

**POWERING  
AGRICULTURE:**

AN ENERGY GRAND CHALLENGE  
FOR DEVELOPMENT



# Module 10: Finance

The Toolbox on Solar Powered Irrigation Systems is made possible through the global initiative Powering Agriculture: An Energy Grand Challenge for Development (PAEGC). In 2012, the United States Agency for International Development (USAID), the Swedish International Development Cooperation Agency (Sida), the German Federal Ministry for Economic Cooperation and Development (BMZ), Duke Energy, and the Overseas Private Investment Cooperation (OPIC) combined resources to create the PAEGC initiative. The objective of PAEGC is to support new and sustainable approaches to accelerate the development and deployment of clean energy solutions for increasing agriculture productivity and/or value for farmers and agribusinesses in developing countries and emerging regions that lack access to reliable, affordable clean energy.

#### Published by

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of BMZ as a funding partner of the global initiative Powering Agriculture: An Energy Grand Challenge for Development (PAEGC) and  
The Food and Agriculture Organization of the United Nations (FAO)

#### Responsible

GIZ Project Sustainable Energy for Food – Powering Agriculture  
Francesca Dobrigna

#### Contact

[Powering.Agriculture@giz.de](mailto:Powering.Agriculture@giz.de)

#### Download

[https://energypedia.info/wiki/Toolbox\\_on\\_SPIS](https://energypedia.info/wiki/Toolbox_on_SPIS)

#### About

Powering Agriculture: An Energy Grand Challenge for Development: <https://poweringag.org>

#### Version

1.0 (April 2018)

#### Disclaimer

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Food and Agriculture Organization of the United Nations (FAO) or any of the PAEGC Founding Partners concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by GIZ, FAO, or any of the PAEGC Founding Partners in preference to others of a similar nature that are not mentioned. The views expressed in this information product are those of the author and do not necessarily reflect the views or policies of GIZ, FAO, or any of the PAEGC Founding Partners.

GIZ, FAO and the PAEGC Founding Partners encourage the use, reproduction and dissemination of material in this information product. Except where otherwise indicated, material may be copied, downloaded and printed for private study, research and teaching purposes, or for use in non-commercial products or services, provided that appropriate acknowledgement of GIZ and FAO as the source and copyright holder is given.

