



<b>From</b>	Agri Knowledge Centre
<b>To</b>	EMT Members, Agri Commercial Officers (ACO's)
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## 1. Summary – Quick Guide Pyrethrum Sector

### Facts and figures:

	<b>Pyrethrum flower</b>	<b>Refined pyrethrum</b>
<b>Yield per ha</b>	250 kg	4.1 kg
<b>Total hectare</b>	3200	
<b>Total production</b>	500 to 700 tons	15 tons
<b>Cost</b>	RWF 1360/kg	
<b>Price</b>	RWF 1122 /kg	\$220 – 300 kg
<b>Market</b>	Only 1 processor	Exported
<b>Harvest</b>	Aug - Feb	

- Some inputs (seeds and splits, organic / chemical fertiliser) are supplied for free or on credit by the processor.
- The demand for pyrethrum on the world market is growing.

### Main risks:

- Disinterest of growers
- Competition from the more profitable Irish potato
- Bad quality inputs (splits instead of seeds and no fertilizer)
- Poorly dried flowers / poor quality
- The whole value chain is controlled by the processor

### Financing opportunities:

As long as the only processor in Rwanda controls the value chain, financing opportunities are limited. In the future, opportunities may arise if the cooperatives get more power in the value chain or new buyers or processors of pyrethrum flowers enter the market. If this happens:

**Save for a Loan** can be used by individual growers who need some working capital.

**Input Finance** could become an option for cooperatives. Fixed price contracts provide comfort with regard to payment capacity

**Asset Finance** is only applicable to the processor or to cooperatives for a truck. But for now, this type of finance is not applicable as the cooperative are prohibited to obtain bank finance by the existing processor

**Raw Material Collection Finance** might become an option in the future. The strong market for pyrethrum, the fixed prices and off-take contracts make this kind of financing interesting.

## **2. Introduction**

The pyrethrum plant is grown for its flowers. The flowers are dried and processed into an liquid extract used for insecticides, parasite control in livestock, shampoos for pets and insect sprays (RDB, 2010).

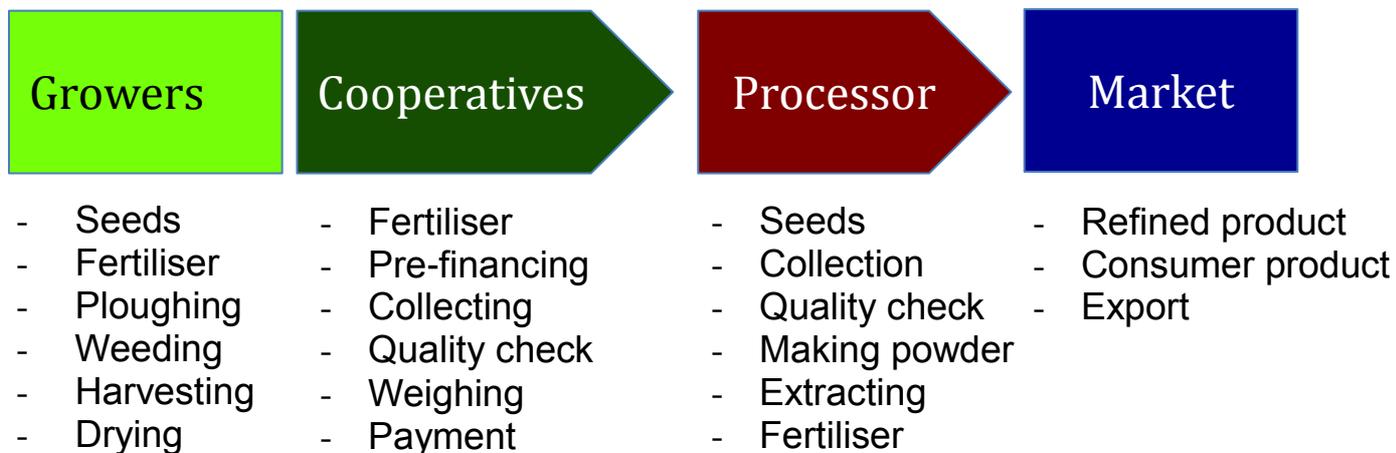
The cultivation of this crop is limited to the Northern Province because of the high altitude and volcanic soils needed. In the Northern Province 3200 hectares of land are used for the production of the pyrethrum flower. The production of pyrethrum furthermore requires sufficient rain and sun and is labour intensive. In northern Rwanda 30,000 people are employed in different pyrethrum activities ranging from cultivation, weeding and harvesting. The fields are all hand planted, hand weeded and the flowers are handpicked. After harvest farmers dry the flowers on shelves. Together, the growers produce 500 to 700 tons of dried flowers per year (Sopyrwa website, 2012).

