



**OFFICE FOR THE PROMOTION OF THE COMMERCIAL
AGRICULTURAL SECTOR**

In collaboration with
INTERNATIONAL CAPITAL CORPORATION (MOÇAMBIQUE) LDA

**IDENTIFICATION OF OPTIONS & FEASIBILITY FOR
THE PROMOTION RURAL AGRO-INDUSTRY**

DRIED FRUIT

PRELIMINARY BUSINESS PLAN

October, 2002

DRIED FRUIT

PRELIMINARY BUSINESS PLAN

INDEX

- A. BACKGROUND AND OPPORTUNITIES**
- B. BUSINESS STRUCTURE AND INVESTOR PROFILE**
- C. MARKET**
- D. RAW MATERIAL SUPPLY SOURCES**
- E. PRODUCTION PROCESS DESCRIPTION**
- F. MANAGEMENT AND WORKFORCE**
- G. CONSTRAINTS & RISKS**
- H. LINKS AND SUPPORT NETWORKS**
- I. ASSUMPTIONS AND PRELIMINARY FINANCIAL PROJECTIONS(US\$ 000) –BASE CASE**
- J. SENSITIVITY ANALYSIS (BEST CASE / WORST CASE)**
- K. KEY ISSUES TO CONSIDER IN THE PREPARATION OF A DETAILED BUSINESS PLAN**

Annexes

- ASSUMPTIONS AND FINANCIAL PROJECTIONS – BASE CASE**
- ASSUMPTIONS AND FINANCIAL PROJECTIONS – BEST CASE**
- ASSUMPTIONS AND FINANCIAL PROJECTIONS – WORST CASE**

A. BACKGROUND AND OPPORTUNITIES

The production and sale of dried fruit is based on the availability during the harvest season of an excess of fresh fruit which has no market. There are various methods of preserving the fruit, but all of them are based on the removal of the moisture. Drying is the most basic method of fruit conservation resulting in a dried product which is capable of being transported and sold to distant markets.

There is an opportunity to establish fruit drying installations in Mozambican localities where there are sufficient concentrations of fruit. The processing unit would collect, prepare and dry, using solar energy or additional artificial heating, a range of tropical fruits. The dried fruits would then be packaged and transported directly to the European markets, or to a marketing agent in South Africa who would re-package the fruit under its own mark and sell the product into its own established marketing network.

The areas that are the most suitable are located in Zambézia province, particularly in the area around Licuári / Nicoadala as well as in the area of Guruè / Ile where there is excess production of fruit that the rural markets cannot manage to absorb. There are other suitable areas in Inhambane and Sofala Provinces.

Dried exotic tropical fruits such as pineapple, mango, papaya e banana are becoming more commonly found in European supermarkets and in specialised natural food stores where they are sold in pre-packaged cellophane packets or in bulk by the kilogram. Other developed markets such as Japan also buy the dried tropical fruits but in smaller quantities than the European and American markets. Normally, these products are sold with additives such as sugar and sulphur for the retention of colour. There is, however, a growing demand for a totally natural product.

B. BUSINESS STRUCTURE AND INVESTOR PROFILE

The processing and marketing of dried fruits can be organised at two distinct levels. The first operates at the localised level of smallholders who use family hand labour to collect and prepare the fruit for drying, using solar drying - a simple inexpensive technology. The necessary quantities of fruit could be gathered even more efficiently by an association rather than by individual farmers. The semi-dried fruit would be sold to an exporter as part of the business enterprise.

At a second level, the business would be developed by a larger operator who would acquire the fruit semi-dried by small producers in solar driers. In this larger processing plant, conventional fuel or electric driers would be used to produce dried fruit with internationally acceptable levels of humidity (10% to 13% humidity). The fruit would then be packaged in accordance with the standards previously agreed with the wholesalers and other buyers. The

same operator could support the establishment of several satellite processing plants in order to ensure the increased available supply of semi-dried fruit.

This operator would also arrange the export of the dried fruit product from the main and satellite processing plants. The existence of the larger unit is essential for the viability of the satellite units.