Implemented by

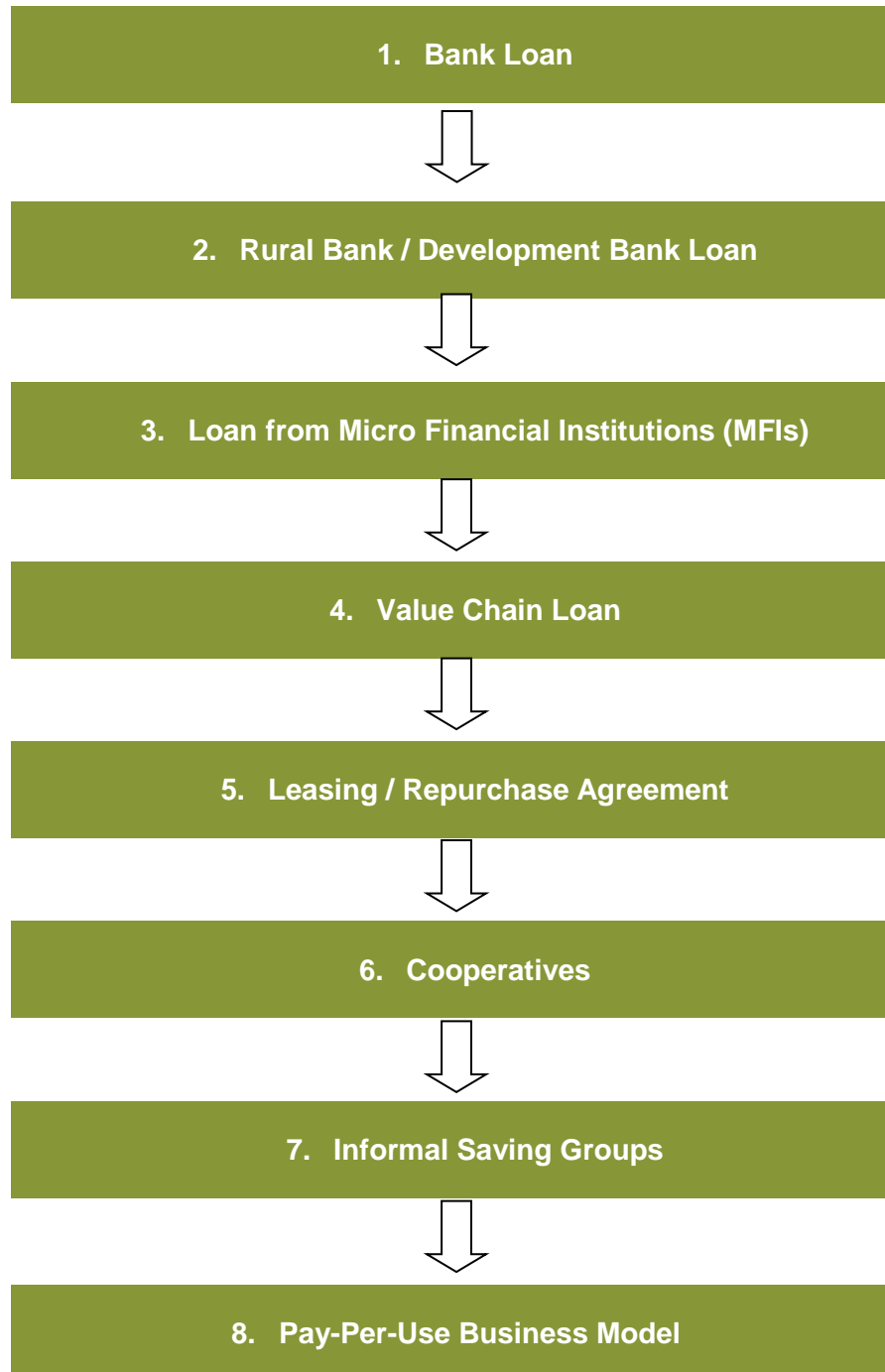




## **ABBREVIATIONS**

EUR	Euro
FI(s)	Financial Institution(s)
JOYWO	Joyful Women Organization
KSh	Kenyan Shilling
MFI(s)	Micro Financial Institution(s)
MNRE	Ministry of New and Renewable Energy
NABARD	National Bank for Agriculture and Rural Development
PAYGO	Pay-as-you-go
SACCOs	Savings and Credit Cooperative Organization
SMEs	Small and medium-sized enterprises
SPIS(s)	Solar Powered Irrigation System(s)
USD	US Dollar

## FINANCE



## MODULE AIM & ORIENTATION

The **FINANCE** module describes general financial services possibly available to farmers who want to adopt a Solar Powered Irrigation System (SPIS). The goal of the module is to inform decision-making agencies (governments, financial institutions, technology providers, development practitioners, etc.) about the financial option more suitable for farmer needs considering their specific characteristics. As a result, more farmers will have access to finance for procuring Solar Powered Irrigation Systems (SPISs), increasing the efficiency and sustainability of the agriculture sector.

If farmers possess enough money to purchase a SPIS without the need of a loan, they should consider the **INVEST** module.

Agricultural productivity and profitability are highly correlated with the state of development of financial sector in a country. Therefore, agricultural financing is an important driver for growth. Unfortunately, limited access to adequate financing is a common problem among farmers, especially in developing countries. This shortage of agricultural funds derives mostly from the unwillingness of financial institutions (FIs) especially banks to finance new technologies in the agriculture sector. The main reason for this is the perceived risk of non-repayment due to the uncertainty of the sector w.r.t. price, production, highly unpredictable markets and risks associated with a new technology. Furthermore, the remote location of some farms, the shortage of knowledge about the agricultural sector and inadequate policies like strict collateral requirements constrain the access to agricultural financing.

These difficulties could be overcome with innovative finance products, the adoption of adequate insurance, increasing awareness about agricultural specific risks and the expansion of agriculture financial service providers. As a result, the financing of Solar Powered Irrigation Systems could be seen as an opportunity for financing institutions, technology providers and governments to diversify their loan portfolio, expand their range of financial products, and enhance the economic development of a country.

This module differentiates between two main financing model categories: development models and business models. Development models are mostly used by governments, NGOs and non-profit institutions that aim to enhance the livelihood and overall development for farmers. Development models would typically include grants, subsidies and infrastructure programmes. Business models on the other side are adopted by banks and financial institutions, which, besides enhancing the economic growth of a country, aim to obtain profits from the provided credit. Business models are suitable for more mature markets, where appropriate credit mechanisms are readily available.

Even if, in rural areas, the loans from family members, neighbors and friends are widespread, they are not going to be described in this module, since they do not add overall value to the market.

In this module eight financing models are described and subcategorized between development and business financial models.

## 1 BANK LOAN

### OUTCOME / PRODUCT

A commercial bank is defined as a financial institution whose main occupation consists of giving loans and taking deposits. A commercial bank earns its income through the interest resulting from the loans provided. Therefore, a commercial bank uses a **business financial model**.

Depending on the size, the length and the purpose of the credit, banks offer different types of agricultural loans. Unfortunately, the majority of commercial banks have not developed a financial product specific for the purchase of Solar Powered Irrigation Systems yet. Consequently, a standard agricultural loan needs to be requested.

In order to secure a loan from a commercial bank, several documents are required to be signed by both parties. A **note** in which the borrower agrees to pay the loan back at the decided interested rate, a **loan agreement** which contains the terms and conditions of the loan, a **security agreement** which explains what will happen with the collateral in case the borrower fails to pay back the loan and finally a **financial statement**.

Depending on their term, loans can be subdivided into three categories: short, intermediate and long term loans. Normally for the purchase of a farm equipment an intermediate term loan, which has a life span between 1 to 5 years, is used. Since the usual payback time for a SPIS stretches between 2 to 5 years, depending upon the farm income and other associated economics, an intermediate loan, is the best solution.

Once the loan is availed, interest needs to be paid. It can be fixed, adjustable or variable. Fixed interest remains constant during the entire loan period, adjustable interest is allowed to change but only in determinate intervals of time while variable interest changes as per the market conditions.

