OFSP vine multiplication and production • 84 DVMs (33 women) trained in OFSP vine multiplication and production
Activity 1.1.3 Facilitate stakeholder coordination activities in the OFSP value chain at all levels	At least 12 coordination meetings facilitated	5 coordination meetings held in the 4 districts—2 in Vilankulo and 1 each in Govuro, Massinga, and Mabote—where we presented the results of 2018's activities
Outcome 1.2 Stakeholder M&E in the OFSP value chain at all levels facilitated		
Activity 1.2.1 Joint M&E surveys/studies on OFSP varietal retention by farmers, dietary behaviour change, and sweetpotato-cropping systems in Inhambane together with SDAE technicians	At least 160 (4 per technician) surveyed	Survey data were collected from 274 HH in 8 localities by 47 SDAE technicians (17 women): 62 HH in Vilankulo, 77 in Govuro, 54 in Mabote, and 81 in Massinga: • The last 2 years HH growing OFSP increased from 77% to 88% • 89% % of HH continue to produce OFSP (96% in Govuro, 100% in Mabote, 81% in Massinga, and 82% in Vilankulo) • 19 OFSP varieties were mentioned by HH, including 'Irene' (36%), 'Sumaia' (16%), 'Delvia' (12%), 'Namanga' (9%), and 'Alisha' (4%) • Average OFSP plot: 86m^2 and average OFSP yield of 11.2 t/ha • 76% of children have access to vitamin A-rich food • Individual dietary diversity score (IDDS) under 60 months reference: 5.6 • Women's dietary diversity score (WDDS)15–49 years: 5.3 • Household dietary diversity score (HDDS): 7.2

Narrative	Indicators and Targets	Progress in First Six Months of 2019
		• Poor food consumption score (FCS): Child 6.9% • 35% received incomes from OFSP roots
Activity 1.2.2 Conduct yield assessment	At least 120 yield assessments conducted	• 20 yield assessment with 'Namanga', 'Sumaia', 'Delvia', 'Irene', and 'Alisha' varieties realised • Yield ranged from 5 to 42 t/ha with an average of 12 t/ha
Activity 1.2.3 Facilitate development and dissemination of clear M&E indicators to be used for project planning, implementation, and M&E of government OFSP programme	Indicators for the project/ programme in government set	• Yield from measurement of area and production • Dietary diversity score for Household, women, and children and FCS • Vitamin A knowledge and intake • Income
Objective 2: Strengthen the contribution of OFSP to food security and dietary diversity of pregnant women and children under 5 years in the target communities in Inhambane Province		
Outcome 2.1 Intervention communities in Inhambane identified in September and October 2018 sensitised	At least 40 new communities sensitised	54 communities identified by 48 technicians for interventions: 14 in Govuro, 10 in Mabote, 14 in Massinga, and 16 in Vilankulo
Activity 2.1.1 Develop training materials for nutrition-based agriculture	400 copies of training material developed and distributed	• 100 training materials printed and distributed to DVMs and community leaders • 100 leaflets on nutrition printed for the community volunteers
Activity 2.1.2 Conduct awareness campaign about OFSP advantages	One awareness campaign per technician	48 technicians conducted awareness campaign in 4 districts: 14 in Govuro, 10 in Mabote, 14 in Massinga, and 16 in Vilankulo
Activity 2.1.3 Select the interested communities and prioritise pregnant women and HH with children under 5 years	At least 1 community per technician selected	• 54 direct intervention communities selected: 14 in Govuro, 10 in Mabote, 14 in Massinga, and 16 in Vilankulo • Pregnant women and HH with children under 5 years to be prioritised
Outcome 2.2 OFSP planting material multiplied and conserved during the dry season	OFSP vines available at DVMs	
Activity 2.2.1 Introduce and establish net tunnels, irrigation pumps, and Triple S in selected communities	• No. of DVMs trained • 3 net tunnels installed • 3 irrigation pumps installed • At least 20 Triple S established	• 83 DVMs (33 women) trained in OFSP vine multiplication and production: 15 in Govuro (6 women), 27 (16 women) in Mabote, 28 in Massinga (8 women), and 13 in Vilankulo (3 women) • 1 net tunnel installed • 1 irrigation pump installed
Activity 2.2.2 Support farmers in OFSP planting material conservation during the dry period	No. of participants	• 57% of HH conserved OFSP in lowlands according to the survey results • 1,500 HH (59% women) received OFSP vines in April–June 2019 for multiplication and conservation

