Commissioned by:	UN Environment, CTCN, Adaptation Fund
Project Title:	Solar based irrigation business mode 'pay as you irrigate' for women empowerment, water management and food security in Mozambique
Implemented by:	Practica & HUB
Country:	Mozambique
Deliverable:	5.1.a Minute of the stakeholder consultation workshop to understand the main barriers to invest and finance solar powered irrigation systems, with local smallholder farmers and financial institutions in Pangalata, Moamba, Mozambique

Solar-based irrigation business model 'pay as you irrigate' for women empowerment, water management and food security in Mozambique

Minute of the stakeholder consultation workshop to understand the main barriers to invest and finance solar-powered irrigation systems, with the local smallholder farmers and financial institutions in Pangalata, Moamba, Mozambique

August 2024

This project has been proposed by Universidade Pedagógica de Maputo

With the support of the Ministry of Science and Technology and High Education

Implemented by PRACTICA & HUB

Commissioned by UN Environment, CTCN, Adaptation Fund

Disclaimer:
This document is an output of the Technical Assistance Response in Mozambique. The present report is the output of the project 'Solar based irrigation business model 'pay as you irrigate' for women empowerment, water management and food security in Mozambique. The views and information contained herein are a product of the international TA implementation team led by PRACTICA & HUB.

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1. Introduction

This report is part of the deliverables for the project *Solar-based irrigation business model' pay as you irrigate' for women empowerment, water management and food security in Mozambique* implemented by the consortium PRACTICA and HUB. The project's overall objective is to identify the best Solar Powered Irrigation System (SPIS) for the Pangalata association in Moamba that could be deployed using groundwater, surface water, and the possibility for rainwater harvesting. The system's design will be reinforced by the definition of a clear *pay-as-you-irrigate* business model that will be customized for the lowest-income farmers.

This deliverable provides an overview of the feedback collected during the stakeholder consultation meeting. Specifically, the main barriers farmers face in obtaining credit for their productive activities and the bottlenecks financial institutions face in providing smallholder farmers loans or other financial products.

Note to the reader: Activities 4.3 and 5.1 were conducted during the same workshop. Therefore, the agenda and list of participants are similar to the one shown in deliverable 4.3.

2. Objectives

1. Understand the main barriers to obtaining credit to finance productive agricultural activities (solar powered irrigation systems included) faced by smallholder farmers.
2. Understand the bottlenecks for financial institutions towards providing loans and other financial products to smallholder farmers.
3. Discuss the most suitable business model (s) for financing the solar powered irrigation system tailored to the expectations of the Pangalata association farmers.

2.1 Agenda

Workshop for stakeholder consultation project 'Solar-based irrigation business model *pay-as-you-irrigate* for women empowerment, water management and food security in Mozambique

Objective: To present the cost analysis of the technologies selected (activity 4.3), and to organize a participatory consultation to understand the main barriers to financing SPIS (activity 5.1).

Local time: Mozambique (GMT+2)
Data: Tuesday 25th July 2024
Local: Meeting Room of the Government of Moamba District

Time	Activity
08:30-09:00	Registration and welcoming of participants
09:00-09:30	Presentation of the agenda and introduction of the team and participants Inácio Nhancale (HUB) & Pedro Pinheiro (HUB)
09:30-09:45	Presentation of the fact sheets & cost analysis Inácio Nhancale (HUB)
09:45-10:00	Participatory discussion on the fact sheets & cost analysis Inácio Nhancale (HUB)
10:00-10:30	Coffee break
10:30-13:15	Participatory consultation to understand the main barriers to financing SPIS faced by smallholder farmers and financial institutions. Pedro Pinheiro (HUB)
13:00-13:15	Q&A about the next steps of the project, Wrapping up and closure of the meeting Inácio Nhancale (HUB) & remote by Berry van den Pol (PRACTICA
13:15-14:15	Lunch