Bank loans can be paid through fixed constant payments or fixed principal payments. In the first case, interest and the principal are equally divided among the length of the loan. In the second case the principal is equally divided and interest is calculated each time based on the amount of the loan remaining to be repaid. In case of fixed principal payments, the initial payments are the highest.

Due to the high risk of the agricultural sector, interest on agrarian loans are typically high.

One example: in Kenya, which is the East African country with the highest financial inclusion, interest rates range between 20 and 30% (as at 2017). The Equity Bank of Kenya requires 18% of interest plus an additional 3% for the application fee. The KCB Bank, partly owned by the Kenyan government, charges 22% interest and an additional 2.5% for the application fee. In addition, two compulsory insurances are required: a credit insurance with a 2.5% interest rate and a crop insurance with a 7% interest rate. Overall, the interest reaches about 30%.

### DATA REQUIREMENTS

The data required in order to finalize a credit are the following for most commercial banks:

Farmer personal data:

- Sex: According to studies women are more likely to pay back debts than men.
- Age: Some banks offer credit only to specific age groups: i.e. between 25 and 55 years old. In addition, in many countries, interest rate subventions are provided to senior citizens.
- Marital status: Married people with kids are more likely to pay back debts.
- Documents of identification.

Farm information:

- Property certification: If the land is leased, the chance to obtain credits is much lower.
- Credit history: Did the farmer pay back all his past loans? Is the farmer creditworthy?
- Insurance of the loan (if applicable)
- Bank account statement: In order to check the farmer's cash flow and transactions.
- Income from agriculture
- Income from other activities besides farming
- Collaterals: Banks need a security in case the farmer is not be able to pay back his debt.

the optimal utilization conditions, presence of a second-hand market and risk of theft. Banks require this kind of information in order to safeguard themselves from inconvenient situations, which will end up in a loss of money. If for example, the system is stolen or the pump is positioned in an area with high salinity and it breaks down, the farmer is not likely to continue to pay the loan back and the bank will end up with unpaid credit and a worthless collateral.

## PEOPLE / STAKEHOLDER

- Commercial Bank
- Financial experts / Risk analysts
- Farmer

## IMPORTANT ISSUES

Generally, big farmers are more likely to obtain credits from big banks; conversely, small farmers will be better off dealing with smaller financial institutions. Small farmers with narrow financial means and limited access to the market and customers, are challenged to obtain credits from a commercial bank. Collaterals, alternative sources of income and a bank account represent the main barriers for credit eligibility. Collaterals and alternative source of income act as an insurance for the bank, safeguarding them in case the agricultural activity is not profitable.

Unfortunately, the solar pump itself is not considered as collateral, since banks lack information about this product. Therefore, financial institutions which mostly rely on internal data, do not have experts that can assess the risk of the loan. In order to use a solar pump as collateral, a financial analyst is required to know the initial price, the lifespan and the depreciation rate of the product in order to be able to trace its value back. Furthermore, it is necessary to know



## 2 RURAL/DEVELOPMENT BANK LOAN

### OUTCOME / PRODUCT

Agrarian development banks also referred to as rural development banks, are financial institutions operating at regional level, which provide financial services with comparatively low interest rates, flexible repayment terms, amortized lending and technical and marketing support to actors involved in the food value chain. The main goal of a rural bank is the development of rural areas in terms of standards of living, food security and sustainability of the agrarian production through financial inclusion of SMEs. This implies, that rural banks use financial models which are substantially more focused on **development** than their conventional counterparts.

Rural development banks are able to offer convenient conditions because they collaborate with governments, NGOs and private companies, which support them economically. This strategic cooperation imposes limitations to financing activities since farmers need to meet specific requirements of the donors. For example, just specific food value chains, considered relevant for the development of a country, are subsidized by the government. And private companies finance just farmers, who agree to sign commercial contracts with them.

The main weaknesses of rural banks are a higher operating risk, lower earning capacity and the competitiveness of minor financial institutions as MFIs. Usually, rural banks finance just part of the investment (around 75%), meaning that farmers need to possess seed capital. Interest rates are much lower than the ones charged by commercial banks. For instance, the interest rate charged by the Agricultural Bank of Ghana ranges between 4 and 8.5%.

One example of a governmental program is the subsidy scheme for Solar PV systems launched by the Indian government and

supported by the National Bank for Agriculture and Rural Development (NABARD). This sharply reduced the price burden on farmers. Farmers could buy SPIS from manufacturers approved by the Ministry of New and Renewable Energy (MNRE) with a discount of 40%. Out of remaining 60%, 20% is beneficiary contribution and 40% is eligible for a soft loan, which usually could be repaid in 5 years at the bank-specific interest rate.

### DATA REQUIREMENTS

The information needed in order to finalize a credit with a rural or a development bank are mostly the same as those requested by commercial banks. In addition, environmental and social considerations also play a role:

- Farmer personal data: as those requested by commercial banks.
- Farm information: as those requested by commercial banks.
- In some cases farmers need to pay a deposit: In order to secure the loan.
- A bank account at the rural bank or at another financial institution is required: In order to check the farmer's cash flow and transactions.
- Collateral or alternative source of income are requested in order to secure the investment: In the framework of some development programs, farmers need to provide soft collateral only, or in some cases the donors provide guarantee for them.
- Proof of identity: Normally just citizens of a specific country, can get access to government subsidies.
- Insurance on the loan: In some development projects, insurance is provided by the donor.
- Submission of business proposal: Banks need to verify if the business plan of the farmer matches the requirements imposed by donors or within the pillars of the subsidy scheme.
- Environmental and social feasibility of the project need to be verified.