The ideal operator to implement this business project would be an individual capable of managing a simple business and to operate in a rural environment. The individual should be capable also of investigating markets, either regional or international, and negotiating contracts for the supply of products that meet the desired standards of appearance quality and hygiene. Engineering skills would be useful, since there is the possibility if not necessity to adapt the equipment used in the drying of fruit. Also given that the business could be located far from urban areas, basic mechanical skills would be important in order to deal with equipment repairs.

C. MARKET

The principal consumers of dried fruit are North America, Northern Europe and Japan. Each of the countries located in these regions have particular preferences regarding the type of fruit and method of preparation.

Also there are two distinct markets: fruit produced normally which could involve the use of preservatives and other additives, and fruit produced organically. The latter requires that no artificial products be used not only in the cultivation of the fruit but also in the processing.

The largest consumers of dried tropical fruit are (1) the dried fruit and nut industry (selling single fruit, mixed fruit and mixed fruit and nut packets, (2) the breakfast cereal industry (principally for muesli); and (3) the confectionary industry (ingredients for chocolate bars).

In general the market for dried tropical fruit is already well-supplied, and to enter this market, a new supplier will have to have competitive advantage in terms of quality, presentation, and/or price. Surveys of some of the importers in Europe and the United States¹ demonstrate that importers are less interested in sun-dried products. This lack of receptivity is due to a perception that the sun dried fruit will contain foreign matter, insect fragments, defects, damage and microbiological problems that do not meet food hygiene regulatory standards.

There is a growing demand for organically certified products, and for fruit that contains lesser quantities of sugar (only at natural levels). Organic products can achieve prices that are much more attractive than ordinary products.

Statistics for United States and European imports either are not available or are not credible. For this reason it is difficult to estimate the actual size of the market. Using other studies and industry sources, a market of US\$60 million can be projected, divided among dried banana (7,000 tonnes), banana chips (14,000 tonnes), dried papaya (4,000 tonnes), dried pineapple (5,000 tonnes), and other dried fruits including dried mango (3,000 tonnes).

According to industry sources, the markets in the United States and Europe have registered a growth that is hoped will continue as more consumers are introduced to the range of marketed products.

Table 1: Estimate of the Size of the Import Market for Dried / Dehydrated Tropical Fruits in Europe and the United States

Market	Total Imports (MTs)	Comments
Belgium	300	The principal items are banana chips, pineapple, and papaya
France	1,800-2,800	banana chips (600-800), papaya (500-800), pineapple (500-800), others (200-400)
Germany	3,500	banana chips (1,500), others (2,000)
Netherlands	1,600-1501,800	banana chips (600-800), others (1,000)
Switzerland		banana chips (1,500), others (2,000)
United Kingdom	3,500	banana chips (1,500), others (2,000)
USA	4,500-6,000	banana chips (3,000-4,000), others (1,500-2,000)

Source: ITC/UNCTAD/GATT, 2000

In South Africa, the current purchase price (CIF) for a 10 kg box paid by exporters of dried fruit from South Africa are US\$2.50 per kg of banana, US\$3.50 per kg of pineapple, US\$2.50 per kg of papaya and US\$4.00 per kg of mango.

Thailand is the primary supplier in the world for dried pineapple, papaya, and mango. The Philippines, Malaysia and Taiwan are also key suppliers of dried pineapple, papaya and mango. Ecuador, along with the Philippines and Thailand, are the largest suppliers of dried banana. Other suppliers of dried tropical fruit include Australia, Kenya, South Africa, Sri Lanka, Peru, and Vietnam.

In the initial phase of the project, it is assumed that all of the fruit would be sold to a buyer in South Africa and transported there by ship in a container. This operation would involve the shipment of 18 tonnes by container, at a cost of US\$600 per shipment, including handling and truck delivery to the buyer. In practice, it will probably be more convenient to make smaller, more frequent exports. One of the possible routes would be direct to Durban, or Maputo with subsequent land transport to Johannesburg. The typical form of packaging is a 20 kg cardboard carton box containing four 5 kg plastic packages.