Cooperatives bring the dried flowers to the only processor in Rwanda. This processor controls the value chain by supplying all inputs needed, supplying credits and by being the only sales market for the growers to bring their produce to. The growers get a fixed price (RWF1080/kg for the grower and an extra RWF 42/kg is added for the cooperative to keep) for the dried flowers that is, according to them, not competitive with other crops. Cultivating Irish potato or maize is more profitable and the field would be suitable to grow these crops as well. Therefore, growers would rather cultivate Irish potato / maize than pyrethrum. However the growers are required to cultivate pyrethrum on 40% (20% for growers with less than 2ha land) of their land since it is state owned land and pyrethrum is 'a crop of focus' for the government. Because of this situation growers can be found to be reluctant towards growing pyrethrum and their motivation is the most important risk in financing this business.

Growing the pyrethrum plant is, if managed well, not a very risky business. Because the plant itself is an insecticide to date no problems with insects or pests have occurred and therefore almost no diseases that affect the pyrethrum plant are known. It is however important that the right inputs are used, the flowers are picked at the right time and well dried.

The only processor in Rwanda produces 15 tons of extract a year. With this production Rwandan pyrethrum covers 8% of the total world supply and the national production is still growing. All liquid extract is exported. The most important trading partners are the USA, Europe and Asia.

### 3. Pyrethrum Value chain



Looking at the pyrethrum value chain, three main players are identified. The chain starts with the growers, these farmers cultivate the land and produce dried pyrethrum flowers. The second actor in this chain are the cooperatives, they collect the product, distribute fertilizer and pay the growers. The third step is the processor, in case of Rwanda, Sopyrwa. They distribute seeds, collect the dry flowers and refine the extract. In this process fertilizer is produced as a by-product and is freely available for the growers. The end product is sold on the international market, this marks the final step in this value chain.

As we will see later on, all steps are interdependent and cannot be considered as independent activities.



special shelves, kept dry and away from direct sunlight for 5 days in case of dry weather and 7 to 10 days during rainy times. The drying process is very important for the quality of the flowers. If not dried thoroughly the moisture content will be too high and the price will decrease.

The inputs used in this process are seeds or splits, fertilizer, land, labour and water. The seeds or splits are for free for the growers since the seeds are freely available from the processor Sopyrwa and the splits can be made by the growers themselves by uprooting an older plant, dividing it and putting it back in the ground. This, in the long term, decreases the quantity and quality of the yield and it is advised to use new seeds instead of splits. To increase the yield two types of fertiliser, organic and chemical, can be used. The organic fertiliser is important to avoid soil degradation and is, just as the seeds, freely available from Sopyrwa. The only cost for farmers using this fertiliser is the transportation from Sopyrwa. For some growers this is a threshold / this can be prohibitively expensive because a truck has to be hired and the transportation has to be managed. For growers who are organised in cooperatives, the cooperative takes care of hiring the truck and distributing the fertiliser. Some of the cooperatives ask for a small amount paid per kilo fertiliser to cover the transport cost (approx. RWF50/kg). The chemical fertiliser is also supplied by Sopyrwa and can be bought on credit. However, none of the growers we spoke to reported used this kind of fertiliser. The land cultivated by the pyrethrum growers is state owned land. Since pyrethrum is a crop of focus of the government, the growers are obligated to use 40% (20% for growers with less than 2 ha) of their land for pyrethrum cultivation. Since rainfall is the only form of irrigation, there are no costs associated with the use of water. Therefore, labour is the most expensive input. Labour is needed for planting, ploughing, weeding and harvesting. Altogether the costs of the inputs (incl labour) per hectare per year are estimated at approx. RWF 340.000.