## PEOPLE / STAKEHOLDER

- Rural/ Development Bank
- Government/NGOs/Private Company
- Farmer

### 3 LOAN FROM MICRO FINANCIAL INSTITUTION (MFIS)

#### OUTCOME / PRODUCT

Micro Finance Institutions (MFIs) are organizations which provide financial inclusion to the poor strata of the population (excluding the poorest). There are innumerable typologies of organizations acting as MFIs: commercial and development banks, saving groups, cooperatives and NGOs with non-profit status. These institutions can provide micro loans with favourable conditions to the urban and rural poor. MFIs are considered one of the best ways to decrease poverty and enhance development; therefore they most often adopt a **development financial model**.

Thanks to the spread of internet accessibility and mobile devices amongst the population in developing countries, and due to better access of finance for the poor, micro financing has been booming worldwide.

Due to the variety of profiles of MFIs, it is challenging to define an absolute micro financing model. Usually, non-profit organizations are financed by donors and in order to provide micro credits, they first need to loan money from financial institutions. This double loan system, does not guarantee a constant availability of funds and the interest rate for the final debtor is high. Conversely, classical financial institutions, which decide to enter in the micro financing business, have the advantage to rely on existing infrastructures, the know-how and their own capital. Different than non-profits, which work on local level, formal financial institutions (FIs) lack the physical connectivity to poor people. Therefore, they need to find an alternative way to check the credit worthiness of farmers and to find substitutes for collateral. Furthermore, due to the innumerable transactions and the small amount of money dealt, micro loans

barely cover the transaction cost faced by formal FIs.

In general, MFIs offer quick loan disbursement, frequent repayment rates and customized loans, which imply an intensive personal relationship between lender and borrower. Micro financing loans range usually between 4 and 12 months and they need to be repaid either with monthly, weekly or even daily rates. Typical loans from MFIs range between 100 and 300 USD. However, with the entry of for-profit FIs, the loan's range has increased substantially, allowing farmers to purchase capital intensive farming equipment such as SPIS.

MFIs offer loans both to a single farmer as well as groups of farmers. Planting Model Group are established specifically for the purchase of SPIS and allow farmers to obtain higher loans. Group members provide a guarantee for each other: if a farmer fails to repay his debt, the other members are responsible to take it over. Just farmers, who trust each other, are willing to form Planting Model Groups. Similarly, in India, Joint Liability Groups consisting of 4-10 members are formed for the purpose of availing bank loan on individual basis through group mechanism against mutual guarantee. Generally, the members engage in a similar type of economic activity and offer joint undertaking to the bank that enables them to avail loans.

#### DATA REQUIREMENTS

Due to the variety of the institutions involved in the micro financing business, the requirements that farmers need to meet in order to obtain a micro loan vary considerably. It is therefore necessary to check the data requirements requested by the individual FIs in the other chapters of this module.

Nevertheless a list with the most common documents necessary to obtain a loan are as follows:

- Documents of identification.

- Minimum age: 18 years old.
- Experience in the sector: normally 1 year requested.
- A bank account at the MFI or at another financial institution is required: In order to check the farmer's cash flow and transactions.
- Credit history: Did the farmer pay all his past loans? Is the farmer creditworthy?
- Soft collaterals or guarantors.
- Insurance on the loan (if applicable).
- A clear purpose of the loan need to be given to the MFI.
- MFIs' loan are mostly based on human relationship therefore personal interviews need to be conducted.
- Interest rate of MFIs are much higher than the one for SACCOs' members.
- The repayment time allowed by MFIs is much shorter.
- MFIs are run by paid workers while SACCOs are run by cooperative members.
- In SACCOs, debtors are members which share the ownership of the cooperative, in MFIs debtors are clients.

#### PEOPLE / STAKEHOLDER

- Micro Finance Institution (MFI)
- Farmer or Group of Farmers

#### IMPORTANT ISSUES

Micro financing allows social inclusion but does not always alleviates poverty, as expected. In fact high interest rates, which on average are around 37% and can reach 70%, can make poor people even worse off.

As commercial banks are more likely to be financial partners of big farmers, so MFIs have mostly SMEs farmers as customers with limited financial means and no collateral. Similarly, Savings and Credit Cooperative Organizations (SACCOs) are owned, managed and run by its members to provide a source of fair loans and reasonable rates of interest.

Sometimes MFIs and SACCOs are confused between each other. Here some main differences between these two institutions:

- From the loan application at a MFI till the loan disbursement just few days pass. SACCOs require instead up to 6 months to pay the loan out.