¹source: web-site - www.just-food.com

D. RAW MATERIAL SUPPLY SOURCES

The collection of raw materials can take place in the local rural markets where the fruit is grown or at the production plant. The fruit should be of the highest available quality, otherwise the quality of the final dried product will be compromised. It is feasible to collect fruit within a thirty km radius of the drying plant. A cost of US\$ 20 per tonne is assumed, based on a cost of US\$0.30 per km/tonne. The driver of the plant vehicle or the subcontracted drivers must be given very clear instructions to only purchase good quality fresh or semi-dried fruit.

The different fruits have different crop seasons. While banana and papaya can be collected throughout the year, pineapple has its principal gathering season between October and January and mango is gathered November through January. Due to the existence of fibres in the majority of the Mozambican varieties of mango, mango would not be used and marketed because there is no market acceptance. Only banana, papaya, and pineapple would be used. An assumption of a 2,400 Meticals/kg (US\$ 100/ton) purchase price was assumed as an average, taking in to account that there is currently a production oversupply.

E. PRODUCTION PROCESS DESCRIPTION

There are two available technologies, depending on the scale of operations and the levels of quality desired. Solar drying is the simplest option. Air passes through the drier by natural convection. The air is heated as it passes through the collector and then partially cooled to the degree it absorbs the humidity from the fruit. The fruit is heated both by the air and directly by the sun. There are several possible variations on this model. The most sophisticated uses solar panels which powers a fan to move the air, thereby reducing the drying time.

Prices for the smallest basic drier with a 100 kg capacity vary between US\$100 to US\$2,000 for units with solar panels and fans. The solar models require 3 to 4 days for a drying cycle.

A second option for drying is an installation using a commercial electric drier. This option requires a regular electrical energy supply or the purchase of a generator. These driers can be acquired in South Africa, Zimbabwe or Europe in sizes that range from units that handle 300 kg of fresh fruit per one day drying cycle up to units that handle one tonne per drying cycle. The electrical energy requirements varies between 25 kVA and 50 kVA. The model chosen for this business plan is a unit that processes 600 kgs per each cycle, and costs around US\$12,000. The budget also includes US\$15,000 for a suitable quarters and another US\$25,000 for the acquisition of a one tonne truck.

The choice of the location for the installation of this commercial drier should take into consideration requirements such as the ambient cleanliness and ability to ensure hygiene and a dust free atmosphere. Electrical energy and potable water should also be accessible.

Before becoming involved in this business, an exporter needs to understand very clearly the client determined specifications and the rules of the game generally. It is essential to take all the measures necessary to ensure a “clean” product. The Codex Alimentarius publishes the international standards recommended for hygienic practices for dried fruits.

Contacts of suppliers of driers are:

RUTEC Pty Ltd, 50 Davies Street, New Doornfontein, Tel 27 11 402 3245 Fax 27 11 402 3246 E-mail: rutec@iafrica.com.

Dryers for Africa (Hamish Brebner) PO Box 3423 White River 1240; Mpumalanga, South Africa hbrebner@mweb.co.za Tel: 20 13 751 3743

ITDG, 3rd floor Coal House, 17 Nelson Mandela Avenue, P.O.BOX 1744, Harare, Zimbabwe, (Mr. Alex Mugove) Tel (263 4) 780995, 750880/2 Fax (263 4) 771030 E-mail: itdg@ecoweb.co.zw

Mr. Ulrich Oehler - Small scale solar energy equipment, training, consulting Tel/Fax 061 3016622 / 3014959 (Switzerland)

F. MANAGEMENT AND WORKFORCE

At the level of family operated processing, the only example of a dried fruit operation in Mozambique is located near the city of Beira. Five women process 25 kg of fruit per drying cycle with two cycles per week. This level of productivity is very low. To be a viable small scale fruit drying operation, each unit should handle 25 kg of fruit per day. This level would require 4 workers for each 100 kg drier.

At the level of an industrial processor, a productivity of 25 kg of fruit per person per day receiving the minimum monthly salary of 820,000 Meticals (US\$ 35) for an industrial labourer. Workforce availability is not considered a constraint since there is a large number of persons in Zambézia Province with few opportunities for alternative employment. The work does not require any specific skill and training can be carried out at the workplace during the course of the work.