Narrative	Indicators and Targets	Progress in First Six Months of 2019
Activity 2.2.3 Produce planting material for distribution and sales	At least 5,000kg of OFSP vines distributed	• 11 DVMs (2 women) supplied OFSP vines during the first 6 months: 6 (2 women) in Govuro, 1 in Mabote, 3 in Massinga, and 1 in Vilankulo • Govuro DVMs were more motivated because some of them sold OFSP vines at 9 MZN/kg in response to the emergency caused by Cyclone Idai, where one of them produced almost 4 tonnes (t) • About 4,600kg of vines distributed
Activity 2.2.4 Establish demo plots at each new DVMs and in 1 school/district	• At least 40 demos at DVMs • At least 4 demos at schools	• 56 demos were established at DVMs: 36with organic fertiliser and 20 on rapid multiplication • 2 demos established at primary schools
Outcome 2.3 Planting material of selected varieties distributed to 10,000 smallholder HH with children under 5 years and/or pregnant women	At least 10,000 HH with children under 5 years received OFSP vines	
Activity 2.3.1 List the interested beneficiaries and received OFSP vines during the awareness campaign	At least 10,000 beneficiaries received OFSP vines	• 3,290 of HH (58% women) received OFSP vines from January to June 2019 • 74% of HH (58% women) have 5,524 children under 5 years • 97% of HH (84% women) have 5,412 women in reproductive age (15–49 years) • 44% of HH are headed by women
Activity 2.3.2 Distribute OFSP vines to the interested beneficiaries preceded by vine conservation and nutrition sensitisation	• Name & no. of varieties • Quantity of OFSP vines	• 6 varieties: 'Sumaia', 'Delvia', 'Irene', 'Namanga', 'Cecilia', and 'Alisha' were the most distributed • About 4,600kg of OFSP vines were distributed
Activity 2.3.3 Participate in diverse events for OFSP awareness and vine distribution	No. of events (field days, fairs, etc)	• DVMs supported by CIP and SDAE participated in investors conference in Massinga • DVMs sold their OFSP roots during Mozambican Women Day, Massinga City Day, Independence Day, and during the Mozambican president's visit in Inharrime; CIP invited by the provincial director of agriculture
Outcome 2.4 Consumption of OFSP as an affordable source of vitamin A promoted to community with emphasis on pregnant women, children under 5, and at primary schools in the target districts	% of HH improving their diet	
Activity 2.4.1 Conduct participatory training on nutrition	• At least: 40 technicians trained; 10 volunteers/ technician trained; and 10 HH assisted by each volunteer	• 37 SDAE technicians (14 women) participated on nutrition training through culinary demos • 5 nutritionists from health centre supported the training • 78 volunteers (55 women) at 4 communities participated in culinary demos

Narrative	Indicators and Targets	Progress in First Six Months of 2019
Activity 2.4.2 Organise culinary demos and contests	At least 160 HH (40/ district) participated)	• 6 SDAE technicians facilitated 7 culinary demos in 7 communities with the participation of 140 volunteers (119 women); the culinary contest will be in October
Objective 3: Increase the opportunities for households in Niassa and Inhambane to increase their family incomes through sale of OFSP and OFSP-based products		
Outcome 3.1 Traders and vendors in at least 2 local markets per district improved availability of and access to OFSP	No. of active traders and vendors	
Activity 3.1.1 Identify potential OFSP traders and vendors interested at different levels	No. of potential traders and vendors identified	18 actual DVMs in Massinga, Vilankulo, and Govuro were identified as vendors
Activity 3.1.2 Conduct a participatory market analysis at the local market (SWOT analysis)	No. of participants	Will be realised during the second 6-month period of 2019
Activity 3.1.3 Train traders and vendors and implement pilot market activities	No. of participants	Will be realised during the second 6-month period of 2019
Activity 3.1.4 Support HH and associations for year-round production of OFSP	At least 40 HH and associations produced OFSP all year round	• 18 DVMs planted every month from January at least 3 times • 3 associations with 65 members planted continuously
Outcome 3.2 At least 50% of traders and vendors participants generate at least $200 income from sales of OFSP (roots and leaves)	• % of participants • Average of income	
Activity 3.2.1 Conduct production and market surveys to evaluate the availability of and access to OFSP	At least 160 HH (40/ district) surveyed	• 274 HH surveyed: 38% of HH sold roots and vines and received an average income of $23 ($17–27) and 30% of HH sold roots
Activity 3.2.2 Monitor quantity and price of roots and leaves sold over the year	At least 20 markets surveyed continuously	• 48 data sheets shared with SDAE technicians • 11 SDAE technicians registered prices at implementation done in collaboration with SDAE • Price ranged from 15 to 60 MZN[5] from January to June, depending on variety, period, and market • OFSP came from Chimoio and each district

