



Utilizing Sweetpotato for Nutrition and Development in Inhambane Province

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Utilizing Sweetpotato for Nutrition and Development in Inhambane Province

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Acronyms

CHWs	Community health workers
CIP	International Potato Center (<i>Centro Internacional de la Papa</i>)
DPASA	Provincial Directorate of Agriculture and Food Security
DVM	Decentralized vine multiplier
FACIM	Feira Agro-pecuaria Comercial e Industrial de Mocambique
FCS	Food consumption score
GoM	Government of Mozambique
HH	Household(s)
IDDS	Individual dietary diversity score
LGAs	Local government authorities
M&E	Monitoring and evaluation
MEL	Monitoring, evaluation and learning
OFSP	Orange-fleshed sweetpotato
SDAE	<i>Serviço Distritais de Actividades Economicas</i>
SETSAN	<i>Secretariado Técnico de Segurança Alimentar e Nutricional</i>
SO	Specific objective
SWOT	Strengths, weaknesses, opportunities, threats analysis

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 rates of malnutrition: 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 Recognizing the importance of malnutrition and micronutrient deficiencies, the GoM has prioritized the improved food and nutrition security national plans and programs. 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 Utilizing Sweetpotato for Nutrition and Development in Inhambane Province project. The goal is to strengthen the capacity of local authorities in planning and leading, production, utilization 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. During 2018–2019, 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 four-year intervention. In 2019 CIP proposed to develop these ideas further and lay the groundwork to support scaling-up of production and utilization of vitamin A-rich OFSP for improved food and nutrition security beginning in 2020.

CIP's 2018–2019 interim "design phase" was implemented by CIP and partners in nine districts in Niassa province (Lago, Sanga, Lichinga, Ngauma, Mandimba, Metarica, Maua, Cuamba and Mecanheles) from January to 15 April 2018, and in four districts in Inhambane province (Massinga, Mabote, Govuro and Vilankulo) from 1 January 2018 to 31 December 2019. The project aimed to (1) strengthen the capacity of local government and NGO service providers in 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 years in the target communities in Inhambane, including influential community leaders and husbands; and (3) increase opportunities for HH in Inhambane to increase their family incomes through sales of OFSP and OFSP-based products.

From 25 June to 25 August 2019, an external evaluation and audit evaluated the Niassa and Inhambane project to determine its impact in Niassa and the implementation of lessons from

1. SETSAN. (2014). Relatório de Estudo de base de segurança 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.

Niassa in Inhambane. The external evaluation report found that the project had reached one out of the four objectives; however, the donor members themselves observed many examples of nutrition, market and capacity building in the field. After receiving the final report from the external consultant, the donor recommended that two workshops be organized in the two provinces with the participation of all stakeholders to validate the evidence from the field. The workshops were held on 7–8 November 2019 in Lichinga for Niassa and on 19–20 November 2019 in Vilankulo for Inhambane.

This report summarizes the outcomes during 2018–2019 in Inhambane province as follow:

- A detailed work plan was developed in alignment with the project, extended up to the *Serviço Distritais de Actividades Economicas* (SDAE) technicians after the presentation of 2017 and 2018 results and lessons.
- The office in Niassa province was temporarily closed from mid-April 2018 and the project transferred to Inhambane province.
- Capacity building was carried out and 499 technicians, decentralized vine multipliers (DVMs) and volunteer community health workers (182 women, 317 men) were trained in participatory planning, data collection, OFSP multiplication and production, Triple S, marketing and nutrition. There were 293 (81 women) trained in 2018 in Niassa and Inhambane and 206 (101 women) in 2019 in Inhambane.
- Coordination meetings were held in nine districts in Niassa to present the 2017 results and in four districts in Inhambane to present the lessons learned from Niassa (2013–2017) and from Inhambane 2018, to develop a plan to be implemented in 2019.
- Surveys were conducted in four districts. Baseline surveys of 107 HH in Vilankulo and Massinga were conducted in May–July 2018. A total of 539 surveys (268 HH in May and 271 HH in November–December 2019) were carried out in Govuro, Mabote, Massinga and Vilankulo. Topics covered included OFSP varietal retention by farmers, dietary behavior change and sweetpotato-cropping systems.
- An external evaluation and audit team were hired by the donor for technical and financial evaluation of Niassa and Inhambane project to determine its impact in Niassa and the implementation of lessons from Niassa in Inhambane.
- DVMs were identified in Inhambane to ensure that OFSP vines were multiplied.
- Awareness campaigns were conducted for community selection in 2018. Out of 62 communities, 37 were selected by technicians in 2019 as both the first intervention to inform the community about the importance of OFSP and as the first step in the community selection process.
- A field day was organized for experience exchanges in Massinga. Participating were an SDAE team, health center, DVMs and voluntary women representatives from four districts.
- Four net tunnels and three irrigation pumps were installed in 2019. Eleven SDAE technicians (three women), 10 DVMs (five women) and 28 HH were trained in Triple S. About 31 Triple S trials were established after the training. Some 84 HH (43 headed by females) participated.
- A total of 55 t of OFSP vines with about 39 t of 14 varieties of OFSP vines were supplied by 17 DVMs (three women) in 2018. About 16 t of OFSP vines were supplied by 16 DVMs (three women) in 2019.
- A total of 20,366 HH received OFSP vines: 12,100 HH (59% women) in 2018 and 8,266 HH (63% women) from January to 10 December 2019.
- Most of the varieties distributed were ‘Sumaia’, ‘Irene’, ‘Delvia’, ‘Cecilia’ and ‘Namanga’. A total of 5,668 HH (69% of total beneficiaries and 64% women) received OFSP vines in April–September 2019 for multiplication and conservation.

- Participatory training on nutrition through culinary demos was conducted in one community at each district with the participation of 37 SDAE technicians, five nutritionists at health centers and 78 community volunteers. These 78 volunteers trained another 410 volunteers under the supervision of SDAE technicians.
- Seventeen SDAE technicians conducted culinary demos in 23 communities; 892 HH took part.
- A total of 826 OFSP beneficiaries produced OFSP continuously year-round in 2019.
- The two surveys conducted in 2019 showed that vitamin A deficiency was higher in both children and adults in November–December than in May.
 - Of 268 HH surveyed in May 2019, 37% sold roots and vines and received an average income of \$104, ranging from \$1.25 to \$943.33.
 - Of 271 HH surveyed in November 2019, 42% sold roots and vines and received an average income of \$174, ranging from \$4.20 to \$2,649.40.
- OFSP in the market coming from the intervention zones became more important than OFSP coming from Chimoio to be sold in the districts in Inhambane.
- 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 28,044 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 the main crops, as explicitly mentioned in Objective 4 of the *Multi Sectorial for Chronic Malnutrition Action Plan (Plano de Acção Multi-setorial para a Redução da Desnutrição Crónica)*, led by the technical secretary for food security and nutrition—*Secretariado Técnico de Segurança Alimentar e Nutricional* (SETSAN). Planting material of OFSP varieties is multiplied in virtually all the districts of Niassa province under the government initiative. After more than a year the project shifted to Inhambane to start a similar project.

The project temporarily closed its Niassa office and all staff were moved to Inhambane province in mid-April 2018, after launching the training process in Niassa. In this context CIP continued a two-year implementation of the lessons learned from Niassa to support demand for OFSP in Inhambane. In two years, CIP strengthened 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 two-year interim phase is to enable local government authorities (LGAs) and private sector stakeholders to make better investments in nutrition-sensitive agriculture and rural income opportunities in Inhambane province, 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, decentralized vine multipliers (DVMs) and schoolteachers 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 Conduct baseline surveys in new districts.
- 1.2.2 Joint M&E surveys/studies on OFSP varietal retention by farmers, dietary behavior change and sweetpotato-cropping systems in Inhambane together with *Serviço Distritais de Actividades Económicas* (SDAE) technicians
- 1.2.3 Conduct yield assessments

- 1.2.4 Review internally the monitoring, evaluation and learning (MEL) data
- 1.2.5 Facilitate stakeholder workshop for analyzing lessons from Niassa and Inhambane held in both Niassa and Inhambane
- 1.2.6 Facilitate development and dissemination of clear M&E indicators to be used for project planning, implementation and M&E of government OFSP programs

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 sensitized

- 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 priorities pregnant women and HH with children under 5 years

2.2 OFSP planting material multiplied and conserved during the dry season

- 2.2.1 Conduct participatory training with DVMs
- 2.2.2 Introduce and establish net tunnels, irrigation pumps and Triple S (sweetpotato root storage in sand and sprouting) in selected communities
- 2.2.3 Support farmers in conserving OFSP planting material during the dry period
- 2.2.4 Produce planting material for distribution and for sales
- 2.2.5 Establish demo plots at each new DVM and in one school in each 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 sensitization
- 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 Organize 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, using strengths, weaknesses, opportunities and threats (SWOT) analysis
- 3.1.3 Train traders, vendors, small bakers and street vendors in OFSP processing and implement pilot market activities
- 3.1.4 Support HH and associations in year-round production of OFSP

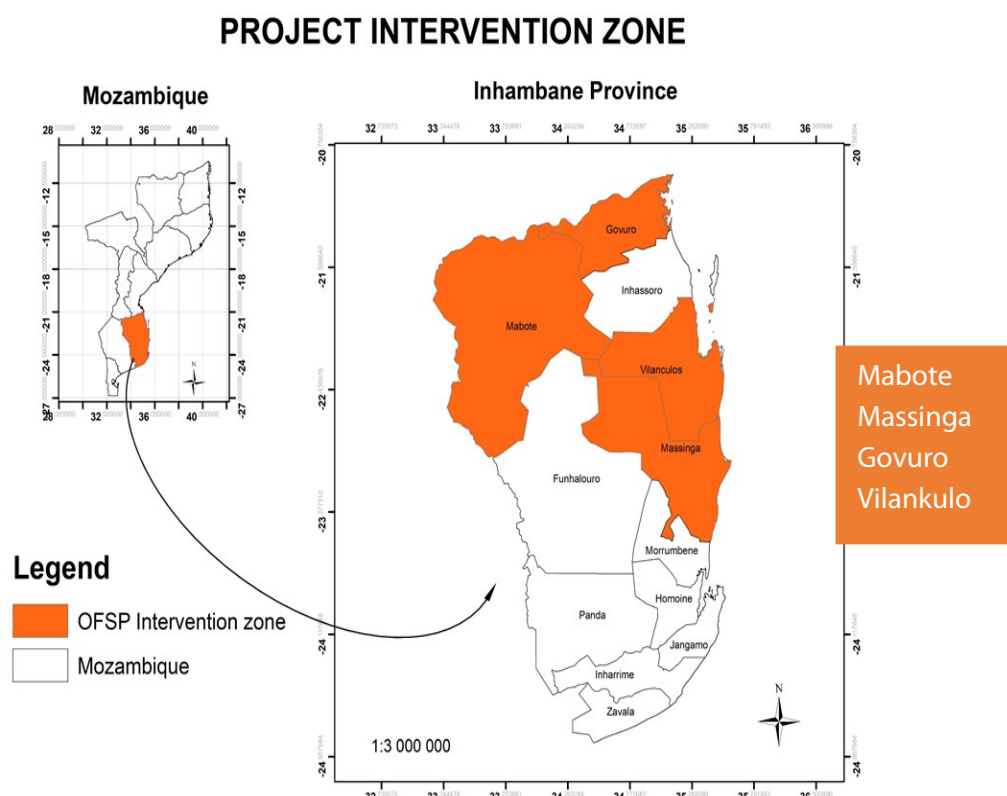
3.2 At least 50% of trader and vendor participants generate at least \$200 income from sales of OFSP (roots and leaves)

- 3.2.1 Conduct production and market surveys to evaluate OFSP availability and access
- 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) (Figure 1). The project started the technicians' capacity-building process in nine districts in Niassa (Lago, Sanga, Lichinga, Mandimba, Cuamba, Mecanheles, Ngauma, Maua and Metarica) before shifting to Inhambane.

Figure 1. Intervention zones in Inhambane province.



Attention was also given to other HH members who were considered influencers of adoption and behavior 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 during 2019

Table 1 summarizes the main project activities and achievements during 2019.