## 4 VALUE CHAIN LOAN

### OUTCOME / PRODUCT

Value chain finance is a financial method to enable investments and loans within the value chain. This type of loan is a partnership between different actors in the same value chain, who want to increase the productivity and the competitiveness of the value chain itself. Suppliers and traders act as financial providers and enable farmers to access financial products, which they would otherwise not be able to obtain from classic financial institutions. Value chain actors either lend their own capital to farmers, or, if they do not possess the financial means necessary for the loan, they act as financial mediators between farmers and FIs. Actors involved in value chain loans work with a **business financial model**.

This type of financing creates a win-win situation for all parties: farmers obtain a customized loan, which they will need to start to pay months after the disbursement, suppliers and traders guarantee themselves a profit through the interest earned and the improved value chain.

The main advantage of a value chain loan is that it reduces the typical risks of agricultural financing. Suppliers and traders, working at the local level, take care of money transfers, facilitating the transactions. Furthermore, thanks to their personal relationship with farmers, suppliers and traders can guarantee for them. The main disadvantage is the interest rate which can be as high as 30% since banks' interest are summed up with financial mediators' interest.

This financial model can also apply to loans for the purchase of SPISs:

- SPISs' producers supply farmers with the technology, farmers need to pay them just at a later time, normally after the sale of the harvest. Using this type of loan, more farmers will be willing to purchase a SPIS, and

suppliers will increase their customer base.

- Food traders instead, pay farmers in advance for the food they will buy at a later point, providing farmers with the cash necessary to purchase a SPIS. Farmers in return, will guarantee traders the delivery of the food after the harvest. Food traders agree to this kind of financial agreement because they have obligations to deliver high quantity of quality food to downstream actors. SPISs increase both these variables. Furthermore, traders use this type of loan to earn the loyalty of farmers, preventing them from selling their harvest to other interested buyers.

Examples of value chain loans both from upstream and downstream actors include:

Hortifruti is a company which provides fruit to wholesale supermarkets in Costa Rica. In the 70s, when Hortifruti started to operate in the sector, the fruit market was fragmented, farmers lacked infrastructures and technologies, making it impossible for retailers to sell good quality fruits on a large scale. Hortifruti therefore decided to support farmers with technical support and financing. Hortifruti developed two types of financial models: a bank financing and a non-bank financing model. The bank financing was supported by the BAC San Jose´ - Hortifruti guaranteed to the bank that they will buy fruits from the farmer with the bank financing comprising 60% of the production costs. In this model, no collateral was requested, but an insurance on the yield was required. The farmer, needed to pledge that he will deliver the crops to Hortifruti at a later point. With just a selling contract, the farmer was considered creditworthy at BAC San Jose´. The second type of loan is a non-bank financing model in which Hortifruti paid for 30% of the fruit production costs. No interest was charged. The farmer only needed to sign a contract to deliver the food in the future and in return obtained the required inputs.

An example of an upstream value chain loan is the one offered by the equipment dealer SolarNow in Kenya. SolarNow proposes loans with 6, 12 and 24 months terms. In order to get a 6 months loan, the farmer needs to deposit half of the price of the pump upfront, to secure the loan. Since the total price of the pump is KSh. 68,500, the payment will be of KSh.34, 250. After the first payment, six equal installments of KSh. 6,550 each will need to be paid. At the end of the loan the farmer will have paid KSh. 73,550, which is 7% more expensive than the original price of the pump. For the 12 months loan, the upfront deposit will be of 15%, followed by 12 monthly payments of KSh. 10,275 each. Finally, the 2 year loan requires a 15% deposit also, followed by 24 installments of KSh. 3,850 each.

Futurepump in Kenya provides farmers with the option to purchase a SPIS through loans with major banks. Equity Bank offers loans up to 2 years with an upfront deposit of 30%, a 5% set-up fee and an interest rate of 14%. With KCB, a lower deposit of 10% needs to be given in advance and the interest rate is 14% plus an additional set-up fee.

Finally, SunCulture ran a pilot initiative in 2017 with 150 Rainmakers. Every Rainmaker cost KSh. 50,000. Farmers needed to deposit 20% of the total cost followed by 12 monthly installments of KSh. 4,500 each. Therefore, every farmer invested KSh. 64,000 in the system. This price did not include the delivery, the installation and the training cost. After this pilot project, SunCulture decided to increase the price of the Rainmaker since they decided to improve the product and they realized that higher margins are needed.

### DATA REQUIREMENTS

Farmers will obtain a loan under the following conditions:

- Documents of Identification.
- Bank account: In order to check the farmer's cash flow and transactions.

- In some cases farmers need to pay a deposit: In order to secure the loan.
- Show the existence of a market for the food produced.
- Prove one or two successful past harvests: In order to verify the experience on the field.
- This type of loan, implies a closer relationship between farmers and financial providers. The latter need to trust farmers and be convinced in their ability to succeed and repay the loan.
- Sometimes financial institutions ask for quotations from suppliers and traders (similar to a guarantee).
- Purchasing or sales contracts are necessary to finalize the loan: FIs need to be sure that the farmer will earn money.
- Collateral as assets and alternative source of income are normally not required.
- Farmers do not need to be a land owners: land could be rented or leased.
- Size of the farm and type of food cultivated play an important role: Traders have obligations to supply downstream actors with large quantities of a specific product, therefore they will choose among farmers, who meet their expectations.

