

**Assessing the  
Competitiveness  
of the  
Horticultural Sector  
in the  
Beira Corridor**

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## TABLE OF ACROYNOMS

ARA-Centro	Central Region Water Authority
AV	Added Value
CAPEX	Capital Expenditure
CBT	Competency Based Training
CPI	Investment Promotion Centre
CTC	Consortium of Farmers in the Vanduzi area
DFI	Development Fund Initiative
EN	National Road
EM	Electricity Supply Company of Mozambique
EMOSE	Mozambican Insurance Company
ESKOM	Electricity Supply Company of South Africa
EU	European Union
EUREPGAP	European Good agricultural Practices
FRELIMO	The Mozambican Front for Liberation
GAPI	Office for Small Business Development
GOM	Government of Mozambique
Ha	Hectare
HVH	High Value Horticulture
IAC	Chimoio agricultural Institute
IFC	International Finance Corporation
IPO	Investment Promotion Office
LDC	Less Developed Country
MTOM	Maximum Take Off Mass
MSC	Mediterranean Shipping Company
NGO	Non-Governmental Organization
RSA	Republic of South Africa
SSA	Sub-Saharan Africa
UK	United Kingdom
USD	United States of Dollar
VC	Venture Capital
Wks	Weeks
ZESA	Zimbabwe Electricity Supply Authority

## EXECUTIVE SUMMARY

In mid-September, TechnoServe, Inc. launched a 10-week study, with the input of a team of horticulture experts and volunteer analysts, to assess the competitiveness of the Beira Corridor's horticulture industry. Following interviews with key stakeholders (including existing growers, the public sector, airport and port management, input suppliers, etc.) as well as an analysis of the agro-ecological conditions of the area, we have come to the following conclusions:

**There is significant opportunity for high value horticulture development.** 550,000 hectares of land within the Beira Corridor that is suitable for horticultural production. This could generate as much as \$2.75 billion in annual revenues through both commercial and small holder (family) production. To date, only 74,000 hectares are currently under production - primarily by small holders.

**The Beira Corridor can support diverse fruit, vegetable and floriculture crops.** We identified a range of micro-climates which could support different crops (e.g., the high humidity in Sofala favors tropical fruit, while the drier Northern Manica is best for vegetables). This means that growers are better able to serve the local formal markets, as significant supermarket buyers such as Shoprite demand diverse selection. Different crops will also encourage the development of a robust agro-processing industry in the Beira Corridor.

**The region already offers six potential investment opportunities.** Various investors – Dutch, South African, Zimbabwean, and Mozambican – have already established six high value horticulture farms producing vegetables (CTC, Waluru), paprika (Pimenta de Mocambique), roses (Vilmar), bananas (Metuchira) and mangos (EAM). These businesses have the potential to generate \$43 million in annual revenues by 2008 – should they be able to access the finance required to expand. \$6 million of investment is required in 2004 to support the development of the initial 554 hectares.

**The investor will play a key role in the region's development.** We see the role of investors as more than just a source of funds. As the horticulture industry continues to consolidate, potential investors in Mozambique – which are expected to be key growers/buyers already active in other African countries - will also bring the management expertise, market access, and capacity building that is critical to realizing Mozambique's potential.

**The region is ripe for other *start-ups* in at least six areas.** In general, we expect that production for export will be focused on six specific crops (or crop models) which are best suited to the region: paprika, roses, hypericum and summer flowers, vegetables, large fruit estates and fruit farms. At least 5050 hectares of these crops can be established in the short- to medium-term and are expected to generate \$36 million in annual revenues. We anticipate that the success of the specific companies above will encourage additional investment in these six areas.

**However, in order for the region to fully develop its potential, *significant* investment is required – *quickly*.** The primary – and most pressing - constraints to development are the lack of infrastructure (primarily roads and power supply) and inability to secure finance. We recommend that the 140 kilometers between Beira and Inchope be upgraded to support transport to both Beira port and airport (particularly given that freight volumes do not justify the cost of upgrading Chimoio airport). We also recommend the establishment of a \$30 million loan facility, which could support 12-22 horticulture initiatives per year. Finally, although labor costs are lower than those of other leading African producers, significant investment must be made in capacity-building programs to increase productivity

of managerial, technical and field staff. In total, we estimate that at least \$90 million is required to put the right infrastructure and financing in place for the region's development.

**Some initiatives must be implemented immediately.** We have proposed a road map, which outlines the most important activities to be undertaken by each player and recommend these initiatives be undertaken within the next 12-18 months. However, in the shorter-term (e.g., within three to six months), three key issues must be addressed: infrastructure (primarily through rehabilitation of the Beira – Inchope road), bureaucratic reform (primarily through the launch of a 1-2 person task force to address bureaucratic constraints and develop a horticulture association which can play this role going forward) and finance (through a \$30 million loan facility, which could begin as a smaller, pilot fund of \$1 million). By making some progress on these three constraints, we hope that new investors will be encouraged to invest into the Corridor.

**Urgent collaboration among all stakeholders is key to realizing the region's potential.** The Beira Corridor will not be developed by a single investor or donor. Rather, stakeholders – the private sector, NGOs, the donor community, the government of Mozambique – must act now and act together to address some of these urgent needs. In order to raise awareness of this immense opportunity among the various stakeholders, we will be holding an investor's conference on March 9-10 in Maputo for the investment community, with site visits to existing horticulture enterprises on March 11. We hope that through this event – which will bring together the private sector (potential and current investors), government, donors – we can launch many of the initiatives outlined in the road map and discussed further in the following report.

## 1. THE CHALLENGE OF ENTERING THE HORTICULTURAL MARKET

Horticulture is an expanding sector in sub-Saharan Africa and provides excellent employment and economic opportunities. However, there is increasing competitiveness in this market and Mozambique need to move quickly and introduce incentives in order to attract investment.

### a. Increasing Challenges of Modern Horticultural Exports

A recent study for the World Bank by V.E.K. Adviesgroep B.V., concluded, when examining the challenges faced by Sub-Saharan African horticultural exporters, that horticultural exports are not as easy to establish as they were 20 years ago. Market saturation has resulted in only two ways to create value: through pre-packed “convenience” foods or by supplying a greater range of products *year-round*. Several trends are contributing to these challenges:

- ❑ **Concentration of buyers.** For fruit and vegetable products (and increasingly for flowers and ornamentals), the head of the value chain is dominated and effectively controlled by the large and sophisticated European multiple retailers, such as Tesco, Sainsbury and Marks and Spencer. Competition among suppliers for this market has reached the point where it is no longer sufficient to supply product of comparable quality or at a cheaper price. It is now imperative that suppliers offer the best quality and the lowest price to ensure market entry.
- ❑ **Concentration of growers.** For fruit, vegetables and flowers, the supply chain is increasingly dominated by transnational producer groupings, e.g., Flamingo Trading (which joins growers in Kenya, Zambia, South Africa and Guatemala, and Mitchell and Mitchell in Zimbabwe, Zambia and South Africa. The advantage to the growers is strength in negotiations with large buyers and ability to fill large orders year round.
- ❑ **Rising standards.** Exacting new standards of production and supply in the form of EUREPGAP now dominate the marketplace to the point where EUREPGAP registration has become a license to market rather than just a beneficial marketing tool. For exporters, registration is required of all their product suppliers, and while this still makes it possible for very small outgrowers to participate in the value chain, it does mean that they have to be very well organized and consistent. For the commercial suppliers, sufficient supporting infrastructure and excellent coordination of supply is imperative.

### b. Markets and Competitors: RSA, Zambia, Tanzania, Zimbabwe, and Kenya

For high value horticulture producers, transport costs can be as much as 50% of gross revenue (with net profit of 14% on average). Accordingly, when supply a market such as the EU, Mozambique may not be able to compete against a county like Egypt, which has the advantage of proximity. We consider South Africa (RSA), Kenya, Zambia, Tanzania, and Zimbabwe to be the more realistic competitors to Mozambique. All five of these countries have already established market supply credentials, with Kenya and RSA having several decades of experience, Tanzania and Zimbabwe less so, and Zambia being a relatively recent entry. Nevertheless, all four of these countries are also experiencing particular problems and challenges that could lead to the restructuring of the marketplace. We outline below the factors contributing to each of these countries’ successes as well as trends that may point to a perceived weakness, vis-à-vis Mozambique.

**Table 1: Advantages and Perceived Weaknesses of Primary SSA Competitors**

Country	Advantages Contributing To their Success	Perceived Weaknesses
Zimbabwe	1. Land tenure system, or at least a land valuation system (e.g., Zambia)	-Emigration of human capital and know-how -High Inflation -Land tenure and security of investment in question
Kenya	2. Security of investment	-2006 loss of LDC status -Escalating costs -Road and power infrastructure in poor shape
Zambia	3. Common language between all stakeholders (English)	-Political stability questionable -Landlocked -Limited crops (no fruit, too hot for vegetables) -Overpowering public sector
RSA	4. Critical mass cluster in terms of service and input supply, as well as processing industry established.	-High labor costs -Increasing labor problems -Limited crops (no tropical fruits)
	5. Financing systems and loan instruments well developed.	
	6. Human resource capital built or expanding	
	7. Freight forwarding and cargo handling hub established.	
Tanzania	8. International best practices and standards implemented	-Despite continued efforts over the last decade, public sector still not facilitating full development -Key airport infrastructure still not in place -Human resource capital, especially at supervisory level still slow to develop
	9. Trading history and proven track record of operators in the EU market.	

### c. Opportunity for Mozambique

In Phase I of our analysis, we demonstrated that, despite excellent agro-ecological conditions, Mozambique lacks the key skills and experience at the *upper managerial level*; any new investor in Mozambique would have to supply such key personnel. Certainly, some of this know-how could come from neighboring Zimbabwe. For example, many Zimbabwean growers are relocating to Zambia – lured by ability to access loans against 99-year leasehold titles and a common language. While new entrants to Mozambique – such as Vilmar from Zimbabwe – are creating jobs and opportunity, Mozambique cannot rely on simply attracting growers from Zimbabwe to develop its horticulture sector.

#### Kenya to Lose LDC Status

Under the Lome Agreement, developing countries in Africa, the Caribbean and the Pacific, are entitled to duty-free entry into the EU markets. However, these entitlements were not meant to be in perpetuity, and it was intended that Lesser Developed Country (LDC) status would be revoked as each country developed. Kenya is currently facing the anticipated loss of LDC status in 2006 (and consequent imposition of duties and tariffs on all of its exported flowers and vegetables entering the EU market.) This presents an onerous challenge to the Kenyan exporters who are already struggling with rising costs. Small wonder that many of these exporters are now looking to move into neighboring LDC countries that are not threatened with loss of entry privileges to the EU markets.

Rather, the country must target all the major competing supply countries in SSA in order to access skilled and experienced investors. Kenya, Zimbabwe, and RSA have also built-up their human resource capital at the field and packhouse supervisory levels, with Zambia and Tanzania less well developed, and new investors in Mozambique would have to start

almost from scratch with training of local supervisory staff as these will probably not be sourced by incoming expatriate personnel.

We expect RSA, Kenya and Zimbabwe to be the most likely source of experienced investors in Mozambique’s emerging horticulture sector. Given the potential weaknesses outlined in the table above, we anticipate that investors – such as Homegrown in Kenya or Mitchell and Mitchell or Hortico in Zimbabwe – may be looking to diversify into a new sourcing location. The first challenge will be in

attracting such investors in time in order to realize Mozambique's potential, and the second challenge will be in developing the necessary skills and experience at the field and packhouse supervisory level.



## 2. INVESTMENT ENVIRONMENT – CONSTRAINTS & RECOMMENDATIONS

There is significant opportunity to develop a successful horticulture sector in Mozambique. However, in order to realize this potential a number of measures need to be urgently put in place.

### a. Finance, Land Tenure and Security of Investment

Inability to access finance can cripple Mozambique’s horticulture sector. As addressed in Phase I, the state ownership of land – that is made available for use by private individuals or corporations on a

#### Land Title as Collateral

In Kenya, Tanzania and RSA, investors can own land and obtain Freehold Title, which has collateral value. In Zimbabwe, Freehold Title can also be obtained but under the current circumstances, the title may not have full collateral value because of the current turmoil in the country. Mozambique and Zambia do not permit anyone to own land and so Freehold Title is not an option, but Leasehold Title is applicable. Zambia offers 99-year leasehold title, which, due to the fact that the land used for agricultural production is well established, has collateral value with banks. On the other hand, Mozambique, with its larger areas of undeveloped fertile land, has not yet established a land value system and, as a result, Leasehold Title is still not recognized as collateral by the banks. This is despite the fact that the normal Title is for 50 years with a renewal option for a second 50-year period.

lease basis – coupled with many years of war – that has led to the exodus or destruction of most commercial farmers and fixed assets that could be used as collateral in a loan – has made access to rural financing on a commercial level an extremely difficult and onerous task. The number of banks operating in the Mozambican economy is still

small, and even smaller has been their interest in financing agriculture. The lack of interest on their part is mainly due to this lack of collateral.

**OUR RECOMMENDATIONS.** We believe that this complex issue can be addressed by five initiatives – led by different stakeholders.

- ❑ **Privatize land.** A sensitive issue, land privatization will enable the use of land as collateral for loans, provided the privatization is done correctly (and in a way to decrease “land grabs” by speculators.). The government has not shown any interest in this topic. It would be important for the Donors and the IFC to take this aspect into careful consideration and assist the GOM to review it and come up with a possible solution
- ❑ **Use land lease as collateral.** Land can be leased in 50-year increments to individuals and transferred to a third party, which signifies that the lease title has some value and could be used as collateral. Zambia is a good example of where land lease as collateral has worked – and this is due to the fact that most arable land is occupied thus accruing value to land lease. As land gets occupied this will happen naturally in Mozambique, and market value will be established and land will be able to be used as acceptable collateral.
- ❑ **Provide non-collateralized debt.** While this would give growers easier access to finance, it significantly increases the risk to lenders. The objective is to lay a low financial threshold for starting private horticultural entrepreneurs and to initiate a pilot project. However, this could be done in more creative ways which limit the risk to lenders such as:
  - a. *Link creditworthiness to a track record.* Some entrepreneurs already have proven track record among a financial institution, making them more credit-worthy than others.
  - b. *Lend money to smallholders associations as opposed to individuals.* Associations have two advantages over individuals: the ability to piece together some collateral (pooled from members) and lower likelihood to default (given potential access to more resources than an individual).
  - c. *Commercial farmers can associate and form credit unions.* This has worked in several countries (such as Farmers co-operatives in Zambia, Zimbabwe and South Africa), but requires

an established (and wealthy) farming community, making this an option in the medium term for the Beira Corridor.

*d. Wholesalers finance farmers.* This has also been a successful formula in Africa where wholesalers and/or processing companies provide farmers with funding and expertise, such as Interfresh and Cairns Foods in Zimbabwe. In exchange, farmers sell their produce to the wholesalers/processors. To date, this is already occurring in the Beira Corridor in the tobacco sector.

*e. Divide up projects.* Some larger scale horticulture projects exceed the maximum amount for a loan that credit institutions currently offer (e.g., Vilmar’s need for \$1.25 million per each 5 hectare expansion well exceeded GAPI’s available funds.) As such projects may involve more than one party, it could be possible for each party to apply as a separate entity for smaller tranches of funds.

- **Promote alternative financing structures.** Not all financing occur through loans. Joint ventures with strategic partners, venture capital operations, commercial papers issuance,

**ABSA in South Africa**

ABSA bank in RSA is one of the largest farmers in the country. The bank offers loans to farmers, using the expected crop as collateral and repayment. In other words, a percentage of the crop belongs to ABSA, and the remainder to the farmer, thus forcing the farmer to be extremely efficient (if he is to make a living). The bank has financed over 100,000 hectares of commercial agriculture in RSA in this way.

derivative operations, or a combination of these can be feasible alternatives to a start-up sector in which collateral and proven track record are difficult to obtain. These options

will be further addressed in the Investment Models section.

- **Provide insurance and hedging opportunities.** Insurance companies currently do not provide any policy for crops. If crop insurance were provided, the risk of rural credit operations would be spread between financial institutions and insurance companies, making the whole operation more attractive to the former. The government, through EMOSE (a government-controlled insurance company) or any of the privately owned insurance companies, could start providing this form of insurance, thus stimulating rural credit. In fact, Hollard Insurance has begun insuring tobacco crops for commercial operators in Tete Province – a model which could eventually be offered for horticultural crops. Crop insurance is available in Zimbabwe, RSA and Zambia for export horticulture.

Futures contracts between farmers and wholesalers could also be another form of protection to farmers, wholesalers and financiers. Farmers can pre-set a price for their harvest (or part of it) with the buying party, and thus provide the financial institution with a “future collateral.” This creates some assurance for the banks that the farmer will have a minimum amount of cash on hand when the loan has to be repaid.

The system of “warehouse receipts” has been recommended as a solution in the cashew sector. The processor stores cashew in a warehouse, and uses this stock as collateral against working capital loans. However, this system would not be applicable to horticulture, because the crops are harvested and transported fresh to the consumer.

## **b. Water Supply**

Water supply is the most important factor governing the choice of sites for horticultural production. And tropical and sub-tropical rainfall calls for an effective irrigation systems, primarily because:

- ❑ Rainfall is concentrated (60%) in a four-five month period, meaning that the dryer months experience significant shortages.
- ❑ Short duration of rain (85% occurs at the beginning of the storm) leads to higher risk of water loss through run-off
- ❑ Annual evaporation (losses) are 1000 mm, further depleting the water supply

**OUR RECOMMENDATIONS.** Clearly, larger scale irrigation is required in the Beira Corridor, and in Phase I, we estimate that up to 1723 small- to medium dams can be built in the Beira Corridor.

Region	Actual Dams	Potential Dams	Dams to Build
Zimbabwe	250	300	50
Northern Manica	4	390	386
Central Manica	15	360	345
Southern Manica	30	540	510
Sofala	0	432	432
<b>Total</b>	<b>299</b>	<b>2022</b>	<b>1723</b>

In order to assess the exact irrigation needs (and costs) for the horticulture sector, we analyzed the needs for two base cases: a unit of 48 hectares of vegetable crops and 4 hectares of rose or other cut flowers (Appendix 1). Approximate water requirements for these base units are 3288 m<sup>3</sup>/day and 240m<sup>3</sup>/day, as outlined below.

**Table 2: Assumptions for Base Case Water Requirements**

<p><b>Base Case #1 (Vegetables): Open field irrigation requirements (excluding rain) for 48 ha unit</b></p> <ul style="list-style-type: none"> <li>❑ Estimate of 48 ha of staggered planting over 16 weeks at 3 ha per week</li> <li>❑ 75% will be in vigorous growth stage/pod fill/maturation at any one time</li> <li>❑ 25% will be in root establishment or senescence</li> <li>❑ Peak summer water demand estimated at 6mm/day, reducing to 4mm/day in the early and late stages. The total water requirement overall averages 5.5mm/day.</li> <li>❑ Allowing 80% efficiency factor, brings the total to 6.85 mm/day or 68.5 m<sup>3</sup>/day per hectare. The total daily water requirement is estimated at <b>3288 m<sup>3</sup>/day</b> for a 48 ha unit.</li> </ul>
<p><b>Base Case #2 (Cut Flowers): Greenhouse irrigation requirements (excluding rain) for 4 ha unit</b></p> <ul style="list-style-type: none"> <li>❑ Assume that the summer demand peaks at 60m<sup>3</sup>/day/ha</li> <li>❑ Total daily water requirement is estimated at <b>240m<sup>3</sup>/day</b> for a 4 ha unit.</li> </ul>

The total establishment and operating cost for the base units is estimated at \$1.35 million.

**Table 3: Cost Components for Base Case**

Earth Dam	\$100,000
Irrigation equipment	\$150,000
Buildings establishment	\$ 70,000
Vehicles	\$100,000
Machinery	\$200,000
Operating Costs	\$100,000 (in first year of ops)
Packhouse	\$630,000 (or \$120,000 if central packhouse)
<b>TOTAL</b>	<b>\$1,350,000 (or \$840,000 if central packhouse)</b>

An average dam would serve either four 4-hectare rose projects or 2/3 of the needs of a vegetable project.<sup>1</sup> A medium-sized dam would serve 12-15 4-hectare rose projects or 2 vegetable projects. In

<sup>1</sup> Assumes that a 48ha field vegetable project requires a minimum storage of 1,500\*10<sup>3</sup> m<sup>3</sup> and a 4ha greenhouse project requires minimum storage 250\*10<sup>3</sup>m<sup>3</sup>.

general, water source to land distance should not be more than 1km to curtail costs. These dams should therefore be located on the farms with a small catchment area of 20 to 30 km<sup>2</sup>.

Environmental issues such as water pollution and river siltation will not be a major issue, given that these dams are to be built within existing farming areas, where there are no major river systems. Of concern however, is the resettlement of smallholders that might be practicing stream bank cultivation within the dam sight or up-stream of the dam. This issue must be handled by the ARA-Centro.

We estimate that an investment of over \$30 million is required in order to develop the irrigation requirements of the 40 floriculture, fruit and vegetable projects detailed in Appendix 1. While farmers will build (and own) the dams<sup>2</sup> with the assistance of loan capital, the water remains the property of ARA-Centro, the Water Authority responsible for authorizing the construction. The farmer will then receive a water abstraction license from ARA-Centro and pay a water tax of 40 Meticaais per m<sup>3</sup> of water used for irrigation. Communities around the dam and further down stream would be allowed to use the water for subsistence and household purposes.