Table 1. Main project activities planned and achievements during 2019

Narrative	Indicators & Targets	Progress for 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		• 499 technicians, DVMs, schoolteachers and volunteer community health workers (CHWs) for nutrition (182 women, 317 men) trained in participatory planning, data collection, OFSP multiplication and production, Triple S and nutrition in four districts of Inhambane: 293 (81 women) in 2018 in Niassa and Inhambane and 206 (101 women) in 2019 in Inhambane • 3 coordination meetings held in Niassa with Provincial Directorate of Agriculture and Food Security (DPASA) in 2018 • 18 coordination meetings in 4 districts of Inhambane in 2018–2019 • 1 coordination meeting with SETSAN in Inhambane in 2019
Activity 1.1.1 Conduct participatory training for technicians in planning, implementation, data collection and M&E	At least 40 technicians trained	• 192 technicians (49 women) in 13 districts of Niassa and Inhambane trained in OFSP participatory planning, implementation and M&E, where 144 technicians (33 women) in 13 districts of Niassa and Inhambane in 2018, and 74 (11 women) in 9 districts of Niassa and 70 (21 women) in four districts of Inhambane and 48 technicians (16 women) in four districts of Inhambane in 2019 • 22 technicians (6 women) in Massinga and Vilankulo districts of Inhambane trained in data collection with tablets in 2018 • 49 technicians (17 women) in May 2019 and 40 technicians (8 women) in November 2019 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	• 384 technicians, DVMs and association members (106 women) in Niassa and Inhambane trained in OFSP production: — 252 technicians, DVMs and association members (58 women) in Niassa and Inhambane in 2018 and — 132 technicians, schoolteacher, and DVMs (48 women) in Inhambane in 2019. • 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: 16 in Govuro (6 women), 27 (16 women) in Mabote, 28 in Massinga (8 women) and 13 in Vilankulo (3 women)
Activity 1.1.3 Facilitate stakeholder coordination activities in the OFSP value chain at all levels	At least 12 coordination meetings facilitated	21 coordination meetings: 3 in Niassa in 2018, 9 in the 4 districts in Inhambane in 2018 and 9 in the 4 districts—3 in Vilankulo and 2 each in Govuro, Massinga and Mabote in—where we presented the results of 2017’s and 2018’s activities
Outcome 1.2 Stakeholder M&E in the OFSP value chain at all levels facilitated		
Activity 1.2.1. Conduct baseline surveys in new districts	Baseline surveys conducted	Data collection done at 107 HH: 53 HH by 12 SDAE technicians (2 women) in Vilankulo and (2) 54 HH by 10 SDAE technicians (4 women) in Massinga.
Activity 1.2.2 Joint M&E surveys/ studies on OFSP varietal retention by farmers, dietary behavior change and sweetpotato- cropping systems in Inhambane together with SDAE technicians	At least 160 (4 per technician) surveyed	Survey data were collected in May from 268 HH in 8 localities by 47 SDAE technicians (17 women): 62 HH in Vilankulo, 77 in Govuro, 54 in Mabote, and 81 in Massinga; from 271 HH in 10 localities by 40 SDAE technicians (8 women): 81 HH in Vilankulo, 93 in Govuro, 48 in Mabote, and 49 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%) in May

Narrative	Indicators & Targets	Progress for 2019
		2019 13 varieties mentioned by HH in November, including 'Irene' (35%), 'Amelia' (12%), 'Delvia' (16%), 'Namanga' (9%) and 'Sumaia' (11%) - Average OFSP plot: 608 m² and average OFSP yield of 11.2 t/ha in May surveys, plot of 467m² and yield of 14t/ha in average in November surveys 75% of children have access to vitamin A-rich food in May 2019, significantly higher than the baseline with only 14% 25%, 29% and 79% of Reference Child under 60 months had low individual dietary diversity score (IDDS) respectively in May 2019, in November–December 2019 and in June 2018.
Activity 1.2.3 Conduct yield assessment	At least 120 yield assessments conducted	284 yield measurement conducted by 11 SDAE technicians with 8 OFSP varieties and one local variety "Irene", "Cecilia", 'Delvia', "Namanga", "Tio Joe", "Ininda", "Gloria" and 'Sumaia' were the OFSP varieties. - Yield ranged from 2 to 61 t/ha with an average of 10 t/ha
Activity 1.2.4 Review internally the MEL data		- The senior MEL in Mozambique participated to the field monitoring and support how to record the evidence in the field - The project continues to use the tools developed shared to each technician for monitoring and evaluating results
Activity 1.2.5 Facilitate stakeholder workshop for analyzing lessons from Niassa and Inhambane in Niassa and Inhambane	At least 2 stakeholder workshops conducted	- Two (2) workshop conducted in Lichinga and Vilankulo: - In Lichinga, 100 persons (24 women) from 19 institutions, producer DVMs and women participated - In Vilankulo, 47 persons (15 women) from 9 institutions, producer DVMs and women participated
Activity 1.2.6 Facilitate development and dissemination of clear M&E indicators to be used for project planning, implementation, and M&E of government OFSP program	Indicators for the project/ program in government set	- Yield from measurement of area and survey, and production from surveys - Dietary diversity score for HH, women and children and food consumption score - 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 New intervention districts and communities in Inhambane identified and sensitized, in consultation with provincial leaders	New district identified and at least 40 new communities sensitized	- Vilankulo is the identified new district 62 communities identified and selected by 48 SDAE technicians 37 communities sensitized by 29 SDAE technicians as reported.
Activity 2.1.1 Develop training materials for nutrition-based agriculture	400 copies of training material developed and distributed	200 training materials (2 pages) printed and distributed to DVMs and community leaders 100 leaflets on production and nutrition (10 pages) printed for SDAE technicians and the community volunteers
Activity 2.1.2 Conduct awareness campaign about OFSP advantages	One awareness campaign per technician	39 out of 66 technicians conducted awareness campaign in 4 districts: 10 in Govuro, 6 in Mabote, 10 in Massinga and 13 in Vilankulo 29 out of 48 technicians conducted awareness campaign in 37 communities in 3 districts: 6 in Govuro, 14 in Massinga and 17 in Vilankulo
Activity 2.1.3 Select the interested communities and priorities pregnant women and HH with	At least 1 community per technician selected	62 direct intervention communities initially identified by 48 SDAE technicians: 15 in Govuro, 11 in Mabote, 16 in Massinga and 20 in Vilankulo - Pregnant women and HH with children under 5 years to be prioritized

Narrative	Indicators & Targets	Progress for 2019
children under 5 years		
Outcome 2.2 OFSP planting material multiplied and conserved during the dry season	OFSP vines available at DVMs	
Activity 2.2.1. Conduct participatory training to DVMs	No. of DVM trained	28 DVMs (8 women) trained in OFSP vine multiplication and production: 13 DVMs in Govuro (3 women), 6 DVMs (3 women) in Mabote, and 9 in Massinga (2 women).
Activity 2.2.2 Introduce and establish net tunnels, irrigation pumps, and Triple S in selected communities	3 net tunnels installed 3 irrigation pumps installed - At least 20 Triple S established	4 net tunnels installed 3 irrigation pumps installed 31 triple S installed in Govuro and Mabote
Activity 2.2.3 Support farmers in OFSP planting material conservation during the dry period	No. of participants	14,038 HH where: 8,470 HH (59% women) received OFSP vines for multiplication and conservation during dry season (May–November 2018) and 5,668 HH (69% women) from April to September 2019 21% and 60% of HH conserved OFSP in lowlands respectively in May and November 2019 according to the survey results
Activity 2.2.4 Produce planting material for distribution and sales	At least 5,000 kg of OFSP vines distributed	16 DVMs (3 women) supplied OFSP vines during the year: 8 (3 women) in Govuro, 1 in Mabote, 5 in Massinga and 2 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 t - About 16,322 kg of vines distributed
Activity 2.2.5 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: 36 with organic fertilizer and 20 on rapid multiplication 2 demos established at primary schools
Outcome 2.3 Planting material of selected varieties distributed to 13,000 smallholder HH with children under 5 years and/or pregnant women	At least 13,000 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 13,000 beneficiaries received OFSP vines	20,366 of HH (61% women) received OFSP vines from January 2018 to 10 December 2019 84% of HH (61% women) have 43,876 children under 5 years 94% of HH (61% women) have 24,822 women in reproductive age (15–49 years) 43% of HH are headed by women
Activity 2.3.2 Distribute OFSP vines to the interested beneficiaries preceded by vine conservation and nutrition sensitization	- Name & no. of varieties - Quantity of OFSP vines	6 varieties: 'Sumaia', 'Irene', 'Delvia', 'Namanga', 'Cecilia' and 'Alisha' were the most distributed in 2018–2019 - About 5,5 218 kg of OFSP vines were distributed in 2018–2019

Activity 2.3.3 Participate in diverse events for OFSP awareness and vine distribution	No. of events (field days, fairs, etc)	• CIP participated to 8 events in 2018, 8 events and organized 1 field day in 2019
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/ technicians trained, and 10 HH assisted by each volunteer	• 90 SDAE technicians and SETSAN focal point, nutritionist and CHWs (41 women) participated on nutrition training in 4 districts in Inhambane in 2018 • 37 SDAE technicians (14 women) participated on nutrition training through culinary demos in 2019 • 5 nutritionists from health center supported the training in 2019 • 78 volunteers (55 women) at 4 communities participated in culinary demo in 2019 • 410 volunteers (281 women) at 17 communities participated under SDAE technician supervisions in 2019.
Activity 2.4.2. Promote community practical training on nutrition	Nutrition education delivered in communities	• 4,722 HH within 82 communities participated in sensitization and information about nutrition conducted by 51 nutritionists, technicians and SETSAN focal points in 2018.
Activity 2.4.3 Organize culinary demos and contests	At least 160 HH (40/ district) participated)	• 17 SDAE technicians (5 women) out of 37 technicians trained facilitated 23 culinary demos in 23 communities in 2019 • 892 HH (655 women) participated with 211 HH in Govuro, 59 HH in Mabote, 310 HH in Massinga and 312 HH in Vilankulo in 2019
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	• 16 DVMs in Massinga, Vilankulo and Govuro sold OFSP vines and roots • 317 HH sold OFSP at 3 districts, Govuro, Massinga and Vilankulo
Activity 3.1.2 Conduct a participatory market analysis at the local market (SWOT analysis)	No. of participants	• The market is not yet a problem in Inhambane province; no vendor complained about price and unsold OFSP roots. OFSP sold in the province came from Manica province.
Activity 3.1.3 Train traders, vendors, small bakers and street vendors, and implement pilot market activities	No. of participants	198 technicians and DVMs (47 women) were trained in OFSP production costs in 9 districts of Niassa and 4 districts of Inhambane. However, 101 technicians (18 women) in 9 districts of Niassa; 69 technicians (21 women) in 4 districts of Inhambane; 28 DVMs (8 women) in 3 districts of Inhambane. 83 (25 women) technicians and DVMs were trained in market strategy, marketing pillars and in product sorting in 4 districts of Inhambane, where 55 technicians (17 women) and 28 DVMs (8 women) and 15 DVMs (2 women) acted as traders and sold their OFSP roots directly

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	• 20 SDAE technicians monitored OFSP production continue • 826 HH produced continuously OFSP all year round • 3 associations with 65 members planted continuously • 15 DVMs produce OFSP vines and roots all year round
Outcome 3.2 At least 50% of trader–vendor 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	• Surveys were conducted only among DVMs in 2018 • 15 DVMs produced and sold 39 t of OFSP vines and 31 t of OFSP roots: — 9 of 9 DVMs in Massinga sold 34,212 kg of OFSP vines and 8 of 9 sold 29 t of OFSP roots — One DVM in Vilankulo sold 440 kg of OFSP vines, another sold 5 t of OFSP roots — 7 of 13 DVMs in Govuro sold 4,327 kg of OFSP vines, 6 of 13 sold 7 t of OFSP roots — 1 of 6 DVMs in Mabote sold 304 kg of OFSP vines • 37% of 268 HH surveyed sold roots and vines and received an average income of \$104 (\$1.25–\$943.33) in May 2019 • 42% of 271 HH surveyed sold roots and vines and received an average income of \$174 (\$4.2–\$2,649.4) in November 2019
Activity 3.2.2 Monitor quantity and price of roots and leaves sold over the year	At least 20 markets surveyed continuously	• Data sheet already edited • Implementation done in collaboration with SDAE. • Price of roots: on average of 25 MZN (\$0.35) year-round (from 15 MZN to 50 MZN) in 2018 Leaves market: not common in the 4 districts market • 48 data sheets shared with SDAE technicians • 22 SDAE technicians registered sweetpotato prices at 22 different markets in 3 districts: Govuro, Massinga and Vilankulo • 20 SDAE technicians registered OFSP root prices at 20 markets • OFSP came from 20 localities, 19 of them from 3 districts and 1 from Chimoio • Markets prices ranged 35–43 MZN/kg from January to December for leaves, 25–42 MZN for the OFSP roots and 23–40 MZN for other sweetpotatoes, depending on variety, period and market • 11 SDAE technicians registered prices for sweetpotato leaves at 12 markets

3. Project management and partnerships

3.1 Staff structure

CIP managed the project from Lichinga until March 2018 with the support of an agronomist coordinator for Inhambane. From mid-April all CIP staff in Lichinga shifted to the office in Massinga district in Inhambane province to focus exclusively on its four districts. One shared office was arranged with SDAE in Govuro for the technician, to reduce travel costs, until July 2018 when all staff were based in Massinga.

The project was supported by two drivers in 2018. The MEL specialist resigned in May 2018, and the agronomist/provincial coordinator was transferred to Nampula on 17 April 2018 to work on another CIP project.

CIP managed the project from Massinga district to focus exclusively on its four districts. The project was supported by one driver and one agronomist in 2019, thus ensuring the field supervision and MEL. After the external evaluation conducted in June–July, the project coordinator and field agronomist were supported by the senior M&E specialist from CIP–Mozambique and advised a regional nutritionist based in Uganda.

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.