G. CONSTRAINTS & RISKS

The specific risks and constraints identified as being associated with this undertaking are:

- At the village level, the lack of equity investment funds to support the cost of investment, even where these costs are minimal. World Vision has already indicated its willingness to support the implementation of this venture. The contacts in World Vision are Brian Hilton, Coordinator of ZADP in Quelimane, Zambézia, Gary L. Bayer, Director of Agricultural Project at World Vision in Maputo at the head offices of World Vision.
- Local residents have a low level of skills related to fruit drying. World Vision has undertaken to provide assistance in disseminating technologies and procedures.
- Market penetration of a new, unknown product is without a doubt the most significant constraint. Initially, the investor will have to visit potential buyers with samples of the product, and convince these buyers of the excellent quality and competitive prices, or other advantages such as the product being organic. For possible assistance in this regard, the investor may also wish to contact the organization “Fair Trade”, linked to OXFAM in Great Britain.
- Once the market is established, the greatest risk is the loss of final product quality control. The quality requirements are very demanding, competition is strong, and the market does not easily forgive failures in quality. Worse than this, once a market is lost, the recovery of the market is very difficult if not impossible.
- The exporter has to do everything within reach to control quality rigorously, including if possible, personally inspecting all of the fruit prior to export. It is preferable to throw out rather than sell any product of suspect quality.

H. LINKS AND SUPPORT NETWORKS

To be successful, this venture depends on the existence of a support network for both production and for marketing and sales. The processing unit at the village level requires support from the investor or from an NGO with regard to the acquisition of the necessary equipment, transfer of technology, and marketing of the final product.

World Vision has an extensive program to support small holders and to provide agricultural extension services in Zambézia province. This organisation has indicated its willingness to support activities carried out by village residents to add value to products. The most important intervention and role would be to facilitate the linkages between the small holders and the commercial processing units.

The fundamental problems holding back business development in Zambézia Province is the lack of infrastructure, long distances within the province, the distance to market and the lack of capital. World Vision is prepared to provide financial assistance to support any commercially viable dried fruit business initiative along with assistance in the acquisition of production equipment and through their team of rural extensionists help train the small holders to acquire the necessary technical expertise.

L. ASSUMPTIONS & PRELIMINARY FINANCIAL PROJECTIONS(US\$000) – BASE CASE

Financial Projections: Village Model

General Assumptions

- Sun drying of fruit by small holders to supply the commercial business model
- Opportunity Cost of Capital = alternative domestic application without risk = treasury bonds = 28%
- Target project internal rate of return = 35% (28% for treasury bills plus 7% risk premium)
- Cash flow years 6 – 10 = cash flow year 5
- Cash flow terminal year 10 = 0
- Necessary funds = investment + operating funds
- Bank loan term = 5 years (with reimbursement of capital each year)
- Tax obligations are not included (these will vary depending on the nationality of the investor, location of the investment, and the special tax regime applied)

BASE CASE FINANCIAL ASSUMPTIONS

Equity Capital	50%
Cost of internal bank loans after inflation (interest)	30%
Net present value discount value	35%
Target Internal Rate of Return (IRR)	35%
Income Sensitivity Factor	1 (relating to the base case)
Operating Cost Sensitivity Factor	1 (relating to the base case)
Year 1 Operating cost investment (in Year 0)	50% of the annual operating cost
Capital Investment	0.5 (USD 000)
Capital Equipment Depreciation	15% (of the initial value each year)

Volumes/prices/cost Assumptions (USD real)	Yr 0	Yr 1	Yr 2	Yr3	Yr 4	Yr5
Processed fresh fruit (tonnes)	0	9.6	9.6	9.6	9.6	9.6
Fruit sold (ton)	0	1.9	1.9	1.9	1.9	1.9
Dried fruit price (USD/ton)	0	2000	2000	2000	2000	2000
Raw material price – tonne(purchase of fruit)	0	100	100	100	100	100
Other costs	0	0.2	0.2	0.2	0.2	20

