

**FEASIBILITY STUDY FOR THE DEVELOPMENT FUNDING AND
MANAGEMENT OF AN ALOE PROCESSING PLANT IN LIMPOPO –
PHASE 4**



TRADE & INVESTMENT
LIMPOPO

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EXECUTIVE SUMMARY

Phase 4 of The Feasibility study for the Development, Funding and Management of an Aloe processing plant in Limpopo Province entails the uses of Aloe Ferox and Aloe Vera, both Locally and Globally. This will give the reader a full and comprehensive understanding of the market that exists for this commodity and the products produced from the plant.

Phase 3 of the feasibility concentrated heavily on the benefits of cultivating a crop such as Aloe. It took into account the employment that could be created, alleviation of poverty, promotion of food security, the benefits to the environment, possible secondary and tertiary development opportunities and its benefits towards developing a new industry in South Africa.

Whilst all of these factors play an important role in the development of Limpopo Province and South Africa as a whole and its adherence to the mandates set out by The South African Government, it is of vital importance to ascertain if the establishment of an Aloe Processing Plant for either Sap, Gels or Nectar production is economically viable and feasible.

Subsequent to Phase 3 additional research has been conducted and some new information has been obtained from global experts that will have an added influence on the feasibility of this project and for these reasons Phase 4 will detail the findings.

Phase 3 gave a basic indication of the funds that will be required to start up a venture such as this. It did not however give a full budget and synopsis of the costs associated with the crops development and processing over its 8 year life span.

Phase 4 will be regarded as the Master Budget that will detail all costing associated with establishing and operating this project over the 8 year life span of the Aloe plant.

A Summary, Recommendations and Conclusions section will complete the feasibility study and will tie in with those made in Phase 3 of the study.

It is however important to note that whilst reasonably large amounts of Aloe is produced in areas such as South America there is very little produced in South Africa at present. Over and above this, global production has only recently shown an increase in demand and whilst a market definitely exists for Aloe by-products the economics behind producing it is very important.

Internationally there are a number of producers with thousands of hectares of established plantations. Various Companies, Regions and Countries that produce Aloe will all have their own production costs and Income and Expenditure tables however in order for us to create a costing analysis we cannot use their figures as their input costs will vary greatly.

For these reasons alone we will only be able to project the figures associated with production of the crop in South Africa.

It should therefore be noted that whilst we have made every endeavour to create a workable and real commercial budget certain assumptions and projections have been made. The figures detailed in the commercial or master budget are up to date figures of all input costs and should be regarded true and current.

Phase 4 of the Feasibility study will relate closely to Phases 2 and 3 and will be regarded as a culmination of the previous Phases. Over and above this the Recommendations, Summary and Conclusions made in Phase 3 of the feasibility remain as is and unchanged but Phase 4 will add to them thus covering all aspects of the Feasibility study into the development, funding and management of an Aloe processing facility in Limpopo.

CHAPTER 1

ALOE & ALOE COMMERCIAL USES

Trade and Investment Limpopo requested Measured Farming Consultants to conduct a Feasibility study into the Development, Funding and Management of an Aloe processing Plant in Limpopo Province. Three different Aloe species were identified by Trade and Investment Limpopo and MFC had to assess the viability of each. The species were Aloe Marlothii, Aloe Ferox and Aloe Vera.

Of the 3 species Aloe Marlothii was deemed non-viable due to its random chemical composition and its inability to generate a consistent production of by-products for production and marketing purposes. Phase 3 of the feasibility details these findings.

Therefore for the purposes of the feasibility study and specifically Phase 4 we will only concentrate on the economic viability of Aloe Ferox and Aloe Vera.

Phase 2 of the feasibility study gives detailed descriptions into the uses of Aloe and specifically Aloe Ferox however the following which has been obtained from Wikipedia is served as a refresher to Phase 2.