2.2 List of Participants

No	Name	Institution	Gender
1	Herrita Massango	UP Maputo	F
2	Arsenio Mindú	UP Maputo	M
3	Cesar Menaco	CITT	M
4	Rosita Cumbe	GAPI	F
5	Aderito Miranda	FUNAE	M
6	Saibo Amade	SDAE	M
7	Joaquim Valoi	SDAE	M
8	Domingos F. Macandio	INIR	M
9	Neussia M. Ubisse	INIR	F
10	Manuel P. Miquitaio	INIR	M
11	Olaxio Messa	SDAE Moamba	M
12	Adelino Magu	Smallholder farmer Pangalata	M
13	Ana Bernardo	Smallholder farmer Pangalata	F
14	Elisa Elmane	Smallholder farmer Pangalata	F
15	Watanica Fernando	Smallholder farmer Pangalata	F
16	Marta Tazula	Smallholder farmer Pangalata	F
17	Elisabeth José	Smallholder farmer Pangalata	F
18	Cecilia Alberto	Smallholder farmer Pangalata	F
19	Inocencio Decivi	SDAE	M
20	Celso Francisco	SDSMAS	M
21	Lidia timana	Smallholder farmer Pangalata	F
22	Adelina Mutuque	Smallholder farmer Pangalata	F
23	Maniamo Francisca	Smallholder farmer Pangalata	F
24	Ezar Essau	UP Maputo	M
25	Manuel Oliveira	UP Maputo	M
26	Paulino Victor	UP Maputo	M
27	Jose Chamessango	UP Maputo	M

3. Main outcomes of the consultation workshop

27 participants (of which 12 were female and 15 males) + 3 HUB staff attended the workshop. Participants belong to the Pangalata association, Mubobo association, agricultural extension services (SDAE), District Service for Health, Women and Social Action (SDSMAS), Center for Research and Technology Transfer (CITT), and National Irrigation Institution (INIR). Maputo Pedagogical University (UP) also attended the workshop (see 2.2 list of participants).

3.1 Main barriers to finance solar powered irrigation systems

Once the first half of the workshop was concluded, the specialist in Economy for this technical assistance, Pedro Pinheiro, introduced himself and explained the process that would be followed to collect feedback from the participants regarding the workshop's objectives.

The participatory discussion was held to understand smallholder farmers' main barriers to obtaining credit for their productive activities[1]. At the same time, the financial institutions were consulted to understand the bottlenecks they face in providing loans and other financial products to smallholder farmers. As these barriers are interlinked, they are presented in Table 1 as a summary of the main barriers to accessing finance for solar irrigation in general. The barriers to financial, technical, legal, institutional, and knowledge/cultural barriers have been analyzed.

Table 1. Main barriers to acesss finance for solar irrigation highlighted during the workshop[2].

Barrier	Description
Financial	Agricultural activities in general (especially by smallholder farmers) are perceived as high risk for financial institutions to provide credit.
	The lack of guarantees to provide collateral from smallholder farmers (especially women farmers) makes it difficult for farmers to offer guarantees (the usually required collateral is 120% of the financing amount).
	Interest rates are prohibitively high in general.
	Lack of grace period and agriculture without grace period is challenging to finance.
	Market prices for agricultural products are highly volatile, and the risk of taking expensive credit is too high without the certainty of recovering the costs.
Technical	There is a misunderstanding among the financial sector that the quality of the solar irrigation systems is too low due to previous experiences in different projects.
	Suppliers often make a poor selection of the pump and a poor irrigation system design. Frequently, there is not enough water being pumped to irrigate the fields. Therefore, the system does not solve the irrigation problem.
	Climate change risks, such as flooding, are becoming more recurrent, which may cause the loss of all investments.
Legal and institutional	Lack of land rights (DUAT[3]) hinders their possibility of matching criteria with financial institutions' requests to access credit.

Commented [SM1]: Why is there a gender emphasis here ? Why is it harder for women farmers to provide collateral as opposed to men ? Is it because women in Mozambique do not own land or assets in general ?