The average yield is approx. 250kg of dried flowers per hectare per year. Amounts as high as 1250kg per hectare are reported. On the other side, there are also growers who had to report a yield of 0kg that year. The (extremely) low yields can have two causes. The first is the lack of motivation of the grower. Growers feel the price for dried pyrethrum is not even high enough to cover the cost of cultivation and therefore rather plant the competitive crop Irish potatoes. However, growers on government land are obliged to use 20 to 40% of their land for pyrethrum cultivation. As a consequence, they neglect their field of pyrethrum, use old splits, pick too late or too early and don't dry the flowers properly. The second cause is often related to the inability (not every farmer is a good farmer) or disinterest of the growers, and has to do with using not enough or wrong inputs. Not all growers are able/willing to transport the freely available fertilizer from Sopyrwa to their fields. Some are not able to pay the rent of a truck to transport the fertiliser whereas others are not used to using fertiliser and have a hard time adapting to this new way of farming.

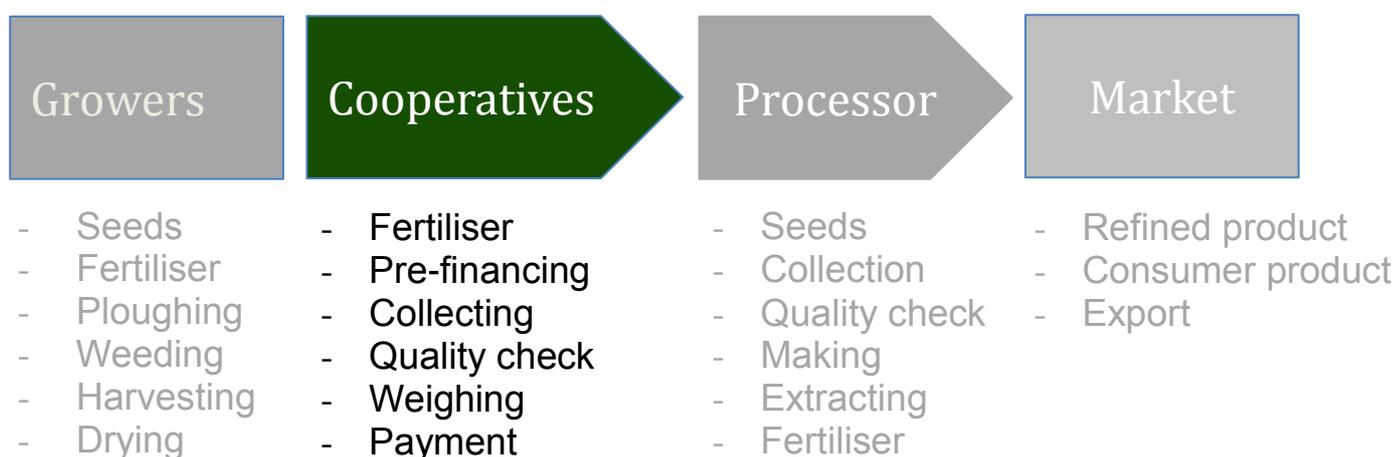
## Key issues

- Location is important (high altitude, volcanic soil, sufficient rain and sunshine)
- Some inputs are freely available (seeds, organic fertiliser). Chemical fertiliser is available from Sopyrwa on credit
- Picking the flowers at the right time and drying them to the right level is important for the quality and therefore the price of the harvest

## Risks

- Disinterest of growers
- Bad quality of splits
- Picking flowers too early / too late
- Badly dried flowers
- Insufficient use of organic fertilisers leading to decrease soil degradation

## b) Cooperative



When the growers are finished with plucking and drying their flowers, they bring their produce to the cooperatives. At the cooperative, the dried flowers are checked on quality, weighed and stored. The cooperative pays the grower and after collecting enough kilos they bring the produce to the processor. For collecting the flowers the cooperatives get RWF42/kg paid by the processor.

Some cooperatives are collecting the fertiliser from the processor, hire a truck and bring it to their members. Some of these cooperatives also give training to their members in cultivating the pyrethrum and act as a mediator between the growers and the processor.

The cooperatives are pre-financed (interest 0%!) by the processor to collect the harvest and pay the growers. Some cooperatives face a problem here, they pay the growers for their dried flowers after a visual quality check, then they bring the product to the processor where the quality is checked in a laboratory. Often it is found that the quality does not meet the quality standards and the cooperative is paid less per kilo by the processor than they already paid the growers.