- **DPASA:** Provincial Directorate of Agriculture and Food Security through SETSAN and SDAE:
 - **SDAEs in 11 districts in Niassa** were involved in the project until the end of March 2018; 67 technicians (11 women) took part in the participatory planning and have their individual work plans. However, CIP decided to temporarily close the office in Lichinga and transferred all staff to reinforce the activities in Inhambane.
 - **SDAE in four districts in Inhambane** are involved in the project. Seventy technicians (21 women) participated directly in the implementation of project activities in 2018, and 50 technicians (18 women) participated in 2019. SDAE technicians ensured the direct community sensitization, vine multiplication and dissemination of OFSP varieties at district level under CIP staff supervision.
 - **SETSAN** in Inhambane has started to put the focal points in the districts which need capacity building to monitor the food security and nutrition situation at district level. SETSAN focal points are involved in all SDAE technician work. SETSAN organized a meeting on 10 December 2019 to review the 2019 activities. Thirteen institutions and students from the University of Maxixe were represented; present were representatives from agriculture, health, public function, finance, education, gender & social action, culture & tourism, disaster management, fisheries, CARE, Malhalhe and CIP. OFSP potentiality for nutrition contribution occupied times for discussion as all participants showed interest.
- **DPS: Provincial Directorate of Health.** Nutrition specialists were involved in the project in the dissemination of nutrition messages to communities in Niassa and Inhambane provinces, but the same task was also done by SETSAN focal points. The hospital in Govuro and the health center in Mapinhane are the most active. SDMAS–Govuro participated in OFSP vine production in 2018 and in nutrition training through culinary demos in 2019. The SETSAN focal point at DPS presented during his presentation at SETSAN coordination meeting.

- **The Associação de Iniciativa Para o Desenvolvimento Comunitário**, a youth association with 11 members (2 women) and 10 ha of land located 6 km from Lichinga city, is interested in producing OFSP in 2018. It asked CIP for capacity-building support, in which all members took part in participatory planning and OFSP production training.
- **The Instituto de Professoras in Vilankulo** works with the project through OFSP vine multiplication and root production from 15 kg of vines provided and supplied their neighbors.
- **Red Crista** collaborated with the project in Govuro district in Inhambane by inviting CIP to make a presentation on OFSP at the Catholic church.
- **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.

The communities supported by the partners working with the project in Niassa continue to produce OFSP in 2019. These partners are Associação Progresso, Diocese de Niassa (Anglican diocese), WeEffect through União dos Composeiros e Associações de Lichinga and Forum, the Ajuda de Desenvolvimento do Povo para Povo, Manda Wilderness Agricultural Project and Smart Development Works.

3.3 M&E

The M&E specialist participated in both the STATA trainings and the community of practice in Nairobi in February 2018. The baseline survey was conducted. In 2019 the field technician participated in the MEL community of practice in Entebbe, Uganda, in February 2019. The baseline surveys for two districts without any database at CIP were conducted at the end of May 2018. Two surveys on the variety adoption, nutrition and markets were conducted in May and November–December 2019. The questionnaire was reviewed in collaboration with the M&E specialist based in Nairobi. Data were collected manually in May and with tablets in November–December 2019. 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.

An external evaluation was conducted in June–July 2019. The project also conducted an internal MEL review after the external evaluation, and organized two workshops in Niassa and Inhambane.

3.4 Events

The project participated in eight main events in 2018 in Lichinga, Massinga, Govuro, Inharrime and Vilankulo and in eight main events in Massinga and Inharrime in 2019 through DVMs. These included the investors conference in Lichinga; different visits by the provincial governor of Inhambane in Massinga and Inharrime and the administrator of Massinga in Massinga; a visit by the president of Mozambique in Govuro and Massinga and a visit by the Minister of Education accompanied by the governor of Inhambane in Vilankulo in 2018. For 2019 these events included Mozambican Women's Day, an investors conference in March and Massinga City Day in April (all in Massinga), the visit in June by the Mozambican president in Inharrime, Independence Day in June, *Feira Agro-pecuária Comercial e Industrial de Mocambique* (FACIM) preparation in September and launching Agriculture Campaign in Mabote and Massinga in October, at which DVMs from Massinga sold their OFSP roots. The project also organized one field day in Massinga; more than 500 persons from all intervention districts representatives attended.

3.5 Coordination

The project participated in three coordination meetings in Niassa with DPASA in 2018. Eighteen coordination meetings were held in four districts during 2018–2019 during which the project results in 2018, the planning for 2019 and the progress and the lessons learned of the project

during 2019 were presented. The project also presented the results of the project during the SETSAN coordination meeting.

4. Project progress: Implemented activities and outputs achieved against the work plan

In 2018–2019, 29 activities out of 29 programmed under the project's three SOs were realized. The project worked closely with the district leaders during the period. About 20,366 HH (61% women) in 88 communities were covered by OFSP vine distributions in four intervention districts for Inhambane province (i.e., Mabote, Massinga, Govuro and Vilankulo), reaching 20,366 HH for 2018 and 2019.

4.1 SO 1: Strengthen the capacity of LGAs for planning, implementation and monitoring, using a participatory planning-implementation-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 system strengthening. In the four districts of Inhambane province, technicians, DVMs and volunteers in nutrition were trained in participatory planning, data collection, OFSP multiplication and production and nutrition. Workshops were organized in Lichinga and Inhambane; an M&E system was enhanced. Nine 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

During the two years, 499 technicians, DVMs, schoolteachers and volunteer CHWs in nutrition (182 women, 317 men) were trained in participatory planning, data collection, OFSP multiplication and production, Triple S and nutrition in four districts of Inhambane: 293 (81 women) in 2018 in Niassa and Inhambane and 206 (101 women) in 2019 in Inhambane.

Twenty-two coordination meetings were conducted: three in Niassa with DPASA in 2018, 18 in four districts of Inhambane in 2018–2019 and one with SETSAN in Inhambane in 2019.

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

The trainings started at the end of January in 2018 and end of February in 2019:

- A total of 192 technicians (49 women) in 13 districts of Niassa and Inhambane took part in OFSP participatory planning, implementation and M&E trainings to strengthen the extension system in each intervention district where:
 - A total of 144 technicians (33 women) in 13 districts of Niassa and Inhambane in 2018 with 74 (11 women) in nine districts of Niassa and 70 (21 women) in four districts of Inhambane
 - Forty-eight technicians (16 women) in four districts of Inhambane in 2019. These technicians used their individual work plan (Annex 1).
- Forty-nine technicians (17 women) were trained in data collection with:
 - Twenty-two technicians (six women) in Massinga and Vilankulo districts in 2018
 - Forty-nine technicians (17 women) in four districts in May 2019
 - Forty technicians (eight women) in four districts in November 2019

The evaluation of trained technicians showed low learning skills for most of them despite the opportunities.

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 postharvest management. Topics included land preparation; planting material selection; plantation; soil fertility management for sweetpotato production, including the use of organic fertilization for sustainable crop production; irrigation in case of planting during the dry season; pest management and harvest. Considering the lessons from 2018, immediate field participatory trainings were more effective for DVMs. During the two years:

- A total of 384 technicians, DVMs and association members (106 women) in Niassa and Inhambane trained in OFSP production: in 2018, 252 technicians, DVMs and association members (58 women) in Niassa and Inhambane, and in 2019, 132 technicians, schoolteachers and DVMs (48 women) in Inhambane.

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

Coordination meetings were organized at provincial level and in each district. For two years 21 coordination meetings were organized: three at DPASA in Niassa in 2018, nine in the four districts in Inhambane in 2018 and nine in the four districts in Inhambane in 2019.

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

Conduct baseline surveys at new districts

Baseline surveys were conducted at the end of May 2018. Twenty-two technicians trained in data collection with tablets applied their training to collect data on at least five HH each:

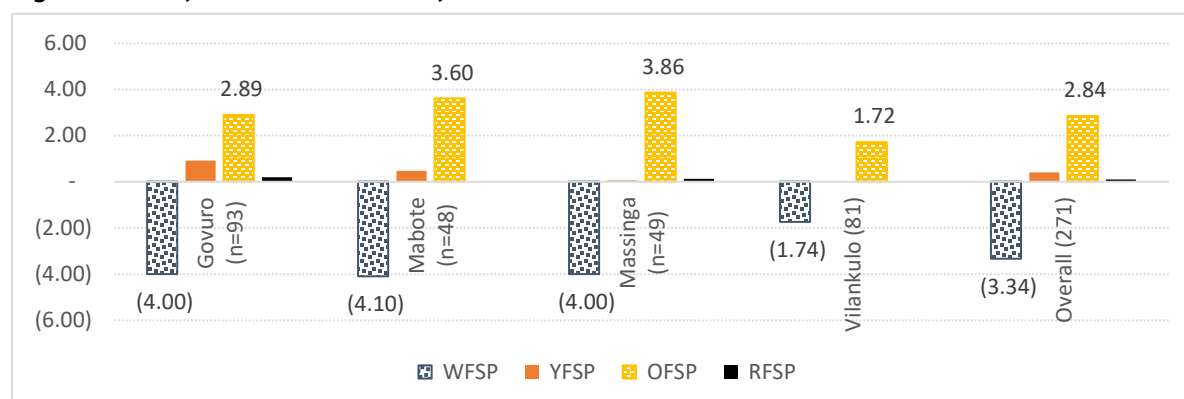
- Data were collected from 107 HH—54 surveys by 12 SDAE technicians (two women) in Vilankulo and 53 surveys by 10 SDAE technicians (four women) in Massinga
- Thirty-two villages (10 in Vilankulo, 22 in Massinga) in four administrative posts of two districts of Inhambane province

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

OFSP varietal retention by farmers, dietary behavior change and sweetpotato-cropping systems surveys were conducted in four districts in May and November–December 2019. SDAE technicians who were trained in data collection and participated at the data field collection were also involved.

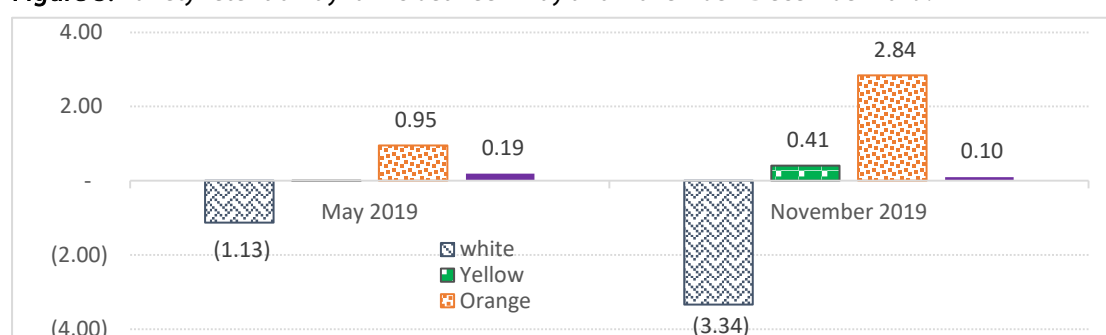
- Out of 49 technicians trained in data collection, 47 participated in survey data collection in May and 40 participated in survey data collection in November–December 2019.
- A total of 539 HH in the intervention communities were surveyed where:
 - A total of 268 HH by 47 SDAE technicians (17 women) in May 2019: 62 HH in Vilankulo, 77 in Govuro, 54 in Mabote and 81 in Massinga
 - A total of 271 HH by 40 SDAE technicians (eight women) in November–December 2019: 81 HH in Vilankulo, 93 in Govuro, 48 in Mabote and 49 in Massinga
- HH growing OFSP increased from 77% to 88% in two years recorded in May 2019 and to 92% recorded in December 2019.
- 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.
- The HH producing OFSP increased in each district for two years with 3.86 points of 10 in Massinga (Figure 2) and HH producing white-fleshed sweetpotato decreased.

Figure 2. Variety retention within two years in four districts.



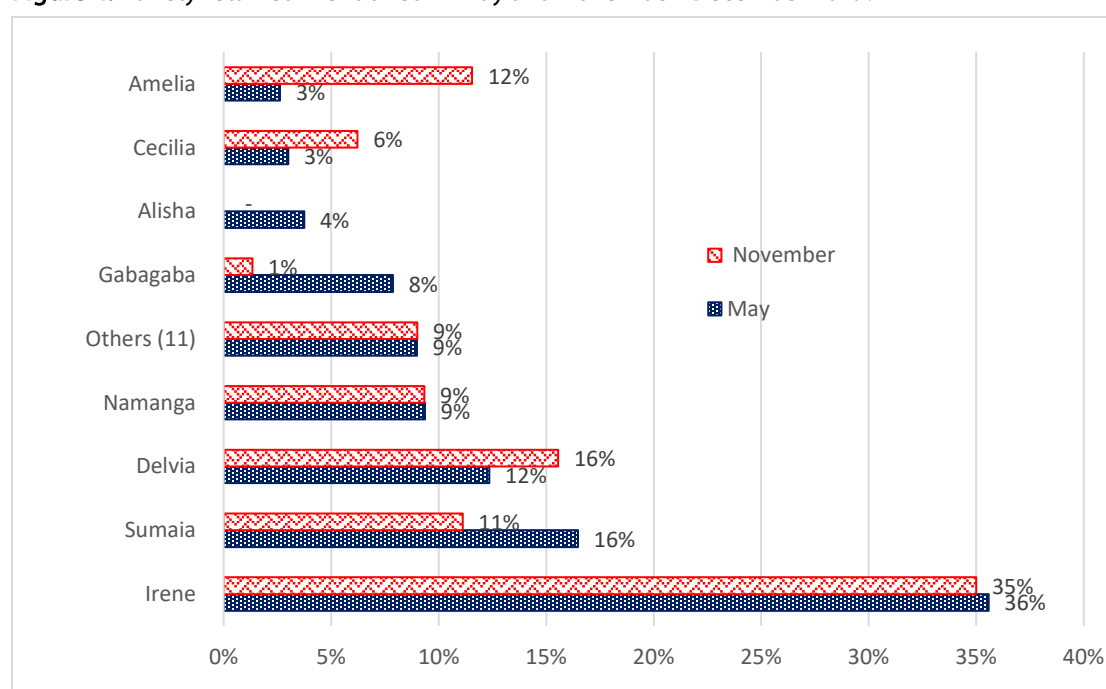
- HH retaining OFSP increased from 0.95 points in May 2019 to 2.84 points in December 2019 (Figure 3).