### PEOPLE / STAKEHOLDERS

- Upstream / Downstream Actors (SPIS's manufacturers and suppliers, food processors, food traders)
- Financial institutions
- Farmer

### IMPORTANT ISSUES

Value chain loans can reduce farmers' independence. Buying and purchasing contracts are mostly necessary for the loans, binds farmers to specific suppliers and/or distributors. Furthermore, farmers need to meet some requirements in order to be eligible for a loan.

## 5 LEASING / REPURCHASE AGREEMENT

### OUTCOME / PRODUCT

Leasing is a financial instrument which allows the use of an equipment without the need to purchase it. A leasing contract involves a lessor, the owner of the asset, and the lessee, who is the actor with the right to utilize the asset in exchange for a monthly contribution. At the end of the lease agreement the lessee can use the option to buy the equipment. Different kinds of institutions are active in the leasing business as MFIs, banks and equipment producers and dealers. Leasing is a **business financial model**.

In spite of its for-profit scope, leasing acts as an alternative financing method, since it overcomes the development barrier in rural areas. Leasing provides farmers, who normally are excluded from credit, access to innovative agrarian equipment. Farmers with a leasing agreement are therefore able to use a SPIS without ownership on it.

Lease agreements cover just a part of the total value of the equipment, meaning that at the end of the lease, the equipment will still have a residual value. The length of a lease agreement depends on the lifespan of the leased asset itself. Leasing agreements are seen as flexible since the assets can be sold and traded at any time. Equipment more suitable to be leased are assets with innovative technology, that turn obsolete fast, and assets that experience a lot of wear and tear.

From the lessor's perspective, the main challenge of a leasing contract is the difficulty in monitoring the payments and to verify that the lessee utilizes the asset correctly without damaging it. Therefore, the institutions with the highest success rates are the ones working at local level, reaching farmers who live in remote areas.

There are several typologies of leasing. The two most common are operating and capital leasing. Operating leasing is similar to rent. The lessee pays the lessor a fee for

the utilization and another fee for the depreciation of the asset. In turn, the lessor takes care of the maintenance and pays both the insurance and registration fee. In financial leasing (more similar to a loan), the lessee pays part of the total value of the assets plus the agreed interest rate in monthly rates during the entire lease agreement. At the end of the leasing contract, the lessee can buy the asset at a nominal price (residual amount decided upfront). With this contract typology, the lessee is in charge of paying the insurance and maintenance cost. For instance, if a SPIS costs 3,000 USD, during the leasing contract the farmer pays just 60% of its entire value plus an interest rate. At the end of the contract, the SPIS has a residual value of 40% (1,200 USD), that need to be paid in order to purchase the equipment.

The equipment producer and dealer "Kickstart" provides micro-leasing for the purchase of solar pumps where 30% of the payment needs to be made in advance. The residual payment can be made 5 months later, when the farmer would have earned the money from the yield sold.

### DATA REQUIREMENTS

The requirements for a lease are much less stricter than the one for a loan. Therefore, small farmers are more likely to obtain a lease than a loan.

The following requirements are necessary to be eligible for an equipment lease:

- Documents of Identification.
- Bank account: In order to check the farmer's cash flow and transactions.
- Farmer's credit history: A leasing contract will not be recorded in the credit history of a farmer, but in order to verify his credibility, the past credit history needs to be checked.
- Show the existence of a market for the food produced.
- Prove one or two successful past harvests: In order to verify the experience on the field.

- Insurance on the lease is sometimes required.
- An upfront payment to secure the assets could be requested.
- Collaterals or alternative sources of income are not normally required. A guarantor can be present.

### PEOPLE / STAKEHOLDER

- Lessor (Equipment Producer or Dealer / Financial Institution or both)
- Lessee (Farmer)

### IMPORTANT ISSUES

The main advantage of a lease is that it is generally cheaper than a loan. Farmers with a leasing agreement need to pay part of the total value of a SPIS plus an interest rate. On the opposite, farmers, who purchase a SPIS must pay the total value of the equipment plus an interest rate. If the farmer decides to purchase the SPIS at the end of the lease agreement, then the lease would be more expensive than a loan.

In some leasing contracts, farmers need to agree upfront with the lessor on how many hours they will utilize the SPIS. The more precise the approximation will be, the more the farmer will gain. In fact, hours not used will not be reimbursed, and extra hours will be heavily penalized.

Most of the leasing contracts are arranged between equipment manufacturers or dealers and farmers. But usually the former, working at local level, acts as an intermediary between farmers and FIs. Manufacturers and dealers in fact do not possess the capital, the knowledge and infrastructure necessary to manage the lease, therefore, they involve a third party in the transaction. Usually, the FI buys the solar pump from the dealer and leases it to the farmer. Normally, the pump is used as collateral, just in few cases instead, the dealer is asked to guarantee for the farmer. The FI can own the equipment until the

lease is over. In an event of a non-payment, the FI just claims the asset back, rather than going through bankruptcy procedures and the sale of the equipment. FIs have innumerable advantages acting as lessors: they collect interest and principal payments as in a loan, but since they own the asset, the leasing is less risky than a loan. Furthermore, leasing contracts broaden the customer base, since the credit assessment is focused on the lessee's ability to repay and not on the credit history or the assets base of the farmer. After the equipment is no longer usable, the FI can either sell it to the market or for scrap value. More specifically, SPIS have "buyback provisions" from the solar irrigation equipment provider. That means that in an event of a non-payment or the end of the leasing contract, the equipment dealer agrees to buy back the equipment. For example, a SPIS manufacturer agrees to a 2 year lease, and establishes the resale value of its equipment starting from a default scenario of 3 months. If, for instance, the lessee defaults at 9 months and the residual value at that point is 75%, the SPIS manufacturer will repay the FI the "buyback value", while the FI would retain leasing payments on the initial 25%.