BASE CASE(USD 000)	Yr 0	Yr 1	Yr 2	Yr3	Yr 4	Yr5
<u>CASH FLOW - OPERATIONS</u>						
VOLUMES						
Volume of Dried Fruit sold	0	1.9	1.9	1.9	1.9	1.9
INCOME AFTER VAT						
	0	3.8	3.8	3.8	3.8	3.8
OPERATING COSTS						
Raw material purchase	0	-1.0	-1.0	-1.0	-1.0	-1.0
Depreciation	0	-0.1	-0.1	-0.1	-0.1	-0.1
Other costs	0	-0.2	-0.2	-0.2	-0.2	-0.2
OPERATIONAL CASH FLOW						
	0	2.6	2.6	2.6	2.6	2.6
<u>CASH FLOW - FINANCING</u>						
INVESTMENT (Including Year 1 Operating Costs)						
Equity Capital	0.6	0.0	0.0	0.0	0.0	0.0
Bank Finance	0.6	0.0	0.0	0.0	0.0	0.0
CAPITAL & OPERATING EXPENDITURE						
	-1.1	0.0	0.0	0.0	0.0	0.0
BANK FINANCE COSTS						
Interest – long term loan	0	-0.2	-0.1	-0.1	-0.1	0.0
Principal – long term loan	0	-0.1	-0.1	-0.1	-0.1	-0.1
Overdraft Facility – short term loan	0	0.0	0.0	0.0	0.0	0.0
<u>TOTAL CASH FLOW</u>						
Annual Cash Flow	0.0	2.3	2.3	2.4	2.4	2.4
Accumulated Cash Flow	0.0	2.3	4.6	7.0	9.3	11.8
Net Present Value (NPV) up to Year 10	\$4.72					
IRR Cash Flows (including cash flows for Yrs 6-10)	-0.6	2.3	2.3	2.4	2.4	2.4
Internal Rate of Return (IRR)	411%					

The preliminary financial projections for this village model indicate that the venture is viable, needing a minimum investment of \$600 in the case of 50% financing with equity capital funds.

Even assuming the “worst case scenario” in which the income is reduced by 10% and the costs are increased 10%, the project rate of return under any structure of bank loan appears to be viable (see table below).

SENSITIVITY OF THE BASE CASE TO THE FINANCING STRUCTURE

Equity Funds	50%					
Bank Loan	50%					
	Yr 0	Yr 1	Yr 2	Yr3	Yr 4	Yr5
Annual Cash Flow	0.0	2.3	2.3	2.4	2.4	2.4
Accumulated Cash Flow	0.0	2.3	4.6	7.0	9.3	11.8
Net Present Value (NPV) up to Year 10	\$4.72					
IRR Cash Flows (including cash flows for Yrs 6-10)	-0.6	2.3	2.3	2.4	2.4	2.4
Internal Rate of Return (IRR)	411%					
Equity Funds	90%					
Bank Loan	10%					
	Yr 0	Yr 1	Yr 2	Yr3	Yr 4	Yr5
Annual Cash Flow	0.0	2.5	2.5	2.5	2.5	2.5
Accumulated Cash Flow	0.0	2.5	5.0	7.5	10.1	12.6
Net Present Value (NPV) up to Year 10	\$5.07					
IRR Cash Flows (including cash flows for Yrs 6-10)	-1.0	2.5	2.5	2.5	2.5	2.5
Internal Rate of Return (IRR)	250%					
Equity Funds	10%					
Bank Loan	90%					
	Yr 0	Yr 1	Yr 2	Yr3	Yr 4	Yr5
Annual Cash Flow	0.0	2.1	2.1	2.2	2.2	2.3
Accumulated Cash Flow	0.0	2.1	4.2	6.4	8.6	10.9
Net Present Value (NPV) up to Year 10	\$4.38					
IRR Cash Flows (including cash flows for Yrs 6-10)	-0.1	2.1	2.1	2.2	2.2	2.3
Internal Rate of Return (IRR)	1848%					

At the level of the small holders where family labour is available and the simple technology of solar drying is used, dried fruit presents excellent opportunities to increase family income. However, these small business venture will depend on the establishment of a commercial enterprise to export the dried fruit produced.