Another problem faced by the cooperatives is that the processor does not allow them to take a loan by anyone else than them. The only processor in Rwanda is keen on keeping control over the whole value chain. By obligating the grower to use no other credit than from the processor, the grower is bound to the rules of the processor.

The processor pre-finances the harvest and gives out chemical fertilizer on credit. Some loan applications to the BPR have been made, however, the applications have not been successful since the processor objected.

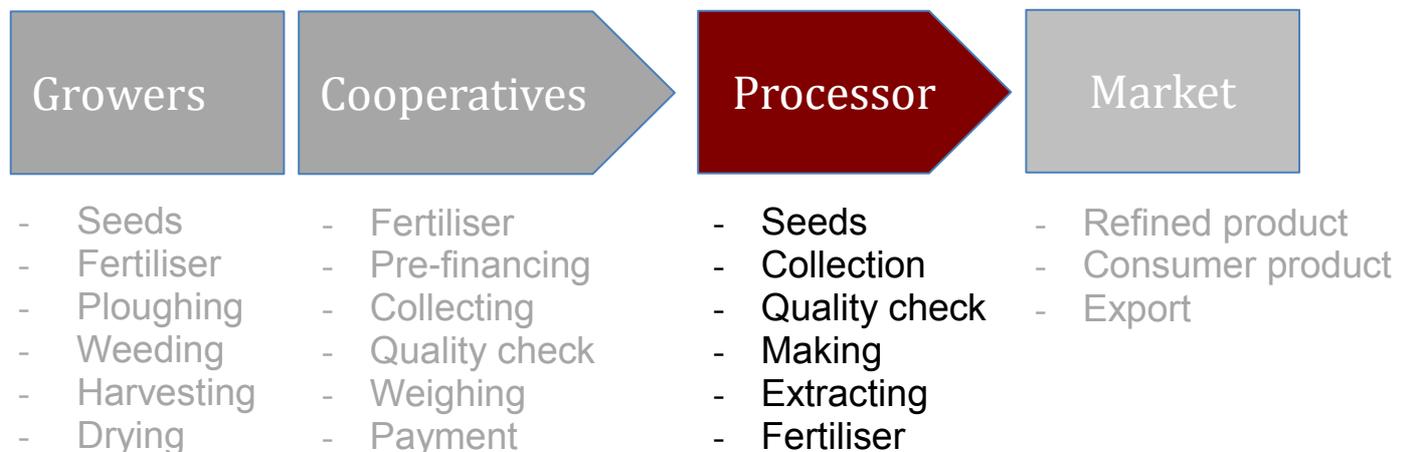
#### Key issues

- Cooperatives collect the dried flowers, pay the growers and distribute fertiliser (if financially feasible)
- Cooperatives act as a mediator between growers and processor
- Cooperatives are pre-financed by the processor and are NOT allowed to take a loan elsewhere

#### Risks

- The cooperatives cannot adequately assess the quality of the dried flower and may therefore have financial problems
- Cooperatives are completely dependent on the processor

### c) Processors



The pyrethrum sector in Rwanda is known to have only one processor, Sopyrwa. This processor controls the whole value chain, from providing inputs needed by the growers, to completing the refining process and selling the produce on the world market.

In the 1994 the government privatised the company, however, due to bad management, the plant did not perform well and was acquired in 2009 by the Horizon Group. The current owners brought in a new management team and most of the management problems have been solved and the plant has a sound performance.

To provide the inputs to the growers the processor works together with cooperatives. Sopyrwa gives out 2 tons of seeds per year for free, and is working on tissue culture to improve quality. The seeds are bought by Sopyrwa for \$15 per kg. The process of refining the pyrethrum leaves some waste material that can be used as fertiliser. Cooperatives are free to come and collect the fertiliser from the processor.

Each year, 23 cooperatives are bound by contract to bring their produce to Sopyrwa, together this is 500 to 700 tons of dried pyrethrum flowers. In addition to buying the national production of Rwanda, Sopyrwa also imports 1000 tons from Tanzania. The price paid by Sopyrwa to the cooperatives is RWF1122/kg. This is a fixed price, set by the processor. Sopyrwa has the capacity to handle 3000 tons of dried flowers per year.