Figure 3. Variety retention dynamic between May and November–December 2019.



- HH mentioned that they continued to produce 19 OFSP varieties of which the top four were 'Irene' (mentioned by 36% of HH) as shown in Figure 4, 'Sumaia', 'Delvia' and 'Namanga', 'Alisha', 'Cecilia' and 'Amelia' were also retained.

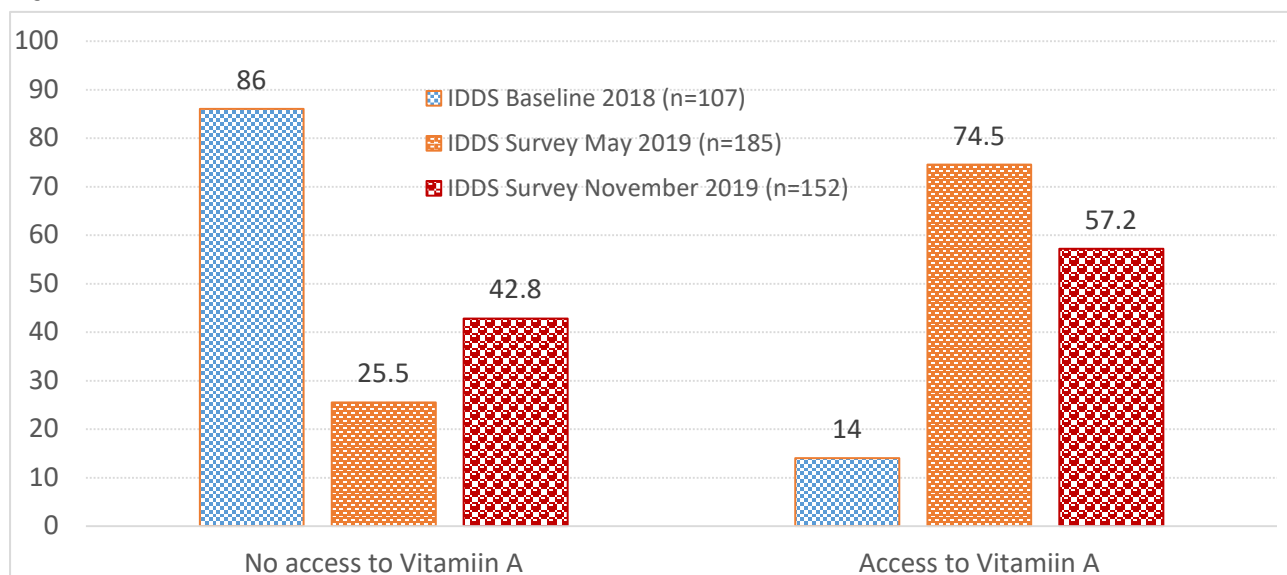
Figure 4. Variety retained mentioned in May and November–December 2019.



The average OFSP yield was 11.2 t/ha, with an average plot of 862 m²/HH in May survey and 14.1 t/ha 467 m²/HH in November survey.

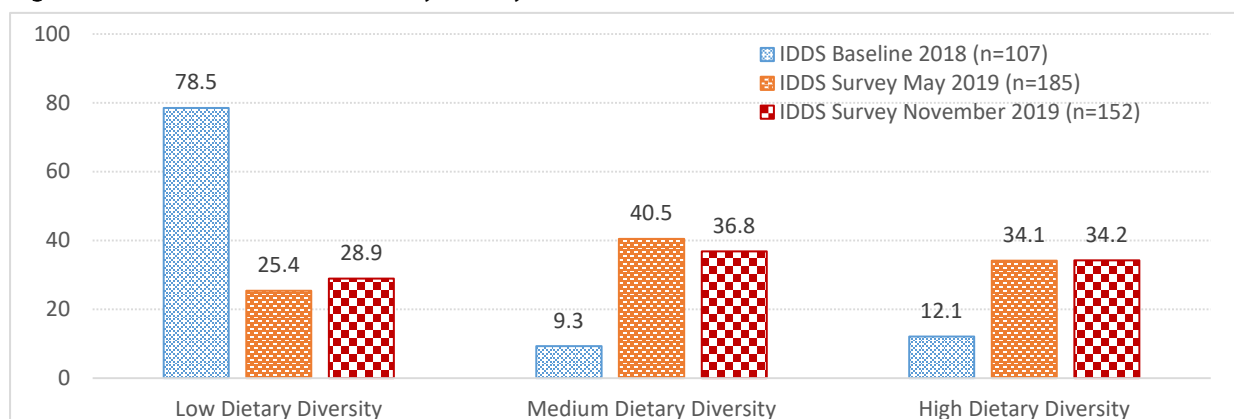
- Access to better, vitamin-A rich food improved between the baseline and the survey: 75% of children have access to vitamin A-rich food, better than the baseline results of 14%.
- Child access to vitamin-A rich food was better in May 2019 during the harvest period than in the November–December 2019 lack of food period (Figure 5). Before the intervention, access to vitamin A was very low with 14%.

Figure 5. Child vitamin A access in June 2018, May and November–December 2019.



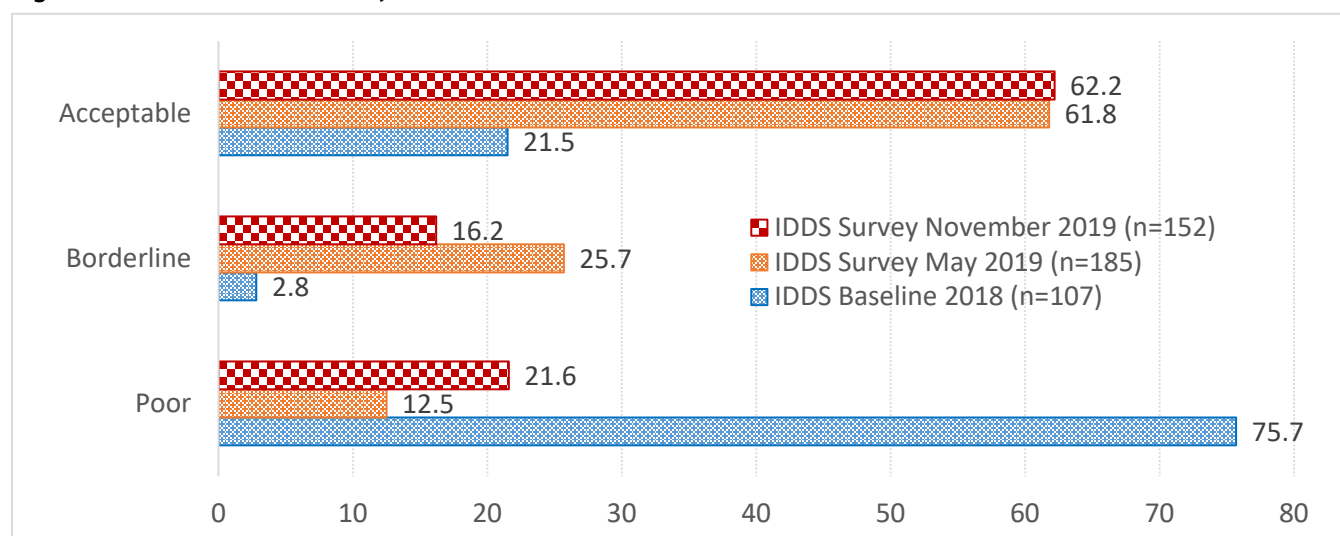
- 25% and 29% of reference child under 60 months had low dietary diversity respectively in May and November–December 2019 (Figure 6).

Figure 6. IDDS in baseline 2018 surveys in May and in November–December 2019.



- Food consumption score (FCS) showed the same tendency as the vitamin A. The lowest poor FCS occurred in May 2019, followed by November 2019. The highest poor FCS was in June 2018, during the baseline when the project started to implement the project (Figure 7).

Figure 7. FCS in June 2018, in May and November–December 2019.

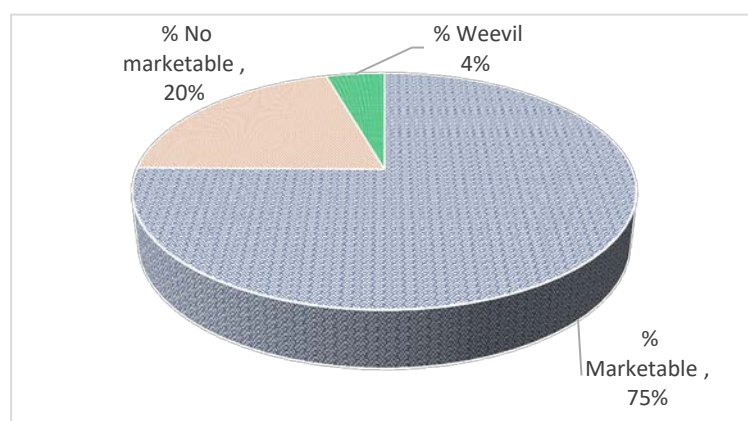


Conduct yield assessment

The yield assessments were carried out in 2019. 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).

- Eleven (three women) out of 34 (12 women) trained SDAE technicians measured yields.
- Yields were measured at 284 plots, ranging from 2 to 61 t/ha, with an average of 10 t/ha.
- 'Irene', 'Cecilia', 'Delvia', 'Namanga', 'Tio Joe', 'Ininda', 'Gloria' and 'Sumaia' were the OFSP varieties measured.
- The marketable roots represented 75%, whereas weevils affected 4% of roots (Figure 8).

Figure 8. Proportion of marketable, no marketable and weevil-affected roots.



- Regarding the weevil, 70% of weevil attack was in Vilankulo, 21% in Govuro and 9% in Massinga districts (Figure 9). The varieties 'Sumaia', local, 'Namanga' and 'Irene' were the most affected by weevil, respectively by 24%, 20%, 14% and 11% (Figure 10). One of the reasons was that these OFSP varieties were introduced in 2012 and the vines could not be well controlled during the distribution.

Figure 9. Weevil incidence per district.

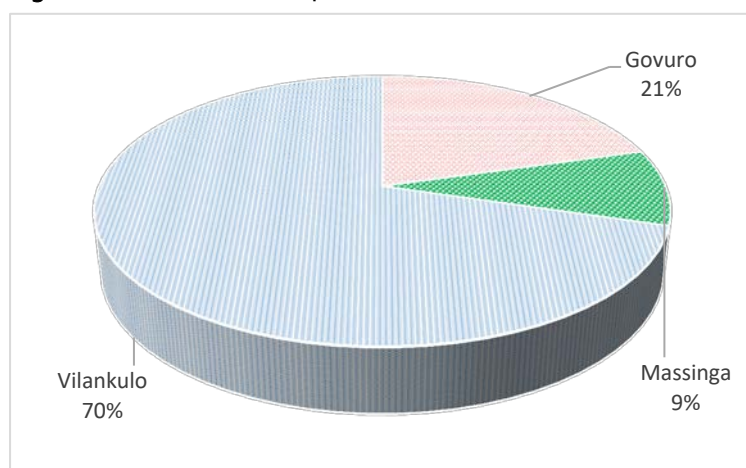
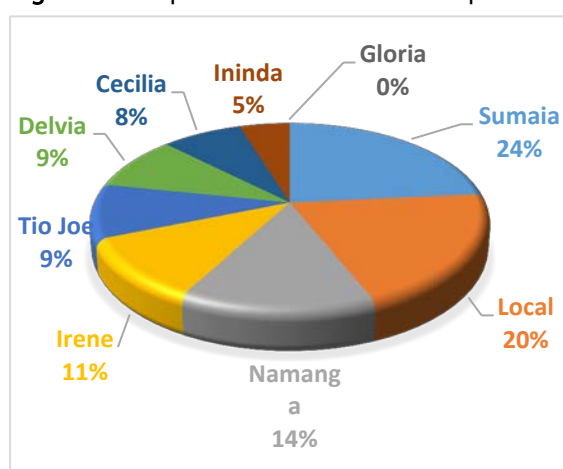
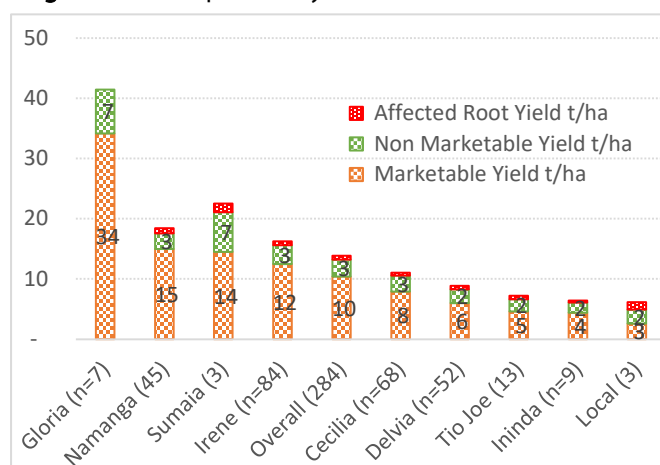


Figure 10. Proportion of weevil infection per variety.



- Varieties 'Gloria', 'Namanga', 'Sumaia' and 'Irene' had higher yields than the average of nine varieties measured, respectively, at 34 t/ha, 15 t/ha, 14 t/ha and 12 t/ha (Figure 11).

Figure 11. Yield per variety.



- The average yield over time was higher in November and July (Figure 12). As mentioned earlier, rain was very irregular, affecting yields. The results confirm that some HH plant OFSP continuously over the year 2019.
- Weevil incidences were higher in April, May and July (Figure 13).