1.1 – Aloe Ferox

Aloe Ferox can grow to 10 feet (3.0 m) in height, and can be found on rocky hills, in grassy fynbos and on the edges of the Karoo. The plants may differ physically from area to area due to local conditions. Its leaves are thick and fleshy, arranged in rosettes, and have reddish-brown spines on the margins with smaller spines on the upper and lower surfaces. Its flowers are orange or red, and stand between 2 and 4 feet (0.61 and 1.2 m) above the leaves.

Aloe Ferox plants are propagated mainly from seed and head cuttings, with plants sowed with approximately one meter separations. From seed, it takes about 4 to 5 years for the plants to reach the first harvest. At the time of harvest, each leaf weighs about 1.5 kg to 2 kg. Aloe Ferox prefers dry-tropical climates, open areas, sandy-loamy soils, full sun, and moderate watering with a good drainage system.

1.2 - Aloe Vera

Aloe Vera is a species of succulent plant that probably originated in northern Africa. The species does not have any naturally occurring populations, although closely related aloes do occur in northern Africa. The species is frequently cited as being used in herbal medicine since the beginning of the first century AD. Extracts from Aloe Vera are widely used in the cosmetics and alternative medicine industries, being marketed as variously having rejuvenating, healing or soothing properties. There is, however, little scientific evidence of the effectiveness or safety of Aloe Vera extracts for either cosmetic or medicinal purposes,

and what positive evidence is available is frequently contradicted by other studies. Medical uses of Aloe Vera are being investigated as well.

Aloe Vera is a stemless or very short-stemmed succulent plant growing to 60–100 cm (24–39 in) tall, spreading by offsets. The leaves are thick and fleshy, green to grey-green, with some varieties showing white flecks on the upper and lower stem surfaces. The margin of the leaf is serrated and has small white teeth. The flowers are produced in summer on a spike up to 90 cm (35 in) tall, each flower being pendulous, with a yellow tubular corolla 2–3 cm (0.8–1.2 in) long. Like other Aloe species, Aloe Vera forms arbuscular mycorrhiza, a symbiosis that allows the plant better access to mineral nutrients in soil.

1.3 – Aloe Commercial Uses

There are numerous benefits of Aloe with Aloe Vera being regarded as the cultivar with the most health benefits. Some, but not all benefits are listed in the following points so as to give the reader an indication of the Health and nutritional viability of this crop.

- High levels of Vitamins D, A, C, B-1,2,6,12 and Minerals such as Calcium, Sodium, Potassium, manganese, Magnesium, Copper, Zink content as well as anti-oxidants such as Selenium.
- Aloe sap and gel inhibits the secretion of hydrochloric acid in the stomach thus reducing the effect of painful Stomach ulcers.
- Aloe acts as a mild laxative.
- Aloe Vera sap is used to treat burns and scalds.
- Aloe sap is mostly used in the commercial cosmetic market for the treatment of tropical skin conditions such as Sunburn and insect bites.
- Aloe (especially Aloe Vera) juice reduces acidity and Ph. levels in the body and thus alleviates heartburn. It has also been found to alleviate inflammation in the digestive tract thus reducing the effects of Crohn’s disease.
- Aloe Vera reduces fever and plays an active part in reducing the effects of viruses such as Influenza and Measles.
- Many varieties of Aloe are used to accelerate the healing process with ailments such as Canker sores, ulcers, burns, Herpes and Hives.
- Medical practitioners often recommend the use of Aloe gel for the treatment of minor cuts, abrasions, and scratches as it aids in new tissue formation.
- Additional ailments such as cold sores, fever blisters, inflamed joints, boils, allergic

reactions, insect bites and eczema can be treated with Aloe gels and sap.

- The cosmetic industry makes use of large quantities in their products for assisting with wrinkles and hair and scalp treatments.

1.4 – Aloe Commercial Budget

The following Commercial or Master Budgets detail the input costs associated with Establishment of the project, cultivating the crop over an 8 year cycle and eventual commercial processing of the crop. Income and Expenditures and break even points are also detailed (Table 1).