#### **Water Use Legislation in Mozambique**

Mozambique has embarked on developing a modern water use legislation to ensure the sustainable use of its water resources. ARA-CENTRO is the authority responsible for the entire Pungue and Buzi river basins. They manage user rights, allocate licenses and defend the interests of the users and communities living within the basin areas. The authority is new and inexperienced. To date it has issued one user license to AUZMOZ in Manica and is struggling to deal with gold panners polluting the Revue and Pungue Rivers. ARA-CENTRO is technically competent but lacks the ability to resolve conflicts and work at a quicker pace. It will be necessary to build their capacity in these areas is to champion water use and security for investors.

However, in order for such a scheme to be successful, ARA-Centro must be able to properly manage water use and resolve conflicts. To date, it has unsuccessfully prevented gold panners polluting the Pungue and Revue rivers. Until the Water

Authority's capacity is strengthened, farmers will have little incentive to build their own dams with so much uncertainty around water rights.

### **c. Labor productivity**

In less developed countries, the horticultural industry is highly labor intensive, thus making labor productivity a key component of competitive advantage.

However, productivity in Mozambique does not greatly surpass that of its nearest labor-intensive regional competitors, Zimbabwe and Zambia. The horticulture sector uses a productivity measure, which assumes that productivity is related to employment cost and respective output levels. Labor cost is measured as a percentage of gross income. Assuming no new labor, increases in gross income (with no increase in labor cost) will increase this percentage, pointing to higher labor productivity. Using this methodology, we estimate productivity of Mozambican labor to be about 4% (compared to 12-14% in South Africa), per Table 4.

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<sup>2</sup> Construction is authorized by ARA-Centro and the National Water Directorate (DNA) within one month of presenting a technical project plan and Environmental Impact Assessment.

**Table 4: Labor Productivity by Country**

Country	Roses labor cost	Vegetables labor cost	Remarks
Mozambique	4%	4%*	* Estimate
Zambia	3%*	3%*	* Estimate
Zimbabwe	3%	3.5%	
South Africa	12%	14%	Fast mechanizing
Europe	18%	20%	Highly mechanized

Source: Interviews with sector associations, CDI and producers

It is essential that productivity be improved if Mozambique is to be more attractive to investors than neighboring countries. This increase can be achieved through good leadership, industry specific training, improving working conditions, and rewarding for reaching performance targets.

#### Role of Associations in Productivity

The Zambian horticultural growers association realized a need to build the local staff capacity to manage and supervise projects, so they embarked in the creation of the Zambian Horticultural College, which offers on the job, practical training to students. The college's graduates are able to assume supervisory roles and the training of other staff. The college has indicated a keen interest in establishing a link with local institutions in Mozambique's Manica Province.

Of further concern is the limited knowledge of the sector demands by the small to medium sized Mozambican farmers. It will be essential to improve the smallholders' production and quality control management capacity if they are to participate in the export of horticultural produce from the region.

#### Farming in Mozambique

Farming as a business is a new concept for most Mozambican farmers. Many small- to medium-sized farmers have regular, 8-5 jobs (with NGO's, government or self employment) in order to subsidize farming operating costs on their 3 to 20 hectare farms. As a result, they have little time to devote to improving yields; and most use unprofessional and primitive farming methods.

At the same time, several former Portuguese farming companies such as JFS and Entrepoto still exist and farm on estates of over 2,000 hectares. These companies have weak management and fail to utilize their production resources successfully, so that their farms are always under threat of negative income. Clearly, both groups could benefit from better production processes, superior management skills and technology.

#### OUR RECOMMENDATIONS

We anticipated that investors into the Beira Corridor will also supply the much needed senior management expertise, which requires years of training and experience to develop. However, at the same time, we recommend a comprehensive capacity building program (Competency Based Training), which will address the productivity (and expertise) issues

across supervisory and lower levels of management as well as smallholders.

#### Competency Based Training (CBT)

If the horticulture sector in the Beira Corridor is to produce 261 tonnes of high value product per week over the next three years, an unprecedented number of qualified supervisors and managers will be needed in the first three years of the expansion program.

Supervisory Training Needs for the Next 3 Years				
Year	Projects Initiated	Growing Supervisors	Mechanical Skills	Packhouse Supervisors
1	5	75	50	50
2	10	150	100	100
3	10	150	100	100

We believe that a robust program of Competency Based Training (CBT), which assumes three pillars to competency in any job or profession: knowledge, the skills to apply this knowledge, and the right behavior (which applies the skills and knowledge), is critical to grow this pool of managerial skills.

**OUR RECOMMENDATIONS.** We recommend a three-part program in order to ensure a pool of productive and skilled resources to lead the region's growth.

- ❑ **Selection.** Investors are expected to play a key role in selecting top management with the appropriate leadership skills to motivate the workforce. We recommend that one key component to the upcoming investors' conference is to address, through a case study of the Zambian Horticultural College, the specific skill sets (leadership, motivation & incentives, communication, etc.) that would be required at each level of management to drive productivity.
- ❑ **Training.** No horticultural-specific training is available in Mozambique. Yet substantial training materials are readily available in the region; the Zambian Horticultural Training College has developed and systemized such materials over the past four years. The college uses Competency Based Training techniques on their own training farm and all courses are aligned to HACCP and EUREPGAP. We recommend that this program be brought to Mozambique, through the leadership of a local organization, such as the sponsors of the Njerenje project (Appendix 2.2), who can establish a training farm at the Institute of Agriculture in Chimoio (IAC). As we outline in the appendix, this three-part program would require \$175,000 in investment and develop – through a combination of academic and hands-on study – at least 30 managers and supervisors over the next 3 years.
- ❑ **Motivating.** Clear performance targets and appropriate incentives must be in place to ensure high productivity. An assessment of the most effective monetary (and non-monetary, such as social benefits, peer recognition, training) incentives will be required for each enterprise.

#### **d. Bureaucracy & Legislation**

Bureaucracy is often cited by new investors as the main deterrent for investing in Mozambique. Key constraints to doing business in Mozambique include:

- ❑ **Customs and immigration** continues to be a major concern. Customs clearance takes a minimum of 48 hours, even with all documentation in order, but in most cases 1-2 weeks delays are experienced. Some progress has been made (e.g., cutting importing procedure from 24 to 8 points). However, continued customs delays are keeping prices high. According to a major transport company, demurrage built in to price by transporters currently averages 15% for Mozambique.
- ❑ **Language** can be an issue, particularly when an investor is faced with an equally attractive opportunity in a neighboring English-speaking country. All official forms and investment requirements should be translated into English for potential investors.
- ❑ **Different interpretations of the law** and duties can lead to confusion and differing customs charges (e.g., 5% irrigation pipes but 17.5% on the bends on the end of the pipes).
- ❑ **Corruption.** While many government officials aim to attract investment, potential investors have indicated that some officials purposefully delay decisions in order to get an “incentive” to accelerate the process.
- ❑ **Excessive fines** have been levied on local businesses (for example local retailers and businesses in Chimoio have been given fines up to \$25,000 - \$50,000 USD) which some believe is a way for local (bankrupt) government to access funds.
- ❑ **Delays** continue to hurt new businesses. It takes on average 1-2 weeks to import items through customs, which compared to a few hours in many countries such as South Africa leaves

Mozambique at a significant disadvantage. Starting a business takes up to 6 months and 18 months to obtain the necessary CPI documentation (and during this waiting period, a company is not exempt from tariffs.)

- ❑ **Lack of farming legislation.** Legislation needs to be introduced to prevent spread of diseases, water contamination, etc.

**OUR RECOMMENDATIONS.** Clearly, addressing bureaucratic constraints to horticultural development should be a priority, and we recommend the formation of a small task force to address bureaucratic issues and corruption. This could be modeled on the IFC’s SEATEC (tourism) model in Mozambique where 1-2 experts are in place – with access to government officials – to identify what issues must be addressed to encourage investment. In addition, other steps must be taken by all partners, including:

- ❑ **Form horticultural associations** to provide advice to new investors and lobby on all issues of mutual interest. This is an initiative that we expect the private sector to lead.
- ❑ **Establish a “Fast Track Service”** for investment advice and services in Mozambique. Modeled on the DTI initiative in South Africa this initiative should be semi-private, business-orientated, and funded by the government, donors, confederation of industries, and fees paid by investors for specific services. This organization should assist in forming companies, give investment advice and fast track applications through the bureaucratic procedures. It should also lobby government and donors to provide fiscal benefits to encourage investment into Mozambique.
- ❑ **Introduce a border pass pre-clearance card** so that investors and transporters do not have to continuously fill in forms. Countries such as Zimbabwe and South Africa and America and Canada already have these reciprocal arrangements in place.
- ❑ **Translate all forms into English** and ensure that key government departments have English-speaking officials.

**e. Infrastructure: Roads**

Further in the document, in the section on *Export Logistics: Airports*, we state that air freight volumes would not be sufficient to justify expensive rehabilitation to the Chimoio airport. Accordingly, the surface transport infrastructure of the Beira Corridor becomes that much more critical. In particular, the road connections between Manica Province and the seaport and airport of Beira and the road connections through to Harare or Johannesburg are not yet capable of allowing rapid and low-cost transit of products in small and heavy trucks. Roads should be able to transport 40 foot refrigerated containers and similar sized refrigerated trucks to the seaport of Beira and large refrigerated trucks (containing pre-packed and pre-cooled aircraft pallets) to the airports of Beira, Harare and Johannesburg. Roads must also be able to accommodate transport of input supplies (fertilizer and equipment) from Beira port to Manica Province in similar capacity vehicles.

The map to the right shows the critical highway routes for the transport of refrigerated produce from the Beira Corridor to the necessary ports of export: Beira; Harare; and, Johannesburg. Table 5



below describes the current condition and status of these highways. Further details are described in Appendix 2.3.

**Table 5: Fresh Produce Export Routes, Current Condition and Status**

Highway	Current Condition and Status
EN4 Maputo to Komatipoort	Good condition and well maintained.
EN1 Maputo to Inchope	Variable condition, northernmost 100km in very poor condition. Road scheduled for major upgrade 2004/5 with funds allocated through World Bank loan and tendering in progress.
EN6 Beira to Chimoio and Machipanda	Variable. Chimoio to Machipanda in relatively good condition and will need resurfacing in 2004/5. Chimoio to Inchope moderate to good condition, will need re-surfacing in 2004 or 2005. Inchope to Beira in relatively poor condition and whole stretch urgently needs upgrading. Worst stretch between Tica and Dondo needs major road raising and bridgeworks across Pungue floodplain.
EN102 Vanduzi to Tete	This whole highway in process of major upgrading, but works currently stalled by litigation between contractors and Govt. Mozambique and new contracts out to tender.

**OUR RECOMMENDATIONS.** With the exception of Highway EN6, Beira to Chimoio, all the main export connections are in reasonably good condition or are in process of major upgrade. The 130km stretch of Highway EN6 from Inchope to Beira is in poor condition and has a history of flood disruptions and a constantly deteriorating surface. The worst section is between Tica and Dondo where the high water table of the Pungue River plain and occasional flooding of the whole area creates substantial hydraulic lift of the road surface and rapid deterioration thereafter, which temporary fixes have not properly addressed. Failure to improve this vital transport link would prove to be a major impediment to horticultural exports from the Beira Corridor and a considerable disincentive to prospective investors in the industry. We recommend that donor assistance be sought at the earliest opportunity to address this major infrastructure weakness.

In order to properly upgrade this 130km stretch, an investment of \$20 million (based on \$150,000 per km at today's prices) is required. However, this upgrade must also be accompanied by raising the road embankment a further 300 mm of this 130km in order to reduce flooding to 100 mm for just 4 days every 25 years, allowing heavy vehicles to pass. Finally, we recommend that the 750 meters of bridgeworks across the maximum full flood width of the Pungue River, estimated at \$20 million.

A long-term fix to Highway EN6 between Inchope and Beira could cost \$44 million<sup>3</sup>.

130km upgrading Inchope to Beira	\$20 million
Road raising across main floodplain	\$4 million
Bridgeworks across River Pungue	\$20 million
<b>Total</b>	<b>\$44 million</b>

In view of the current litigation problems resulting from breakdown in contract management procedures, we also recommend that training of staff from the Highways Department be instigated to

<sup>3</sup> Interview with Mr. Brian Warren and Rick de Gouveia, senior engineers with the original design contractors C.P.P. Consultants.



address these operational issues. We estimate the cost of such training, in terms of material preparation and launch, to be approximately \$80,000 and further recommend that donor assistance be sought to fund the programme. (Make sure this is in road map!)

### f. Infrastructure: Electricity Supply

Horticultural export production requires substantial amounts of electrical power to run pumping and irrigation equipment, cold stores and refrigerated packhouses, ancillary lighting in greenhouses for day-length sensitive flower production, as well as for general and domestic uses around offices and other support buildings. In addition, while crops such as flowers may not have the same irrigation (and energy) requirements, they have other energy needs – enough electrical lighting to mimic extended day length. Appendix 2.4 gives details of typical electrical power consumption for irrigated horticultural crops.

In Mozambique, the parastatal Electricidade de Mocambique (EM) has a monopoly on supply. Further, there is very little reticulation of electricity supply away from the main grid apart from supply to urban centers (particularly in Manica and Sofala Provinces), which means that while urban centers, such as Chimoio, regularly experience quite short interruptions in supply (up to 20 or 30 minutes at a time) and occasionally longer interruptions, customers in rural locations can see interruptions extending for several days. One new horticultural grower <sup>4</sup> reported recently going seven days without power of any kind and is now having to invest in back-up generating capacity at a cost of \$10,000 when they thought it would not be necessary. Accordingly, the customers must still invest in back-up generators to provide cover when main supplies are down.

Companies seeking to access mains power in rural areas are expected to meet the full costs of installation but the work must be carried out by EM, or their preferred contractors. While the customer can claim 140% of that cost back in the form of tax allowances or rebates in successive years, most start-up businesses do not anticipate paying tax in early years (due to no anticipated profit) and this tax rebate becomes a poor incentive for investment in the substantial costs of electrical supply installation. Reticulated supply from the main grid costs approximately \$6-10,000 per kilometer of supply, depending on the installations required and topographic or other physical obstructions (requires step-down transformer as well as poles and lines providing eventual 330 volt triple phase supply). A generator, on the other hand, can cost upwards of \$10,000, depending on size and generating capacity, and will have to carry an overhead of maintenance and depreciation, as well as the diesel fuel costs. Any extension of electrical reticulation beyond a few kilometers from the main grid is therefore not cost effective, and growers will prefer to invest in generators.

Operating Costs: Electricity vs. Diesel	
Assuming the need for 12 hours of power (100kW or 1200kWh), EM supply is marginally more expensive than use of own generator at present fuel costs.	
<b>Daily Cost</b>	
Electricity supply From Electricidade de Mocambique (EM):	
-	1 kWh costs \$0.097
-	1,200 kWh = <b>\$116.40</b> per day of operation
Electricity supply from own generator:	
-	100kVa generator consumes 90 liters of diesel in 12 hours @ \$0.50 per liter
-	<b>\$90.00</b> per day of operation (does not include maintenance costs and depreciation)

<sup>4</sup> Interview with C.T.C.

**OUR RECOMMENDATION.** Developed industrial economies have found an efficient solution to this problem. Funding of further reticulation of the electrical supply is done through well-developed money markets (local or global), combined with soft loans where applicable over extended periods. For example, in RSA, ESKOM is funding expansion through the country's own money markets. In Zimbabwe, before its economy collapsed, ZESA sought funding for small projects through its own money markets but looked to multilateral lending institutions, such as the World Bank, for funding of major works. However, money markets in Mozambique are less developed and multilateral funding institutions are the only recourse.

We estimate that an additional 1,500 km of electrical reticulation would be needed for those rural areas of Manica Province where horticultural production could be immediately successful (e.g., new main lines at a stepped down voltage running north and south of the existing main grid line and then secondary reticulation off of this to link with farms and newly developing areas). Total cost for this reticulation would cost approximately \$15 million,<sup>5</sup> most likely funded through donor assistance.

Achieving increased efficiency and reliability in the supply of electrical power will also require training of EM managers and supervisors. We recommend that a training programme be implemented at the earliest opportunity for EM staff, covering improvements in operational and management efficiency. We estimate that the training programme would cost approximately \$80,000 to prepare and launch and we recommend that donor assistance be sought for funding.

An alternative solution to energy provision for rural areas already exists in Mozambique but is not yet fully utilized. The Fundo Nacional de Energia (FUNAE) was established to promote innovation in energy supply for rural areas. FUNAE can provide soft loans of up to \$100,000 for the installation of any new energy supply provided that it can be demonstrated to have a positive impact on rural employment and standard of living. Accordingly, installation of a substantial electricity generator by an investor in horticultural production would be able to access a FUNAE loan provided that they included some form of a local low power electricity supply for the immediate community (e.g., for wiring of domestic properties for lighting and other low power consumption items). This would require investors to oversize their generator installations, but would be sensible in any case to cover future production expansion needs.

We recommend that FUNAE be strengthened in terms of its total loan capacity and loan provision services, and loans targeted to new investors in horticultural production in Manica Province and the Beira Corridor.

#### **g. Export Logistics: Airports**

If the Beira Corridor is to attract investors in the horticultural sector, then reliable airfreight options must be made available to move fresh produce quickly from the corridor area to the overseas markets. Presently all fresh produce from the Beira Corridor area is air freighted from Harare, Zimbabwe or Johannesburg in RSA. All cut flowers together with some vegetables are freighted via Harare in chartered flights, while the bulk of the vegetables are freighted through Johannesburg as belly cargo in passenger airliners. The lower value of the vegetables implies that they must be transported as belly cargo in passenger flights rather than the more expensive charter flights. Generally, exporters will send only vegetables on charters to fill a plane should there be space available.

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<sup>5</sup> Based on top-end estimates from E.D.M. at \$10,000 per km.

Of the Harare, Beira and Chimoio airports, only **the Harare airport** is equipped for fresh produce freight. The airport has benefited from over 20 years of investment in fresh cargo freight and has several advantages: 1) a 4000m<sup>2</sup> cold storage Europort, with the capacity to store, pallet and cool over 160 tons of fresh produce per day, 2) all the necessary loading, navigational and mechanical equipment and landing and storage facilities needed for fresh freight, and 3) existence of regular chartered flights from Harare to Europe. These advantages make Harare an attractive airfreight option for most producers in the Beira Corridor area.

**The Chimoio airport** can only service light aircraft on a daylight operation only basis due to several drawbacks:

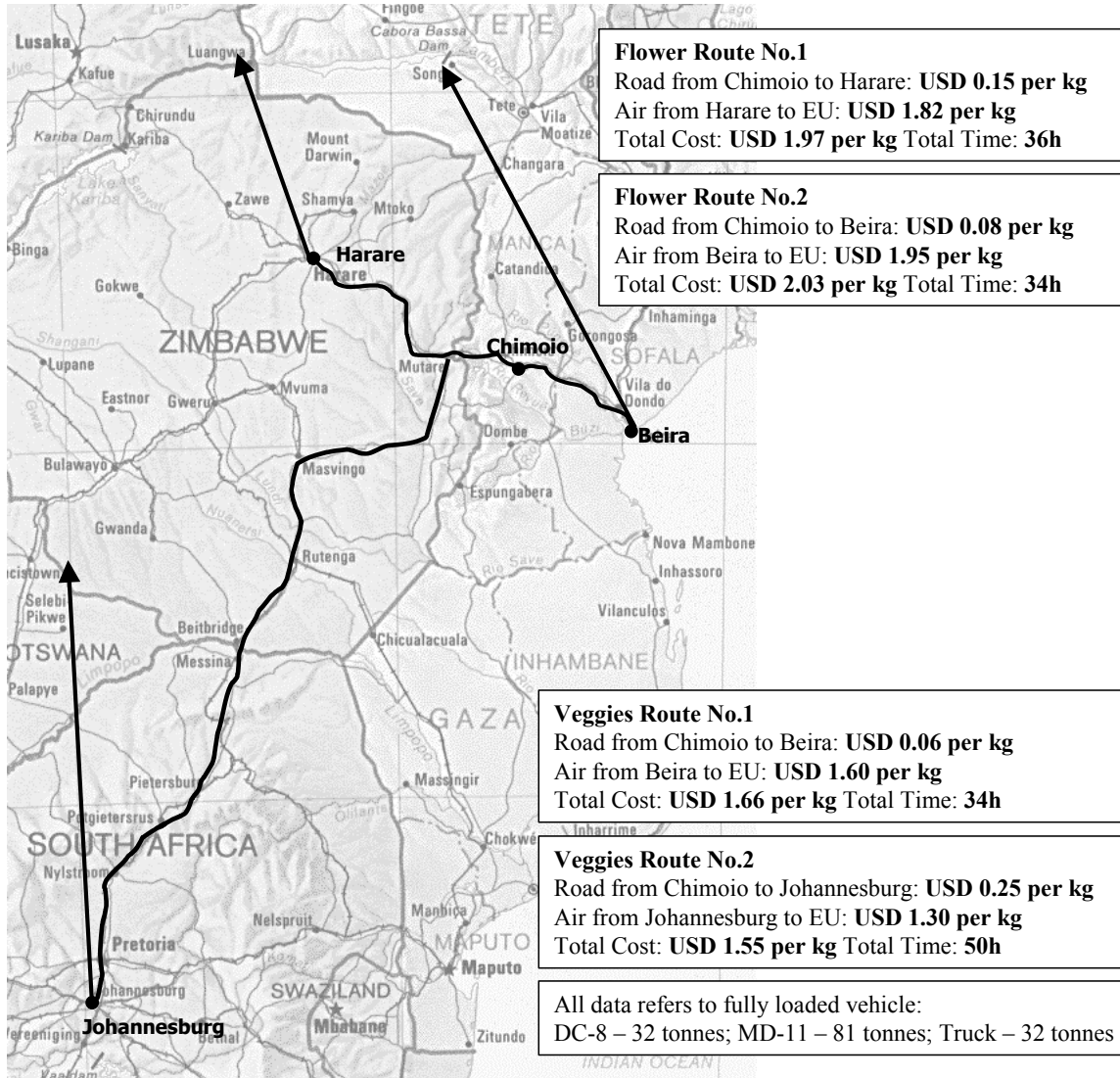
- ❑ **Insufficient runway mass bearing capacity.** Capacity at 26/F/B/X/U is well below required strength for the operation of both small freighter aircraft (DC8-62F requiring PCN56 and medium freighter aircraft (MD11-F requiring PCN66F/B).
- ❑ **Insufficient runway length.** Length at 2400m will not allow for small freighter aircraft (DC62-F) to operate between Chimoio and Nairobi at a maximum take off mass (MTOM) of 39000kg net payload. Minimum length would have to be 2600m (to achieve the MTOM for a DC-8 at a maximum temperature of 30°C) or even 3000m (to accommodate a medium-sized freighter such as an MD 11-F reaching MTOM at a maximum temperature of 30°C). Only 300m land is available for runway extension – insufficient for this latter case.
- ❑ **Not ideal climate.** High seasonal temperatures (37°C in November) negatively impact the potential of achieving MTOM for both freighters. Further, fog and low cloud cover is a concern, in the absence of navigational instrumentation to facilitate landing. Detailed analysis of existing infrastructure is attached as Appendix 2.5 and 2.6.
- ❑ **Little demand for south-bound transport into Chimoio.** This means that freighters into Chimoio would land empty, resulting in very expensive freight costs. This would not be the case if Chimoio had an existing commercial sector which demanded large quantities of high value, low volume imported products (such as computers and vehicle spares) or if Chimoio were a major passenger destination. However, these scenarios are unlikely to happen, given the proximity of the Beira airport, which already has the necessary capacity and traffic for such loads and is a mere 2.5 hours by road.