Figure 12. Yield during the year.

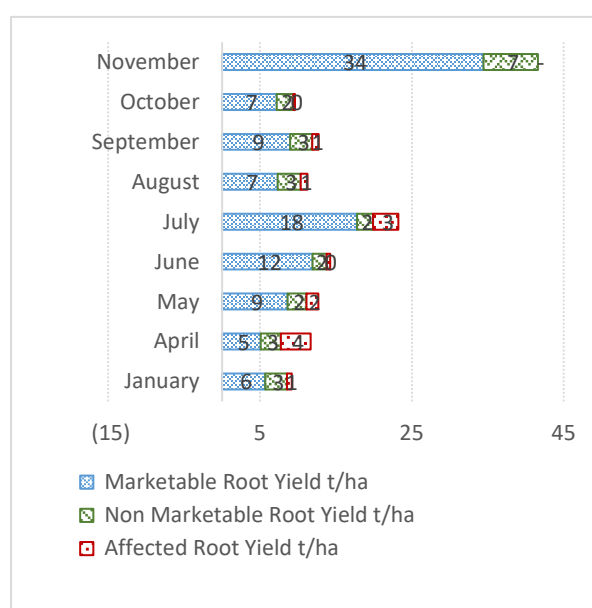
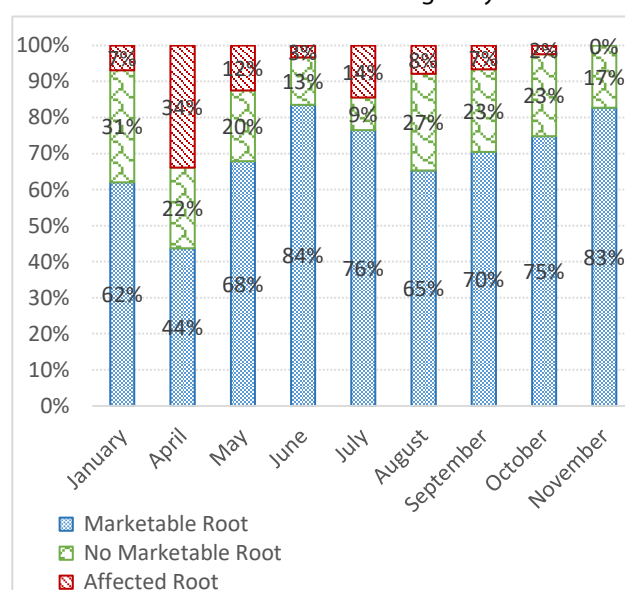


Figure 13. Proportion of marketable roots, no marketable roots and weevil infection roots during the year.



- The yield was very low: 42% of HH had yields <5 t/ha and 8% had yields >30t/ha (Figure 14).
- For the vine, 5% of HH had yields <5 t/ha and 13% had yields >30 t/ha (Figure 15).

Figure 14. Root yield range and proportion.

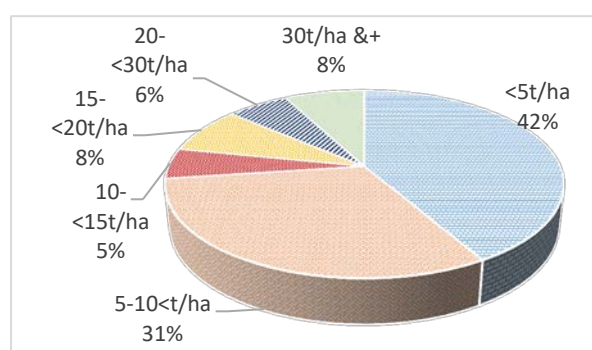
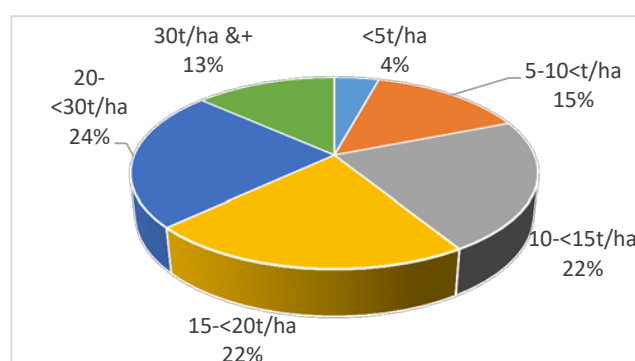


Figure 15. Vine yield range and proportion.



Review internally the MEL data

The external evaluation recommended the improvement of monitoring and tracking data. Early in 2019 the project developed individual work plan and monitoring tools with SDAE. The evaluator did not consult these monitoring tools, however, claiming that the tools did not exist. The MEL tracking should be improved in relation to the monitoring system in Niassa. The outputs of this activity were:

- The senior MEL specialist in Mozambique participated in the field monitoring and support how to record the evidence in the field.
- All DVMs and mothers visited had OFSP vines available in early November 2019.
- The project continues to use the tools developed shared to each technician for M&E results.

Facilitate stakeholder workshops for analyzing lessons from Niassa and Inhambane in Niassa and Inhambane

The external evaluation report (Annex 2) related that one out of the four SOs was reached by the project. The project did not completely achieve the other three SOs. Yet the donor member themselves observed much evidence on nutrition, market and capacity building in the field. After

receiving the final report (see Annex 3) from the external consultant, the donor recommended that two workshops be organized in two provinces (Niassa and Inhambane) with all stakeholders in November to evaluate and capture the evidence from the field.

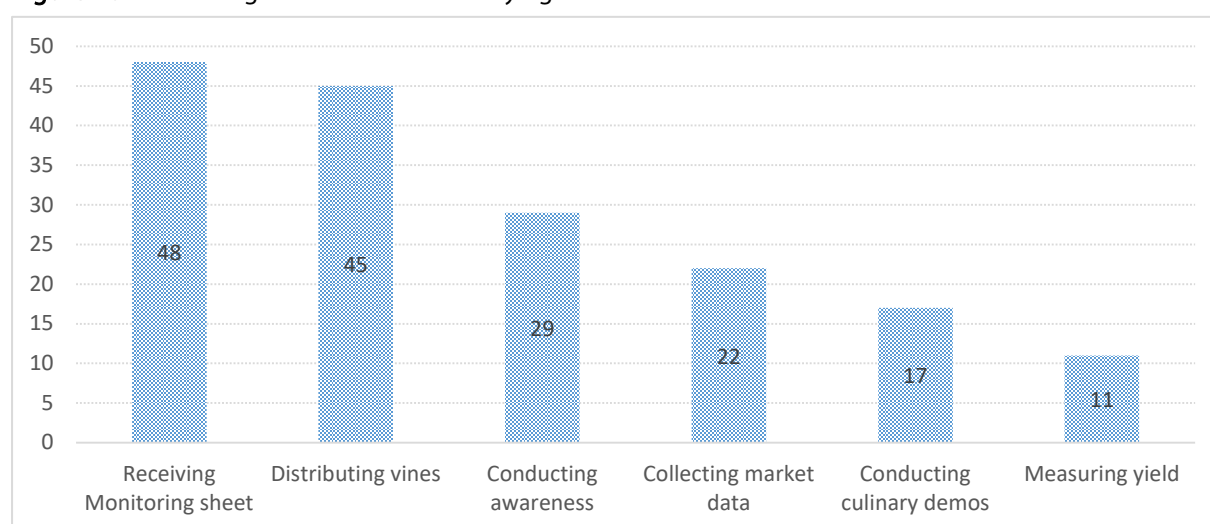
- Evaluations have been organized on 7–8 November in Lichinga Niassa province and on 19–20 November 2019 in Vilankulo, Inhambane province.
- In Lichinga 100 persons (24 women) from 19 institutions, producer DVMs and women participated.
- DVMs and mother’s testimony that they continue producing OFSP vines to sell, OFSP roots and leaves for consumption and for sale.
- In Vilankulo 47 persons (15 women) from nine institutions, producer DVMs and women participated.
- All DVMs confirmed that they produced OFSP vines and roots year-round this year.
- Mothers conserved OFSP vines for their own production.

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

The project is helping the SDAE team realize 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, and the project could track the progress results from each technician.

- An annual plan was developed to record all activities and all indicators needed from the sensitization events and community selection to the activity implemented.
- Recorded field information to assess progress and SDAE technicians’ performance.
- Forty-eight technicians (17 women) received field data sheets (Figure 16).

Figure 16. Monitoring SDAE technicians carrying out activities.



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

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

4.2.1 New intervention districts and communities in Inhambane identified and sensitized, in consultation with provincial leaders

Develop training materials for nutrition-based agriculture

Training materials were developed on topics like vine multiplication and nutrition-based agriculture; leaflets were created for an awareness campaign in both 2018 and 2019 (Annexes 4 and 5).

- Two-hundred 2-page training materials printed and distributed to the DVMs and leader communities
- One-hundred 10-page leaflets related to nutrition and production assembled and distributed to SDAE technicians, nutritionists and health community leaders

Conduct awareness campaign about advantages of OFSP

The intervention at community level started with a focus on sensitization and awareness. The project uses the materials developed for message dissemination during the two years:

- Out of 66 technicians, 39 conducted the awareness campaign in 2018 in four districts: 10 in Govuro, six in Mabote, 10 in Massinga and 13 in Vilankulo. Out of 48 technicians in 2019, 29 conducted the campaign in three districts: six in Govuro, 14 in Massinga and 17 in Vilankulo.
- A total of 3,936 HH in 37 communities were reached directly through the campaign in 2019.

Select interested communities and prioritize pregnant women and HH with children under 5

The project encouraged each SDAE technician to select one community for intervention in 2019. SDAE technicians seemed motivated, putting a higher objective in the first year. But some of the technicians did not record their activities and the participants as reasons for the lack of information recorded in the data.

- Fifty-eight direct intervention communities within 88 communities in planning were reached by sensitization and information about OFSP: 14 in Govuro, five in Mabote, 16 in Massinga and 23 in Vilankulo.
- Sixty-two communities were identified by the technicians in 2019: 15 in Govuro, 11 in Mabote, 16 in Massinga and 20 in Vilankulo.
- Thirty-seven out of 62 communities were recorded from 29 SDAE technicians.
- Fewer than 10 HH in each of 39 neighboring communities received OFSP vines during the distribution.

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. However, the available netting was limited.

- Four net tunnels were installed in four districts: Govuro, Mabote, Massinga and Vilankulo.
- 'Namanga', 'Sumaia' and 'Irene' varieties were multiplied in the net tunnels.
- Three irrigation pumps were installed: at one DVM in Govuro, at one DVM in Massinga and at one association in Vilankulo.
- Eleven SDAE technicians (three women), 10 DVMs (five women) and 28 HH were trained in Triple S.
- Thirty-one Triple S were established at five localities in two districts of Govuro (six) and Mabote (25); 84 HH (43 women) participated.

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

Beginning in May, which is considered the start of the dry season, the project distributes 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 be able to multiply the vines and are used to doing so every year from their planting material after harvest.

- Out of 14,038 HH, 8,470 HH (59% women) received OFSP vines for multiplication and conservation during the dry season (May–November 2018) and 5,668 HH (69% of total beneficiaries and 64% women) received the vines in April–September 2019 (Figure 17).
- According to the survey results, 21% and 60% of HH conserved OFSP in lowlands in May and November–December 2019, respectively (Figure 18).

Figure 18. Distribution for multiplication and conservation during the dry period in 2018 and 2019.

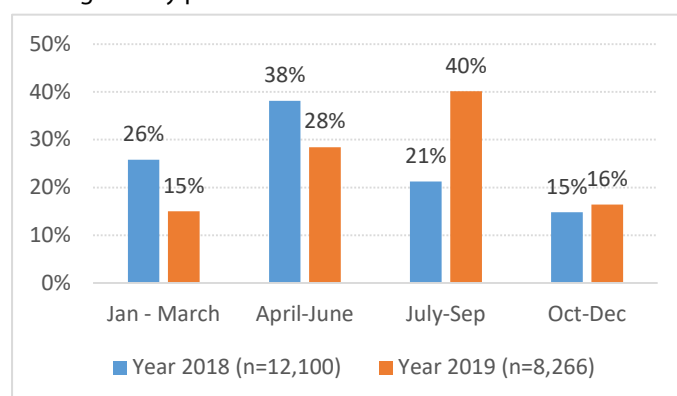
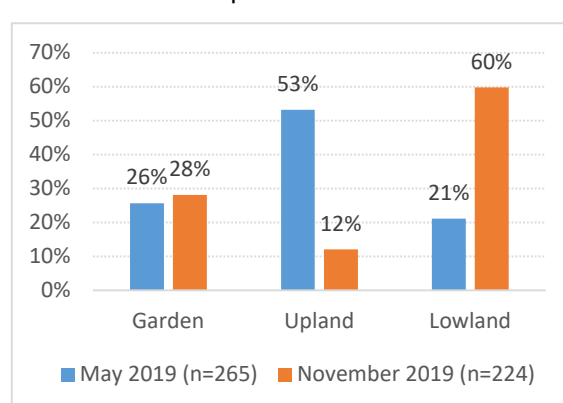


Figure 17. HH using lowlands for production-conservation-multiplication.



Produce planting material for distribution and sales

DVMs are supposed to produce OFSP vines continuously. However, climate change significantly affects the possibility of planting as of October 2018 because of the availability of any water sources in the lowlands. Farmers were thus unable to grow any crop.