5. 60 MZN = $1

3. PROJECT MANAGEMENT AND PARTNERSHIPS

3.1 STAFF STRUCTURE

CIP managed the project from Massinga district in Inhambane Province to focus exclusively on its four districts. The project is supported by one driver and one agronomist, thus ensuring the field supervision and the monitoring, learning, and evaluation during the first 6 months of 2019.

3.2 PARTNERSHIPS

The main partners for this phase are the provincial and district government departments, SETSAN, and local NGOs supported in their initiatives by the project. The health department, nutrition section, and the education department at district level are among the implementing partners.

- **Provincial Directorate of Agriculture and Food Security** through SETSAN and SDAE:
  - **SDAE** in four districts in Inhambane are involved in the project. Fifty technicians (18 women) participated directly in the implementation of project activities. SDAE technicians ensured the direct community sensitisation, vine multiplication, and dissemination of OFSP varieties at district level under CIP staff supervision. Some 49 extension agents and supervisors (17 women) participated in variety adoption, nutrition, and data collection from market surveys in Massinga, Mabote, Govuro, and Vilankulo.
  - **SETSAN** in Inhambane has begun to place focal points in the districts which need capacity building in order to be operational and to monitor the food security and nutrition situation at district level.
- **Provincial Directorate of Health**. Nutrition specialists involved in the project helped disseminate nutrition messages to communities in Inhambane Province (the same task was also supposed to be done by SETSAN focal points). The hospital in Govuro and the health centre in Mapinhane are the most active. SDMAS–Govuro participated in nutrition training through culinary demos.
- **GAPI** has begun to collaborate with the project in Vilankulo district through one association under their supervision soliciting OFSP vines for multiplication in May 2019.

3.3 MONITORING AND EVALUATION

The field technician participated in the monitoring, learning, and evaluation community of practice in Entebbe Uganda in February 2019. The questionnaire for the variety adoption, nutrition, and market surveys was reviewed in collaboration with Nairobi. Data were collected and are being cleaned. In the field, continuous monitoring is undertaken to assess the progress of the project. Five focus groups in data collection were also carried out in four communities with 18 men and 12 women.

3.4 EVENTS

The project participated through DVMs in four main events in Massinga and Inharrime. These consisted of Mozambican Women's Day, an investors conference in March, and Massinga City Day in April (all in Massinga) and the visit in June by the Mozambican president in Inharrime, at which DVMs from Massinga sold their OFSP roots.

3.5 COORDINATION

The project is coordinated at district level where the solicitation to the meeting at the provincial level was not yet done. Four coordination meetings were held in four districts during the first 6 months of 2019; the project implementation in 2018 and the planning for 2019 were presented.

4. PROJECT PROGRESS: IMPLEMENTED ACTIVITIES AND OUTPUTS ACHIEVED AGAINST WORK PLAN

In 2019 21 activities out of 23 programmed under the project's three SOs were initiated. The project worked closely with the district leaders during this reporting period. About 3,290 HH in 54 communities were covered by OFSP vine distributions in four intervention districts for Inhambane Province (ie, Mabote, Massinga, Govuro, and Vilankulo).

4.1 SO 1: Strengthen the Capacity of LGAs for Planning, Implementation, and Monitoring, Using a Participatory Planning-Implemention-Learning Cycle Approach to the OFSP Value Chain

Capacity building concerns mainly the extension system, the DVMs, and the volunteers for nutrition at community level. All public sector extension agents and NGOs in the districts working on food security and nutrition were involved in strengthening the system. In the four districts of Inhambane Province, 206 technicians, DVMs, and volunteers (101 women) were trained in participatory planning, data collection, OFSP multiplication and production, and nutrition. Four activities under two outcomes were undertaken to achieve this SO.