## 6 COOPERATIVES / JOINT LIABILITIES

### OUTCOME / PRODUCT

A cooperative is “an independent association of women and men, united voluntarily to meet their common, social, economic and cultural needs and aspirations through a jointly owned and democratically controlled enterprise” (*ILO, Recommendation 193: Promoting Cooperatives, 2002*). Cooperatives unify people with a common bond, which could be the same occupation, living location, or religious affiliation. The main goal of Agricultural cooperatives` is to increase agricultural production and the income of its members by bringing food producers together which enables them to obtain economic and financial advantages that individual farmers would not be able to obtain. Cooperatives are non- for- profit organizations, therefore they adopt a **development financial model**.

Financial services are provided from specific branches called Savings and Credit Cooperatives (SACCOs). Every person, sharing the common bond, which characterizes that specific SACCO can become a cooperative member after payment of the registration fee.

Normally, agrarian cooperatives are financed by banks, governmental and international development programs or voluntary deposits from its members. Each member of the SACCO is a partial owner, receives dividends and has the right to vote (with the 1 man - 1 vote principle). The board is formed by unpaid volunteers elected from the cooperative members.

SACCOs, thanks to their non-profit status, are able to offer their members competitive loans with reasonable interest rates. Cooperatives normally obtain a loan from a classical financial institution and then divide it among their members. A loan for the

purchase of a SPIS does not normally require collateral. If the farmer fails to repay the loan, the solar pump will be given to another member or the amount of the loan will be deducted from the dividends of the farmer. Group loans are also possible: members co-guarantee for each other- if one of the borrower defaults, the other members are forced to assume the debt obligation.

SACCOs offer innumerable types of loans which most of the time work with multipliers. This means that if a member has contributed 200 EUR to the cooperative fund and the SACCOs uses a multiplier of 2, then he/she can obtain a maximum loan of 400 EUR. The Kenyan Waumini SACCO for example, offers a development loan with a multiplier of 3, an interest rate of 12% and a maximum repayment period of 60 months fully secured. In the same SACCO, it is also possible to get a group super flex loan in which group members co-guarantee for each other. Insurance is required at 1% interest and the loan can stretch between KSh. 10,000 to KSh. 3,000,000. Another SACCO in Kenya called Hazina offers a normal loan with a multiplier of 4, and a maximum loan of KSh. 3,000,000 repayable in 72 months.

### DATA REQUIREMENTS

The condition to become a member of a Cooperative are the following:

- Identification documents.
- Common bond with the other cooperative members.
- Photograph taken from the cooperative branch.
- An account opened at that specific SACCO.
- A one-time non-refundable entrance fee (KSh. 500 at Waumini SACCO).
- A one-time minimum deposit contribution (KSh. 300 at Waumini SACCO).

- Share capital that can be paid all together or in different rates (KSh. 15,000 at Waumini SACCO).
- Sometimes a risk insurance is required to be paid monthly (KSh. 50 at Waumini SACCO).

A cooperative's member in order to be eligible for a loan need to:

- Fill an application form.
- Find other members who can guarantee for him, in case it is a group loan.

### PEOPLE / STAKEHOLDERS

- Cooperative (SACCO)
- Financial Institutions
- Cooperative members

### IMPORTANT ISSUES

The main differences between banks and cooperatives are the following:

- Anyone can join a bank, but only people with specific characteristics are allowed to become a cooperative member and therefore apply for a loan.

- Cooperatives are normally smaller institutions with one or two branches and a limited number of ATMs.
- SACCOs offer the same service as banks do, but the interest rates at SACCOs are lower, the loans are customized, the customer service is better and the system is based on trust rather than collateral.
- Cooperatives are less attractive for big players since they have lower capital incentives.
- Sometime cooperatives have difficulties in getting loans for their members, since they first need to apply for a loan from a larger financial institution.
- In cooperatives the decision-making process is slower and not as effective since every member has the right to vote.

## 7 INFORMAL SAVING GROUPS

### OUTCOME / PRODUCT

Informal saving groups are groups of people who save money in a common fund and borrow directly from their savings. Informal saving groups are based on a predetermined rotation where every member is able to obtain a loan. Among these groups, credit is perceived as a human right, therefore, a **development financial model** is utilized.

Informal saving groups have between 10 and 30 members who meet on a monthly basis. During these meetings, group members are required to deposit their savings. The money collected will then be given to a group member. As soon as the debtor repays his loan, another member obtains his credit. The main benefit of Informal saving groups' is that they discipline people. Owing to the social pressure, members are more likely to meet their monthly saving commitments. The interest rate that members need to pay on their loans are much lower than the ones requested by banks and MFIs. These kinds of organizations are spreading rapidly in rural areas of developing countries.