Commented [SM2]: I assume this is no longer a problem with this project right ?

[1] The slides deck used during this participatory exercise can be accessed in the link: https://docs.google.com/presentation/d/1bo5i4O5dPX95CO_OvM0mxwG9I4P2E-hN/edit?usp=sharing&ouid=112789746957537703336&rtpof=true&sd=true

[2] This table presents the summary of the barriers discussed during the workshop.

[3] Direito de Uso e Aproveitamento da Terra.

	Lack of long-term and transparent policies and institutional alignment from governmental institutions (INIR[4] and Agricultural Ministry) to support the upscaling of solar irrigation.
	Lack of financial stability in some areas of the country.
	Smallholder agriculture in Mozambique is often organized in associations. It is common for these associations to be informal agreements between the members. However, when filling out the credit request, the bank requires a legal constitution document of the association.
Knowledge/ Cultural	Farmers don't know who to ask for formal credit, what institutions provide credit, for what, and under what conditions (also afraid to ask)
	Credit institutions are not easy to access for farmers (they often have offices only in the capital of the province, far from villages)
	Fear from farmers of not being able to comply with payments[5].
	Often, unviable and unrealistic business plans are presented to the financial institutions.
	Access to information is still a main barrier for women in rural Mozambique. Especially for women, the financial information does not reach them that easily.

More detailed questions were asked directly to the financial institution accompanying this technical assistance, GAPI-Sociedade de Investimento[6]. These questions allow to identify acceptable levels of risk for providing credit for solar irrigation. The answer to these questions is summarised in Table 2.

Table 2. Main constraints faced by financial institutions in Mozambique.

Guiding questions	Information provided
What is the usual required guarantee for obtaining a loan?	Usually, 120% of the financing amount.
What is accepted as a guarantee for a loan by GAPI?	The most common are physical assets such as buildings or equipment. However, most of the farmers do not have such assets. To solve this, they recommend smallholder farmers to find a guarantor that can provide such a guarantee in place or that the equipment acquired with the loan is used a collateral.

[4] Instituto Nacional de Irrigação

[5] As an example mentioned during the workshop, most of the farmers have never even tried to access formal credit. Some of them are part of informal communal saving groups (grupos de poupanças). Only one farmer received financing for agriculture, to invest in a motor pump worth 50,000 Meticais, for which he received financing and which he paid off in 14 months with 5,000 Meticais installments. That results on an estimated annual interest of 34%. This credit was provided by an agricultural reseller.

[6] GAPI is a financial institution for development. With the mission to contribute to the sustainable economic development of Mozambique through the i) promotion of national entrepreneurship; ii) building an inclusive financial system.

Do you have specific financial products tailored for smallholder farmers?	GAPI is working towards taking credit lines closer to smallholder farmers. For now, GAPI has a specific credit line for renewable energy that goes up to 10,000 USD. There is also a specific financing line for agriculture that ranges up to 50,000 USD with interest rates between 9% and 18%. It all depends on the viability and risk assessment done by the credit managers at GAPI
Do you see investments in SPIS as high-risk, and why?	Yes, SPIS's quality and long-term performance are a concern in Mozambique. This is not only true for GAPI but is also commonly expressed by different financial institutions. The supplier chain of solar irrigation is not well developed in the country and is not reliable, long down-time experience by the farmers.
Do you have skilled staff to provide technical support to farmers in preparing and presenting their business plans for loans?	GAPI provides support to smallholder farmers or associations in preparing business plans (or projects) for submitting loan requests. However, awareness of the staff in how to assess risks on SPIS investments needs to be strengthened

Commented [SM3]: How would this be done ? Would the farmers need to pay for this service ? Or do GAPI do this as part of their awareness program to reach more clients ?