4.1.1 Capacity of stakeholder programming and coordination activities in the OFSP value chain developed

Conduct participatory training for technicians in planning, implementation, data collection, and M&E

The trainings started at the end of February 2019 and continue. Fifty technicians (18 women) took part in different trainings to strengthen the extension system in each intervention district. The evaluation of technicians showed low learning skills for most of them despite the opportunities.

- Forty-eight SDAE technicians (16 women) were trained in OFSP participatory planning, implementation, and M&E facilitated by a CIP staff team. An individual work plan was developed and used by the technicians for 2019.
- Forty-nine SDAE technicians (17 women) were trained in data collection and participated in survey data collections on variety adoption. A nutrition and market survey was conducted in four districts with 274 HH.

Conduct participatory training for technicians, DVMs, and schoolteachers in OFSP production techniques and management

OFSP production techniques and management training covers different topics, from field preparation to post-harvest management. Topics included land preparation; planting material selection; plantation; soil fertility management for sweetpotato production, including the use of organic fertilisation for sustainable crop production; irrigation in case of planting during the dry season; pest management; and harvest. Taking into account the lessons from 2018, immediate field participatory trainings were more effective for DVMs.

- Forty-four SDAE technicians (13 women) were trained in OFSP vine multiplication and conservation; 13 technicians (2 women) in Govuro, 11 technicians (6 women) in Mabote, 12 technicians (4 women) in Massinga, and 8 technicians (1 woman) in Vilankulo were trained. These technicians in turn helped to train DVMs.
- Four schoolteachers (all men) participated in OFSP vine multiplication and conservation.
- Eighty-four old and new DVMs (33 women) took part in participatory OFSP vine multiplication training and conservation in four districts: 16 DVMs (6 women) in Govuro, 27 DVMs (16 women)

in Mabote, 28 DVMs (8 women) in Massinga, and 13 DVMs (3 women) in Vilankulo. The trainings were conducted immediately in the field.

Facilitate stakeholders' coordination activities in the OFSP value chain at all levels

Coordination meetings were organised in each district in February and June 2019 to present the results from 2018, to discuss the 2019 activity lines, and the balance for the first 6 months of 2019.

- Five coordination meetings were organised, one at each district except in Vilankulo.
- Fifty-one SDAE technicians and supervisors (19 women) participated: 16 (4 women) in Govuro, 4 (3 women) in Mabote, 18 (9 women) in Massinga, and 13 (3 women) in Vilankulo.
- Other coordination meetings will be organised during the second 6-month period.

4.1.2 Stakeholder M&E in the OFSP value chain at all levels facilitated

Joint M&E surveys/studies on OFSP varietal retention by farmers, dietary behaviour change, and sweetpotato-cropping systems in Inhambane together with SDAE technicians

OFSP varietal retention by farmers, dietary behaviour change, and sweetpotato-cropping systems surveys were conducted in four districts. SDAE technicians who were trained in data collection and participated at the data field collection were also involved.

- Out of 49 technicians trained in data collection, 47 participated in survey data collection. The number of HH surveyed per technician was 3–11, or an average of 6 HH per technician.
- A total of 274 HH were surveyed by 47 SDAE technicians (17 women): 62 HH in Vilankulo, 77 in Govuro, 54 in Mabote, and 81 in Massinga.
- In the last 2 years, HH growing OFSP increased from 77% to 88%.
- Some 89% of HH kept OFSP varieties and continued to produce, with 96% in Govuro, 100% in Mabote, 82% in Massinga, and 82% in Vilankulo.
- HH mentioned that they continued to produce 19 OFSP varieties of which the top five were 'Irene' (mentioned by 36% of HH), 'Sumaia' (16%), 'Delvia' (12%), 'Namanga' (9%), and 'Alisha' (4%).
- The average OFSP yield was 11.2 t/ha, with an average plot of 862m^2/HH.
- Access to better, vitamin-A rich food improved between the baseline and the survey:
  - 76% of children have access to vitamin A-rich food, better than the baseline results of 40%
  - IDDS under 60 months reference: 5.6
  - WDDS (15–49) years: 5.3
  - HDDS: 7.2
  - Poor FCS: Child 6.9%
- 35% received incomes from OFSP roots: 26% received from roots and 9% from vines.

Conduct yield assessment

Owing to the inconsistency of the weather, most of the farmers delayed planting their OFSP. Some data were collected from DVMs and continue as the rain continues until June. (The rains were irregular in January–March.)