After the harvest is collected and brought to the plant, Sopyrwa checks the dried flowers on moisture and pyrethrine content. After the quality check Sopyrwa pays the cooperative and starts the refining process. This process begins with the crushing of the flowers into powder. Next, the powder is mixed with hexane which extracts the pyrethrum from the powder. This mixture is heated and steam will separate the hexane from the pyrethrum extract. The final product is an oily liquid used to produce pesticides. 60kg of dried flowers can be refined into 1kg of pyrethrum extract. The extract is sold at \$220-\$300 per kg to export markets where it is made into consumer products for the national market. Currently (2012) Sopyrwa is building a factory to produce consumer products from the liquid extract. This last stage of producing a consumer product out of the refined product gives a high added value and Sopyrwa will try to capture this advantage. The products will be sold on local and international market. Since the demand for pyrethrum based insecticides is growing, this will not be a problem.

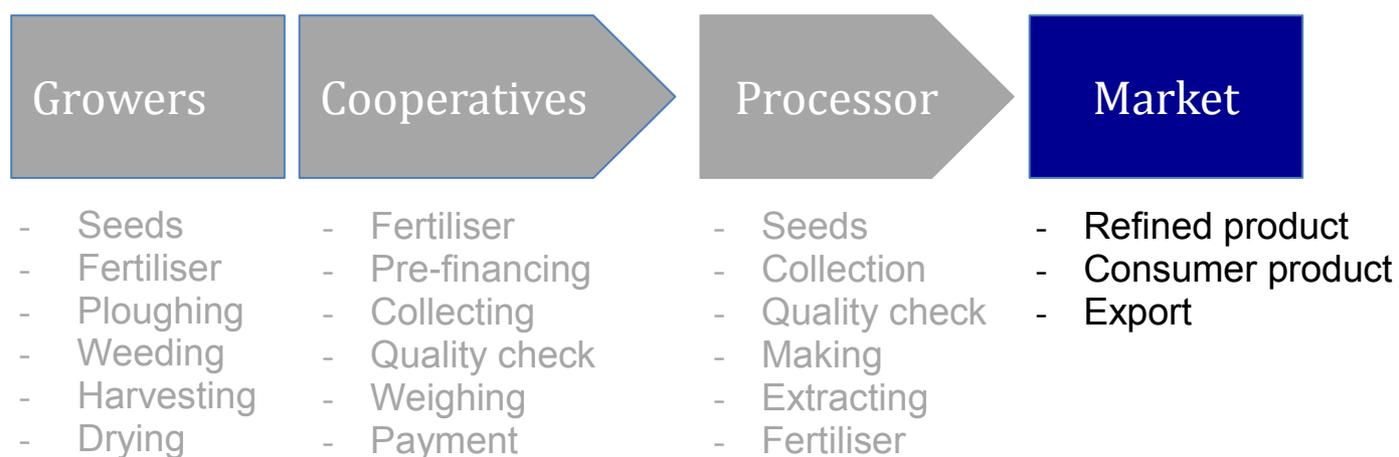
#### Key issues

- Sopyrwa is currently the only processor
- Sopyrwa provides seeds, fertiliser and pre finances the cooperatives to purchase the flowers.
- Sopyrwa has a capacity of 3000 tons per year, and is currently working on half capacity
- Sopyrwa pays the growers RWF1080/kg and the cooperatives RWF42/kg
- 60 tons of dried flowers is processed into 1kg of liquid extract.
- The liquid extract is sold for \$220 - \$300/kg
- Financial healthiness of Sopyrwa

#### Risks

- Decrease in demand on world market
- Not enough supply of flowers

#### d) Market



The 15 tons of refined pyrethrum is entirely sold on the world market at a price of \$220 to \$300/kg. Most of the extract is exported to the USA, Europe and Asia where it is used for instance for pre- and post-harvest sprays for foodstuffs, intestinal parasite control in livestock, shampoos for pets and insect sprays.

At time of writing, Sopyrwa is establishing a factory in which they can process the extract into consumer sprays for the local and international market.