3.2 Preferred payment modalities for smallholder farmers

To draft a tailor-made business model for smallholder farmers, it is essential to understand how the money flows through the year according to their activities. This helps to assess the payment capacity of farmers throughout the year. The agricultural production calendar is shown in Table 3. It highlights the moments when farmers need to buy inputs, which means investing money and the months when they have positive cash flow. Highlighted in green are the months farmers referred to be selling crops.

Table 3. Calendar of agricultural production in Pangalata.

Main Activity/Month	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**June**	**Jul**	**Aug**	**Sept**
Buying inputs[7]									x	x	
Sowing										x	
Irrigating	x	x								x	x
Harvesting	x	x									
Selling crops		x	x	x	x						

Dry season	
Rainy season	

The payment modalities in Table 4 were shown and explained to the farmers, who were then asked what their preferred financing modality would be.

[7] Seeds, irrigation equipment (buckets), chemical fertilizer.

Table 4. Different payment modalities discussed with the farmers.

Payment modality	Months												
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Sales							30000	20000	15000	10000			
Inputs	-15000											-20000	
1st financing option	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-18000
2nd financing option							-4500	-4500	-4500	-4500			-18000
3rd financng option							-18000						-18000
4th financing option		-4500	-4500	-4500	-4500								-18000

Most farmers indicated that their preferred option corresponds to number four, payments from November until February. This way, they can ensure enough cash flow to cover the instalments.

Their second preferred option is option one (monthly payments divided throughout the year). They refer to like this model as it distributes the amount over the months (a smaller amount than the other options) and thus feels less complicated to cover the monthly payments. When asked how farmers would pay in the months, they have no revenue. They answered that they could use incomes from other activities and would have to manage savings in the months they have revenues to pay the monthly instalments during the season.

As for the preferred technology that should be used to pay for the service, the most preferred is in cash directly to the supplier who comes and collects it from the village, as they would like to receive a paper voucher that the payment has been made[8]. The second one Is through mobile banking (M-pesa, E-mola), which predominates even in rural areas of Mozambique. Webpage payment or bank transference is not the farmers' preference.

3.3 Data collected to define the business model

Detailed data on the production system was collected to build the business model for the farmers. The detailed information is presented in deliverable 5.1.b, but Table 5 summarises the production system key information.

Table 5. Data collected to define the business model for Pangalata.

Data collected to define the business model	
Number of members	25
What is the production model of the association?	All the members work on the same plot in a rotation scheme. They control the work time of each member, and they divide the profits according to the work participation
What was the area under production during 2023?	2,5 Ha
What crops were produced?	Potato, cabbage, tomato and pepper.
What are the production plans for when the SPIS is installed?	Focus on Potatoes in the 5 Ha that will be irrigated due to very high market demand and local crop potential and high-profit potential if produced off-season

[8] Practica had a similar experience in Mozambique as in a different project farmers were making payments through mobile banking (M-pesa), but they were complaining that their only proof of payment was an SMS, therefore they requested the supplier to provide a paper receipt that they can keep in their records.