- Twenty yields were measured, ranging from 5 to 42 t/ha, with an average of 12 t/ha.
- 'Namanga', 'Sumaia', 'Delvia', 'Irene', and 'Alisha' varieties were measured.
- The yield measurement will continue during the second 6 months of 2019.

Facilitate development and dissemination of clear M&E indicators to be used for project planning, implementation, and M&E of the government's OFSP programme

The project is helping the SDAE team realise the importance of M&E and data records to measure the project's progress. Each technician has a plan to measure what they undertake in his/her respective community.

- An annual plan was developed to record all activities and all indicators needed from the sensitisation events and community selection.
- Forty-eight technicians (17 women) recorded field information to assess progress.

4.2 SO 2: Strengthen the Contribution of OFSP to Food Security and Dietary Diversity of Pregnant Women and Children Under 5 in the Target Communities

Twelve related activities under four outcomes were carried out to achieve this SO.

4.2.1 Intervention communities in Inhambane identified in September and October sensitised

Develop training materials for nutrition-based agriculture

The project increased the number of training materials printed on topics such as vine multiplication and nutrition-based agriculture; a leaflet was created for an awareness campaign.

- Two-hundred additional training materials were printed and will be distributed to the DVMs and leader communities: 100 for DVMs and community leaders and 100 related to nutrition for the community volunteers. The health leader in the community should be involved.

Conduct awareness campaign about advantages of OFSP

The intervention at community level started with a focus on sensitisation and awareness. The project uses the materials developed for message dissemination.

- Forty-eight technicians conducted an awareness campaign and conducted trainings in four districts. Fifty-four communities were reached through the campaign.

Select the interested communities and prioritise pregnant women and HH with children under 5

The project selected 54 communities for intervention: 14 in Govuro, 10 in Mabote, 14 in Massinga, and 16 in Vilankulo. Once they were aware of the importance of OFSP, these communities were willing to produce OFSP.

4.2.2 OFSP planting material multiplied and conserved during the dry season

The best way to get planting material at the appropriate time for the most vulnerable HH during the planting season is through vine conservation at community level, both by the HH themselves and by the nearest DVMs.

Introduce and establish net tunnels, irrigation pumps, and Triple S in selected communities

New technologies are introduced to conserve OFSP vines such as the use of net tunnels, irrigation pumps, and Triple S.

- One out of three net tunnels is already installed in Govuro.
- One out of three irrigation pumps is already installed in Govuro at the DVM who supplied 4,000kg of OFSP vines to in response to the emergency situation caused by Cyclone Idai.
- Triple S will be started in July to reduce the time of conservation until the planting period.

Support farmers in the conservation of OFSP planting material during the dry period

This year the rains were very irregular: there was rain in June but very little in January–March. The project distributed OFSP vines in small quantities for two reasons. First, OFSP planting material was multiplied and conserved during the dry season by HH who keep their own small plots in the garden or in lowlands during the dry period (May–October). Second, HH will multiply the vines and are used to doing so every year from their planting material after harvest.

- 57% of HH conserved OFSP in lowlands according to the survey results.
- A total of 1,500 HH (59% women) received OFSP vines in April–June 2019 for multiplication and conservation.

Produce planting material for distribution and sales

DVMs are supposed to produce OFSP vines continuously. However, climate change affects significantly the possibility of planting from October, in which any water source was available for the lowlands and farmers were not able to grow any crop.

- Eleven DVMs (2 women) supplied OFSP vines during the first 6 months of 2019: 6 (2 women) in Govuro, 1 in Mabote, 3 in Massinga, and 1 in Vilankulo.
- Govuro DVMs were more motivated because some of them sold OFSP vines at 9 MZN/kg in response to the emergency situation caused by Cyclone Idai. One DVM produced almost 4 t.

Establish demo plots at each new DVM and in one school per district

Demos are part of field schools for DVMs. Owing to the critical climatic situation for this first 6-month period of 2019, demos take other forms such as continuous planting.

- Thirty-six DVMs established variety and organic fertiliser demos.
- Twenty DVMs used rapid multiplication for OFSP vine multiplication.
- Two primary schools multiplied OFSP vines and produced OFSP roots.

4.2.3 Planting material of pre-selected varieties distributed to 10,000 smallholder HH with children under 5 and/or pregnant women

Distribution occurs over the year for production as well as for multiplication and conservation.