Financial Projections: Commercial Business Model for dried fruit export (US\$ 000)

General Assumptions

- Drying and export of dried fruit
- Opportunity cost of capital = alternative domestic application without risk = treasury bonds = 28%
- Target project internal rate of return = 35% (28% for treasury bills plus 7% risk premium)
- Cash flow years 6 – 10 = cash flow year 5
- Cash flow terminal year 10 = 0
- Necessary funds = investment + operating funds
- Bank loan term = 5 years (with reimbursement of capital each year)
- Tax obligations are not included (these will vary depending on the nationality of the investor, location of the investment, and the special tax regime applied)

BASE CASE FINANCIAL ASSUMPTIONS

Equity Capital	50%
Cost of internal bank loans after inflation (interest)	30%
Net present value discount value	35%
Target Internal Rate of Return (IRR)	35%
Income Sensitivity Factor	1 (relating to the base case)
Operating Cost Sensitivity Factor	1 (relating to the base case)
Year 1 Operating cost investment (in Year 0)	50% of the annual operating cost
Capital Investment (Year 0)	52 (USD 000)
Capital Equipment Depreciation	15% (of the initial value each year)

Volumes/prices/cost Assumptions (USD real)	Yr 0	Yr 1	Yr 2	Yr3	Yr 4	Yr5
Processed raw material (ton)	0	90	180	180	180	180
Fruit exported (ton)	0	18	36	36	36	36
Dried fruit price (USD/ton)	0	2500	2500	2500	2500	2500
Raw material price – tonne(purchase of fruit)	0	100	100	100	100	100
Labour/processed ton	0	35	35	35	35	35
Energy/processed ton	0	30	30	30	30	30
Packing material/exported ton	0	80	80	80	80	80
Transport/processed ton	0	20	20	20	20	20
Other costs and general expenses	0	4	8	8	8	8

BASE CASE(USD 000)

Yr 0	Yr 1	Yr 2	Yr3	Yr 4	Yr5
------	------	------	-----	------	-----

CASH FLOW - OPERATIONS**VOLUMES**

Volume of Dried Fruit sold	0	18	36	36	36	36
----------------------------	---	----	----	----	----	----

INCOME AFTER VAT

	0	45.0	90.0	90.0	90.0	90.0
--	---	------	------	------	------	------

OPERATING COSTS

Raw material purchase	0	-9.0	-18.0	-18.0	-18.0	-18.0
Labour	0	-3.2	-6.3	-6.3	-6.3	-6.3
Energy	0	-2.7	-5.4	-5.4	-5.4	-5.4
Packing Material	0	-1.4	-2.9	-2.9	-2.9	-2.9
Transport	0	-1.8	-3.6	-3.6	-3.6	-3.6
Depreciation	0	-7.8	-7.8	-7.8	-7.8	-7.8
Other costs	0	-4	-8	-8	-8	-8

OPERATIONAL CASH FLOW

	0	15.1	38.0	38.0	38.0	38.0
--	----------	-------------	-------------	-------------	-------------	-------------

CASH FLOW - FINANCING

INVESTMENT (Including Year 1 Operating Costs)	66.9	0.0	0.0	0.0	0.0	0.0
Equity Capital	33.5	0.0	0.0	0.0	0.0	0.0
Bank Finance	33.5	0.0	0.0	0.0	0.0	0.0

CAPITAL & OPERATING EXPENDITURE

	-66.9	0.0	0.0	0.0	0.0	0.0
--	--------------	------------	------------	------------	------------	------------

BANK FINANCE COSTS

Interest – long term loan	0	-16.7	-15.2	-12.7	-10.7	-8.7
Principal – long term loan	0	-10.0	-8.0	-6.0	-4.0	-2.0
Overdraft Facility – short term loan	0	-6.7	-6.7	-6.7	-6.7	-6.7
	0	0.0	-0.5	0.0	0.0	0.0

TOTAL CASH FLOW

Annual Cash Flow	0.0	-1.6	22.8	25.3	27.3	29.3
-------------------------	------------	-------------	-------------	-------------	-------------	-------------

Accumulated Cash Flow	0.0	-1.6	21.2	46.5	73.8	103.1
------------------------------	------------	-------------	-------------	-------------	-------------	--------------

Net Present Value (NPV) up to Year 10**\$37.68****IRR Cash Flows (including cash flows for Yrs 6-10)**

	-33.5	-1.6	22.8	25.3	27.3	29.3
--	--------------	------	------	------	------	------

Internal Rate of Return (IRR)**49%**

On the basis of the base case scenario assumptions, and assuming that 50% of the necessary investment are equity funds and 50% are loan funds, an investor who invests US\$ 33,500 in year 0 for capital and operating expenses will generate an internal rate of return of 49%.