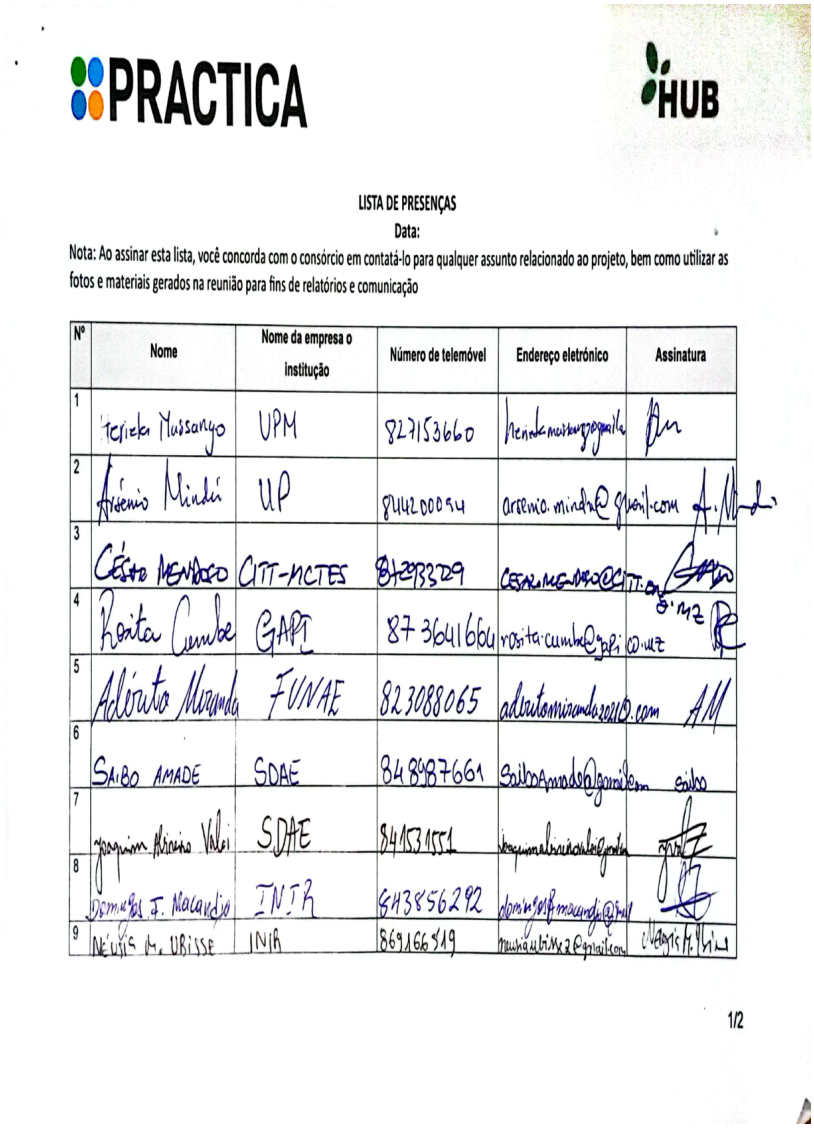
What is the area planned to be irrigated with the SPIS	5 Ha
What is the average yield of potatoes in the region?	Between 20 and 30 Ton per Ha
What was the yield for the Potato crop during 2023?	20 Ton/ha
What agricultural inputs did you apply in your fields?	Seeds, fertilizer, pesticide, insecticide and fungicide
Inputs costs 2023	Seeds: 300.000 MZN
	Fertilizer: 40.000 MZN
	Pesticide, Insecticide and fungicide: 220.000 MZN
Other costs 2023	Land preparation: 12.000 MZN
	Other labor: 10.000 MZN
	Diesel: 30.000 MZN
	Transport: 120.000 MZN
	Total Costs: 732.000 MZN
Sales 2023	40.000 Kg
	45 MZN/Kg
	1 800 000 MZN
Profit 2023	1 068 000 MZN
Profit per ha	534 000 MZN /Ha
Projected Investment in SPIS	3.333.371 MZN
Projected Water Consumption	220 m3/day
Markets	All the production is sold in the Zimpeto Market. There is a huge demand for potatoes in the market.
Transport	They rent transport to deliver the product to Zimpeto market
Product specifications	They sell potatoes in bags of 10Kg and 20-kg boxes
Prefered Payment	They pay the inputs in cash and receive the sales value in cash

4. Next Steps

To close the session, it was explained to the participants that the next step for the consortium is to work on preparing the business case, which will be presented in a workshop to collect a final round of feedback from the working group.

5. Annexes

Annex 1. List of Participants



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LISTA DE PRESENÇAS

Data:

Nota: Ao assinar esta lista, você concorda com o consórcio em contatá-lo para qualquer assunto relacionado ao projeto, bem como utilizar as fotos e materiais gerados na reunião para fins de relatórios e comunicação

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Annex 2. Pictures from the workshop.


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