List the interested beneficiaries during the awareness campaign

Awareness campaigns preceded the distribution of OFSP vines and could be undertaken any moment of the year when the community could exercise a participatory-planning process. The first awareness campaign informed the community of the importance of OFSP. The interested members registered for and took part in the second sensitisation meeting, committing to a participatory-planning process.

- Forty-eight SDAE technicians carried out 54 awareness sessions in 54 communities: 14 in Govuro, 10 in Mabote, 14 in Massinga, and 16 in Vilankulo.
- A total of 3,290 HH (59% women) received OFSP vines from January to June 2019.
- A total of 74% of HH (58% women) have 5,524 children under 5 years.
- A total of 97% of HH (84% women) have 5,412 women of reproductive age (15–49 years).
- Some 44% of HH are headed by women.

Distribute OFSP vines to the interested beneficiaries preceded by vine conservation and nutrition sensitisation

About 4,600kg of OFSP vines were distributed in January–June 2019 in this reporting period; this activity will continue until December 2019. The distribution starts with small quantities to develop the mindset of multiplication and conservation. To date:

- The six most distributed varieties were 'Sumaia', 'Delvia', 'Irene', 'Namanga', 'Cecilia', and 'Alisha'.
- A total of 3,290 of HH (58% women) received OFSP vines until June 30th 2019.

Participate in diverse events for OFSP vine distribution

During the first 6 months of 2019, five important events were organised in Massinga and Inharrime. DVMs under CIP and SDAE leadership and support displayed and sold OFSP vines and roots. The events consisted of:

- An investors conference in Massinga district on March 5th 2019, where three DVMs presented and sold OFSP roots and vines.
- Mozambican Women's Day on April 8th 2019, where five DVMs sold OFSP roots.
- Massinga City Day on April 21st 2019, where five DVMs sold OFSP roots.
- Independence Day on June 25th 2019, where six DVMs sold OFSP roots.
- One DVM displayed and sold his best OFSP harvest during the visit by the Mozambican president in Inharrime.

4.2.4 Consumption of OFSP as an affordable source of vitamin A promoted to community with emphasis on pregnant women, children under 5, and at primary schools in the target districts

Conducting participatory training on nutrition

This first 6-month period of 2019 participatory training on nutrition was conducted in one community in each district. Participating were SDAE technicians, nutritionists at health centres, and community volunteers. Communities came with their food basket to be prepared and put together for the participatory practical training on appropriate diets for 1 day.

- Thirty-seven SDAE technicians (14 women) participated and facilitated the training of volunteers at community level through culinary demos which incorporated OFSP roots and leaves. Participating technicians comprised 12 (2 women) in Govuro, 8 (4 women) in Mabote, 6 (5 women) in Massinga, and 11 (3 women) in Vilankulo.
- Seventy-eight volunteers (55 women) participated in May–June in this participatory process.
- Five nutritionists from health centres participated in the culinary demos.
- Less than 5% of community members know about the diversified uses of OFSP roots.
- OFSP mixed with groundnut was the dish most appreciated by participants.

Organise culinary demos and contests

After the participatory training led by CIP at one community in each district, all SDAE technicians were advised to replicate what they had learnt to other communities under their responsibility.

- Six SDAE technicians facilitated seven culinary demos; 140 volunteers (119 women) participated in seven communities: two each in Govuro, Massinga, and Vilankulo and one in Mabote.
- The contest will be held in October 2019, at which each participant will use his/her own products, including OFSP.

4.3 SO 3: Increase the Opportunities for Improving HH Income from Sales of OFSP Roots and Leaves and OFSP-Based Products

Six related activities were undertaken to achieve this SO. Four activities began during the first 6 months of 2019.

4.3.1 Traders and vendors in at least two local markets per district improved availability of and access to OFSP

Identifying potential OFSP traders and vendors interested at different levels

Since 2018 the project has helped develop OFSP traders in the community where DVMs were potentially becoming OFSP vendors. Up to now, some DVMs left and others came. As the production at each district seems not be important, the DVMs themselves arrived to sell their products directly. The collectors are not yet involved. Eighteen DVMs were identified as OFSP vendors.

Conducting a participatory market analysis at the local market (SWOT analysis)

The start of this activity was planned for mid-June. It was, however, postponed to the second 6 months of 2019 because it conflicted with the task of project evaluation.

Train traders and vendors and implement pilot market activities

This activity will be conducted in August 2019.