**The Beira airport** has all the necessary landing facilities for the regular cargo planes such as DC-8's, Boeing 737's and a three-quarter MD-11 load of 60 tons. These planes can land and take-off from Beira, to RSA, Kenya or Europe with cargo. Unfortunately Beira has no cold storage facilities, very poor loading equipment and no experienced fresh produce freight forwarding agents. Detailed analysis of existing infrastructures is attached as Appendices 2.5 and 2.7.

**OUR RECOMMENDATION.** Given the analysis detailed below, we recommend that the airfreight fresh produce and floriculture continue through Harare and Johannesburg, respectively until volumes increase to such a level as to attract an air freighter to Beira. Specifically:

- ❑ **Chimoio airport is not a viable airfreight option.** In order for a small or medium freighter to land in Chimoio (and achieve its MTOM), significant improvements must be made to the airport. Initial estimates of these improvements are \$5-10 million to cover the:

- Lengthening of the runway to increase mass bearing capacity
- Installation of refueling facilities
- Reinstallation of runway, approach, and PAPI night flying lighting
- Securing of perimeter fence and upgrade airfield security



- Installation of instrument landing system
- Construction of air traffic control tower
- Installation of ramp handling equipment (high-loader, pallet transport, etc.)

□ **All air-freight should continue to Harare and Johannesburg.** Initial analysis indicates that because of higher air freight costs, total cost for flower transport to Harare and vegetable transport to Johannesburg is less per kilogram than to Beira.

Source: All cost estimates from Beira were obtained from MK and Martain air freighter companies, while those for Harare and Johannesburg are actuals.

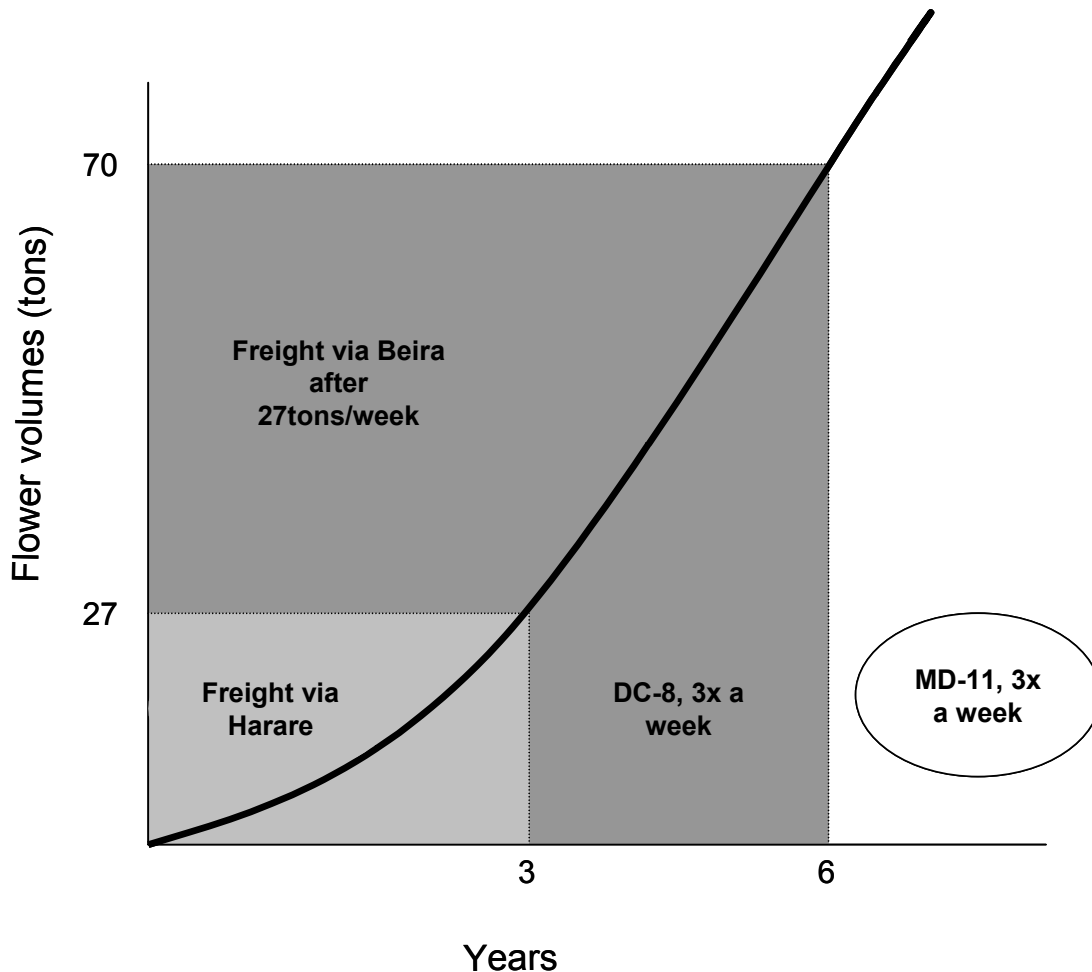
□ **Beira airport will only become a viable option if volumes increase and road transport links improve.** The development of the Beira Airport as a hub will be influenced by three

factors: 1) the floriculture production achieving critical mass, 2) road access from Chimoio, and 3) airport handling costs:

1) Critical mass. A minimum of 68 hectares of flower production (not applicable to vegetables) is required to justify the operation of a scheduled DC8-62F operating 3 flights per week (with a flower and vegetable produce mix of 27 tons of flowers and 6 tons of vegetable produce)<sup>6</sup>.

This minimum production level increased to 178 hectares of flower production (not applicable to vegetables) is required in order to justify the operation of a scheduled MD-11F operating 3 flights per week (with a flower and vegetable produce mix of 71 tons of flowers and 9 tons of produce).<sup>6</sup>

The minimum volumes of flower production required to justify transport via Beira are outlined below. In general, we estimate it will take at least three years to achieve the minimum levels



required for a DC-8 freighter (provided that constraints addressed previously are resolved).

<sup>6</sup> On average 1 hectare of (medium headed) roses will produce 1200kg of flowers per week, or 283,000 stems per week, and on average 1 hectare of hypericum will produce 490kg of flowers per week or 94,444 stems per week

2) Road access. As outlined in the section on *Infrastructure: Roads*, the road linking Chimoio and Beira is deteriorating and is prone to regular Pungue River floods, which tear up the surface and flood it for periods of 3 to 5 weeks at a time. This condition would discourage movement of flowers and vegetables from the Chimoio to the Beira airport because of the higher costs incurred from a prolonged transit time and higher incidence of produce loss.

3) Airport handling costs. The \$0.10 per kilogram freight and handling costs charged at the Beira Airport (tariffs applied by the Airport Authority for landing / navigation, loading and royalties) are much higher than the \$0.04 per kilogram charged in Harare. The policy of levying exporters with such high handling fees may deter exporters from using the Beira facility, encouraging exporters to use the cheaper Harare option.

Even if all three of these areas are adequately addressed, Beira airport would still require the purchase of a high loading scissors jack (\$350,000) to load and off-load the pallets. No further investment is needed if the produce is palletized and trucked from Chimoio.

#### **h. Export Logistics: Freight Forwarding**

As the Beira Corridor's horticulture sector develops, many producers will initially build their own pack sheds and cooling facilities. But an increase in volumes will complicate the logistics of moving produce and the ability to maintain the cold chain. This requirement could translate into significant costs for the producer unless a centralized solution is put in place.

**OUR RECOMMENDATION.** We recommend the development of a centralized, modular cold storage facility in Chimoio through which packaged product can be received, stored and prepared for road transportation to Harare, Johannesburg or Beira. This facility should be operational within 2 years and should be able to vacuum, cool and pallet the produce so that it is ready for loading at the airport. These loaded pallets would be transported in a 3m wide trailer (rather than the standard 2.7m, as a result of the wider pallet sizes) to the airport and loaded directly onto the airplane. This would avoid need for the construction of a cold room facility in Beira, and the added expense of using those in Harare and Johannesburg, as trucks would leave Chimoio to arrive at the airport in time for loading into the freighter. The only investment needed at the Beira airport would be a high level Scissor Jack to transfer cargo from the truck to the plane.

From the hectare assumptions in Appendix 1, the total area under vegetable and flower production by the end of the 3<sup>rd</sup> year should yield approximately 261 tonnes of product (138 tonnes of vegetables and 123 tonnes of flowers) for export per week. This implies a total of 65 tons handled per day, four times a week. In order to accommodate this tonnage and any future growth in the industry, the team estimates that a facility capable of handling at least 80 tons per day should be constructed. It is very important that the cooling facility be developed for future growth. The centralized facility would need to be 2,000m<sup>2</sup> in area in order to accommodate this volume. The building should be modular, therefore allowing for a two-stage construction phase, where 1000m<sup>2</sup> would be built initially and then the second 1000m<sup>2</sup> once volumes had increased sufficiently to utilize the area. This cooling facility would require specialized handling equipment and a vacuum cooling unit. These vacuum units cool down produce rapidly so that the rate of deterioration of the produce is minimal during transportation. A list of all the necessary equipment is attached to Appendix 2.8. A fully equipped facility of this size is estimated to cost \$1.4 million.

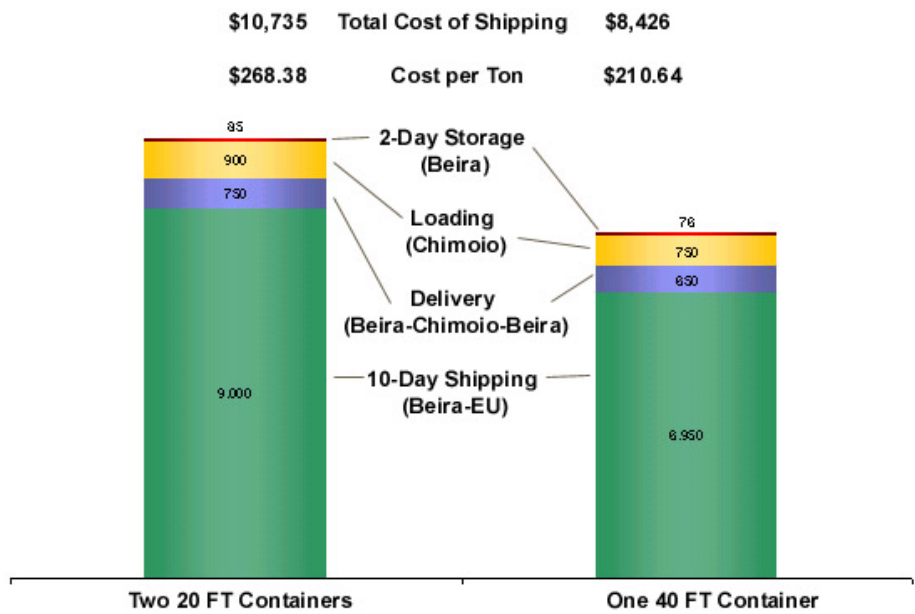
Experience in Zimbabwe and Zambia has been that the initiative for such a complex has come from the numerous freight companies, who joined together to establish and utilize the facility. A similar initiative is likely to drive the demand for this facility in Mozambique.

**i. Export Logistics: Ports**

Beira Port offers a cheaper alternative to air freight, albeit one that is suitable only for heartier fruits and vegetables, such as banana, mangos, filler flowers and fine beans. Recently renovated, the port offers over 100 power points capable of supporting refrigerated containers. The only constraint in using port facilities is the limitation to certain crops as well as the insufficient road linking Chimoio.

**OUR RECOMMENDATION.** According to Orca Shipping Lines, Beira Port offers cost-effective freight options to Europe and Asia for heartier crops, using atmosphere-controlled containers. These containers are either 20FT or 40FT in length with an independent cooling unit that can be plugged into an electricity source on the farm, the port and in the ship. Such containers can be provided at surcharges of about \$1.350,00/20FT and \$1.500,00/40FT. However, in order to ensure efficient shipping, we would recommend that producers using this facility:

- ❑ **Schedule deliveries according to the limited shipping schedule.** Mombasa is considered to be a principle routing option for containers from Mozambique to the EU and Asian markets. These containers are transported from Beira to Mombasa by a weekly Unifeeder service. From Mombasa, seven sailings are offered per month into Europe and the UK to either Felixtown or Rotterdam the main shipping companies, Orca, Delmas and Mediterranean Shipping Company (MSC). MSC has a weekly service out of Mombasa and Delmas has a service every 10 days. Transit time between Mombasa and Felixtown and/or Rotterdam is approximately 21 days, and between Mombasa and the UAE it is approximately 10days. For containers into UAE from Mombasa, MSC vessels offer 4 sailings every month on a weekly basis. The use of refrigerated containers is clearly a must for extended transport times of commodities such as avocados, mangoes and vegetables.
- ❑ **Use 40FT containers.** Indicative freight charges between Chimoio and Rotterdam and Dubai



are \$0.21 and \$0.22 respectively for a 40FT container, and \$0.26 and \$0.29 respectively for two 20FT containers. When 2 x 20ft are loaded on the same truck platform, the doors have to be directed to the outside. Therefore there is little space for the generator sets to work properly and get cooled. This means that only 40ft

can be delivered to loading points with the generator set working. This logistical constraint, coupled with the pricing estimates, suggest that exporters and freighters should consider the 40FT container as a cheaper option. This is better illustrated on the graph below.

- **Prepare for longer transit times.** While the sea freight charge is significantly lower than the airfreight costs that range between \$1.50 and \$2.00 per kilogram from Chimoio to the EU via Harare and Johannesburg respectively, sea transit period is over 21 days compared to the 3 days required for airfreight. This implies that only hardier fresh fruit and vegetables can be transported using this option.

Overall, Beira Port provides a viable shipping option for limited crops – but the ability to take full advantage of this facility depends on the rehabilitation of the road linking Chimoio to Beira discussed in the previous section. No other improvements are needed for the port to be viable.



### 3. FORM & SCALE OF EXPORT PRODUCTION

Should the constraints identified in the previous section be addressed, we have identified six key crops which are best suited to the Beira Corridor and can be developed in the short- to medium-term. The following section addresses the market, financials, timing and required investment for each of these crops. In summary, we believe that the Beira Corridor can generate at least \$36.2 million per annum in revenues through these six crops.

Crop	Total Commercial Ha	Total Outgrower Ha	Total Annual Revenues
Paprika	500	120	\$3,100,000
Roses	50	0	\$9,000,000
Hypericum	50	0	\$4,585,000
Summer Flowers	50	0	\$1,650,000
Vegetables	1200	500	\$5,304,000
Large Fruit Estate	2000	200	\$11,000,000
Fruit Farm	1200	100	\$1,560,000
<b>Total</b>	<b>5050</b>	<b>920</b>	<b>\$36,199,000</b>

#### a. Paprika

	Paprika (per hectare)	Paprika (average crop of 10 ha)
Revenue	\$5,000	\$50,000
Operating Costs	\$2,000	\$20,000
Gross profit	\$3,000	\$30,000
Overhead costs	\$1,000	\$10,000
Profit after overheads	\$2,000	\$20,000
# of employees	500 labor days	5,000 labor days

**The market.** There is a significant gap in the paprika market that we believe Mozambique can fill. Paprika producers can be divided into two groups – those who produce for export (of which the leaders are Peru, South Africa, Morocco and Zimbabwe) and those who produce for internal consumption (of which Hungary, USA and Spain are the leaders). Major markets annually imported 39,000 tonnes of paprika during the 1990s. In 2000, total Southern African production of paprika was 23,000 tonnes, making this region the largest supplier. There are several market dynamics, which will favor Mozambique’s entry into the world market:

- **Significant opportunity for counter-seasonal paprika.** Price negotiations begin in February/March for delivery in March/April (when prices are the lowest). Mozambican production (harvested in Oct and Nov) could fetch higher prices, being off-season.
- **Collapse of Zimbabwean economy.** In 2000, Zimbabwe was the largest producer of paprika in Southern Africa (15,000 tonnes/year), and while a new player, Peru, have captured some of this market, its relatively lower quality and production limitations (e.g., it has reached equilibrium)
- **Relative stability of the market.** Following oversupply in the early 1990s (which depressed prices), the market for paprika has been stable over the 5 years. Prices have risen by 1-1.5% year-on-year since 1998, and with expected increased demand for natural colorants, we anticipate that demand will increase further.

**The numbers.** Paprika can be grown viably by both small scale and large scale commercial farmers. Hectares typically range from 1/3 hectare by small scale farmers to 5-30 hectares by large scale

commercial farmers, with 10 hectares being the average for commercial farming operations. Paprika is usually grown in conjunction with tobacco crops and is planted the year following the tobacco crop.

Input costs for paprika are USD \$2000 per hectare. Farmers receive about USD \$5000 per hectare, hence have a profit of USD \$3000 per hectare. Overhead costs are 1/3 to 2/3 of variable costs per hectare, hence USD \$700 to \$1400 per hectare, leading to a net profit of USD \$1600 to \$2300 per hectare. The main capital required solely for paprika is a dryer which costs \$5000 USD. In addition, tractors, irrigation equipment, generators and storage facilities are needed. Further details of operating and capital expenditure can be found in appendix 3.1. Paprika creates employment of 5 people per hectare and 30 people per thousand tons in the paprika factory.

**Superior Yields in Mozambique**

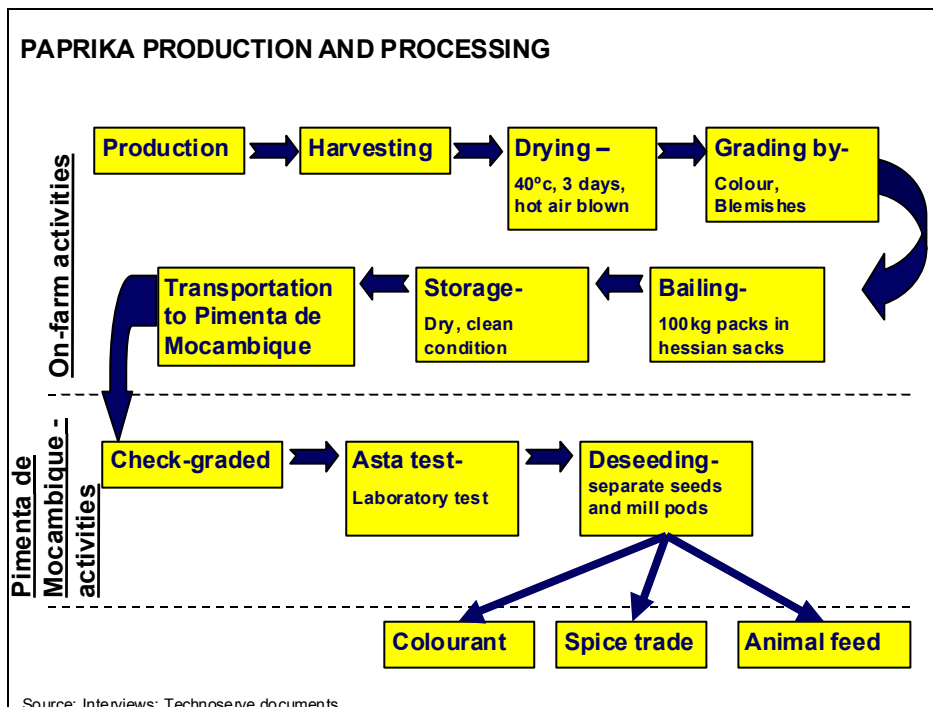
CTC, Auzmoz and Everetz farms have all managed to harvest over 5 tonnes per hectare of paprika in 2003, compared to the 4 tonne and 3 tonne averages achieved in Zimbabwe and Zambia respectively.