- In 2019, 16 DVMs (three women) supplied OFSP vines: eight (three women) in Govuro, one in Mabote, five in Massinga and two in Vilankulo.
- Govuro DVMs were more motivated because some of them sold OFSP vines at 9 MZN/kg (\$0.13/kg) in response to the emergency caused by Cyclone IDAI. One DVM produced almost 4 t.
- A total of 39,283 kg of OFSP vines were produced and distributed in 2018. In 2019, 16,322 kg were produced and distributed, giving a total of 55,605 kg for 2018–2019.

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

Demonstrations are part of field schools for DVMs. Owing to the critical climatic situation in 2019, demos take other forms such as continuous planting.

- Thirty-six DVMs established variety and organic fertilizer 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 preselected varieties distributed to 13,000 smallholder HH with children under 5 and/or pregnant women

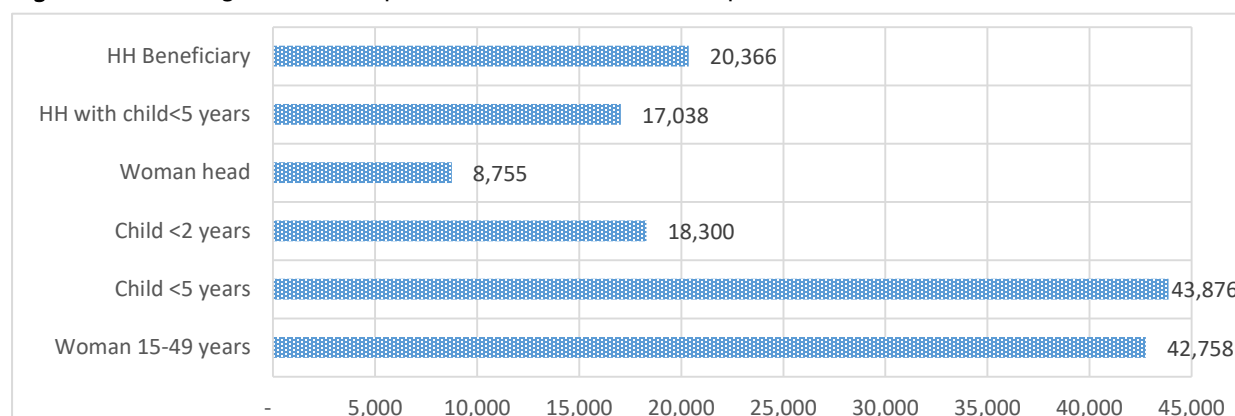
Distribution occurs over the year for production, multiplication and conservation.

List the interested beneficiaries during the awareness campaign

Awareness campaigns preceded the distribution of OFSP vines and could be done 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 sensitization meeting, committing to a participatory-planning process. Some HH near the communities where the awareness campaign took place received OFSP vines. During the two years:

- A total of 20,366 HH (61 women) received OFSP vines from January 2018 to 10 December 2019: 8,266 HH (63% women) from January to 10 December 2019, and 5,668 HH (69% women) from April to September 2019.
- Eighty-two percent of HH (63% women) have 15,438 children under 5 years.
- Ninety-four percent of HH (60% women) have 15,200 women of reproductive age (15–49 years)
- Forty-three percent of HH are headed by women (Figure 19).

Figure 19. HH using lowlands for production-conservation-multiplication.

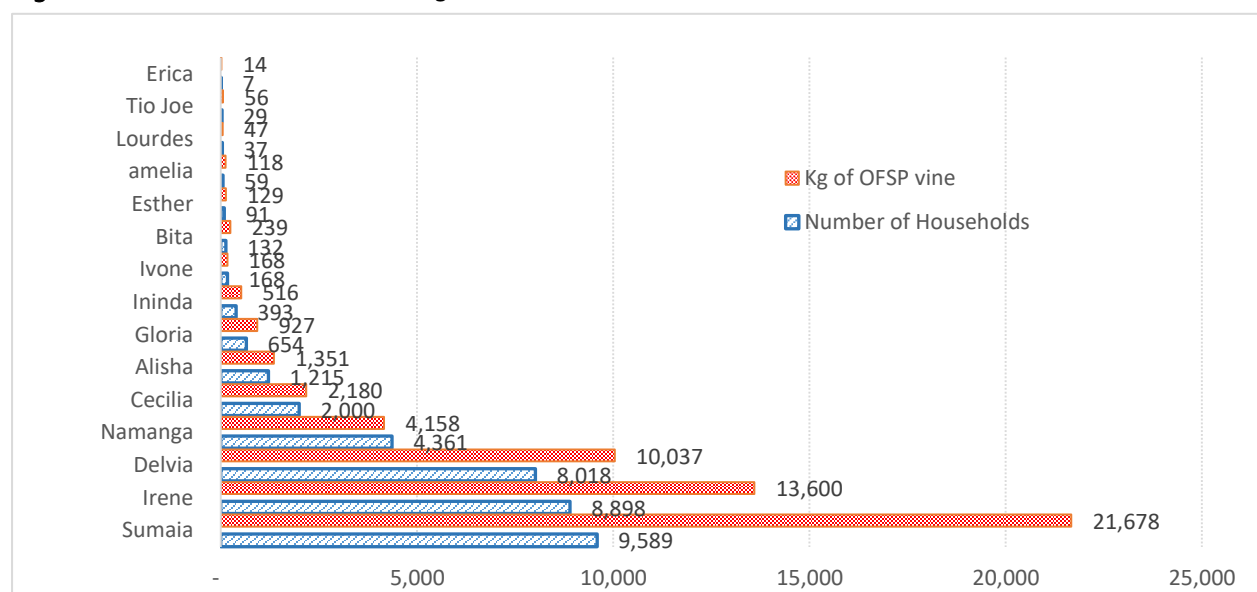


Distribute OFSP vines to the interested beneficiaries, preceded by vine conservation and nutrition sensitization

Small quantities of OFSP were distributed to HH year-round to develop the mindset of multiplication and conservation. The multiplication rate of vines is high, so HH could have enough vines during the planting period.

- Six varieties ('Sumaia', 'Irene', 'Delvia', 'Namanga', 'Cecilia' and 'Alisha') were the most distributed in 2018–2019 (Figure 20).
- About 16,322 kg of OFSP vines were distributed in 2019, and a cumulative figure of 55,218 kg were distributed from 2018 (Figure 20).

Figure 20. Varieties distributed and registered in 2018–2019.



Participate in diverse events for OFSP vine distribution

In 2018–2019 CIP participated in 16 events, eight each in 2018 and 2019. DVMs under CIP and SDAE leadership and support displayed and sold OFSP vines and roots at all these events. The project also organized a field day in 2019 with the participation of all stakeholder representatives in four districts and from Inhambane. The events consisted of:

- An investors conference in Lichinga, Niassa province, on 5 April 2018, and in Massinga, Inhambane province, on 28 March 2019. CIP demonstrated OFSP puree processing in Lichinga.
- Inauguration and hand-over of an irrigation system was led by the governor of Inhambane in Meheleme, Chicomo, in Massinga district, on 17 April 2018. Three DVMs (one woman) participated and sold OFSP vines and roots. Each DVM earned around \$60 during this event.
- As part of his annual visit, the president of Mozambique visited Machacame village, Rio Save post in Govuro district, on 13 June 2018. The next day, he visited Mucuacua in Massinga.
- The governor of Inhambane visited Massinga city for a technology commemoration event on 15 August 2018; six DVMs (two women) from Massinga participated.
- On 21 August 2018 CIP was invited by DPASA–Inhambane with project DVMs to participate in an Inharrime fruits and vegetable promotion event under the governor's leadership.
- The administrator of Massinga organized an “alphabetization day” in the new airport of Kapekape in Massinga on 8 September 2018. Five DVMs displayed and sold their OFSP roots.
- The minister of education and the governor launched an agricultural campaign in Mapinhane Vilankulo on 25 October 2018. Three OFSP varieties were planted to inaugurate the campaign.
- In 2019 CIP participated through DVM events such as Mozambican Women's Day (8 April), Massinga City Day (21 April), Independence Day (25 June), visit by the president of Mozambique in Inharrime, an agricultural campaign lunch in Mabote and Massinga (28 October) and a FACIM preparation.
- A field day on 29 October 2019 was very successful. Although 150 persons were expected, more than 500 attended, including some representatives from DPASA–Inhambane, Massinga Municipality, and Massinga administration. Different OFSP-based preparations were presented and tasted after the field visit. Participants appreciated the different plots with different planting dates.

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

Participatory trainings were organized in 2018 and 2019. CHWs participated in nutrition training in Massinga and Mabote in 2018. Each worker prepared a plan to implement in her/his respective community. These CHWs conducted an awareness campaign; however, coordination and communication with SDAE need to be improved, as no vines were available for distribution.

In 2019 participatory training on nutrition was conducted in one community in each district. Participants were SDAE technicians, nutritionists at health centers and community volunteers. Communities came with their food basket to be prepared and put together for the participatory practical training on appropriate diets for one day. The technicians plan to conduct individual demos in their respective community.

The project adjusted the approach to train and provide all SDAE technicians with a minimum of knowledge about nutrition. Ninety technician staff (41 women) participated in the training:

- Thirty-eight CHWs (22 women) participated in March and April 2018.
- Fifty-two SDAE technicians and SETSAN focal points (19 women) were trained in October and November 2018.
- In 2019, 37 SDAE technicians (14 women) took part in participatory nutrition training and facilitated the training of volunteers at community level through culinary demos that incorporated OFSP roots and leaves.
- Of the 37 SDAE technicians, 12 (two women) were in Govuro, eight (four women) were in Mabote, six (five women) were in Massinga and 11 (three women) were in Vilankulo.
- Five agents from health centers participated in the culinary demos.
- Seventy-eight volunteers (55 women) participated, supervised directly by the project.
- SDAE technicians supervised 410 volunteers (281 women) in 17 communities.
- Less than 5% of community members know about the different uses of OFSP roots before the trainings.
- OFSP mixed with groundnut was the dish most appreciated by participants.

Organize culinary demos and contest

After the participatory training led by CIP in one community in each district, all SDAE technicians were advised to replicate what they had learned to other communities under their responsibility during 2019. Out of 37 SDAE technicians, 17 conducted culinary demos in 23 communities covering 892 HH (670 women) in Govuro, Mabote, Massinga and Vilankulo after the training (Table 2).

Table 2. Participants in culinary demos

District	SDAE Technician	Community	Participants	Women Participants
Govuro	7	7	211	179
Mabote	1	1	59	36
Massinga	5	8	310	239
Vilankulo	4	7	312	216
Total	17	23	892	670

After the evaluation, efforts to organize two workshops took up a lot of time, forcing the project to cancel some activities, such as the culinary contest.

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 SO 3. Four of the activities began during the first six months and continued into 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 in each district seems not be important, the DVMs themselves arrived to sell their products directly. However, HH selling OFSP were registered by SDAE technicians.

- A total of 317 HH sold OFSP in the districts of Govuro, Massinga and Vilankulo.
- Sixteen DVMs in these same districts sold OFSP vines and roots.

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

Meeting some DVMs and producers, followed by market observations and surveys, confirmed that in 2018–2019 the market is not a problem for vendors.

- The market in Inhambane province did not yet have a problem.
- The OFSP roots in the markets came from Manica province in 2018 and 2019.
- Some intervention areas produced OFSP roots for local and provincial markets.

Train traders, vendors, small bakers and street vendors, and implement pilot market activities

This activity included production–cost training during the first phase in Niassa, and participants analyzed each cost element in a participatory way. Using a working-groups tool, all participants were active in discussions and presentations. For Inhambane, the trainings took place from August to October 2018, and involved SDAE technicians and DVMs. Since 2018 the DVMs were trained on market strategy and marketing pillars. In Inhambane province, a few farmers produced OFSP for sale.

A total of 198 technicians and DVMs (47 women) were trained in OFSP production costs in Niassa and Inhambane. They included about 101 technicians (18 women) in nine districts of Niassa in 2018; 69 technicians (21 women) in four districts of Inhambane in 2018; and 28 DVMs (8 women) in three districts of Inhambane in 2018. Some producers from the intervention zones supplied OFSP to the local market in 2019.

Fifty-five technicians (17 women) and 28 DVMs (eight women) were trained in market strategy, marketing pillars and in product sorting in four districts of Inhambane. Fifteen DVMs (two women) acted as traders and sold their sorted and packaged OFSP roots directly. DVMs were linked with potential dealers within and beyond province.

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 material will be ready for planting in the rainy season. Vines were available year-round in Govuro, Massinga and Vilankulo districts. One association with 30 members receiving OFSP vines multiplied continuously in the lowlands to produce vines and roots.

- Twenty SDAE technicians continued to monitor OFSP production.
- A total of 826 HH produced OFSP continuously year-round.
- Three associations with 65 members planted vines continuously.

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

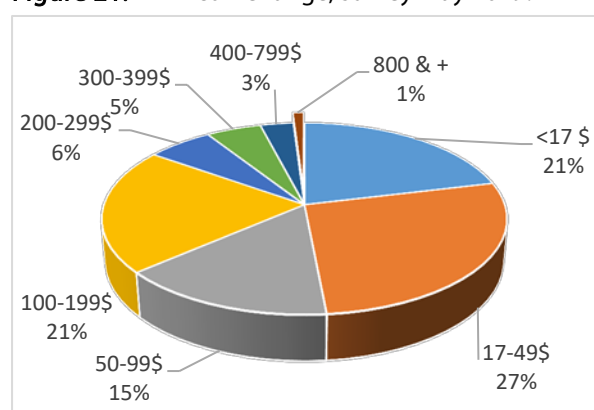
Production and market surveys were conducted with the nutrition survey.