Rwanda supplies 8% of the total world production. Of the 17 other pyrethrum growing countries, the main competitors are Tasmania and Tanzania who both produce more. However, the value of Rwanda's pyrethrum export is higher compared to Tanzania. In 1998 Kenya was world leader in producing pyrethrum but since then the production dropped sharply as a result of erratic and unreliable supply of the flowers, which in turn was mainly due to organizational problems that lead to delayed or non-payment of growers.

Furthermore, there is competition from other forms of pesticides and the cheaper synthetic insecticides. However, there is an increasing global demand for organic pesticides. Therefore, we are of the opinion that the market for organic pyrethrum is not likely to lose out on the synthetic ones.

#### Key issue

- Export of extract
- Growing world demand for pyrethrum

#### Risks

- Competition from other producing countries
- Competition from other forms of pesticides and synthetic insecticides
- Dependent on the world market and world market prices

#### **4. Financing Needs**

Currently, there is only one processor in Rwanda that controls the whole value chain in Rwanda (incl. the possibility of the cooperatives to obtain bank finance). As a consequence, financing opportunities are only feasible with the existing processor and/or with agreement of the existing processor. Going forward, new financing opportunities may arise if cooperatives professionalise and obtain more power / independence in this process, if new buyers of pyrethrum flowers enter the market or if new processors enter the market. Given the excess capacity of the existing processor, we believe the latter is unlikely to happen. If financing options in the pyrethrum business exist, these should be considered on the basis of the cash flow that will be generated and how secure this cash flow is.

##### ***a) Save for a Loan***

Small scale farmers continue to struggle for the finance they need to increase the yield. Small scale farmers, who require finance to buy inputs, are often required to borrow against collateral, which they simply do not have. As a solution BPR has developed a finance solution: Save for a Loan, to provide small farmers a working capital facility. For more information read the product proposal: Agriculture Save for a Loan.

##### ***b) Input finance***

The need for input finance in the pyrethrum business is limited due to the fact that Sopyrwa supplies seeds and organic fertilisers for free and provides chemical fertilisers on credit against a 0% interest rate.

The seeds are supplied for free or growers use splits from old plants. Little fertiliser is used, the fertiliser that is used is supplied for free (organic) or available on credit (chemical) by Sopyrwa. The performance risk is relatively low as the crop has almost no risks of diseases or pests. However, very significant yield differences can be expected depending on the grower's motivation.

If cooperatives professionalize and thereby obtain more bargaining power and independence towards the processor and/or the processor does no longer provide the inputs for free or at 0% credit, input finance could become an option. At present (2012) all cooperatives work with fixed price in their off take contract with the processor. These fixed price contracts can provide considerable comfort with regards to the payment capacity of the cooperatives. We also expect that opportunities could arise if other buyers come to the market or new processors start a business in refining pyrethrum in Rwanda.

##### ***c) Asset finance***

Asset finance is only applicable to processors since growing the pyrethrum flower needs no important assets. When cooperatives professionalize and become more independent from the processor, one of the first assets to finance would be a truck to transport the fertiliser from the processor to the growers, collect the flowers from the growers and bring them to the processor.

But for now, this type of finance is not applicable as the cooperatives are prohibited to obtain bank finance by the existing processor.

**d) Raw material collection finance**

Currently the only processor finances the cooperatives with a kind of payment in advance, so the cooperatives can pay the farmers directly. This is not exactly raw material collection finance, but the purpose is the same. However, in the future this might be a financing opportunity if either the current processor no longer provides raw material collection finance or if new buyers or processors come to the market. There is a strong market for pyrethrum, the fixed prices, off take contract and no external threats makes this kind of financing of interest.