As a result, the Manica region is considered ideal for paprika by many growers and marketing groups, including Pimenta de Mocambique, Hiveld (both Zimbabwe) and Cheetah (Zambia).

**The value chain.** There are four main players in the paprika market:

- ❑ Producers, which grow the paprika
- ❑ Wholesalers, which purchase from producers and prepare for the processing companies by deseeding, cutting stems, etc.
- ❑ Processors, which purchase the prepared product and transform into spice or colorant
- ❑ Buyers in the food, cosmetics and paint industries

The production and processing activities are outlined below. We anticipate that the Mozambique will play a key role in production, but has the opportunity to move into more value-added processing, through the establishment of a deseeding plant. The upside of this move is significant: Revenue per kilogram of raw paprika is \$0.70 vs. \$1.20 for deseeded, stemmed paprika.



**Current Opportunity.** Over 100 hectares of current tobacco production in Manica Province (e.g., available land for paprika cultivation) and prime agro-ecological conditions make the Beira Corridor attractive for investment by potential paprika exporters. We expect that over 500 hectares of paprika can be grown in the Beira Corridor within the next five years, which could generate annual revenues of \$2.5 million USD. Specific investment opportunities include:

- ❑ **Building of a grading and deseeding plant in Manica Province.** Total initial investment required is USD \$260,000 USD, and this plant (a washing unit, 2 pressers and deseeders) would be able to process 1,500 tons of paprika per annum, employ 30 people per thousand tons processed, and generate \$1.8 million in annual revenues. In addition, the construction of such a plant in the Beira Corridor will position Mozambique not as an exporter of raw materials, but a value-added processor.
- ❑ **Grower finance to increase production.** Finance of \$2000 per hectare is required. For 500 hectares, this means an investment of \$1 million as well as the required CAPEX (irrigation equipment, tractors, generators, storage facilities and dryers) for each grower.

**a. Roses**

	Roses (Per Hectare)	Roses (Per Average Crop of 4 ha)
Revenue	180,000	720,000
Operating Costs	66,000	264,000
Gross income	114,000	456,000
Number of employees	11	44
Required investment	250,000	1,000,000

**The market.** Roses comprise 23% of total world cut flower production (which is estimated at \$910 million in 2001). The Netherlands and Colombia dominate production: Netherlands (at 55% of market share) and Colombia (at 12% market share). African producers sell primarily to Germany, France, United Kingdom, Scandinavia, and then the Eastern and Central Europe. The biggest importers of cut roses are the United States (\$170 million), Germany (\$222 million), and France (\$60 million). These four countries buy almost half of all the rose exports.

The main African producers are:

Country	Current Hectares	Expected Increase (in ha) in 2004
Kenya	1200	90 – 100
Zimbabwe	400	0
Uganda	120	20
Zambia	120	5 – 10
Tanzania	60	40
Malawi	30	0
Ethiopia	30	30
RSA	45	10 – 20

The market is broken down into two segments, wholesale 80% of the market (florists, street vendors, etc) and retail 20% of the market (supermarkets). The production of African roses is focused more on the retail segment of the market (estimated at 60% sweethearts, 25% intermediates and 15% T-hybrids). The biggest challenge to African suppliers is how to compete with European growers on quality and supply of the higher value, larger bud T-hybrid variety of rose. Increasingly, European

growers are switching production to these higher quality T-hybrids, while African growers have focused on smaller roses.

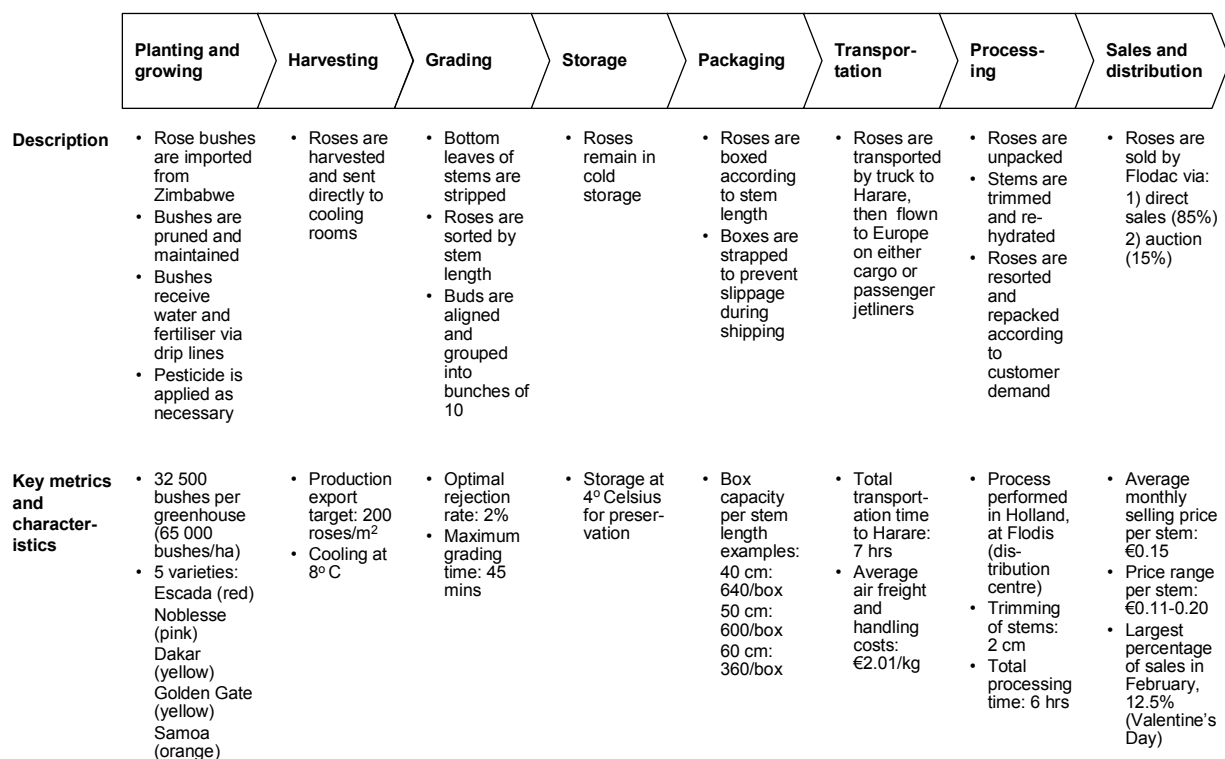
At the same time, producers, particularly of the smaller roses, are feeling price pressure. As exports of sweetheart roses have decreased (20% from 2000 to 2003) and prices of the roses have fallen (by 5-10%). The opportunity now seems to lie in the higher quality, large bud varieties (t-hybrid), where the European production seems to have dropped by 3% to 5% on the last 3 years.

We anticipate that both the wholesale and retail buyers of African roses will increasingly demand a higher quality product, and the intermediate rose (with a longer stem of 40-60 cm and a larger bud) will fit this requirement.

**The numbers.** The minimum scale for commercial production of roses is 4 hectares, primarily because of the high cost of infrastructure and management overhead. \$250,000 per hectare is required to establish a rose production, which includes running capital for the first six months prior to production of the cut flower for export. The employment created is between 11 to 20 people per hectare. Average annual income per hectare is well over \$100,000.

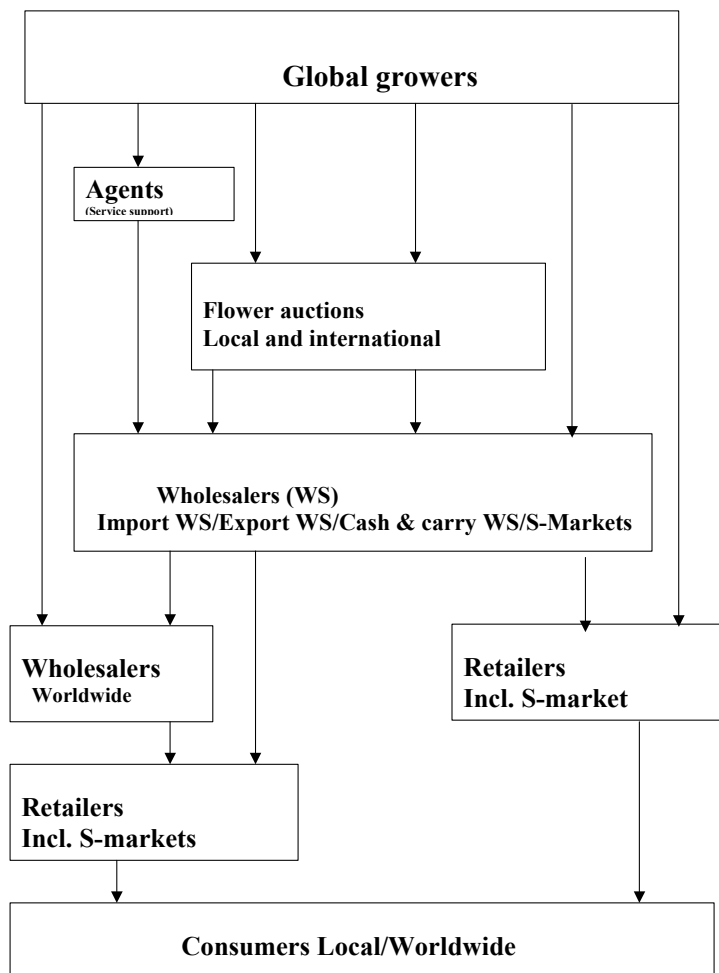
**The value chain.** Growers follow a seven-step process, as outlined below (for Vilmar, the only rose grower in the Beira Corridor.)

## PROCESS OVERVIEW



Source: Interviews; Technoserve documents; Flodac; Vilmar documents

At the same time, the process of getting roses to market can occur through retail or wholesale channels, as outlined below.



**Current Opportunity.** We believe that the Beira Corridor offers at least 50 hectares of suitable land for rose production, which would generate at least \$9 million in annual revenues. Specifically, the market is increasingly demanding producers who:

- ❑ Produce trendy varieties (such as T-Hybrids and Sweethearts)
- ❑ Provide a full color assortment (for supermarkets, six to eight colors are required: red, yellow, orange, pink, white, bi-color, etc.)
- ❑ Are able to provide a continuous supply (e.g., twelve months per year – an advantage that African producers have over European producers)
- ❑ Are able to provide regular volumes (e.g., a minimum of 300,000 stems is required to ship directly to a wholesaler, as opposed to through the auction)
- ❑ Provide high quality (and environmentally friendly) product
- ❑ Package the product according to market requirements (e.g., European importers demand that rose be MPS-compliant. Milieu Programma Sierteelt is an environmental registration and classification system that aims to decrease the environmental impact of cut flower production. MPS is not only aimed at environmental care, but safety, well-being and conditions of employment also play a part. It is now the most widely accepted measure of environmental

accountability in production and MPS has certified approximately 85% of flowers in the Dutch auctions.

- Ensure no time delays in supply (which means that the transport infrastructure must be able to accommodate this requirement)

In order to be successful, however, producers in the Beira Corridor will have to address threats such as increased production from East African producers (production in Kenya, for example, has increased by 26% since 1999), reliant freight links (to enable the product to get to market within 2 to 3 days, and access to inputs (given that the industry is still small, required inputs must be imported).

More information about the rose industry is in Appendices 3.2a-b.

### c. Hypericum & Summer Flowers

	Hypericum Per Hectare	Hypericum (average crop of 4 ha)
Revenue	91,700	366,800
Operating Costs	45,545	182,180
Gross income	46,155	184,620
Number of employees	9	36
Required investment	43,000	172,000

	Summer Flowers Per Hectare	Summer flowers (average crop of 4 ha)
Revenue	33,000	132,000
Operating Costs	11,220	44,880
Gross income	21,780	87,120
Number of employees	8	32
Required investment	18,950	75,800

**The market.** Hypericum and summer flowers (which include carnations, gerbera and lilies) are used as filler flowers in bouquets. Between 500-700 million stems of hypericum (with a 15% growth in annual production) are sold each year. We anticipate that demand for both fillers will increase; production of hypericum has increased by 15% year on year to meet this increasing demand. And as production of summer flowers has decreased in Holland and Israel (but consumption is expected to increase by 5% each year), we anticipate an opportunity for African countries to meet this demand.

The main producers of hypericum in Africa are Zimbabwe, Kenya and South Africa, and Africa production is worth about \$36 million. Kenya and South Africa have rapidly filled the void left by Zimbabwe's decrease in production.

Country	Current Hectares	Expected Increase (in ha) in 2004
Zimbabwe	200	-30
Kenya	Est. 100 to 150	40
RSA	40	20

The main producers of summer flowers in Africa are Kenya, Zimbabwe, Egypt and South Africa. We estimate between 800-1000 hectares of various field flowers are grown each year – primarily on contracts for EU markets.

Country	Current Hectares	Expected Increase (in ha) in 2004
Kenya	300	50 – 80
Zimbabwe	Est. 100 to 150	-15 to 20
Egypt	50	10
South Africa	20	5

**The numbers.** The minimum scale for commercial production of hypericum and summer flowers is 4 hectares per variety due to high management overhead. Further, summer flower production is only feasible as an “add-on” to an existing farm, primarily because the lower value of the crop means that transportation will only be viable if it can accompany higher value produce or roses. Small commercial farmers maybe involved in this activity if they operate as an outgrower for a larger neighboring operation, that provides all technical and managerial assistance. Both flower crops create 8-12 jobs per hectare, an income per hectare of \$91,000 for hypericum and \$35,000 for summer flowers. The start up cost per hectare is estimated at \$200,000 CAPEX and \$50,000 operating costs.

**The value chain.** See the section on rose production. The only difference between rose production and hypericum and summer flower productions is that the Hypericum and summer flowers do not require a greenhouse for production. Other then this, the chain is exactly the same.

**Current Opportunity.** We believe that the Beira Corridor offers at least 100 hectares of suitable land for hypericum and summer flower production, which would generate at least \$6 million in annual revenues. Specifically, the market is increasingly demanding producers who:

**Manica – Ideal for Hypericum**

Manica is more attractive to Hypericum farmers currently operating in RSA, Zimbabwe and Kenya as a result of the favorable agro-ecological conditions and easy market access through the Beira Port. Furthermore the labor is a lot cheaper then RSA, the economy stable in relation to Zimbabwe and Mozambique is not threatened with a loss in their LDC status and increasing trade tariffs, as is Kenya

- ❑ Produce trendy varieties (such as Gerbera and Kangaroo Claw)
- ❑ Provide large, colorful berries and good leaf quality (hypericum)
- ❑ Are able to provide a continuous supply (e.g., twelve months per year – an advantage that African producers have over EU producers)
- ❑ Are able to provide regular volumes (e.g., a minimum of 300,000 stems is required to ship directly to a wholesaler, as opposed to through the

auction)

- ❑ Provide high quality (and environmentally friendly) product
- ❑ Package the product according to market requirements (e.g., European importers demand that summer flowers also be MPS compliant)
- ❑ Ensure no time delays in supply (which means that the transport infrastructure must be able to accommodate this requirement)

Because hypericum is less sensitive to delays in transportation (as it has an estimated shelf life of 20 days), and tests conducted with sea freight with atmosphere CO2 containers from South America into Europe have worked well, Mozambique is well-positioned to produce this product. Further, we have determined that continuous (12-month) production is possible in the Beira Corridor of both hypericum and some summer flowers such as Proteas and Leather Leaf.

In order to be successful, however, producers in the Beira Corridor will have to address threats such as increased production from South and East African producers, reliant freight links (to enable the

product to get to market within 10 to 15 days), and access to inputs (given that the industry is still small, required inputs must be imported).

Cash flow projections for these crops is in Appendices 3.3a-d.

#### d. Vegetables

Per Hectare	Fine Beans (\$/ha)	Chilies (\$/ha)	Baby Corn (\$/ha)	Mange tout (\$/ha)
Revenue	3,367	6,728	1,424	3,367
Operating Costs	2,021	2,112	623	2,013
Gross Profit	1,346	4,616	801	1,354
# of employees	55	15	20	65
Time to harvest	8 wks	12 wks	12 wks	8 wks

Per Average Crop	Fine Beans (5 ha)	Chilies (5 ha)	Baby Corn (14 ha)	Mange tout (24 ha)
Revenue	16,800	33,600	19,900	80,800
Operating Costs	10,100	10,500	8,700	48,300
Gross Profit	6,700	23,100	11,200	32,500
# of employees	275	75	280	1560

**The market.** Total global production of vegetables is 60 million tonnes. Key producers are Italy (14 million tonnes in 2001), Spain (11 million tonnes in 2001) and France (6 million tonnes in 2001) African production is a fraction of global total at only 350,000 tonnes. Key producers in Africa are:

Country	Key crops	Current Tonnes
Morocco	Tomato, Onion	220,000
Kenya	Baby vegetable range	45,000
Egypt	Fine Beans	33,000
RSA	Mixed variety	9,900
Senegal	Fine Beans	7,700
Zimbabwe	Baby Corn	6,800

100% of African production is exported, mainly to England, France and Scandinavia.

There is a window of opportunity in the market place for vegetable producers in Mozambique as buyers are looking to dilute their risk and procuring fresh produce from alternative sources. There are two main reasons for this, namely:

- The current political instability in Zimbabwe. Export growers with EPZ (export processing zone) status who have to date been relatively untouched by the land invasions are now receiving documents stating government's intention to acquire their farms.
- Erratic supply out of Zambia and Kenya caused by unfavorable weather conditions.

Added to the above is the fact that generally the vegetable producers in Southern Africa battle to produce frost sensitive crops such as baby corn, beans and chilies during the winter months. This would be a niche area of the market that Mozambican producers could penetrate. This is also a product, which fetches the highest premium (\$0.85 per kg of chilies vs. \$0.33 per kg of potatoes).

**The numbers.** The minimum start up scale of operation for a company looking to export produce is 48 hectares, where a weekly planting of 3 hectares is carried out and will remain in the ground for 16

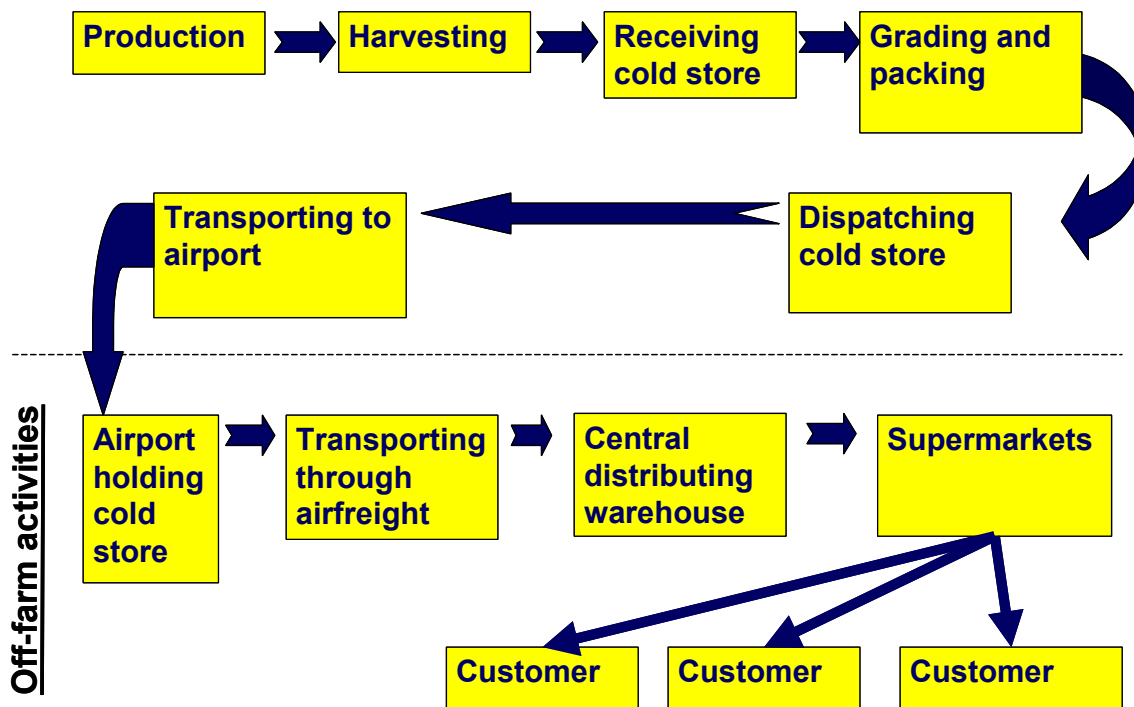


weeks. In the first year, commercial growers will be occupied in establishing their operations and on farm pack house and will have no time to develop the small scale sector. The small scale out-growers will most likely be included in the production scheduling in the second year. Because of the relatively short time to harvest, baby corn, chilies and fine beans can be produced every year, generating revenues per hectare from \$1400 for baby corn to \$6700 for chilies. The start up cost for a standard 48 hectare unit is \$1.35 million if the packshed is built on farm.

**The value chain.** There are four main players in the vegetable market:

- ❑ Producers, who grow the crops
- ❑ Processors, which grade the raw product, value add and package
- ❑ Wholesalers, which purchase from the processors and distributed to the retailers
- ❑ Retailers, sell the product to the end consumer

The production and processing activities are outlined below. We anticipate that most new vegetable companies will be focused primarily on the processing activity, while small holders will be trained and supported to supply the product. This ensures that the Beira Corridor is engaging in more value-added activities – such as processing – while providing opportunities for smaller growers at outgrowers, due to the lower quality demands on this processing crop.