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

Surveys were conducted only among DVMs in 2018. In 2019 production and market surveys were conducted with the nutrition survey in May and November–December with 268 HH and 271 HH, respectively.

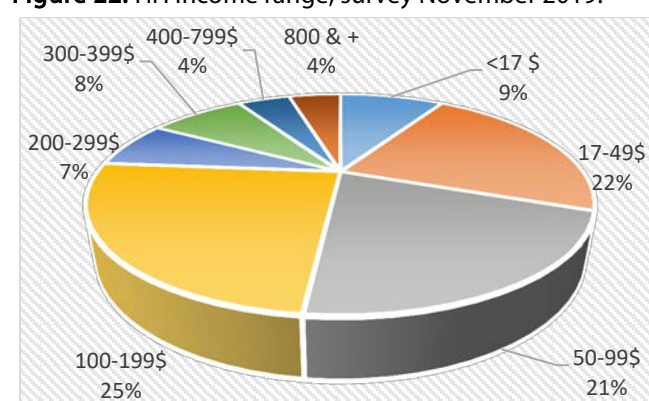
- Fifteen DVMs produced and sold 39 t of OFSP vines and 31 t of OFSP roots in 2018:
 - Nine of nine DVMs in Massinga sold 34,212 kg of OFSP vines, eight sold 29 t of OFSP roots.
 - One DVM in Vilankulo sold 440 kg of OFSP vines and one sold 5 t of OFSP roots.
 - Seven of 13 DVMs in Govuro sold 4,327 kg of OFSP vines, six sold 7 t of OFSP roots.
 - One of 6 DVMs in Mabote sold 304 kg of OFSP vines.
- Of the 268 HH surveyed in May 2019, 37% sold roots and vines and received an average income of \$104 (from \$1.25 to \$943.33) (Figure 21).

Figure 21. HH income range, survey May 2019.



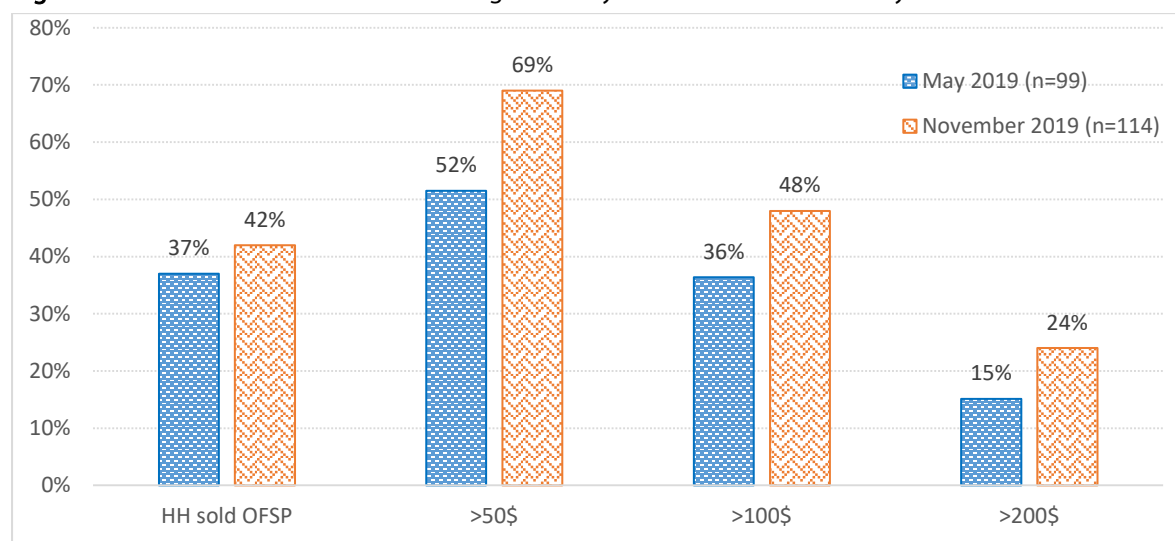
- Of the 271 HH surveyed in November 2019, 42% sold roots and vines and received an average income of \$174 (from \$4.20 to \$2,649.40) (Figure 22).

Figure 22. HH income range, survey November 2019.



- The number of HH selling OFSP increased from May (37%) to November (42%) surveys. The number of HH receiving incomes more than \$50 increased from 52% to 69% from May to November; more than \$100 from 36% to 48% and more than \$200 from 15% to 24% from May to November surveys, respectively (Figure 23).

Figure 23. Number of HH income increasing from May to November 2019 surveys.



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

The data collection sheets 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) in Mabote (a semi-arid zone) and Vilankulo (a tourist zone) from January to April. The price fell to 15–20 MZN/kg in Massinga. Forty-eight market data sheet surveys were shared with 48 SDAE technicians. Twenty-two SDAE technicians registered prices at 22 markets points.

- OFSP provided by wholesalers came from different sources (five zones within Inhambane province). Two years ago, OFSP came from Chimoio.
- OFSP from Mahave and Massinga covered two markets each for nine months, whereas OFSP from Chimoio covered to two markets for five months. Other non-OFSF were also sold at various markets (Table 3). OFSP price was higher than other sweetpotato.

Table 3. Sweetpotato wholesaler market sources

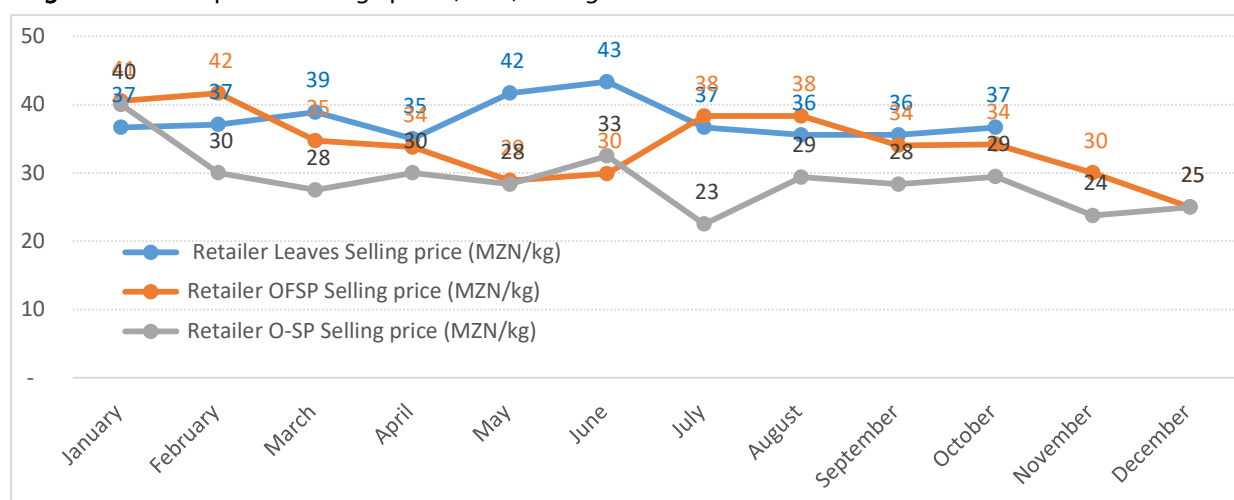
Wholesaler Source	Other Sweetpotato		OFSP	
	Market	Month	Market	Month
Chimoio	4	8	2	5
Pambara	2	4	1	5
Mahave	2	8	2	9
Mampinhane			2	5
Massinga			2	9
Machengue			3	6

- Retailers sold OFSP from Mahave for 12 months, from Massinga for 11 months and from Mapinhane for 10 months (Table 4).
- Sweetpotato leaves started to be sold in 13 markets.
- Prices ranged 35–43 MZN/kg from January to November for leaves, 25–42 MZN/kg for the OFSP roots and 23–40 MZN/kg for other sweetpotato (Figure 24).

Table 4. Sweetpotato retailer market sources

Retailer	Other Sweetpotato		OFSP		Leaves	
	Market	Month	Market	Month	Market	Month
Chimoio	2	1	2	2	0	0
Pambara	0	0	0	0	2	8
Mahave	2	9	5	12	3	5
Mampinhane	0	0	2	10	0	0
Massinga	1	7	2	11	1	8
Murrure			1	4	1	6
Other sources	8	2–4	10	1–5	6	2–4

Figure 24. Sweetpotato average price (MZN) during 2019.



- The average monthly net return per retailer per product and per wholesaler per product are shown in Figures 25 and 26, respectively.
- The average net return was higher in January and April for the retailers (Figure 25). The wholesalers got higher net return in March and August–October (Figure 26).
- Other sweetpotatoes got higher net return in January, April, May, August, November and December than OFSP for retailers. OFSP received better net return over the year for the wholesaler, except in October, May and December.

Figure 25. Retailer net return per product and per month during 2019.

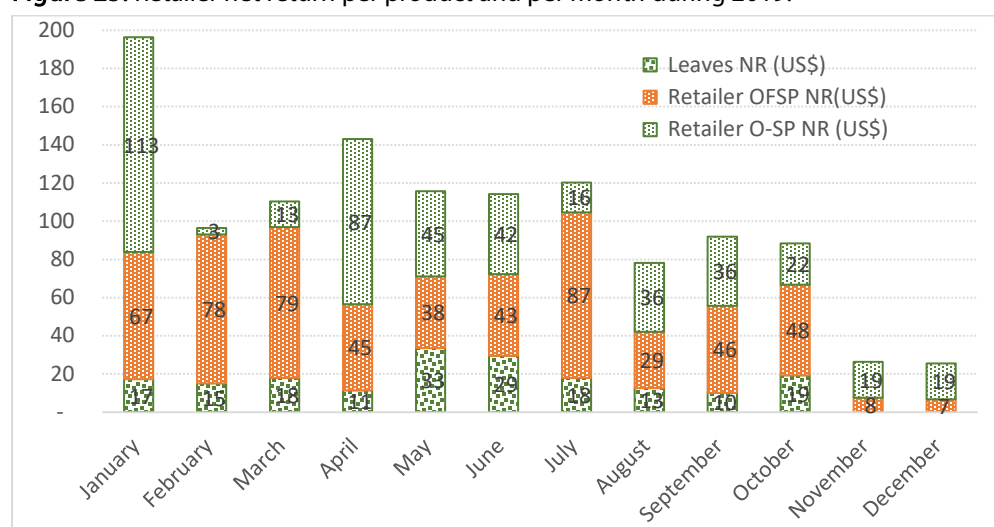
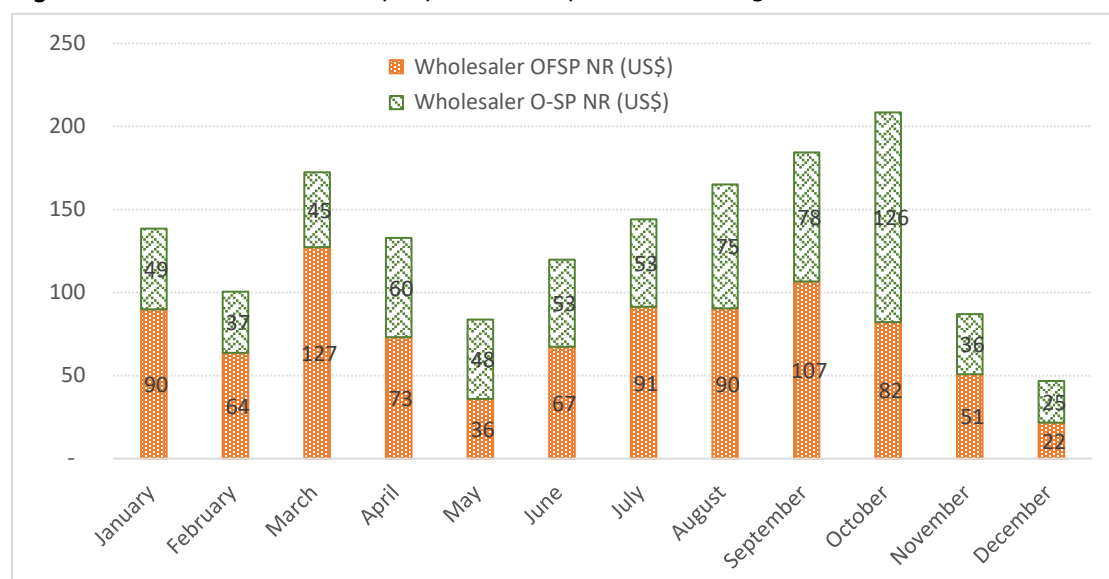
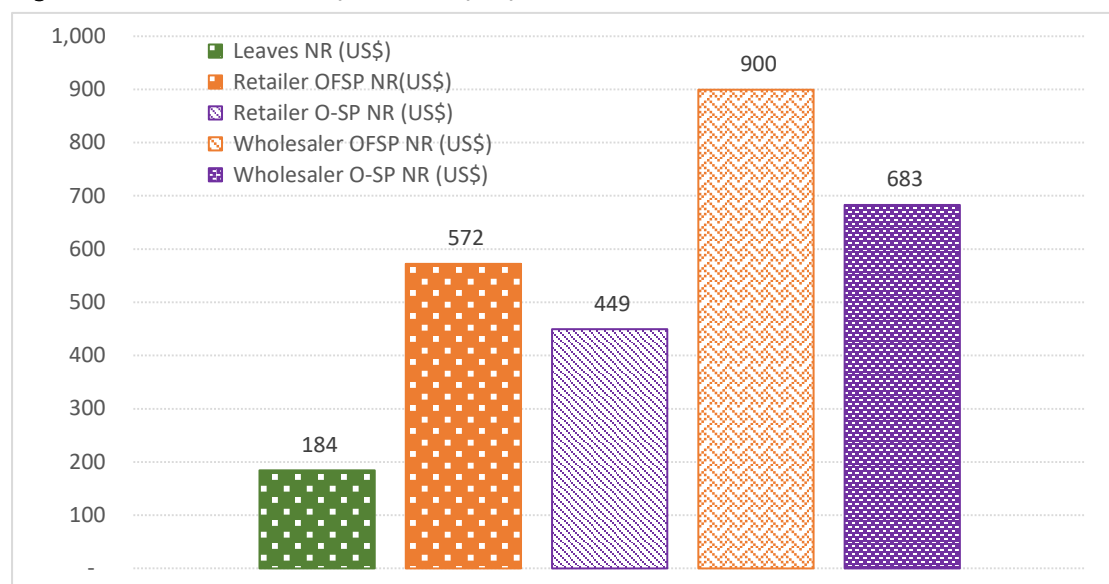


Figure 26. Wholesaler net return per product and per month during 2019.