Much of the information detailed in the tables will relate to Chapter 7, “Financial projections and Funding requirements” of Phase 3 on Page 31. The figures listed in the commercial budget are both assumptions and actual 2012 production figures drawn up by Measured Farming Consultants through extensive research of the local and global industry. We have listed industry averages instead of highs and lows. The figures may vary somewhat according to produce grade, Market demand, geographical location, labour costs, fuel etc. The figures detailed are what we believe to be a true reflection of the input costs associated with cultivating Aloe on a 15 Hectare farm as discussed in Phase 3.

In addition to this we have made certain educated assumptions relating to Aloe cultivation for the production of Sap/Gel and these are detailed below:

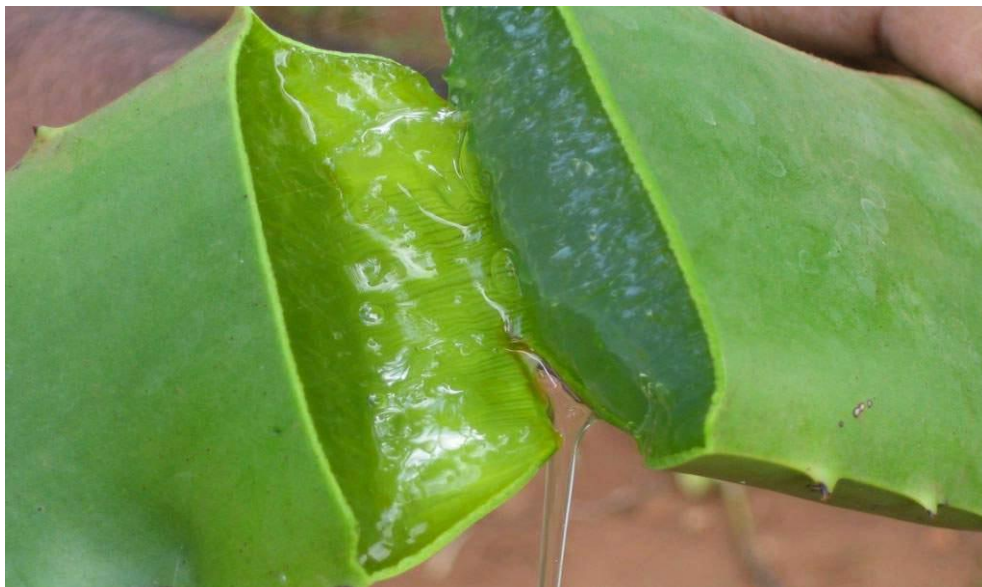
- 10 000 Plants per hectare.
- Area of Cultivation = 15 Hectares (as per Phase 3 Assumptions).
- Total Aloes planted = 150 000 plants
- Cost of new plants – R3 per Plant (Negotiated)
- Time to first harvest – 3 years.
- Harvesting cycle per plant = 4 times per year
- Leaves harvested per cycle per plant = 3
- Leaves harvested per annum per plant = 12
- Approximate Aloe leaf weight = 1 Kilogram.
- Grams of Aloe Fillet per Leaf = 500grams
- Price of Gel delivered to Processing unit = R10 + VAT (R11.40)
- Industry average Aloe Cultivation requires 1.5 people per hectare per Annum
- Aloin content per Aloe Ferox Leaf = up to 20 %
- Aloin content per Aloe Vera Leaf = up to 5%
- Aloe gel/Fillet content per leaf = 80%

Please take note that the figures below do not take into account interest which would probably be at a rate of Prime (currently 8.5%) plus at least 3% therefore totaling 11.5%.

The figures below are the present prices for Inputs, Aloe Gel and Plants and an annual escalation in price has not been catered for.