**Current Opportunity.** We estimate that the Beira Corridor could cultivate 240 hectares of fine vegetables in the first year, with an additional 480 hectares per year in the following two years, resulting in a total of 1200 hectares under cultivation by the end of the third year. This would generate annual revenues of \$3.7 million. In addition, out grower production is expected to be at least 50 hectares by the second year and 150 hectares by the third year.

**A Unique Opportunity**

Two large vegetable export groups in Zimbabwe, Kondozi and Interfresh, have recently shown interest in diversifying production into Mozambique. This implies that the opportunity to encourage production is now ripe and Manica must be prepared to attract these groups immediately, before they turn to Zambia or Tanzania.

Specific investment opportunities include:

- ❑ **Direct production costs.** The initial establishment costs hover around \$2000/ha (see Appendices 3.4a-d for detailed budgets). Therefore a 48 hectare unit would require an investment of \$96,000.
- ❑ **On farm pack house with cold storage facilities.** The size of the packing and cooling facility depends upon the production levels, financial capacity of the farmer and how quickly he will want to reduce the field heat in the produce (e.g., every hour after picking sheds 8 hours from the shelf life from the product when kept at room temperatures. Average shelf life of a premium vegetable such as baby corn is 7 days. The investment required for a state of the art cold store will be \$630,000.
- ❑ **Additional pack house development.** Medium and high care facilities would increase pack house construction costs from between 10 - 30%. These additions, as with the basic structure, would have to satisfy the stringent EUREPGAP regulations.
- ❑ **Extra farm investments.** These would have to include vehicles, tractors, farm machinery, irrigation equipment, electrification and pack house equipment. All these inputs would be approximately \$800,000.

#### e. Large Fruit Estate

Per Hectare	Bananas (Per Ha)	Average Estate of 2000 Ha
Revenue	13,500	27,000,000
Production Costs	2,535	5,070,000
Gross Profit	10,965	21,930,000
Marketing Costs	4,896	9,792,000
# of employees	.9	1800

**The market.** Over 69.8 million tonnes of bananas were produced in 2002, with the largest producer being India (16.5 million tonnes), followed by Ecuador (6.5 million tonnes), Brazil (6.4 million tonnes), and China (5.6 million tonnes). However, because of extensive quota systems, not all of the markets (particularly Europe) for bananas are open to export from Mozambique. Accordingly, we anticipate the target market for Mozambican bananas to be the Middle East and Eastern Europe. The Middle East is particularly attractive due to its relative proximity to Mozambique, which results in higher quality product (as bananas will not necessarily have to be harvested at an immature stage.)

Key banana producers in Africa<sup>7</sup> are as follows. Total production in Africa is only 10%, or 7.1 million tonnes, of world production (2002). Mozambique's 2002 production was 90,000 tonnes.

Country	2002 Production (Tonnes)
Burundi	1,548,897
Uganda	988,800
Egypt	849,293
Cameroon	630,000
Dem. Republic of Congo	313,382
Angola	300,000
Madagascar	290,000
South Africa	280,001

**The numbers.** By "large fruit estate," we refer to a minimum production of 1000 hectares on a commercial scale. However, for bananas, a minimum size of 2000 hectares is required, in order to maintain a regular weekly supply, which would completely fill the smallest available refrigerated

<sup>7</sup> FAO, 2002.

break-bulk vessel. To charter such a vessel with a less than full load is not cost effective. In addition, the use of a break-bulk vessel means that refrigeration at the port of loading is not needed. Per hectare revenues are expected to be \$13,500, with .9 people employed per hectare. Even more jobs can be created by the supporting industries which are expected to develop to service a large estate, especially in transport, workshops, input supplies, port activities, food and catering – potentially another 200-250 jobs for a 2000 hectare estate.

**Current Opportunity.** New and large fruit estates on a scale of several thousand hectares are rarely available for development in most countries. The Beira Corridor offers at least one such opportunity; north of Nhamatanda, an old cotton estate offers 15,000 hectares of fertile and deep alluvial soils on a flat plain, which is eminently suited for large-scale fruit (banana and mango) production. We further detail this opportunity in the following chapter.

With 2000 hectares under cultivation, Metuchira alone is expected to generate \$27 million in annual revenues, 1800 jobs, and position the Beira Corridor as a leader in large scale fruit production.

However, in order to realize a large estate, several components need to be put in place. We examine these components in the context of Metuchira in the following section:

- ❑ Proper irrigation
- ❑ Significant manpower
- ❑ A productive and trained labor force
- ❑ Adequate transport links
- ❑ Significant investment (e.g., \$30 million required for the 2000 hectare estate)

**f. Fruit Farm**

Per Hectare	Banana (\$/ha)	Mango (\$/ha)
Revenue	13,500	7,000
Production Costs	2,535	2,500
Gross Profit	10,965	4,500
# of employees	.9	3

We have identified three fruits – banana, mango, litchi – which offer which are ideal for production on smaller scale fruit farms. This is due to two factors: the seasonal nature of the crop means that farmers can manage this as a second farming activity and because the smaller farmers already have crop experience, and would only need assistance in improved production systems and quality management.

**The market.** Like the large-scale bananas, we are targeting India and the Middle East as the ideal market, primarily because of its proximity to Mozambique and the opportunity to provide counter-seasonal produce. Specifically, India currently produces 11.4 million tonnes of mango<sup>8</sup> and imports of mangoes produced elsewhere have been permitted only since 1999. We believe that there is an opportunity to supply premium mangoes, such as the Alphonso, to India in the off-season; currently Alphonso mangoes are available only from March through to May. Initial research has shown that

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<sup>8</sup> FAO, 2002.

mangos supplied before the season gets under way can fetch a price as much as 58% higher than those supplied in May, at the end of the season.<sup>9</sup>

**The numbers.** All three of these crops offer an opportunity to create a minimum-scale “nucleus” farm, which supports a network of outgrowers, as detailed below.

Form and Scale of Production	Banana	Mango	Litchi
<b>Minimum Scale of Production to Establish</b>	<ul style="list-style-type: none"> <li>- For effective management and economy of scale: 50 hectares</li> <li>- Recommended scale for nucleus farm: 200 hectares</li> <li>- Outgrowers could establish on 10 to 25 hectares if the nucleus farm in place</li> </ul>	<ul style="list-style-type: none"> <li>- Initial establishment of nursery in first year on 0.5 hectare and preparation of orchards for planting</li> <li>- In second year, planting of first orchards to scale of 25 hectares and growth in successive years to maximum size of 200 hectares</li> <li>- Possibilities for nucleus farm with small outgrowers of approximately 5 hectares each</li> </ul>	<ul style="list-style-type: none"> <li>- Production already established in Manica Province of correct export variety! Propagation already underway with local NGO assistance (ACDI/VOCA).</li> <li>- Follows mango process for ramping up, with nucleus farm starting on 25 hectares and scaling up to possibly 50ha</li> <li>- Outgrowers on 0.5 hectare</li> </ul>
<b>Costs</b>	<p><b>For nucleus farm:</b>  <b>Capex:</b> \$ 8,900/ha  <b>Opex:</b> \$2,500/ha/yr  <b>Mktg:</b> \$ 4-5,000/ha/yr</p> <p>NB. Capex lower for outgrowers (\$2,000) because packhouse already in place at nucleus farm. Outgrowers would not have marketing costs.</p>	<p><b>For nucleus farm:</b>  <b>Capex:</b> \$ 8,900/ha  <b>Opex:</b> \$2,500/ha/yr  <b>Mktg:</b> \$ 4-5,000/ha/yr</p> <p>NB. Capex lower for outgrowers because packhouse already in place at nucleus farm. Outgrowers would not have marketing costs. Outgrower capex estimated at \$2,400/ha</p> <p>See appendices 3.5a-b for more detail.</p>	<p><b>For nucleus farm:</b>  <b>Capex:</b> \$ 4,000/ha  <b>Opex:</b> \$2,500/ha/yr  <b>Mktg:</b> \$ 6-7,000/ha/yr</p> <p>Very low. Rainfed tree crop no irrigation costs. Propagation is by “marcotting” (grafting buds from good varieties) and local small growers already engaged and skilled. Minimal fertilizer application seems to be required. Costs are in labor for pruning and training, and in harvesting and grading and packing during the 6 week picking season. Marketing costs would be carried by nucleus farm in conjunction with buyer. Main market is India where a remarkable high value window exists and market linkages already established by TechnoServe.</p>
<b>Employment Opportunities &amp; Impact</b>	<ul style="list-style-type: none"> <li>- 2 employees per hectare in field, harvesting and packhouse and support staff</li> </ul>	<ul style="list-style-type: none"> <li>- 2 employees per hectare in field, harvesting and packhouse and support staff. An additional 3 part-time staff per hectare at harvest periods</li> </ul>	<ul style="list-style-type: none"> <li>- 2 to 4 employees per hectare at harvest and family labor rest of year. Primary impact is the increased income of \$2,000/ha for outgrowers.</li> </ul>
<b>Process Opportunities</b>	<ul style="list-style-type: none"> <li>- Negligible except for possible drying of “banana figs” for export and ripening of fruit for local markets</li> </ul>	<ul style="list-style-type: none"> <li>- Will require critical mass of approx 100 to 200 hectares of export production (in a geographic cluster) before commercial processing is feasible. Some examples: <ul style="list-style-type: none"> <li>- “Achar” processing for local and export markets.</li> <li>- Sliced and diced for canning and bottling.</li> <li>- Juicing for local and export markets.</li> <li>- Drying for local and export markets.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- Canning of peeled and destoned fruit.</li> <li>- Possibility perhaps of fresh exports of peeled and destoned fruit in juice and pre-pack (to EU markets). Close link with mango processing center.</li> <li>- Juicing for local and export markets.</li> </ul>

<sup>9</sup> Accord Associates

<b>Summary of Financial Needs</b>	For nucleus farm Total including marketing costs: \$16,340/ha in year 1, thereafter just Opex and Marketing costs of \$2,500 per hectare total	For nucleus farm Total including marketing costs: \$11,000/ha in year 1, thereafter just Opex and Marketing costs of \$2,500 per hectare total	For nucleus farm Total including marketing costs: \$7,500/ha in year 1, thereafter just Opex and Marketing costs of \$2,500 per hectare total
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**Current Opportunity.** We believe that at least 1300 hectares could be cultivated with small-scale banana, mango and litchi production (100 of which through the family sector), generating \$1.56 million in annual revenues. Further, these three crops offer a significant opportunity to involve small outgrowers – each of which would cultivate at least 0.5 to 1 hectare of fruit.

However, in order to realize this opportunity, several components need to be put in place:

- ❑ Significant support (inputs, financing, training) to the small outgrowers
- ❑ Adequate transport links
- ❑ Adequate cooling facilities in close proximity to the farmers
- ❑ A processing industry that can take the lower quality grade of fruit

## 4. SPECIFIC CASES FOR IMMEDIATE INVESTMENT

In addition to the six general crop opportunities, the team has identified six specific investment opportunities in the Beira Corridor's emerging horticulture sector. This section details each opportunity, the required investment, and anticipated upside of such an investment.

### a. CTC Lda

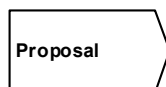
**Background.** CTC is a consortium of three Zimbabwean farmers who decided to pursue opportunities for mixed (Paprika, vegetables, tobacco, maize and fruit) farming in Mozambique in May 2002. Their decision was based on the exiting political instability in Zimbabwe and the new agricultural reform program, which does not promote commercial agriculture and horticultural exports. Taking into account CTC's farming experience and past performance in Zimbabwe and their limited collateral, Mozambique Leaf Tobacco (MLT) offered to finance the group on a 120ha tobacco crop for the 2002/3 season, and MLT continues to offer ongoing support over the next seasons.

There are over twenty-one years of commercial paprika growing experience between the three operating directors and on average, each director has been farming for 18 years. One farmer sat on the Paprika Growers Association of Zimbabwe committee and the other two farmers were Chairmen of their local Intensive Conservation Associations, which offered advice and assistance to both commercial and small-scale farmers. Technically competent, all three farmers hope to establish themselves permanently in Manica to build their businesses and expand into high value horticulture production.

Because the Zimbabwean Government froze their assets, they are now focusing on growing and exporting premium vegetables and tropical fruit in the Beira Corridor. CTC is currently leasing a 750 hectare farm in Manica Province (Vanduzi) which has been operating since 2002. Current crops being grown are paprika, chilies, baby corn and fine beans. CTC is also constructing a packhouse, which will meet EUREPGAP regulations and be suitable for vegetable export to Europe.

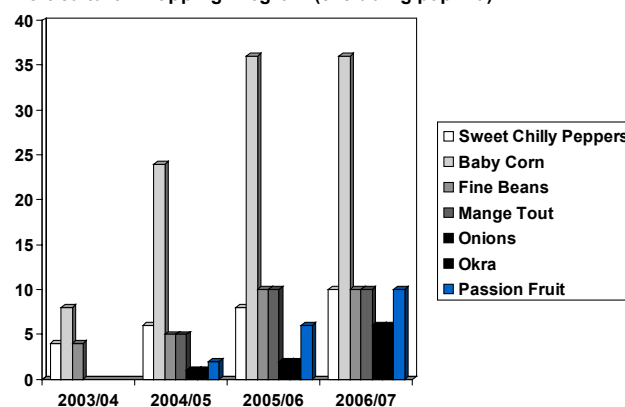
**Proposal.** CTC would like to increase current production from 16 hectares to 88 hectares by the end of 2006. Specifically, CTC plans to expand in 2004 its current production as well as diversify into new crops such as mange tout, onions, okra, and passion fruit.

### CTC HORTICULTURAL EXPANSION PROPOSAL



- Increase own production according to market demand
- Complete construction of packhouse and finalise EUREPGAP accreditation
- Incorporate family sector as out-growers for specific crops suitable for small-scale production
- Establish out-growers and expand the pack-house

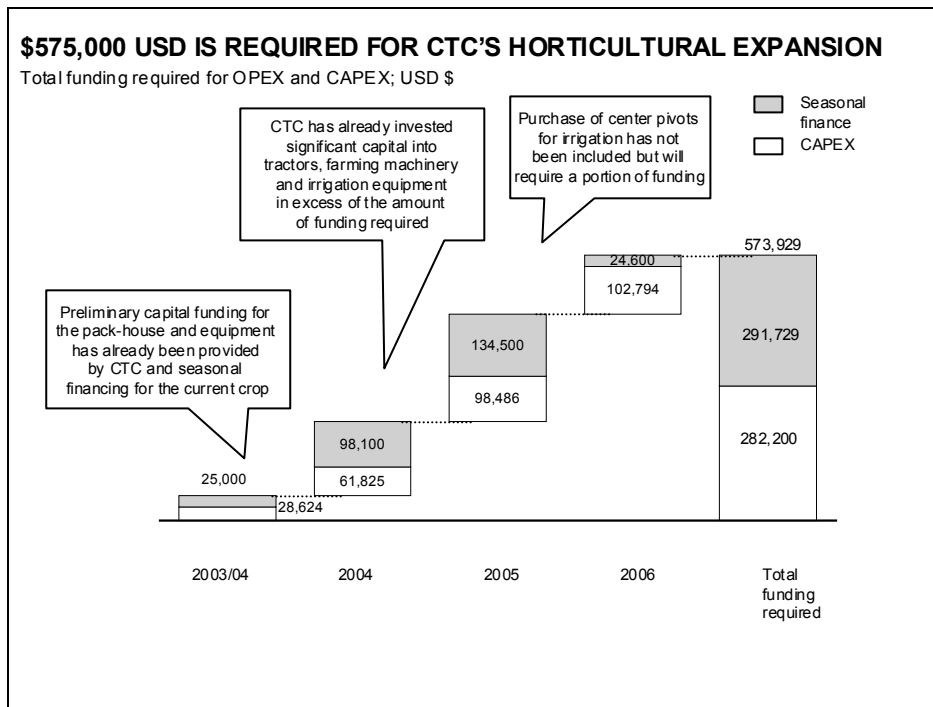
Horticultural Cropping Program (excluding paprika)



**Achievements to Date.**

- ❑ Currently undergoing trials of 26 hectares (4 hectares of chilies, 8 hectares of baby corn, 4 hectares of mange tout, and 10 hectares of paprika) to establish crops best suited for Beira Corridor’s environment
- ❑ Already established export partners for vegetables (Waluru) and paprika (CTE, Lda, through which CTC already exported to Spain in 2003 and Pimenta de Mocambique)
- ❑ Already cleared an additional 50 hectares of land for horticultural development
- ❑ Currently constructing a packhouse, which has been inspected by Euregap consultant to ensure compliancy. Estimated date of completion is January 2004.

**Required Investment.** A total of \$575,000 is required for CTC’s expansion over four years, half of which is for capital expenditures. CTC has already invested \$50,000 of its own capital into constructing the packhouse and planting its initial crops of chilies, baby corn, mange tout and paprika.



**Anticipated Benefit.**

- ❑ Creation of 250 jobs
- ❑ Provision of training / expertise for 10 small producers, who have the potential to earn \$500 per month in revenues
- ❑ Attract additional investors to the region due to initial success
- ❑ Multiplier effect on supporting industries (inputs such as suppliers, fuel, mechanics, construction, etc.)
- ❑ Expected annual revenues of \$4.5 million by 2006.

**b. Pimenta de Mocambique**

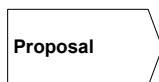
**Background.** Pimenta de Mocambique is a Zimbabwean paprika exporting company, which was formed in as a paprika marketing company under the directorship of three Zimbabweans - J. Lewis, I.

Brown and P. Neil – and has been operational in Manica Province since February 2003. These partners also own a sister company established in Zimbabwe called Commodity Trade Enterprises (CTE (Pvt) LTD), which was one of the first companies to enter the paprika market in Zimbabwe in 1992 and has become well established in the industry since. CTE has a paprika processing facility in Zimbabwe, consisting of a threshing and de-seeding factory and three hydraulic pressing systems. The bulk of the product is de-seeded and re-baled for export to Europe. The company’s sales are projected to be over EUR 2.5 million for 2003.

The directors are now looking to develop Pimenta de Mozambique to a similar capacity, through the promotion and purchase of paprika from both commercial and smallholder farmers in Manica Province. They understand the immense potential for paprika in this region (e.g., superior soil, climate, etc.) and aim to become the leaders in paprika promotion and marketing in Manica. In their 40s and 50s, these partners are committed to developing the paprika sector in Manica and have the vision (and energy) to make it happen. Some farms (notably CTC, and Auzmoz) in Mozambique are currently growing paprika for Pimenta de Mocambique, and 30tonnes have already been exported to Europe this year. And results to date look promising; in 2003, commercial farmers have grown 30 hectares of winter crop and produced 3-6 tonnes per hectare – which is higher than the average yield in Zimbabwe, a leading producer of paprika, where 3 to 4 tonnes was the norm for many producers. In addition, 120 smallholder farmers grew winter-irrigated crops on approximately 0.3ha each, yielding 0.8 to 1 tonnes per hectare.

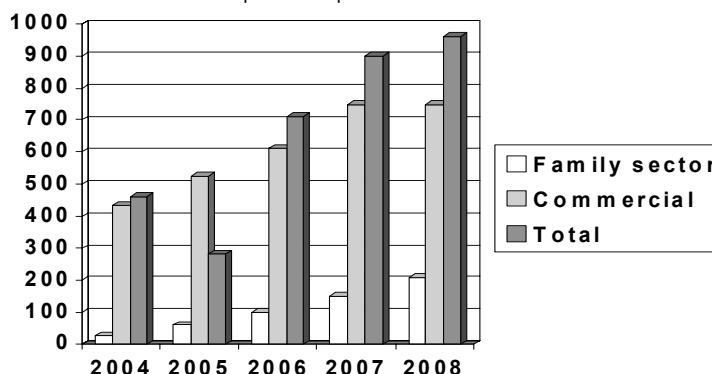
**Proposal.** Pimenta de Mocambique plans to expand the Mozambican operation from the current 30 (of commercial development) to 150 hectares within the next year and to build a pack house in Chimoio. The company also plans to expand small scale (family) production from the current 120 farmers to 500 in 2004. Further, the company plans to build a grading and de-seeding plant in the Chimoio region, which would also incorporate an ASTA testing laboratory and establish Manica Province both as a grower and a processor of high quality paprika.