Every group serves a specific purpose. In Kenya for example, Joyful Women's Organization (JOYWO), a table banking organization, helps rural woman and youths to promote food security. The term "table banking" comes from the method on which money is deposited and exchanged, perhaps on a table. Members of a group share a common bond: for instance in JOYWO, members are women above 18 years old and young men between 18 and 35 year old. Due to the success of the group, more males are willing to join. Therefore, a new rule allows 1/3 of the group members to be male. In JOYWO groups, both short- and long-term loans are possible. People who are members more than 6 months can apply for a long-term loan up to 3 times the amount of their

savings with an interest rate of 1% monthly and a payback time between 12 and 24 months. Short term-loan need to be repaid in 1 month with an interest rate of 10%. The loans provided are mostly unsecured, where smaller valued collaterals such as household assets (television or chairs) are required sometimes. Group members guarantee for each other: If a member fails to repay her loan due to a genuine reason, the other members will do a fundraiser and clear her/his debt. In case of financial distress, a member can withdraw all her/his savings, but a penalty may be applied.

### DATA REQUIREMENTS

In order to join a saving group, the following requirements need to be met:

- Nationality of a specific country (i.e. people with Kenyan citizenship can only become JOYWO's members).
- Members need to belong to a specific social group and /or share a common bond.
- Group members need to know the new applicant and must accept him/her into the group.
- The new member must commit to take part to the monthly group meetings.
- Monthly donations are required.
- The members need to show commitment to the group and to group activities.

### PEOPLE / STAKEHOLDER

- Group of people willing to organize their saving.
- Sometimes informal saving groups are administrated from a central organization, which also helps them

to expand their funds through external donors.

### IMPORTANT ISSUES

Even though formal financial institutions offer saving accounts too, poor people need to organize their savings themselves. Their low amount of savings and their frequent transactions do not cover the operating cost that banks charge.

## 8 PAY-PER-USE BUSINESS MODEL

### OUTCOME / PRODUCT

The pay-per-use system is a business model offered by equipment manufacturers and dealers, who want to provide a service rather than sell a product. Manufacturers and dealers transport their equipment from consumer to consumer, perform the service and get paid depending on the time of utilization, or on the output provided. Different from the other chapters of this module, the pay-per-use model is a business model rather than a financial product.

In the SPIS business, the pay-per-use model is growing and it is spreading rapidly among SPIS's manufactures and dealers. Farmers, who want to irrigate their fields with a solar pump, but lack the capital and the knowledge, can rely on experts, who will irrigate their fields on scheduled dates in return of upfront payments. Farmers will therefore not pay for the SPIS, but for the amount of water pumped, making them more conscious about the water used, and limiting wastefulness.

The main advantage for farmers is that they pay for just what they use without any investment or maintenance cost. The pay-per-use system allows farmers, who normally possess irregular cash flow, to pay for high-quality solar products with a small amount of money over time. Manufacturers and dealers, on their side, use this model to enlarge their business and win more clients. The pay-per-use system will significantly change the business model of many companies and will also influence the value chain of innumerable food related products.

This system is more suitable for farmers situated nearby dealers or manufactures, who can be reached fast and on a regular basis. Also farmers, who do not need to irrigate their fields often or can rely on alternative sources of water (i.e. rain), will

save money paying for only the service rather than for the entire product.

Examples of companies adopting this model are Claro Energy India and Kickstart International. Claro Energy provides farmers a pay-per-use system with a toll-free line, a pre-paid and scheduled irrigation plan and a remote activation system through credit card which can reach farmers living in the most isolated location. Furthermore, trainings and demonstrations are offered. Kickstart International is also developing with Angaza Design, a pay-as-you-go (PAYGO) technology for solar irrigation called Futurepump. Angaza is a web interface, which helps both manufacturers and distributors to manage pay-per-use operations in the renewable energy sector for off-grid consumers.

### DATA REQUIREMENTS

Different from all other financial services, the pay-per-use model does not have a lot of requirements. Farmers only need to:

- own a bank account with a credit card in order to make the upfront payments.
- possess a water license (if applicable): For environmental reasons water cannot always be extracted from the ground.

### PEOPLE / STAKEHOLDER

- SPIS's distributors or manufacturers
- Farmer

## FURTHER READING, LINKS AND TOOLS

### Tools

#### **FINANCE – Finance Deployment Tool**

Other relevant tools:

- **PROMOTE – SPIS Rapid Assessment:** includes a (financial) market analysis for financing of SPIS components
- **INVEST – Payback Tool:** calculates the financial viability of a SPIS and compares that to other alternative pumping systems (diesel and grid power)
- **INVEST – Farm Analysis Tool:** reviews the profitability of a farming enterprise and allows for compiling a farm income statement for submission to a lending institution

## GLOSSARY

Secured Loan	A loan is considered secured when the debtor pledge a collateral. In case the debtor defaults, the creditor will obtain the possession of the collateral.
Seed Capital	The seed capital is the capital used to start a business activity.
Loan Term	A loan term is the length of time you have a disposal to pay your debt back.
Set up fee	A set-up fee is an initial fee requested by a Financial Institution (FI) in order to setup an account.