**5. Strength, Weaknesses, Opportunities & Threats (“SWOT”)**

<p><b><u>Strengths</u></b></p> <ul style="list-style-type: none"> <li>- Excellent soil &amp; climate in northern province of Rwanda for pyrethrum production</li> <li>- Recognised and excellent quality of pyrethrum extract</li> <li>- Consistent good prices in world market</li> <li>- Pyrethrum is a completely biological insecticide</li> <li>- Second position (value) / Third position (tons) in world market in producing pyrethrum</li> </ul>	<p><b><u>Weaknesses</u></b></p> <ul style="list-style-type: none"> <li>- Irregular supply of flowers</li> <li>- Just one processor in Rwanda</li> <li>- Political issues. Due to political issues (Congo) Rwanda might face trade constraints on the international market.</li> <li>- Obligation for growers to grow pyrethrum instead of more profitable Irish potato</li> <li>- Labour intensive crop</li> </ul>
<p><b><u>Opportunities</u></b></p> <ul style="list-style-type: none"> <li>- Cheap labour</li> <li>- Production improvement by using fertilizer</li> <li>- Production improvement by more professionalism of growers</li> <li>- Potential for biological insecticides</li> <li>- Fabricate and export consumer products</li> <li>- Structural over capacity in processing factory (easily expandable production)</li> </ul>	<p><b><u>Threats</u></b></p> <ul style="list-style-type: none"> <li>- Structural over capacity in processing factory (unnecessary high cost price of production)</li> <li>- Lack of good production land</li> <li>- Competition from Tasmania, Tanzania, Kenya</li> </ul>

## 6. Risks

Currently, limited areas offer financing opportunities in the pyrethrum sector. As long as there is only one processor and the cooperatives have no bargaining power and are not allowed to receive input loans from other sources than the processor it is not easy to provide input finance or raw material collection finance. In future opportunities may arise if the cooperatives get more power in the value chain or if new buyers or processors of pyrethrum flowers enter the market.

The risks related to the pyrethrum sector financing will depend on the stage of the value chain being financed. The tables below summarises the main risks and some of the possible mitigants for input, asset and raw material collection finance.

### a) **Save for a Loan**

The save for loan system is fully automatic and there is no need to add mitigants next to the normal precautions. See product description.

### b) **Input Finance**

<b>Risk</b>	<b>Description</b>	<b>Mitigants</b>
Usage	- Risk that the funding is not used to buy inputs (in the agreed manner) or the inputs are sold to other farmers to generate cash	- Only finance reliable companies with good track record that are preferably already banking with BPR.
Performance	- Risk that grower does not achieve expected yields and quality levels (e.g. no good farm management or external sources)	- Finance of only professional growers with a credible / proven track record.
	- Climate risk	- Input insurance
Market	- Risk that the grower is unable to sell the dried flowers	- Off-take agreement between grower or cooperative and trader.
Price	- Risk of falling prices	- At present the cooperatives have fixed price off take contracts with the only processor in the market - High demand for dried pyrethrum (due to over capacity of the only processor and high demand on the world market)
Payment	- Risk that the financing is not repaid as agreed	- Repayment should be on basis of payments for produce received from the cooperative or trader through a BPR client account

### b) **Asset Finance**

Smaller investment finance may be required at cooperative level for transport equipment.

<b>Risk</b>	<b>Description</b>	<b>Mitigants</b>
Usage	- Risk that financing is not used for intended investments	- Financing to be granted on the basis of acceptable invoices from acceptable suppliers for maximum (80)% of invoice amount
Performance	- Risk that the grower / processor does not achieve expected yields/production and quality levels (for instance due to mismanagement or unforeseen external reasons).	- Financing of professional plantations or processing factories with an acceptable track record - Assume conservative performance figures based on track record of past years.
Market	- Risk that the cooperative / processor is unable to sell its produce	- Off-take agreement between cooperative and off-taker. - Strong world market for pyrethrum
Price	- Risk that the price is lower than expected	- Off take contracts with fixed price
Payment	- Risk that off-taker fails to pay or payment is not used to repay financing	- Acceptable level of sales revenues should transit through BPR account.

### **c) Raw material collection finance**

<b>Risk</b>	<b>Description</b>	<b>Mitigant</b>
Usage	- Risk that financing is used for other purposes.	Financing only reliable cooperatives with a credible track record.
Performance	- Risk that the cooperative accept flowers that do not meet the quality standards of their buyers (i.e. existing processor, new buyers, new processors)	Good track record of the cooperative to deliver flowers of the right quality. This can be due to 1. Cooperative has adequate facilities to check the quality. 2. Cooperatives dries the flowers themselves
Market	- Risk that the cooperative/ processor cannot sell the production	- Off-take agreement between grower or cooperative and trader.
Price	- Risk that the price is lower than expected	- Off take contracts with fixed price
Payment	- Risk that off-taker fails to pay or payment is not	Given the current over capacity it is unlikely that the processor

	used to repay financing	does not pay. The processor needs all pyrethrum that is produced. Payment must be made on cooperative account with BPR
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