### PIMENTA DE MOCAMBIQUE EXPANSION PROJECT



- Expansion of current operations in Zimbabwe to Mozambique. A pack house is proposed to be built in the Chimoio region which will be responsible for de-seeding and packing produce grown in Manica region. The plan is to expand the amount grown by commercial farmers from 30 ha to 150 ha within 1 year and to 200 ha in 2 years. In addition, it is planned to increase and develop production by small scale farmers

**PIMENTA DE MOCAMBIQUE EXPECTS TO EXPORT 960 TONNES PER ANNUM BY 2008**  
Total production per annum in tonnes



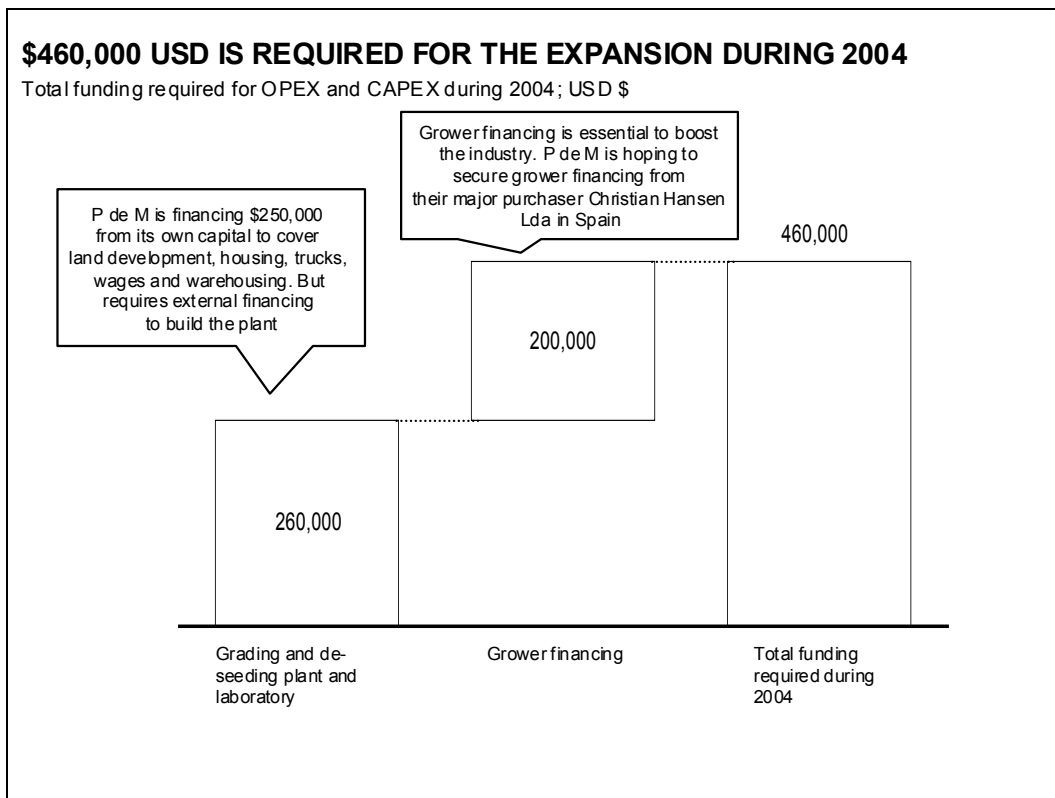
Source: Interviews; Technoserve documents



**Achievements to Date.**

- Currently investing \$250,000 USD of own capital into Mozambique to cover capital expenditure, of which \$220,000 covers:
  - Land \$10K
  - Fencing of Property \$10K
  - Water development (Boreholes, pump, etc) \$10K
  - Prefabricated House, Office \$50K
  - 1 x Pick-up truck \$15K
  - 1 x 3 Tonne truck \$30K
  - Remuneration and wages 2004 \$35K
  - Warehouse and Shed \$60K
  
- In negotiations to secure \$200,000 of grower financing from their main paprika purchaser, Christian Hansen Lda in Spain
- Out-growers grew 30 hectares of paprika for the company during 2003 and over 90 tons were exported from Mozambique
- Well-established relationship with buyers and good market intelligence and know-how
- Pimenta de Mocambique’s sister company currently represents 20% of the Zimbabwean paprika market, and continues to grow and expand amounts produced in Zimbabwe despite political situation. Exported 2,100 tonnes in 2002 and 1,800 tonnes in 2003

**Required Investment.** \$260,000 USD is required to build the pack house and an additional \$200,000 USD is needed for grower financing of the projected 150 hectares over the next year. One option for grower financing would be for the farmers to form associations, which could potentially secure financing from local rural credit agencies, such as GAPI, rather than receive assistance from Pimenta de Mocambique



### **Anticipated Benefit.**

- ❑ Creation of 30 jobs in the grading and deseeding plant and 200,000 labor days per year in the field (approximately 1,000 jobs)
- ❑ Provision of training / expertise for as much as 500 small scale (family) producers and 10 out-growers producers, who have the potential to earn \$500 per month in revenues
- ❑ Attract additional investors to the region due to initial success
- ❑ Multiplier effect on supporting industries (inputs such as suppliers, fuel, mechanics, construction, etc.)
- ❑ Expected annual revenues of \$1,000,000 by date from 180 hectares of commercial (out-grower) production and 150 hectares of small scale (family) production.

### **c. Vilmar**

**Background.** Vilmar is a joint venture between the Dutch company FinFlower Afrika BV (52%) represented by Stan Elkhuisen and the Derek Hinde Consortium (48%) (a Zimbabwean company). Both directors have been in the cut flower businesses for over 15 years and have played a major part in the growth of this sector in Zimbabwe. FinFlower Afrika was one of the largest marketing agents for Zimbabwean roses ((€ 6.0 million in assets, € 2.7 million in gross profit margin)), while the Derek Hinde Consortium established the Export Flower Growers Association of Zimbabwe, which went on to build and encourage investment into the flower sector. Because of his efforts and others, Zimbabwe's horticultural industry revenue increased from \$3.5 million in 1986 to over \$139 million in 2000. Both men are true visionaries, with a firm understanding of the dynamics of the horticultural sector, and established Vilmar in Mozambique in 2002– the first rose farm in the country - as a result of the growing instability in Zimbabwe. Their vision is to become the leading exporter of roses in the region.

The farm began on 5 hectares in 2002, and over the past year, has expanded to 10 hectares, producing 5 varieties of roses: Golden Gate, Nobeless, Samoa, Dakar and Escada. The quality of the roses currently being produced is exceptional: average stem length is 50cm (comparable to the high quality Columbian roses) and shelf-life is 12 to 14 days (also comparable to the high quality roses from the Netherlands). In operation since 2002, Vilmar harvests, grades, and packs roses locally in order to transport to Europe, via Amsterdam, for sales and distribution. The roses are transported by truck to Harare and flown to Amsterdam via Johannesburg. To date, the company employs 250 people (100 in the greenhouses, 50 in the packshed and 100 in construction of the new greenhouses) and ships, on average, 5.6 million stems per month.

**Proposal.** Vilmar aims to expand production from its initial 5 hectares to 35 hectares – an expansion which would enable the company to produce 400 million stems per month at full capacity, generating \$830,000 in monthly sales. To date, Vilmar has already increased cultivation to 10 hectares, and the company is seeking an equity partner to fund the additional expansion

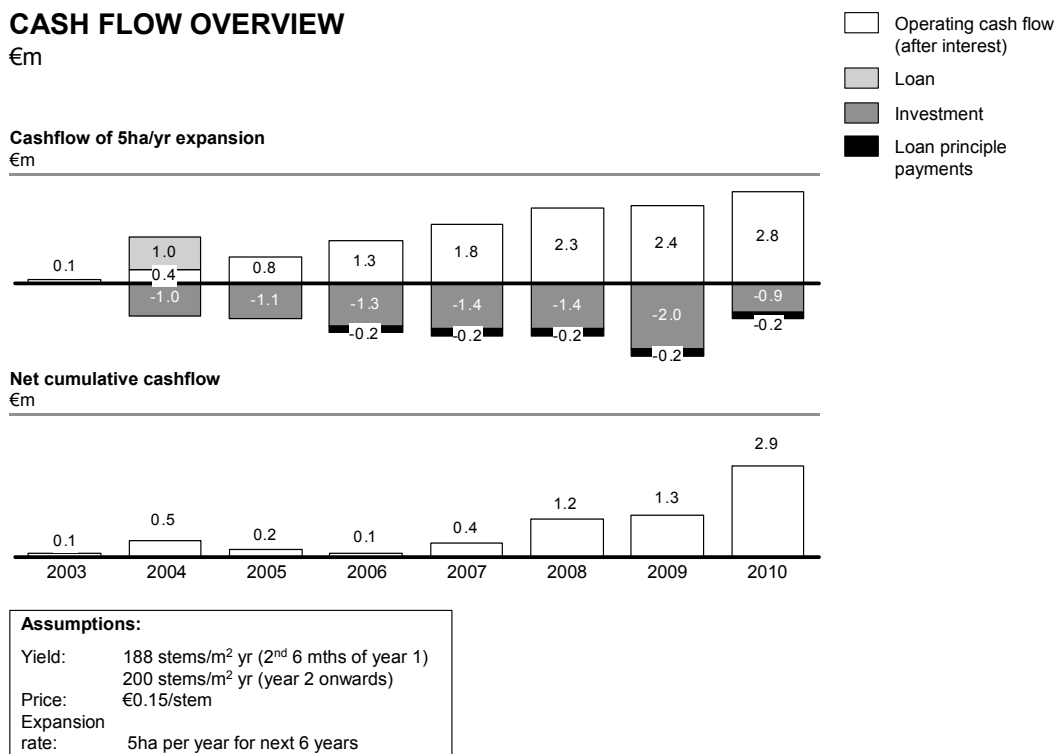
### **Achievements.**

- ❑ Business established and fully operational within 1 year
  - Land demarked and fenced
  - Electrical lines erected and connected
  - 10 greenhouses, packing house with three cold storage rooms, and other structures built
  - Fertigation/irrigation systems installed
  - Successful 10,000 stem pilot launch on 12 Dec 2002

- ❑ Regular subsequent (2 to 3 times a week) shipments mainly to European and South African markets.
- ❑ After a set back of several weeks from mid-January 2003 (due to adverse weather), production has been successfully re-launched on 22 April.
- ❑ Received very favourable customer feedback regarding rose pigmentation, opening and vase life
- ❑ Received financial support from Dutch Ministry of Economics Affairs in the form of a EUR 680K grant and operational support from local Mozambican authorities, to the extent that Vilmar is showcased to all potential investors as the successful trail blazer in the Beira Corridor
- ❑ Has a significant social impact in the area as the key employer of 300 workers and a role model for surrounding businesses and foreign investors.

**Required Investment.** \$250,000 is required to expand each hectare. Moderate (5 ha/yr) expansion is preferred over fast (10 ha/yr) expansion because of lower operational risks.

**Anticipated Benefit.**



- ❑ Creation of 1050 jobs in the field and pack shed at full (35 hectares) capacity
- ❑ Attract additional investors to the region due to initial success
- ❑ Multiplier effect on supporting industries (inputs such as suppliers, fuel, mechanics, construction, etc.)
- ❑ Expected annual revenues of \$10 million once all 35 hectares are under cultivation. On average, each hectare is expected to generate \$285,000 in revenues per year.

#### **d. Waluru**

**Background.** Waluru is a fresh produce logistics, export and marketing company who wish to develop horticultural exports from the Manica province. Waluru's two directors, Ed Whitfield (British) and Monty Hunter (Irish) are young highly motivated, committed and experienced individuals with a history of international successes in export, horticulture, agribusiness, company turnarounds, entrepreneurship and general management. Both have worked in the fresh vegetable export sectors, first as outgrowers in Zimbabwe and then as marketers, for some of the largest food chains in the UK, such as Safe Ways. With this experience, the partners established in February 2003 a marketing company in Zimbabwe (Afruita), which currently exports over USD1.5 million in vegetables annually to the UK and South African markets.

In February 2003, they began assessing the opportunity to produce, in Mozambique, premium vegetables for export to the British market. Enthusiastic about the opportunity in the Beira Corridor, the partners invested \$35,000 of their own capital to establish 12ha of premium vegetables (such as chillies, mange tout, and Baby Corn). Waluru was also the recipient, in November 2003, of a \$25,000 grant from the USDA's Rural Enterprise Innovation Grant fund – proceeds of which will enable the company to expand to 48 hectares. As a marketing company, Waluru is focused on marketing the premium product supplied by a network of high quality producers, and to date, has become the marketing agent for CTC's production of paprika, chillies, baby corn and fine beans. While Waluru is planning to use CTC's packhouse initially, the company plans to establish a central pack-house facility in Manica Province which can service its network of producers.

**Proposal.** Waluru plans to expand its network of out-growers from one (CTC) to 88 within 5 years, marketing an average of over 25 tonnes/day of premium vegetables at full capacity. The first stage of this expansion is the construction of the centralised standard care pack-house, which will incorporate a facility to grade, package, store and export up to 5ton/day, with an overall capacity of 10tonnes/day. Once production reaches 10 tonne/day, Waluru will then install a high-care facility, which will have a maximum capacity of 25tonnes/day

**Achievements to Date.** While Waluru is new to the Beira Corridor, the Zimbabwean company established by its founders has a respectable track record:

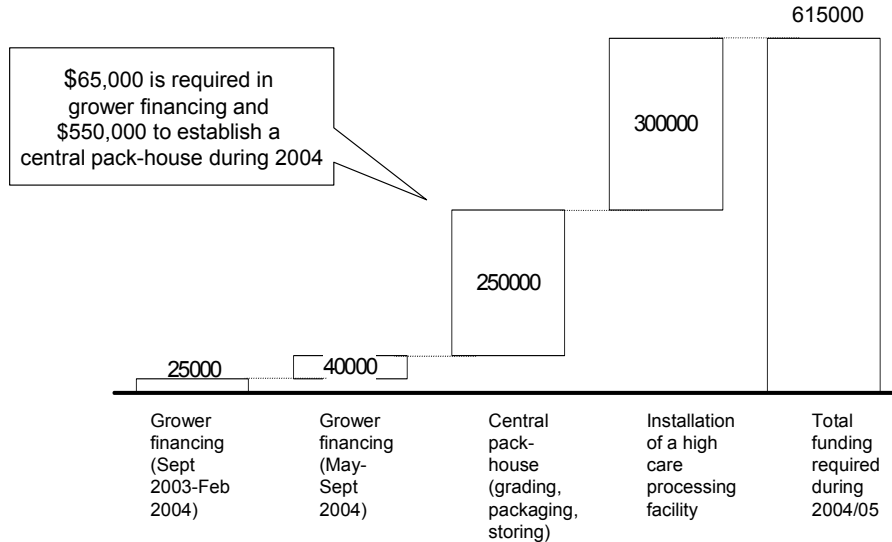
- ❑ Currently exports sugar snap, mange tout, garlic, passion fruit, baby corn and chillies to retailers, wholesalers and catering companies in the UK, Netherlands, France and other European countries
- ❑ Reaches volumes of approximately 12 tonnes per week, generating \$17,000 per day

In addition, Waluru was successful in winning a \$25,000 Rural Enterprise Innovation Grant (out of a pool of 92 applicants), to enable the company to expand its network of producers.

**Required Investment.** \$615,000 is required for expansion from one out-grower (currently supplying a total of 2tons/day of chillies, BC, sugar snap and MT, Onions) to six (4 large commercial and 2 small scale) each supplying 2 tonnes per week by 2004/2005. The bulk of this (\$550,000) is to establish a central pack house and processing facility, which can process 5 tonnes of premium vegetables per day.

## \$615,000 USD IS REQUIRED FOR THE EXPANSION DURING 2004/05

Total funding required for OPEX and CAPEX during 2004/05; USD \$



### Anticipated Return.

- ❑ Creation of 352 jobs in the pack-house
- ❑ Provision of training / expertise for as much as 50 small scale (commercial) producers 40 out-growers producers, who have the potential to earn \$3,000 per hectare in revenues
- ❑ Attract additional investors to the region due to initial success
- ❑ Multiplier effect on supporting industries (inputs such as suppliers, fuel, mechanics, construction, etc.)

### e. Metuchira Estate

**Background.** The Beira Corridor offers a unique opportunity to develop a large fruit estate on 15,000 hectares of fertile and deep alluvial soils on a flat plain. The old Lonhro cotton estate, just north of Nhamatanda (about 100 kilometers from Beira), is being purchased from the Government of Mozambique by an investment consortium of Mozambican businesses. The main player in this consortium is CETA. CETA is the largest Mozambican construction company. It has been involved in the construction of numerous roads, buildings and dams within Mozambique. The company plans to diversify and develop the Metuchira Estate in Sofala. This consortium is seeking investment finance and equity partners to develop the estate, Metuchira, as a major banana plantation and market the fruit produced on the estate.

Funding for a dam on the Metuchira River has already been allocated from public sector funds and the work is currently out to tender. Two sites for the dam have been identified, an upper site with a modest reservoir (400,000 cubic meters) or a downstream site with a substantial reservoir (approx. 10 million cubic meters). Funding allocation has been made for the less costly upstream site. Since the

downstream site would provide for some 500 hectares of irrigation without affecting water supply for the local communities, and because of CETA's construction expertise, CETA is proposing to build the downstream site and cover the additional construction costs (\$0.5 million) from their own resources. This public-private partnership approach would then allow them to begin irrigated production on the Metuchira Estate and establish a nucleus on which to expand across the whole estate.

Full development of the Estate will require some major design and study work:-

For installation of an irrigation canal extending southwards across the estate from the Pungue River.

A full feasibility study for the development of 2,000 hectares, or more, of export banana production;

CETA is looking for equity partners to share the considerable investment costs and for technical and marketing partners to provide the horticultural production and marketing expertise. The potential scale of banana production means that partnering with a multinational fruit company such as Chiquita or Fyffes is required, and some preliminary discussions are now underway.

Five factors favor the development of Metuchira Estate as a leading fruit estate.

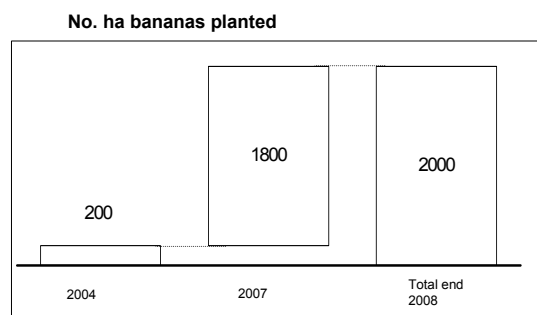
- ❑ **Soil, land and topography.** These conditions favor the establishment of not only banana but also mango and other tropical fruit production. The fertility, texture and depth of the soil enable good internal drainage – which is important for long-term productivity of bananas. Further, the land is very flat over the whole farm – which enables cableway bunch transport systems and overhead pumping – also important for banana production. And 15,000 hectares is available for development.
- ❑ **Climate and temperature.** Temperatures are very suitable for banana production and lie within the required temperature ranges. The winter minimum temperature averages 18°C and the summer mean maximum temperature averages 32°C.
- ❑ **Rainfall and irrigation sources.** Rainfall is erratic and supplementary irrigation is required but this means less disease problems. Further, while a storage dam or weir is needed to be erected for immediate irrigation needs, funding has already been secured. In addition, funding for a large Metuchira dam (mentioned above) has already been secured and construction begins 2004. An irrigation canal from the Pungue river will be, however, required to support full production, which is possible due to the proximity between the Pungue and Metuchira rivers. Although the canal option is probably an expensive one, the benefits from opening up such large areas of reliably irrigated production make the investment attractive.
- ❑ **Infrastructure.** Metuchira is 100km from the port of Beira and is ideal for refrigerated container export. Further, the estate is close to main roads, railways and the energy supply from the main grid has already been established. Metuchira also has existing buildings, workshops, warehouses, offices, some management housing and a short gravel airstrip for planes.
- ❑ **Labor.** A large labor supply is available from the Nhamatanda township (13 kilometers away). Further, different skill levels have already established due to close proximity to previous Lonhro cotton estate, which used to employ X people.

**Proposal** CETA SARL, is in the process of acquiring the Metuchira estate and plans to develop by 2007 a modern 2,000 hectare banana plantation with exports to the markets of the Middle East and Eastern Europe. In addition, CETA would like to plant out other large areas to mango production for close-season export to India and the Middle East. The land is highly suitable for these plans but will first require establishment of a base farm of some 200 hectares to commence production and to train

new employees in the technically demanding job of export banana cultivation. All of these fruits would be intended for export, with second class fruit available for the local market and processing of the pulp and juice. Full development of the Metuchira estate will only be possible when the large irrigation canal from the Pungue River is installed.

### METUCHIRA ESTATE PROPOSED EXPANSION PLANS

- Metuchira Estate plans to grow from 0 ha to 200 ha during 2004/5 and then expand to 2,000 ha by 2007
- 2,000 metric tonnes of high quality banana will be yielded per week by the end of 2008
- The bananas will be initially exported in moderate quantity to South Africa and Zimbabwe and local markets in 2005, and then to the Middle East and Eastern Europe in large quantity 2008 onwards



- 8 pack-houses for the packing of fruit will be constructed by 2008

### Achievements to Date.

- ❑ Funding from the Government of Mozambique and various donors has already been secured for the Metuchira Dam and is awaiting construction (although construction of a large irrigation canal would enable full production of 2000 hectares.
- ❑ CETA SARL has won the right to develop Metuchira and is willing to invest its own capital into the development of the fruit estate
- ❑ Metuchira has the strong support of the public sector, including the Governor of Sofala Province and the Ministry of Agriculture, who are dedicated to “fast tracking” its development into a world-class fruit estate.

**Required Investment.** To develop this large scale estate, over \$3 million in financing is required for the establishment and planting of an initial, irrigated 200 hectare banana estate, one packhouse, ancillary offices and facilities in 2004, as well as initial operating and marketing costs for the first year.

An additional \$30 million is needed in 2007 to fund expansion of additional 1,800 hectares and 7 more pack houses, the irrigation canal (which could be as much as \$5 million) and other facilities as well as cover operating costs in 2007/8 before major fruit income flowing. The irrigation canal is an expensive item but will completely open up the whole estate for efficient commercial production.

This level of investment will first require detailed surveys, plans and feasibility analysis. Development of estates of this size and nature requires several years of intensive preparation work and participation by equity partners already skilled and experienced in such ventures.