Picture 1 – Aloe Plantation



Picture 2 – Aloe Leaf & Gel

MFC															
14-Nov-12			<i>ALOE budget 8 year cycle</i>										14-Nov-12		
08:14															08:14 AM
<i>Trade & Investment Limpopo</i>															
			INCOME BUDGET												
			Year One to Year Eight												
Year			1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
			----	----	----	----	----	----	----	----	----	----	----	----	----
Assumptions.	10000 plants per Ha			6 Litres Gel per Plant per Hectare											
	Harvest from year 3			Ha 15 estate assumed											
	12 Leaves harvested/year/Plant			R11.40 per litre Gel delivered											
															0
Income Gel	AMOUNT					10260000	10260000	10260000	10260000	10260000					51300000
	PRICE														
	VALUE		0	0	0	0	0	0	0	0					0
INCOME OTHER	AMOUNT														

	PRICE														
	VALUE		0	0	0	0	0	0	0	0	0	0	0	0	0
			----	----	----	----	----	----	----	----	----	----	----	----	----
TOTAL VALUE			0	0	0	10260000	10260000	10260000	10260000	10260000	0	0	0	0	51300000
															51300000

Trade & Investment Limpopo															
PRODUCTION EXPENSES		EXPENDITURE BUDGET				<i>ALOE budget 8 year cycle</i>									
Year			1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
			----	----	----	----	----	----	----	----	----	----	----	----	----
AIRCRAFT HIRE															0
ANIMAL SUNDRIES															0
BOARD LEVIES															0
COAL															0
COMMISSON SALES					300000	300000	300000	300000	300000	300000					1800000
CONTRACTORS			220000												220000
CROP INSURANCE															0
CROP PROTECTION															0
ELECT CHARGES			175000	175000	175000	175000	175000	175000	175000	175000					1400000
FARM TOOLS			8000			8000			8000						24000
FEED ADDITIVES															0
FEED CONCENTRATES															0
FEED HAY															0
FENCING			65000												65000
FERTILISERS			6000	6000	6000	6000	6000	6000	6000	6000					48000

FUELS H.F.O.																			0
FUELS DIESEL			210000	210000	210000	210000	210000	210000	210000	210000	210000								1680000
FUELS PETROL			18000	18000	18000	18000	18000	18000	18000	18000	18000								144000
HERBICIDES			5000	5000	5000	5000	5000	5000	5000	5000	5000								40000
LAB ANALYSIS					30000	30000	30000	30000	30000	30000	30000								180000
LABOUR U.I.F.			4200	4200	4200	4200	4200	4200	4200	4200	4200								33600
LABOUR W.C.A.			840	840	840	840	840	840	840	840	840								6720
LABOUR WAGES			420000	420000	420000	420000	420000	420000	420000	420000	420000								3360000
LIME																			0
LUG BOXES																			0
MAINT BUILDINGS				30000	30000	30000	30000	30000	30000	30000	30000								210000
MAINT ELECT			12000	12000	12000	12000	12000	12000	12000	12000	12000								96000
MAINT FEEDMILL																			0
MAINT IRRIGATION					6000	6000	6000	6000	6000	6000	6000								36000
MAINT LIVESTOCK EQPT																			0
MAINT PROCESSING								320000											320000
MAINT VEHICLES				8000	12000	12000	12000	12000	12000	12000	12000								80000
MAINT WATER			2000	2000	2000	2000	2000	2000	2000	2000	2000								16000
MAINT WORKSHOP																			0
MARKETING COMM.																			0
MARKETING EXPORT									110000										110000
MARKETING LOCAL					60000	60000	60000	60000	60000	60000	60000								360000
MEDICINES			6000	1500	1500	1500	1500	1500	1500	1500	1500								16500
MEMBERSHIP SAFA																			0
NEW PROJECTS																			0
PACKING MATERIAL						72000	72000	72000	72000	72000	72000								360000
PACKING SUNDRIES																			0

PEST CONTROL			5000	5000	5000	5000	5000	5000	5000	5000					40000
PEST CONTROL AIR															0
PLANTS			SEE UNDER CAPITAL												0
PROTECTIVE CLOTHING			6000	6000	6000	6000	6000	6000	6000	6000					48000
RATIONS															0
RENTS															0
ROYALTIES															0
SEEDS															0
TRANSPORT HIRE			62000												62000
TRELLISING															0
VETERINARY FEES															0
WATER CHARGES			16000	16000	16000	16000	26000	26000	26000	26000					168000
WELFARE			6000	6000	6000	6000	6000	6000	6000	6000					48000
			----	----	----	----	----	----	----	----	----	----	----	----	----
TOTAL EXPENSES PROD	0		1247040	925540	1325540	1405540	1407540	1727540	1525540	1407540	0	0	0	0	10971820
															10971820