- Sweetpotato leaves started to reach the market in 2019. Annual net returns for wholesalers were higher than for the retailers (Figure 27).
- OFSP net returns were higher than other sweetpotato for both wholesalers and retailers.
- In 2019 OFSP average wholesaler net return reached \$900, 26% more than the net return from other sweetpotato. OFSP average retailer net return reached \$572, 22% more than other sweetpotatoes.
- Average annual net return per retailer for leaves reached \$184 in 2019.

Figure 27. Annual net return per vendor per product in 2019.



5. Key issues

The lack of funds affected project implementation, causing it to stop for about 80 days (14 May–3 August). The office could not operate until the donor sent a letter confirming the transfer of funds with conditions for project reports and audits at the end of 2018.

- The field advance received in early May 2018 for the activities was managed for the baseline and trainings as priorities.
- Staff went on leave or were assigned to other project activities until 10 August 2018.
- Intensive trainings were organized from mid-August to November 2018.

Unpredictable climatic conditions affected the production this last season, not only for OFSP but also for all farmers' crops due to irregular rainfall. Some fields were leached out by the heavy rains, some were flooded and some dried up during the long period without rain. Most yields were very low.

- Planting OFSP continuously, accompanied by mulching, is one option 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 ridges, then raise the ridges during weeding.
- Planting flat without ridging with high-density plantings would be considered if the planting material is available.

Weevils start to attack OFSP roots in the four districts of intervention, especially in Vilankulo, 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 of them were not motivated, either doing no activity or presenting some incoherent and illogical data. Some of the DVMs and farmers presented better information and data than the SDAE technicians. The project should take the following measures:

- Select the motivated SDAE technicians in order to be more cost-effective, and invest more in training the SDAE technicians so that they could be effective and plan for the implementation immediately.
- Make the training practical and hands-on—the same for the DVMs and the volunteers which they understand easily.
- Continuously improve tools for monitoring to be filled by DVMs, technicians and supervisors.
- Reduce the number of communities of intervention and intensify the supervision.

The communities expected to receive some donations from the project—an attitude left over from previous projects. They also think the project is not for their benefit but only to use them. Changing this behavior 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 organizations.

Implementation as well as nutrition and markets need some improvement as issues raised by the evaluation team (Annex 2).

- A review meeting with all stakeholders involved in the project presented positive evidence in their respective fields. These should be explored in Niassa as well as in Inhambane.

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. Results showed that OFSP in the market were mostly from the intervention areas, reducing the supply from Manica province.
- An awareness campaign, followed by 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 fertilizer.
- Rejuvenation of healthy planting material every two months could stand for more than five years at HH level. In the case of the 'Namanga' variety received by DVMs in Massinga and Vilankulo in 2012, the variety is still of good quality in 2018.
- Triple S technology has been developed more in Mabote and in some semi-arid zones of the three other districts. The result here was promising, and HH were motivated due to the situation of the region.
- Culinary demos are one of the activities that created interest among HH. During the demo the participating volunteers appreciated the OFSP-based foods, including the leaves that limited retailers sold in the markets.
- 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.

7. Case studies

During this reporting period the case studies come from the DVMs. **Afonso Siboa**, a DVM in Cuamba Niassa, sold 19 t of OFSP vines in 2018 for 10 MZN/kg and received around 190,000 MZN (\$3,167). He built a new house and continues to produce OFSP vines. He has around 20 t available in 2019. He continues to produce 1,000 loaves of power bread (65% wheat flour and 35% OFSP puree) per week from his OFSP roots, receiving 20,000 MZN/month.

Hermelinda Joao, a DVM in Govuro, produced on an area of about 1,000 m² during the dry period of 2018. She harvested about 1 t and sold about 600 kg for 20 MZN/kg. She earned 12,000 MZN to help with family income and school expenses.

Emilio Nhaduate, an SDAE technician and DVM in Govuro, produced during the dry period of 2018 on an area of about 3,000 m² in the lowlands. He harvested 3.5 t and sold about 800 kg for 20 MZN/kg. He earned about 16,000 MZN, helping his family income and paying his university tuition. He contributed to save the vulnerable persons affected by Cyclone Idai by supplying about 4.5 t of OFSP vines for the emergency activities. He got around 40,500 MZN only from the vines.

Nelia Ngale, a DVM in Tevele Massinga, produced OFSP on an area of 3,000 m² and sold about 3 t of OFSP roots in 2017–2018 in the Massinga market. At 15 MZN/kg, she earned 45,000 MZN (\$750). During the agricultural fairs, she developed business linkage with traders from Maputo, Vilankulo and Mabote. She bought two heads of cattle and paid her children's school fees.



Four DVMs during an event in Massinga in August 2018. Left to right: Abel Luis Ngone, Nelia Ngale, Rafael Paulo and Valentino Bope. (Credit: B. Rakotoarisoa)

Abel Luis Ngone, a DVM, sold 2,840 kg of OFSP roots. He invested his sales income to increase his production area and labor. He started planting monthly after the market training this October.

Valentino Bope, a DVM from Chilacua, Rovene Locality of Massinga, has 1 ha plot under OFSP. Average yield of 'Sumaia' and 'Namanga' varieties is 30 t/ha. He sells vines, roots and leaves in Massinga and Mabote. In the 2018 season his OFSP total sales were 129,000 t. He has bought HH assets, built a better house and integrated an income-generating project: a piggery to use spoiled sweetpotatoes. He has employed five people at his farm. His advice to other farmers is that the market for OFSP is good, but farmers need to stagger their planting to avoid a glut in May–August.

Rafael Paulo is a successful DVM in Rio das Pedras in Massinga. He sold 3,920 kg of OFSP roots registered during different events in 2018 for 78,400 MZN (\$1,307). He built a house and repaired his vehicle in 2018. Any time he participated in a fair, his client networks developed and grew to Maputo. In 2019 he always sold in 10-kg bags at all fairs, the hospital, 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 at least 800 m² every month from January 2019 on, an area that will increase to 5,000 m² in June to meet the market from October, when the price of OFSP is high.

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.

Mariama Foquiço Macamo in interview after the culinary demo in Machengue in June 2019, Vilankulo. (Credit: B. Rakotoarisoa)



Jeremiah Ligogolo, a DVM in Mahave, Novo Mambone Govuro, produced OFSP on 1,000 m² during the dry season 2018, with irrigation through a motor pump. He sold about 2.5 t of roots in the local market and during the agricultural fairs, earning 25,000 MZN (\$417). He increased his production of OFSP vines in 2019, and contributed to save vulnerable persons affected by Cyclone Idai by supplying about 4 t of OFSP vines for the emergency activities. He got around 32,000 MZN 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. (Credit: I. Corthier)

8. Lessons learned

Given the logistics needed for mass distribution during the planting period, and the difficult access to villages due to heavy rain, quality OFSP vines would be delivered in small quantities during the dry season—an observation that has been confirmed every year since 2014 (Photo 1). In 2018 in Inhambane province, for instance, interested HH immediately adopted this approach and found it advantageous during the planting time. As one beneficiary observed, “the challenge is not the availability of OFSP vines but how they are managed.” 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.

Photo 1. (Left): A small quantity of clean ‘Delvia’ variety multiplied near a house during the 2016 dry season in Bia village, Niassa province. (Right): The same variety multiplied in the humid lowland in November 2018, ready to be planted in the field in Chilacua village, Massinga district, Inhambane province in January 2019. (Credit: B. Rakotoarisoa)



OFSP was considered during the Gala Nutrition event in Niassa in 2016 and during the agricultural campaign kick-off in Inhambane in 2018 (Photo 2). The directors of SDAE and the provincial Department of Agriculture and Food Security continued to stress the importance of OFSP at provincial meeting level advocacies. This helped to contribute significantly to the dissemination of OFSP beyond the intervention zones where OFSP is produced in all districts in Niassa province and some districts in Inhambane province without CIP’s intervention.

Photo 2. (Left): The governor of Niassa province hands an OFSP vine to the director of the Economic Activity Service District to emphasize that OFSP should be planted by all district directors to combat malnutrition, August 2016 (Credit: A. Domingos). (Right): The launch of the official agricultural campaign was celebrated by planting OFSP varieties ‘Namanga’, ‘Alisha’ and ‘Sumaia’. The minister of education and human development, the governor of Inhambane, the administrator of Vilankulo and the provincial director of agriculture and food security attended the event on 25 October 2018. (Credit: B. Rakotoarisoa)



A session on production costs was included in the training in Inhambane in 2018, since the project began supporting farmers' bringing their products to market. Production cost is a very important part of developing a business plan. Most of the technicians do not advise production costs for farmers, and roughly 99% of the farmers interviewed never did so. This lack of support has prompted the farmers in Inhambane to report that they did not benefit from the project once the cost of OFSP roots dropped to 10 MZN/kg while their production cost was 6 MZN/kg. Participants appeared satisfied with implementing continuous, year-round planting, seeing the opportunity of a high market price during the scarcity period (October–April). Some of the DVMs plant continuously, as mentioned above in the case studies.

Given the frequent transfer of SDAE staff in the field, involving all of them in the participatory-training process had more advantages. Some of them 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.

The DVMs and mothers' testimonies during the workshops revealed evidence of sustainability. The meetings were good opportunities to explore the successes from others to be implemented in the future intervention.

9. Financial report

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

10. Conclusion

During project implementation in 2018–2019, several observations about the project's three SOs emerged. OFSP was consumed at HH level and reached the market. An awareness campaign done at the beginning of the intervention at community level spurred high community interest and participation. Participatory planning with the community significantly encouraged HH to grow OFSP from April to September—at least for conservation and multiplication—and to use organic fertilizer. The technicians, however, need more capacity building to carry out the campaign properly.

- **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 learned with the technicians and their motivation to sustain the OFSP value chain, at least in the intervention districts. The trainings should be directly in the field. Also, the project requires the communities to be involved in project implementation, from planning to evaluation.

The survey results showed different indicators of changes since the project implementation and during 2019. HH adopted OFSP varieties, improved their incomes, diversified foods and OFSP culinary preparations. Production continued to improve access to vitamin A and incomes.

- **Objective 2.** Enhancing SDAE capacity for monitoring and field coordination is a must. By monitoring the HH receiving OFSP vines last year, more than 80% continue this year, showing that OFSP become an important crop for the beneficiaries. Most of them received small quantities, and the most vulnerable HH were reached. The objective of producing OFSP roots year-round still needs to convince HH.
 - Following the practical training both for the vine multiplication and the culinary demos, implementation seems easy. This training strategy will be developed for the future project; consequently, the beneficiaries to be reached will be easy. Progress was made at

community level once an awareness campaign occurred at the first step of intervention. Each technician got training materials and a brochure for increasing awareness. Some activities need to be enhanced, such as yield measurements, where the project got only data from few technicians and few DVMs. Some semi-arid zones like Mabote district and some areas in the three other districts were supported more in Triple S technology. Many activities to be done by the technicians need to be monitored closely to improve results.

- The number of beneficiaries reached exceeded expectations: 20,366 HH in the four districts of Inhambane province compared with the original target of 13,000 HH. Nutrition activities will be enhanced next year. The practice of distributing smaller amounts of OFSP vines reached most HH in the community, even the smallest ones. This helped to change how HH conserve vines after harvesting. That is, HH should multiply the vines in a small garden rather than keep the plants in old plots.
- **Objective 3.** Although this objective related to the market remains a challenge for the project, market price monitoring and surveys were done. Prices are still high, good for producers but limit the access for the city consumers. However, supply from Manica province was reduced in the market, whereas OFSP in the intervention areas reached the local markets. The last continuous monitoring done with the technicians and DVMs revealed production costs under irrigation of 6–8 MZN/kg of roots. These production costs could be reduced with good management of labor, which implies a price reduction in the market. Access to OFSP increases if the price in the market is reduced. Processing could also be developed if the price of OFSP roots decreases to 10 MZN/kg.

CIP is a research-for-development organization with a focus on potato, sweetpotato and Andean roots and tubers. It delivers innovative science-based solutions to enhance access to affordable nutritious food, foster inclusive sustainable business and employment growth, and drive the climate resilience of root and tuber agri-food systems. Headquartered in Lima, Peru, CIP has a research presence in more than 20 countries in Africa, Asia and Latin America.

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