Anticipated costs per hectare for the initial 200 hectares are as follows:

### Capital Expenses per hectare

Land development costs	\$5,240
Planting and establishment costs	\$3,672
Overhead cableways <sup>10</sup>	\$1,450

**Working Capital per hectare** (first year)                      \$2,535

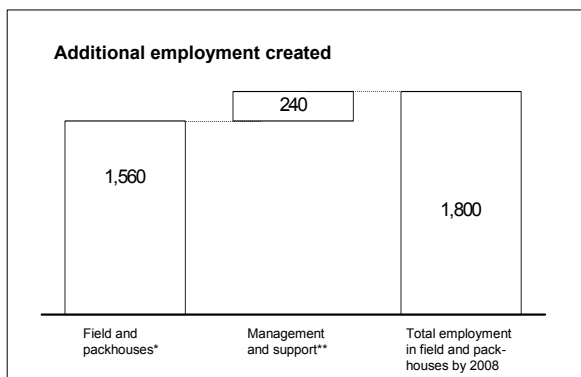
**Marketing Costs** (cartons and transport)                      \$4,896

Once the initial production base of 200ha has been established training of local staff will need to be intensive and will certainly require expert management and technical staff, which can come from Central America – thus lessening the language barrier. The initial 200 hectares will require construction of a dam on the Metuchira river to contain the large amounts of water required for irrigation of bananas. Funding for a small dam is already in place as part of a secure water supply to the small township of Nhamatanda, to the south of the Metuchira estate. However, feasibility for a larger dam has also been conducted and the investors at Metuchira are proposing to meet the additional construction costs to build the larger dam. The reservoir of 3 million cubic meters for the larger dam should allow full irrigated production on between 400 and 500 hectares, depending on the crops. That would include 200 hectares of bananas and establishment nurseries and initial orchard plantings for a range of other tropical fruits, notably mangoes.

### Anticipated Benefit.

- Creation of 1,800 jobs (1,560 field, harvest and packhouse staff plus 240 persons engaged in management, accounts, maintenance, quality control, workshops, offices and general support work.) Diversification into mango production and other tropical tree fruits would probably add another 1,000 jobs and expansion on the production bases would add still more.

#### **1,800 JOBS WILL BE CREATED THROUGH FIELD WORK, HARVEST, AND THE PACKHOUSES ALONE**



At least 1,560 jobs will be created in the field growing and harvesting the 2,000 ha and in the 8 pack-houses. Additional employment of another 240 skilled staff will be created through management and supportive skills and industries

\* Based on 1 person per 2 ha of bananas in field, 160 harvesting and 50 persons in each of 8 packhouses  
\*\* Management, maintenance, workshops, quality control, accounts

<sup>10</sup> Overhead cableways for careful and rapid transport of freshly harvested banana stems from the field to the packhouse are a necessity for modern export banana estates and must be put in place before planting of the bananas.



- ❑ Provision of training / expertise for the family sector (about 20 families), who have the potential to earn \$3,000 per month in revenues
- ❑ Attract additional investors to the region due to initial success
- ❑ Multiplier effect on supporting industries (inputs such as suppliers, fuel, mechanics, construction, etc.)
- ❑ Expected annual revenues of \$27 million (assuming 2000 hectares)

**f. EAM Lda**

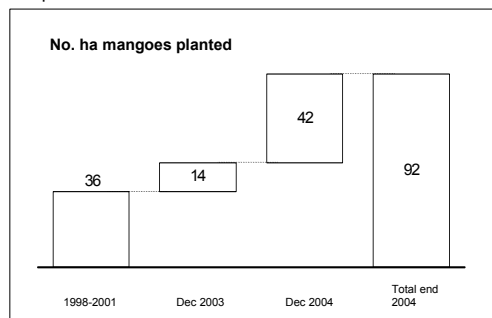
**Background.** Established in 1992 in RSA and Mozambique to grow and export mangos to the EU, EAM Lda has been operating and exporting from Mozambique’s Dombe region (200 kilometers from Beira Port) since 2002. Managed by Mr. Mike Scott, a South African with over 10 years of experience, EAM Lda currently has 36 hectares of mangos under plantation, yielding 5-8 tons per hectare (these is very favorable yields). When the trees reach maturity in 3 years he expects his yields to increase to 15-25 tons per hectare. The mangos are exported to the EU as well as the Middle East and Far East markets – due to the ability to produce counter seasonal mangos in Mozambique. To date, EAM has exported 30 tonnes of mangoes to the UK market and employs 20 people.

Committed to the success of EAM Lda, Mike has reinvested his personal capital into growing the Mozambican operation (over \$122,000 has been invested to date); it has taken over six years to build EAM to its present size. Mike’s decision to invest in the Dombe region was driven by its ideal agro-ecological conditions and proximity to Beira Port.

**Proposal.** EAM plans to expand mango production to 50 hectares by December 2003 and to 92 hectares planted by December 2004. Mangos are currently being exported to the UK via RSA. Dombe would be able to supply the EU and Asian markets directly through the Beira Port. This expansion will require the construction of a manufacturing plant and pack-house able to process 100 tonnes of mango per year.

**EAM PROPOSED EXPANSION PLANS**

- EAM plans to expand from 36 ha to 92 ha by the end December 2004
  - 36 ha established 1998-2001. Trees are bearing 2nd crop currently
  - 14 ha to be planted in December 2003
  - 42 ha to be planted in December 2004



- Achar manufacturing plant to be built in 2004
- Packhouse for the packing of fruit to EUREPGAP standards to be constructed in 2004
- Electricity generator to be erected in 2004

**Achievements to Date.**

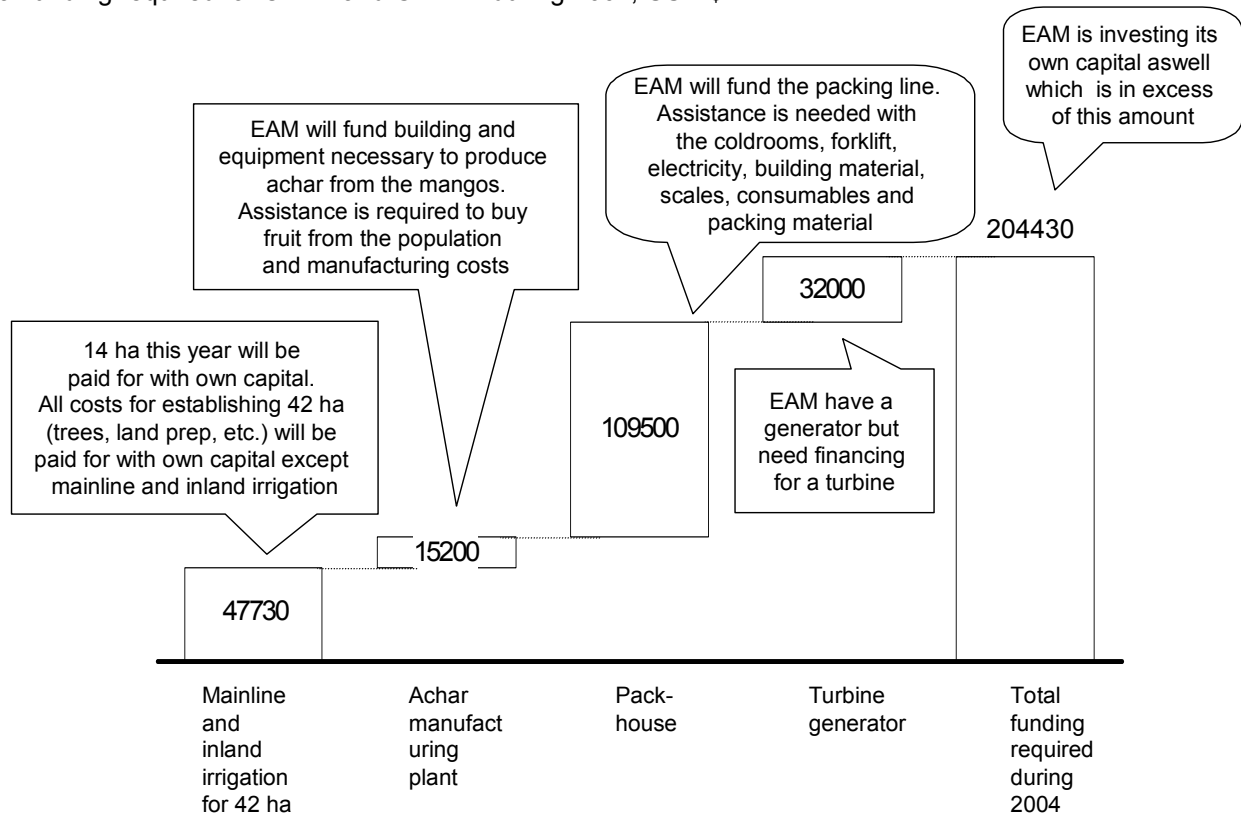
- ❑ Invested \$12,000 capital into EAM to ramp up to 36 hectares

- Exported 30 tonnes of mango to the United Kingdom in 2002

**Required Investment.** \$200,000 is required for the infrastructure required to expand to 92 hectares in 2004, which is broken down further below. Mike plans to contribute \$486,000 of his own capital toward equipment, infrastructures, trees and land preparation. Total cost of the expansion is estimated at \$686,000.

### \$200,000 USD IS REQUIRED FOR THE EXPANSION DURING 2004

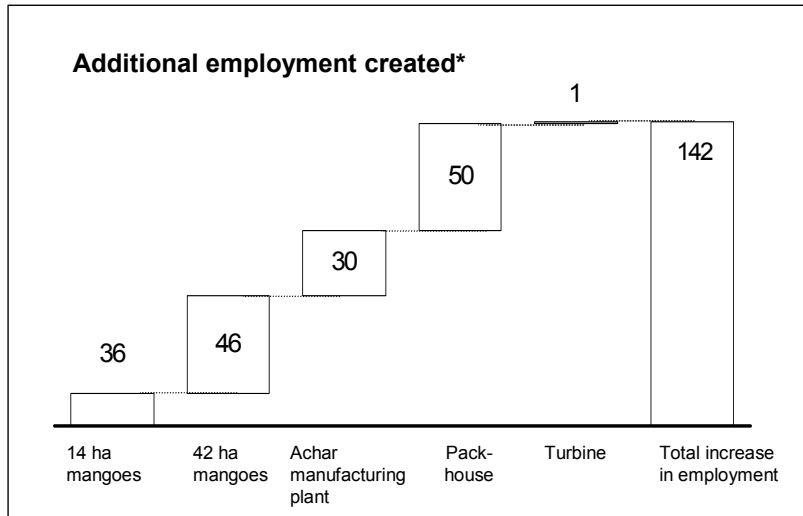
Total funding required for OPEX and CAPEX during 2004; USD \$



### Anticipated Benefit.

- Creation of 140 jobs
- Provision of training / expertise for 20 small producers, who have the potential to earn \$3,000 per month in revenues
- Attract additional investors to the region due to initial success
- Multiplier effect on supporting industries (inputs such as suppliers, fuel, mechanics, construction, etc.)
- Expected annual revenues of \$39,800 in 2004, rising to \$141,720 by 2008

**AN ADDITIONAL 140 JOBS IN THE DOMBE REGION WILL BE CREATED THROUGH THE MANGO PLANTATION EXPANSION AND PACKHOUSE**



140 new jobs will be created in the Dombe region through the expansion from 36 to 92 ha and the building of the achar factory, packhouse and turbine

\* Includes temporary and permanent employment

**g. Other potential SMEs**

In addition to the six real opportunities detailed above, TechnoServe is assisting other potential investors in setting up horticultural production, with the most promising being in the protea sub sector. Zim Flora (a leading protea exporter from Zimbabwe) is assessing the Beira Corridor as a priority region in which to train over 20 outgrowers to cultivate proteas for export. Total required investment is \$10,000/ha for \$40,000/ha in expected annual revenues (based on production of 5 hectares).

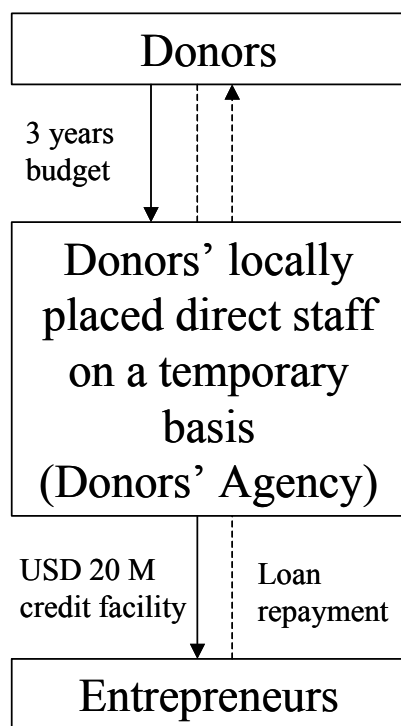
## 5. INVESTMENT MODELS

Given the breadth of infrastructure constraints as well as the inability to procure start-up capital among horticulture entrepreneurs, we believe that the solution lies in the participation (and in some cases, collaboration) across multiple partners. Accordingly, in the following section, we outline three different investment models - in which donors, investors and financial institutions can all play a role.

### a. Immediate Impact Models

We believe that there are several ways in which an influx of investment can have an immediate impact, of even one year or less.

- **Direct (donor-driven) credit.** A three-year non-revolving fund, managed locally by donor staff, could act as a non-collateralized credit facility. Eligibility could be based on technical expertise coupled with project feasibility, both of which could be evaluated by donor staff. Given the average cost of starting up a horticultural project of USD \$300,000 - \$500,000, a three-year non-revolving fund of \$20 million could finance 12-22 projects per year – a reasonable number, given the need for sufficient time to develop the required infrastructure.

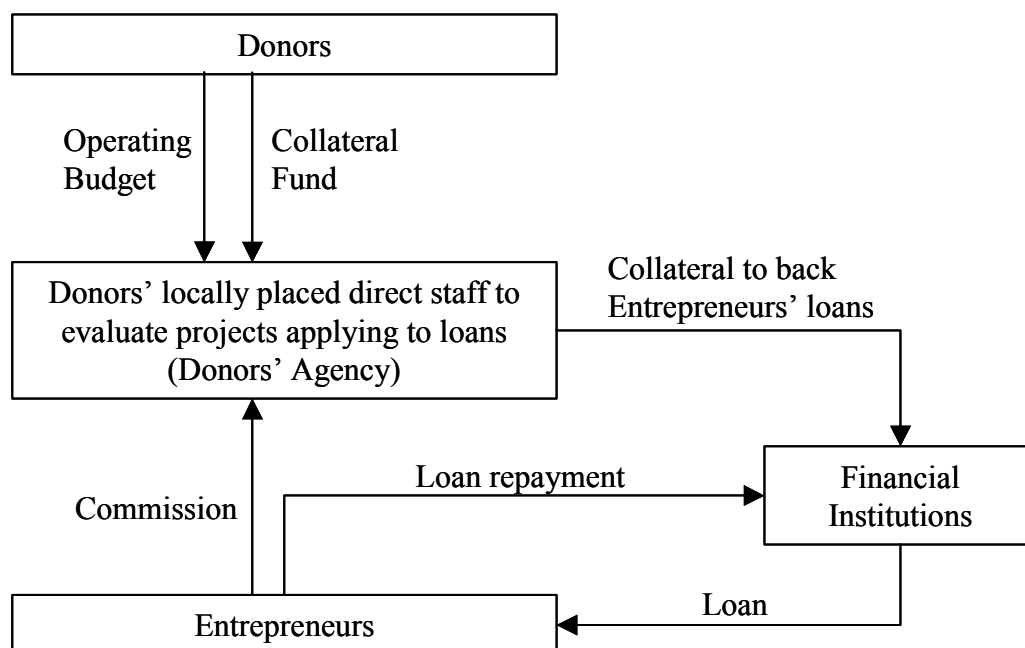


The tenure and interest rates of the loan could depend on how the financing is used, as illustrated in the table below, which is based on figures typically used in rural credit.

Object of financing	Tenure (months)	Grace Period (months)	Interest Rates (USD, per year)
Dams, Irrigation & Storage Facilities	96	36	6.00%
Crop Financing (Working Capital)	12	12	5.50%
Tractors & Heavy Machinery	60	12	8.50%
Workforce Training	60	24	7.00%
Other Assets	60	24	7.00%

While such a loan can pose significant risks to the lender, there could be more creative ways to create collateral against the loan, through a warehouse receipts program, for example, where the grower pledges the physical capital of its inputs or raw materials as collateral.

- **Direct (donor-driven) collateral.** As an alternative to direct credit, a donor could provide collateral to horticulture entrepreneurs to enable them to access debt finance. We would anticipate that such a program be managed by a local technical team, which would perform due diligence on each businesses. The entrepreneurs, in turn, could pay a commission to the donor.



However, even with this option, cost of credit is still high to the grower. We anticipate interest rates will begin to fall only as rural credit operations gain momentum.

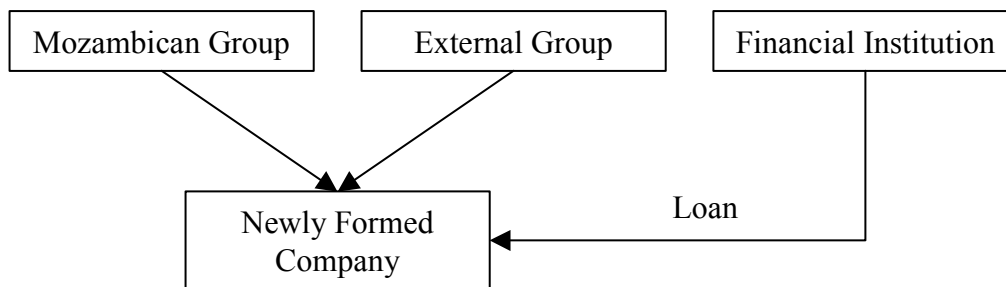
- **Additional immediate impact options** include expanding the capacity of existing financial institutions. Rural finance player GAPI cannot adequately address the sector's finance needs because of low ceilings on loans (e.g., maximum loan of \$80,000) and a limited portfolio (e.g., maximum lending of \$300,000). A donor could play a key role in increasing available funding through existing institutions such as GAPI.

In addition, donors could play a key role in encouraging financial institutions not currently offering rural credit in Mozambique (such as those operating in Zimbabwe or South Africa, which could recognize the track record of an entrepreneur coming from these countries). This might not happen in the short-term, as the decision to expand operations into another market takes time. However, there are financial institutions, such as Standard & Chartered, that have already been looking at this option for quite some time and are in their final stages of decision-making. Both banks are considering moving into Mozambique in the near future.

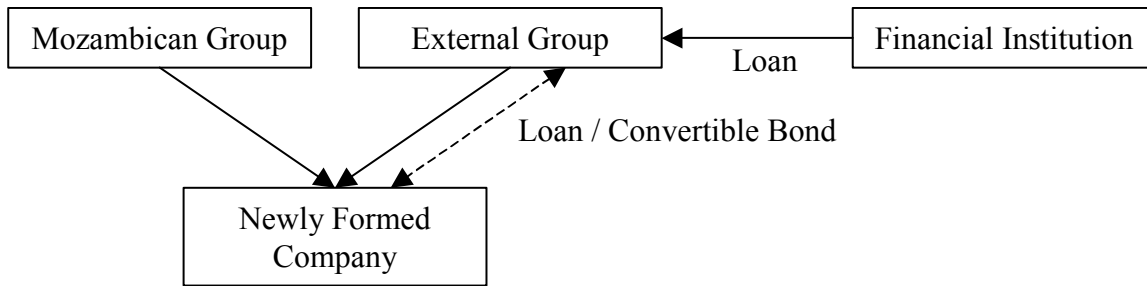
## b. Medium- to Long-Term Fixes

In addition to the donor-driven initiatives, we anticipate that several investment models can be led by the private sector, such as:

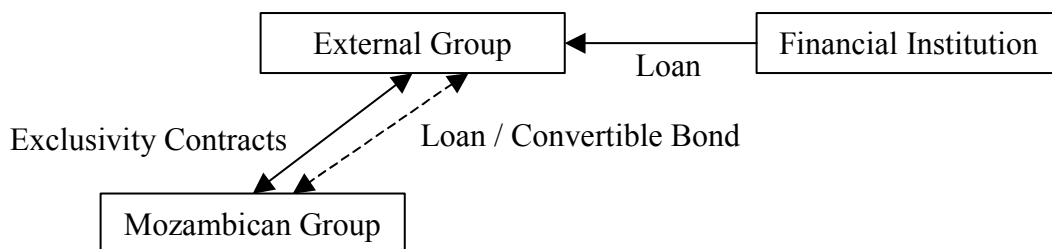
- **Project-specific joint venture** is the collaboration between a Mozambican group with horticulture expertise and an external group with strong market and/or logistics linkages. While the former provides local knowledge (regarding laws, procedures, and practices) and high quality produce, the latter provides access to market and finance. There are many ways in which these joint ventures can be structured. In South America the LAAD was created by a group of entrepreneurs, who invested \$200,000 each to put towards an investment fund. Each investor sat on the LAAD board and they met regularly to review potential JV's and decide on whether to invest or not. The fund has grown quickly and attracted funding from the USAID, for further growth and expansion. A similar fund could be established in Mozambique. For example, in the structure below, the Mozambican group and the external group form a new company that would benefit from the external group's reputation in order to get direct loans.



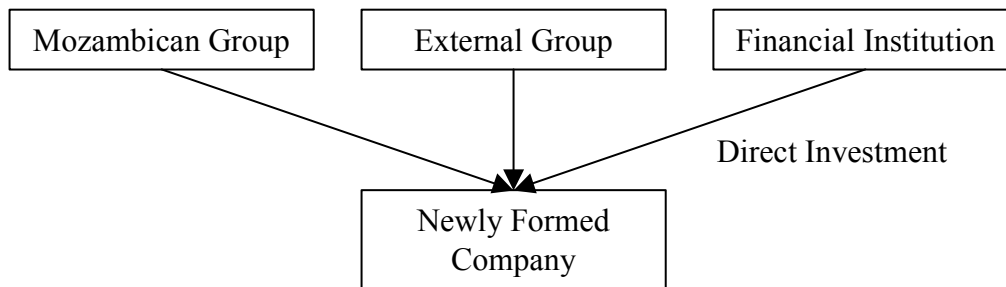
If the loan cannot go through directly to the new company, it could be issued to the external group, which would transfer the funds to its subsidiary through a convertible bond. The new company would issue the bond, which would be sold to the external group for the amount of the loan, and pay off its installments in the same tranches and timing as the loan repayments. In the case of default, the amount of default is converted to equity, thus decreasing the risk to the external group.