EXPENSES ADMIN.			1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
			----	----	----	----	----	----	----	----	----	----	----	----	----
ACCOMMODATION			5000			5000									10000
ADVERTISING				80000		80000		80000		80000					320000
AUDIT			4500	4500	4500	4500	4500	4500	4500	4500					36000
BANK CHARGES			9600	9600	9600	9600	9600	9600	9600	9600					76800
CAR HIRE															0
CONSULTANCY			55000			60000				75000					190000
DEPRECIATION															0
DIRECTORS FEES															0

DIV LEVIES SALARIES	0.2																			0
DIV LEVIES TURNOVER	0.4																			0
DONATIONS																				0
ESTATE MAINT					12000	12000	12000	12000	12000	12000	12000									72000
HIRE PURCHASE																				0
INSURANCE			60000	75000	90000	110000	110000	110000	110000	110000	110000									775000
INTEREST BANK																				0
INTEREST CREDITORS																				0
INTEREST OWNERS																				0
LEASES			14000																	14000
LEGAL																				0
LICENSES			3000	3000	3000	3000	3000	3000	3000	3000	3000									24000
MANAGEMENT CHARGES																				0
MAPPING																				0
MEALS																				0
OFFICE EQPT.			14000			8000														22000
OFFICE SUNDRIES			800	800	800	800	800	800	800	800	800									6400
PHOTOS			1200					2000												3200
RADIO MAINT																				0
REGISTRATION FEES					2500	2500	2500	2500	2500	2500	2500									15000
RENTS BLGS																				0
RENTS others	0.01																			0
SALARIES			460000	460000	460000	460000	460000	460000	460000	460000	460000									3680000
SECRETARIAL FEES	0.015																			0
SECURITY																				0
STAFF MEDICAL																				0
STAFF SALARIES																				0

STAFF U.I.F.			4600	1250	1250	1250	1250	1250	1250	1250					13350
STAFF W.C.A.															0
STAFF WELFARE			8000	2000	2000	2000	2000	2000	2000	2000					22000
STATIONERY/PRINTING			2400	2400	2400	2400	2400	2400	2400	2400					19200
SUBSCRIPTIONS															0
TELEPHONE/POST			9600	9600	9600	9600	9600	9600	9600	9600					76800
TRAINING					15000										15000
TRANSPORT															0
TRAVEL															0
VEHICLE/AIR HIRE															0
			-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
TOTAL EXPENSES ADMIN			651700	648150	612650	770650	619650	697650	617650	772650	0	0	0	0	5390750
															5390750

EXPENSES CAPITAL			1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
			-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BUILDINGS				3800000											3800000
COMMUNICATIONS															0
ELECTRICAL				22000											22000
ESTATE															0
FEEDMILL															0
FURNITURE				12000											12000
IRRIGATION			56000												56000
LAND DEVELOPMENT			280000												280000
LIVESTOCK BEEF															0
GAME															0

SHEEP														0
PACKHOUSE														0
PLANTS		450000				450000	450000	450000	450000					2250000
PROCESSING				4500000										4500000
WATERWORKS			12000											12000
WORKSHOP IMPLEMENTS		40000												40000
TRACTORS		280000												280000
VEHICLES		135000					135000							270000
		-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
TOTAL EXPENSES CAP		1241000	3846000	4500000	0	450000	585000	450000	450000	0	0	0	0	11522000
														11522000