Supporting HH/associations for year-round production of OFSP

The project supported all communities in direct intervention to produce OFSP year-round, at least to conserve OFSP vines where the planting material will be ready for planting in the rainy season. One association with 30 members receiving OFSP vines multiplied continuously in the lowlands to produce vines and roots.

4.3.2 At least 50% of trader and vendor participants generate at least $200 income from sales of OFSP (roots and leaves)

Production and market surveys were conducted with the nutrition survey. The results are still under analysis.

Conducting production and market surveys to evaluate the availability of and access to OFSP

Production and market surveys were conducted with the nutrition survey.

- 274 HH surveyed
  - 38% of HH sold roots and vines
  - 30% of HH sold roots
  - Actual average in this survey is $23.

4.3.3 Monitoring quantity and price of roots and leaves sold over the year

The data collection sheet for the market was implemented by SDAE technicians, starting in February 2019. The results showed that some OFSP roots in the market came from each district, beside the supply from Chimoio. The price over the four districts was high from January to April, when the OFSP roots start to reach the market in May and June. The price is very high (60 MZN/kg)[6] in Mabote (a semi-arid zone) and Vilankulo (a tourist zone) from January to April. The price reduced to 15–20 MZN/kg in Massinga ($0.25–0.33).

- Forty-eight data sheets were shared with SDAE technicians.
- Eleven SDAE technicians registered prices at implementation.
- Prices ranged 15–60 MZN from January to June, depending on the variety, period, and market.
- OFSP came from Chimoio, from Mabote district for the Mabote market, from Massinga district for the Vilankulo market, from Govuro district for the Govuro market, and from Massinga district for the Massinga market.

6. $1 = 60 MZN.

5. KEY ISSUES

Climate change affected the production this last season, not only for OFSP but for all farmers' crops due to the irregularity of the rains. Some fields were leached out by the heavy rains, some were flooded, and some dried up during the long period without rain.

- Planting OFSP continuously accompanied by mulching is one of options to reduce erosion and retain moisture.
- Some varieties, such as 'Namanga', were selected by farmers as drought tolerant and which they can conserve and grow well in Mabote during the long dry period. However, all these varieties mentioned above along with 'Ininda' could tolerate moderate drought.
- Agronomic practice could be developed by planting in line without ridge, then ridge will be raised during weeding.

Weevils start to attack OFSP roots in the four districts of intervention once the area and the frequency of sweetpotato production increase.

- Agronomic practice should be enhanced to reduce the weevil incidence.

The SDAE technicians implemented the training too late and registered data inconsistently. Some communities understood the project well and the community registered all data.

- The project should invest more in the training of SDAE technicians' so that they could be effective and plan for the implementation immediately.
- The training should be practical and hands-on, the same for the DVMs and the volunteers which they understand easily.
- Monitoring should be intensive and supervised closely.

The communities were used to receiving some donations from the project—an attitude left over from a previous project. They also think the project is not for their benefit but only to use them. Changing this behaviour takes time, and some of the communities rejected the project without a donation.

- The project should try to encourage the technicians to continuously stay aware and involve any advanced community-based organisations.

The implementation as well the nutrition and market need some improvement, one of the issues raised by the evaluation team.

- A review meeting with all concerned with food security and nutrition will be organised in August to readjust the strategy to involve all the stakeholders actively.

6. SIGNIFICANT DEVELOPMENTS IN THE SECTOR

Despite the challenge of limited funds, motivated youth who want to learn continue to provide good results. The project also improves the tools for SDAE technicians for monitoring and reporting.

Continuous planting is an opportunity for all HH, not only for the DVMs, once water is available. They could multiply vines and/or produce roots and vines, as well as make leaves, roots, and vines available year-round so that HH could access them easily from their own fields or from the market.

Culinary demos are one of the activities that created interest among HH. During the demo the participating volunteers appreciated the food-based OFSP, including the leaves that anyone sells in the market (except in Vilankulo).

Practical training in the field is more effective once participants implement it immediately. This period all DVMs visited have small plots for rapid multiplication and large plots for vines and roots production.

An awareness campaign is a must for success. Participatory planning with the community will significantly encourage HH to grow OFSP from April to September—at least for conservation and multiplication—and to use organic fertiliser. However, the technicians were not able to carry out the campaign properly.