Alternatively, rather than create a new company, the two partners can develop exclusivity contracts. Funding would come in the form of a loan to the external group, which would in turn transfer it to the Mozambican Group in the form of a convertible bond.



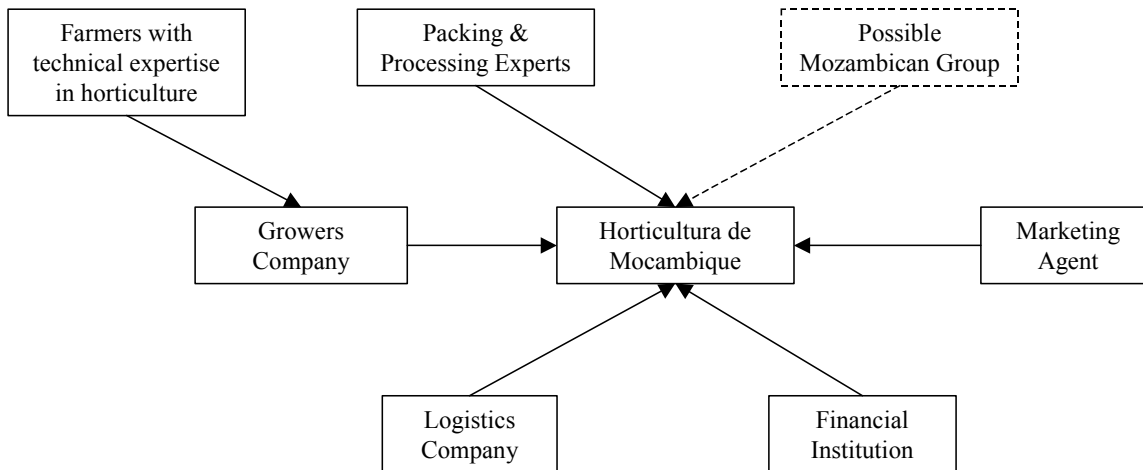
Finally, the joint venture could be established through the formation of a new company in which every party involved in the operation is a shareholder. Funding would not come in the form of loans, but of direct investment.



- **Sector-specific joint venture** is more complex than a project-specific joint venture in that several parties collaborate to develop an entire sector (and, at the same time, create a Mozambican brand, with control over many activities along the value chain). This approach is similar to Café de Colombia, but in this case, Horticultura de Mocambique.

The simplest way to develop this type of joint venture is by marrying the expertise of relocated Zimbabweans to a well-established Mozambican group of public and private sector leaders in order to establish a pool of technical, local, legislative, and political knowledge. With the direction of established Mozambican leaders, this venture would have the creditworthiness and political required to drive the sector's development.

However, a more complex (but ultimately more effective) approach would be to piece together partnerships along each activity of the value chain - growing through processing, packing, marketing, and transporting. In this case, non-Mozambican parties would play a more extensive role, given most of the expertise in the upper steps in the value chain currently lies outside Mozambique. If non-Mozambicans dominate this collaboration, it may be useful to involve an additional “Possible Mozambican Group” to ensure that collaboration has access to the right local knowledge and contacts.

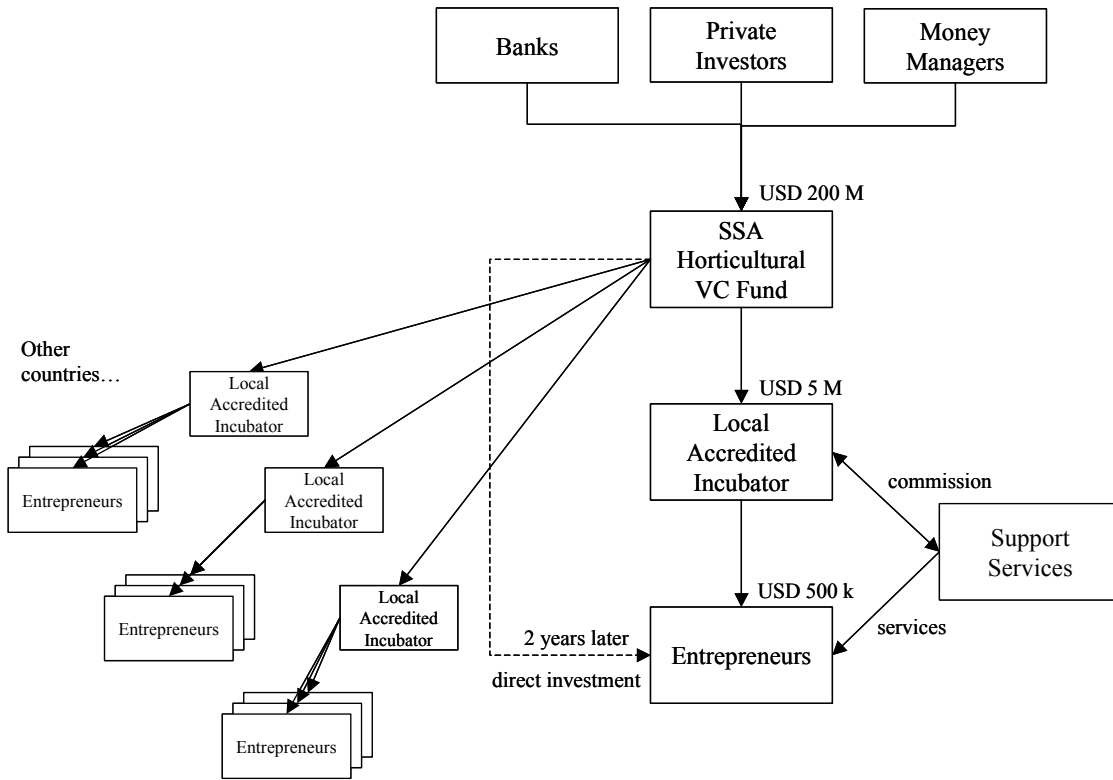


Financing could come through the contacts of one or more of the collaborators, given that they will be established and renowned companies in their respective segments. Collaborators could simply form an association or create a new company, which governs profit allocation, etc.

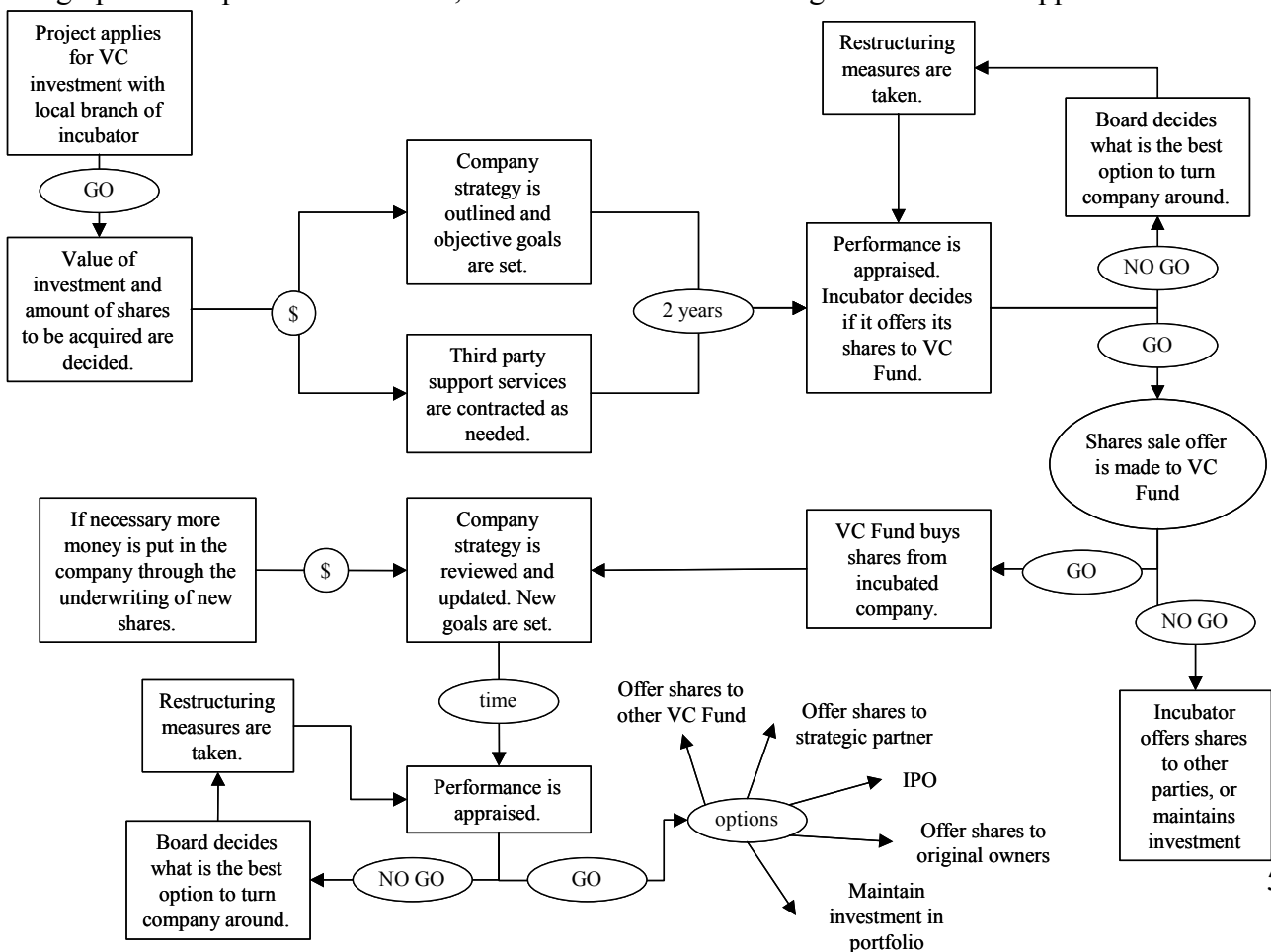
- **Sub Saharan Africa horticultural venture capital fund.** A broader initiative, which brings together banks, private investors, and money managers to develop a regional venture capital fund could be an effective, albeit longer term, way to drive regional horticultural development.

The fund could accredit a local incubator, such as TechnoServe, to identify feasible projects and make the first round of investment. The incubator will provide and/or subcontract supporting services (e.g., accounting, strategic and legal support) on an as-needed basis to maximize each project’s chance of success. After some time, the incubated company is evaluated and, if successful, is offered to the venture capital fund for a second round of investment. At this point, the company’s strategy will be updated, new goals will be set and further growth will be expected from the company.





By supporting businesses through each stage of growth, this fund could most effectively drive development of the horticulture sector. Shareholders remain focused on performance and growth, and through partnerships with incubators, the fund will stimulate the growth of local support industries.



## 6. Road Map

The following section summarizes the investment opportunities for the private sector and donor community.

	Company Name	Total Investment Required in 2004 (USD \$)	Total investment after 2004 (US\$)	Capital Expenditure	Grower Financing
1	CTC	\$215,000	N/A	- \$125,000 (vehicles, buildings, cooling, packhouse & land equipment)	- \$90,000 (seasonal crop financing)
2	Pimenta de Mocambique	\$460,000	N/A	- \$260,000 (grading & deseeding plant in Chimoio with ASTA testing laboratory)	- \$200,000 (seasonal crop financing)
3	Vilmar	\$1,250,000	\$5 million in addition for full expansion to 35 hectares	- \$1,250,000 for CAPEX & OPEX for 5 hectares. (Total (equity) investment required for full expansion is \$6,250,000 or \$250,000 per hectare)	N/A
4	Walaru	\$815,000	N/A	- \$350,000 (packhouse) - \$400,000 (processing facility)	- \$65,000 (seasonal crop financing)
5	Metuchira Estate	\$3 million to establish initial 200 hectare farm	Additional investment of \$27 million for expansion	\$5 million for irrigation equipment for 2,000 ha, \$18.9 million for capital development of 7,500 ha and \$6.3 million for development of family sector farming	- \$2 million required for start up and operating capital for the 200ha of outgrower farm production
6	EAM Lda	\$200,000		- \$50,000 (irrigation equipment) - \$15,000 (purchase of fruit and manufacturing costs at achar plant) - \$110,000 (packhouse) - \$30,000 (turbine generator)	N/A

At least nine donor options for investment into the development of the sector have also been identified.

Investment Target		Investment Required in 2004	Total Investment Required	Brief Description of Funding Requirements
1	Njerenje Education (Residential Training Courses)	\$175,000	\$525,000 (for 3 years)	Required for training expenses and wages, 10 full-time resident student expenses and expenses for 35 courses, accommodating 5 students each
2	Competency Based Training Programme I	\$125,000	\$375,000 (for 3 years, 5 courses per year)	Funding for practical on-the-job training of apprentice supervisors and foremen (similar to the 14-month training at CITRUM). 10 trainees for 8 months and resident on commercial horticultural export operation, with residential expenses and specific training expenses covered
3	Competency Based Training Programme II	\$25,000	\$75,000 (for 3 years)	Incentive scholarships for 10 best EAC undergraduates in their last 8 months to work on commercial horticulture export operations. Training same as in Programme I, and costs to cover residential and specific training expenses incurred by the host farm
4	Competency Based Training Programme III	\$75,000	\$225,000 (for 3 years, 3 courses per year)	Short-term intensive technical training courses for 20 trainees for 3 days each per month over an 8 month period. Training to be facilitated at Njerenje School in conjunction with EAC at Chimoio on specific technical elements. Probable that accommodation will need to be provided at EAC or close by at extra cost.
5	Competency Based Training Programme IV	\$125,000	\$375,000 (for 3 years, 5 courses per year)	Funding for practical on-the-job training of small-holder farmers. 20 trainees for 8 months twice a week on commercial horticultural farms. Cover cost of training
6	Upgrading Highway EN6 Beira to Inchope	\$44,000,000	\$44,000,000	Major sectoral infrastructure improvement opening up the whole Beira Corridor to reliable rapid surface transport. \$20 million for road upgrade, \$4 million road-raising embankment, \$20 million for floodplain bridgeworks.
7	Improved reticulation of electrical power supply	\$15 million for 1,500km \$80,000 for training of EM staff	\$6,000-10,000 per additional km	Targeted at the Beira Corridor, soft loan facility for enhancing reticulation of the main grid to newly opened rural areas appropriate for horticultural exports. Loan is for parastatal or the privatized equivalent when relevant.
8	Fast Track Loan Facility for Rapid Investment and Impact in Horticultural Exports	\$30,000,000	\$30,000,000	A rapid response loan facility to allow horticultural export investors quick access to capital for small-scale dams, irrigation equipment, and other vital equipment and operating expenses.
9	Catalyst for sector growth and development	\$200,000 for specialist and anti-corruption unit		Following SEATEC model (IFC-funded tourism initiative) to establish 1-2 facilitators, with access to key government, to identify obstacles to development

The window of opportunity for Mozambique to attract investment into the horticultural sector has already been open for at least two years. **Mozambique must take steps to improve the investment environment right now if it is to successfully build a horticultural sector and outbid competitor nations** such as Zambia and RSA. The proposed road map outlines what key actions must take place by all stakeholders to realize this potential. This map (see Appendix 6 for more detailed version) addresses the recommendations contained in this report which include:

- i) Review the use of Land Tenure as collateral for finance
- ii) Identify proposals for non-collateralized debt
- iii) Resolve the privatization of land issue
- iv) Identify and promote alternative financing structures such as JV's, etc
- v) Identify and implement insurance and hedging opportunities
- vi) Create a fund to build dams and purchase irrigation equipment
- vii) Build the capacity of the ARA-Centro staff
- viii) Identify methods of providing hands-on training for local staff
- ix) Ensure that the correct incentives exist to attract investment into the horticultural sector
- x) Encourage the placement of a facilitator in Maputo, to network with decision makers and promote the horticultural sector
- xi) Develop of a 'fast track' service to assist investors in the implementation of projects and access to finance
- xii) Establish an anti-corruption task force (could be part of the facilitator's role in x)
- xiii) Print government forms in both Portuguese and English
- xiv) Promote Portuguese and English training courses for investors and civil servants respectively
- xv) Rebuild the EN6 between Chimoio and Beira
- xvi) Build capacity of ANE in management and project implementation
- xvii) Provide a soft-loan facility to the electrical company for power reticulation
- xviii) Strengthen the financial capacity and outreach of the Energy Fund (FUNAE – Fundo Nacional de Energia)
- xix) Build capacity of EDM in management and project implementation
- xx) Identify funding mechanisms for the eventual construction of a cold room facility in Chimoio

Ideally, the Road Map should be implemented within 12-18 months in order to attract investment which otherwise would flow into other SSA countries. However, three specific actions must take priority in the short-term – in order to attract the investors who will build off this initial progress with capacity-building initiatives of their own:

1. **Infrastructure.** The upgrade of the Beira to Inchope road is critical to development of the sector, and a donor must begin the process for enabling this upgrade. A plan for addressing the power supply issue must also be proposed over the next three months; while the training of EM staff (which requires an investment of \$80,000) could occur within this same period.
2. **Finance.** Ultimately, a \$30 million loan facility is required, and over the next three to six months, this could be piloted with a smaller facility (\$1 million) and then expanded as necessary. Again, this fund will require the participation of a donor. Management of the pilot fund could be done by a local organization (such as TechnoServe, which managed the \$250K pilot Rural Enterprise Innovation Grant.)

3. **Bureaucracy.** A small task force (1-2) people must be deployed over the next three months to address bureaucratic constraints to development, working with all stakeholders. This task force will also be key to developing a horticulture association, which will address bureaucratic issues going forward, thus ensuring that the “bureaucracy watchdog” function continues.

Each of these three priorities is highlighted in bold in the following schedule.

All stakeholders must identify their responsible initiatives and begin implementation as soon as possible. TechnoServe can assist in the co-ordination among stakeholders, with the first step being hosting the Investors’ Conference, which will take place in March 2003 and address these constraints, opportunities and next steps. Only through the coordination of the efforts of various stakeholders (as well as the active participation of the private sector – and investors – in addressing capacity constraints) will the Beira Corridor be able to realize its immense potential in high value horticulture.

Initiative	Owner	2004				2005				2006				2007			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>Launch loan facility to allow investors quick access to capital for small-scale dams, irrigation equipment, and other vital equipment and operating expenses.</b>	DFI	▲	→	→	▲	→	→	→	→	→	→	→	→	→	→	→	→
					Establish pilot of \$1M				Launch full fund of \$30 million								
Identify and promote alternative funding sources for investors and technical experts	DFI	▲	→	→	▲	→	→	→	→	→	→	→	→	→	→	→	→
					Develop task force of investors, banks & funds				Implement alternative funding sources								
Encourage the creation of a Mozambican JV fund involving 8 to 10 large companies	DFI																→
Host a horticultural investment promotion conference in Mozambique	GoM	▲															
					March 9-11												
Network with potential investors to begin promoting the 6 potential businesses already identified	DFI		→	→	→												
					(Ongoing)												
Provide funding to build the capacity of the horticultural association in Manica	NGO	▲	→	→	→												
					Submit Proposal				Develop and launch association								
<b>Upgrade Highway EN6 Beira to Inchope</b>	Donor	▲	→	→	→	▲	→	→	→	▲	→	→	→	→	→	→	→
					Donor commits funds				Bid awarded								Construction Begins
Improve reticulation of electrical power supply	Donor	▲	→	→	→	▲	→	→	→	→	→	→	→	→	→	→	→
					Training of EM				Donor commits funds								
Train 10 full-time resident students for 35 technical courses which can accommodate 5 students at a time	NGO	▲	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
					Donor or investors commit funds				(ongoing)								
Provide practical on-the-job training of apprentice supervisors and foremen. 10 trainees for 8 months and resident on commercial horticultural export operation	NGO	▲	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
					Donor or investors commit funds				(ongoing)								
Provide incentive scholarships for 10 best IAC undergraduates in their last 8 months to work on commercial hort export operations	Pvt sector (to fund) NGO (to manage)		▲	→	→	→	→	→	→	→	→	→	→	→	→	→	→
					Scholarships awarded				(ongoing)								
Short-term intensive technical training courses for 20 trainees for 3 days each per month over an 8 month period	NGO	▲	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
					Donor or investors commit funds				(ongoing)								
Funding for practical on-the-job training of small-holder farmers. 20 trainees for 8 months twice a week on commercial horticultural farms	NGO	▲	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
					Donor or investors commit funds				(ongoing)								
Capacity building of ARA-Centro, ANE and EdM	NGO				▲	→	→	→	→	→	→	→	→	→	→	→	→
					Donor or investors commit funds				(ongoing)								
<b>Launch task force to promote sector growth, address bureaucratic issues, develop association for ongoing bureaucratic issues</b>	DFI / Pvt sector	▲	→	→	→	▲	→	→	→	→	→	→	→	→	→	→	→
					Donor or investors commit funds				Association formed to continue work								
Fast track investment assistance	Pvt sector / GoM																→
									(ongoing)								
Land tenure reform	DFI																→
									(ongoing)								
Address language constraints (have English forms, etc.)	GoM				▲	→	→	→	→	→	→	→	→	→	→	→	→
					Convert all forms				(ongoing)								