The table that follows presents the summary of this base case scenario for the three alternative financing structures (50% equity funds, 90% equity funds and 10% equity funds).

SENSITIVITY OF THE BASE CASE TO THE FINANCING STRUCTURE						
Equity Funds	50%					
Bank Loan	50%					
	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
Annual Cash Flow	0.0	-1.6	22.8	25.3	27.3	29.3
Accumulated Cash Flow	0.0	-1.6	21.2	46.5	73.8	103.1
Net Present Value (NPV) up to Year 10	\$37.68					
IRR Cash Flows (including cash flows for Yrs 6-10)	-33.5	-1.6	22.8	25.3	27.3	29.3
Internal Rate of Return (IRR)	49%					
Equity Funds	90%					
Bank Loan	10%					
	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
Annual Cash Flow	0.0	11.8	35.1	35.5	35.9	36.3
Accumulated Cash Flow	0.0	11.8	46.8	82.3	118.2	154.5
Net Present Value (NPV) up to Year 10	\$58.69					
IRR Cash Flows (including cash flows for Yrs 6-10)	-60.3	11.8	35.1	35.5	35.9	36.3
Internal Rate of Return (IRR)	45%					
Equity Funds	10%					
Bank Loan	90%					
	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
Annual Cash Flow	0.0	-15.0	7.0	12.7	18.7	22.4
Accumulated Cash Flow	0.0	-15.0	-8.0	4.7	23.5	45.8
Net Present Value (NPV) up to Year 10	\$14.51					
IRR Cash Flows (including cash flows for Yrs 6-10)	-6.7	-15.0	7.0	12.7	18.7	22.4
Internal Rate of Return (IRR)	54%					

Given the elevated operating *cash flow*, this project could support the cost of a bank loan with a positive impact on the internal rate of return. For example, if the project was financed with 90% equity funds, the rate of return for the investor is reduced from 49% to 45%. If the bank loan amount is increased to 90% (10% equity funds) the rate of return increases to 54%, but the net present value is reduced from \$59,000 to \$15,000 as a consequence of the costs of the bank loan finance.

J. SENSITIVITY ANALYSIS (BEST CASE / WORST CASE)

In addition to being sensitive to the level of bank loan used to finance this project, it is also very sensitive to changes in the earnings and operating costs forecast.. In a “better case scenario” where earnings increase 10% and operating costs are reduced by 10%, the rate of return for the scenario with 50% equity finance, the rate of return increases from 49% to 75%. With 90% equity financing, the rate of return is 62%. With only 10% equity funds, the rate of return increases to 120%, but the net present value is lowered from \$82,000 to \$40,000.

Unfortunately, the inverse applies to the “worst case scenario” in which earnings are reduced by 10% and the costs are increased by 10%. In this case, independently of the financing structure, the rate of return is lower than the target of 35%, and in the case of 90% loan finance, the rate of return is negative.

The following tables show the summary of the cash flow and the rate of return for the “best” and “worst” case scenario.