7. CASE STUDIES

During this reporting period the case studies come from the DVMs. The culinary demo effect was shown spontaneously with reactions from mother participants. "I never knew this way to prepare sweetpotato during my 71 years," said **Mariama Foquiço Macamo**. She was very impressed and plans to prepare one of the dishes for her grandchildren.

(PHOTO: B. RAKOTORISOA)

Mariama Foquiço Macamo in interview after the culinary demo in Machengue in June 2019, Vilankulo.

Rafael Paulo, a DVM in Rio das Pedras in Massinga, continues to be successful. Any time he participated in a fair, his client networks developed and grew to Maputo. He always sold in 10-kg bags. He sold from the end of April 60 bags at 200 MNZ/bag in Massinga and 250 bags at 250 MZN/bag in Inharrime at the hospital, the boarding school, and the prison. He has no problems with his vehicle maintenance, and he continues to increase his OFSP land production. He gave the OFSP leaves as a gift to his clients. He planted every month at least 800m^2 since January, an area that will increase to 5,000m^2 this June to meet the market from October, when the price of OFSP is high. He continues until the water in the small lake has dried up.

(PHOTO: I. CORTHIER)

Jeremiah Ligogolo, a DVM in Mahave, Novo Mambone Govuro, increased his production of OFSP vines. He contributed to save the vulnerable persons affected by Cyclone Idai by supplying about 4 t of OFSP vines for the emergency activities. He got around 32,000 MZN ($530) only from the vines. He sold the roots at 20 MZN/kg in the local market, earning 30,000 MZN. He invested the income by increasing his field and covering family basic needs.

Jeremiah Ligogolo, a DVM in Mahave in his field after harvesting vines in May 2019.

8. LESSONS LEARNT

Given the frequent transfer of SDAE staff in the field, involving all of them in the participatory-training process, many are unwilling to learn because there is no monetary motivation. However, such transfers do not affect the project since there are still other teams in the district. Consequently, transferred staff could contribute to this new site assignment—at least the message of the importance of OFSP.

A smallholder feels vine-secure in the dry area in Mabote. She arrived to conserve OFSP vines in her small garden during the dry period, having received a small quantity in 2018. She continues to conserve in 2019. This approach is an easy step and practice for other small and vulnerable HH.

9. FINANCIAL REPORT

The financial report will be submitted separately from CIP–Lima.

10. CONCLUSION

During this reporting period (January–June 2019), we present a number of things that have been done and what should have been done to improve project implementation:

- **Objective 1**. Capacity building remains the key for strengthening systems; the project did this and continues to do so. The results of SDAE training evaluation were fair. However, to get more effective results, the project should sit together with all the implementing partners at different levels to discuss and decide in a participatory way the way forward on what we learnt with the technicians and their motivation to sustain the OFSP value chain, at least in the intervention districts. Also, the project requires the communities to be involved in project implementation, from planning to evaluation.
  - The survey results are interesting. The project will produce the report as soon as possible. In general, there is a change in food diversification and consumption from last year when we did the baseline and this year, when we looked at variety adoption, dietary behaviour change, and marketing.
- **Objective 2**. Enhancing SDAE capacity for monitoring and field coordination is a must. Monitoring the HH receiving OFSP vines last year, more than 80% continue this year, showing that OFSP become an important crop for the earlier beneficiaries. Most of them received small quantities, and the most vulnerable HH were reached. The objective of producing OFSP roots all year-round still needs to convince HH.
  - Following the practical training both for the vine multiplication and the culinary demos, the implementation seems easy. This training strategy will be developed in the second 6-month period of 2019; consequently, the beneficiaries to be reached will be easy. Some activities need to be enhanced such as yield measurements, where the project got only those from the DVMs during the reporting period. Some semi-arid zones like Mabote district and some areas in the three other districts should be supported more in Triple S technology (HH here were motivated due to the region's situation). Many activities to be done by the technicians need to be monitored closely to improve the results.
- **Objective 3**. Although this objective related to the market remains a challenge for the project, market price monitoring and surveys were done. Market organisation should be linked between initiatives observed at the value chain and the problem analysis to be done shortly.

The International Potato Center (known by its Spanish acronym CIP) is a research-for-development organization with a focus on potato, sweetpotato, and Andean roots and tubers. CIP is dedicated to delivering sustainable science-based solutions to the pressing world issues of hunger, poverty, gender equity, climate change, and the preservation of our Earth's fragile biodiversity and natural resources.
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