SENSITIVITY OF THE BEST CASE TO THE FINANCING STRUCTURE

Equity Funds	50%						
Bank Loan	50%						
		Yr 0	Yr 1	Yr 2	Yr3	Yr 4	Yr5
Annual Cash Flow	0.0	5.4	37.0	38.9	40.9	42.9	
Accumulated Cash Flow	0.0	5.4	42.3	81.2	122.1	165.0	
Net Present Value (NPV) up to Year 10	\$61.61						
IRR Cash Flows (including cash flows for Yrs 6-10)	-32.9	5.4	37.0	38.9	40.9	42.9	
Internal Rate of Return (IRR)	75%						
Equity Funds	90%						
Bank Loan	10%						
		Yr 0	Yr 1	Yr 2	Yr3	Yr 4	Yr5
Annual Cash Flow	0.0	18.5	48.5	48.9	49.3	49.7	
Accumulated Cash Flow	0.0	18.5	67.1	116.0	165.3	215.1	
Net Present Value (NPV) up to Year 10	\$82.08						
IRR Cash Flows (including cash flows for Yrs 6-10)	-59.3	18.5	48.5	48.9	49.3	49.7	
Internal Rate of Return (IRR)	62%						
Equity Funds	10%						
Bank Loan	90%						
		Yr 0	Yr 1	Yr 2	Yr3	Yr 4	Yr5
Annual Cash Flow	0.0	-7.8	23.0	28.9	32.5	36.0	
Accumulated Cash Flow	0.0	-7.8	15.2	44.1	76.6	112.6	
Net Present Value (NPV) up to Year 10	\$40.19						
IRR Cash Flows (including cash flows for Yrs 6-10)	-6.6	-7.8	23.0	28.9	32.5	36.0	
Internal Rate of Return (IRR)	120%						

SENSITIVITY OF THE WORST CASE TO THE FINANCING STRUCTURE

Equity Funds	50%						
Bank Loan	50%						
		Yr 0	Yr 1	Yr 2	Yr3	Yr 4	Yr5
Annual Cash Flow	0.0	-8.6	7.0	11.2	13.7	15.8	
Accumulated Cash Flow	0.0	-8.6	-1.6	9.6	23.4	39.1	
Net Present Value (NPV) up to Year 10	\$12.95						
IRR Cash Flows (including cash flows for Yrs 6-10)	-34.0	-8.6	7.0	11.2	13.7	15.8	
Internal Rate of Return (IRR)	21%						
Equity Funds	90%						
Bank Loan	10%						
		Yr 0	Yr 1	Yr 2	Yr3	Yr 4	Yr5
Annual Cash Flow	0.0	5.0	21.6	22.0	22.4	22.8	
Accumulated Cash Flow	0.0	2.5	5.0	7.5	10.1	12.6	
Net Present Value (NPV) up to Year 10	\$35.30						
IRR Cash Flows (including cash flows for Yrs 6-10)	-61.2	5.0	21.6	22.0	22.4	22.8	
Internal Rate of Return (IRR)	27%						
Equity Funds	10%						
Bank Loan	90%						
		Yr 0	Yr 1	Yr 2	Yr3	Yr 4	Yr5
Annual Cash Flow	0.0	2.1	2.1	2.2	2.2	2.3	
Accumulated Cash Flow	0.0	2.1	4.2	6.4	8.6	10.9	
Net Present Value (NPV) up to Year 10	(\$22.52)						
IRR Cash Flows (including cash flows for Yrs 6-10)	-6.8	2.1	2.1	2.2	2.2	2.3	
Internal Rate of Return (IRR)	#%						

The detailed analyses of the financial projections are set out in the annexes to this document.

K. KEY ISSUES TO CONSIDER IN THE PREPARATION OF A DETAILED BUSINESS PLAN

In addition to the thorough research of costs and prices, the key matters that a potential investor should investigate as part of the process of the preparation of the detailed business plan are as follows:

- The investor should contact various buyers in several countries to select future partners who are looking for the products that the investor intends to produce. OXFAM, in Maputo (www.oxfam.org) has links with an organization that promotes opportunities for companies in developing countries to obtain entry to and supply markets in Europe. It is advisable that the investor contacts Oxfam for this support.
- The investor must maintain a good quality of dried fruit to secure its buyer. The quality of the fruit will not be a problem if the investor uses electric driers in the central unit, but problems in quality can occur in the satellite units. There are various types of solar driers which operate differently and produce a product with different resulting levels of humidity. A degree of innovation and investigation will be necessary to improve the driers and guarantee a uniform product quality in the satellite units.
- The investor should visit the fruit growing areas throughout the year to confirm that the fruit exists in excess and that the quantities are sufficient to permit a viable operation. At the same time, villages with an excess of fresh fruit should be identified for purposes of locating the satellite solar drying units. Since World Vision has indicated that it is interested in supporting investors in such projects, interested parties should contact this organisation.

ANNEXES

- Assumptions and financial projections – Base Case**
- Assumptions and financial projections – Best Case**
- Assumptions and financial projections – Worst Case**