EXPENSES PRODUCTION		1247040	925540	1325540	1405540	1407540	1727540	1525540	1407540	0	0	0	0	10971820
ADMIN		651700	648150	612650	770650	619650	697650	617650	772650	0	0	0	0	5390750
CAPITAL		1241000	3846000	4500000	0	450000	585000	450000	450000	0	0	0	0	11522000
EXPENSES PRODUCTION +ADMIN		1898740	1573690	1938190	2176190	2027190	2425190	2143190	2180190	0	0	0	0	16362570
PROD+ADMIN+CAPITAL		3139740	5419690	6438190	2176190	2477190	3010190	2593190	2630190	0	0	0	0	27884570
INCOME/SALES		0	0	0	10260000	10260000	10260000	10260000	10260000	0	0	0	0	51300000
% OF SALES BY MONTH		0	0	0	20	20	20	20	20	0	0	0	0	100
SALES - PROD+ADMIN														
BY MONTH		-1898740	-1573690	-1938190	8083810	8232810	7834810	8116810	8079810	0	0	0	0	34937430

TO DATE			-1898740	-3472430	-5410620	2673190	10906000	18740810	26857620	34937430	34937430	3E+07	3E+07	34937430	
SALES - P+A+C															
BY MONTH			-3139740	-5419690	-6438190	8083810	7782810	7249810	7666810	7629810	0				23415430
TO DATE			-3139740	-8559430	-14997620	-6913810	869000	8118810	15785620	23415430	23415430				

The Commercial Master budget in the preceding pages gives a fully comprehensive itemization of all the input costs associated with the production of Aloe for Gel. Every conceivable input has been listed and where necessary included so as to give the reader and Investor a full analysis of the costs of developing this industry

To reiterate we have not taken into account aspects such as Interest on finance or funding and have detailed a zero % interest increase annually. It is almost guaranteed that interest will be charged by the funding institutions and we do not believe that interest rates will be at less than the current prime Rate.

In addition and in order to keep this budget as simple and as user friendly as possible we have mostly not itemized increases in costs of inputs and consumables over the 8 year period. All input costs have remained constant.

Considering that Aloe Gel is harvested from the leaves and that the average commercial life span of an Aloe Plant is 8 years we have worked off this as a norm. After year 8 the Aloe plants will have reached full maturity and will begin to die off thus requiring the project to re-establish plantations for the next generation

We however recommend that the plantations are planted on a rolling cycle where various lands will mature at different times thus allowing for a consistent harvest over many years and thus a consistent income and cash flows.

As Aloe will start producing an income in year 4 as per the commercial budget above and will show good returns we feel this crop has viability.

If the above assumptions are to be regarded as a benchmark for Aloe Gel production income of R10 260 000 would be realized in year 4. Whilst this is deemed to be a relatively large amount of capital it is unfortunately offset by the first 3 years of production and input costs totalling R14 997 620 in year 3 therefore initially making a loss.

However as is the case in most new Agricultural ventures there will be losses incurred in the first few years of start-up due to these inception costs. In the case of this feasibility study we see that a profit will start to be generated from Year 5 of R869 000. In the following years this profit margin will increase substantially due to the reduction on start-up and initial input costs.

The figures above show an initial loss however the subsequent years of capital and profit generation offset these losses and for this reason we feel the introduction of Aloe farming and processing in Limpopo Province has merit and is economically viable.

SUMMARY, RECOMMENDATIONS AND CONCLUSION

Trade and Investment Limpopo enlisted the services of Measured Farming Consultants (Pty) Ltd to conduct a Feasibility Study into the Development, Funding and Management of an Aloe processing facility in Limpopo Province.

We have now fully completed the feasibility study found in Phases 1, 2, 3 and 4 and our Summary, Recommendation and Conclusion are detailed below.

Phase 1 detailed the timelines associated with conducting the study. Phase 2 detailed the morphology, description, geographical prevalence and other aspects related to its cultivation. Phase 3 detailed benefits of establishing a crop such as this from a food security, poverty alleviation, Job creation and upskillement aspect with a small concentration on the costs associated with start-up requirements. Phases 1, 2 and 3 showed the crop to be feasible from a point of view of these aspects in relation to The South Africa Government and Development agencies mandates of Rural Development and upliftment.

If it is the objective of Limpopo Province and Governmental departments such as The Department of Rural Development and Land Reform or Department of Agriculture, Forestry and Fisheries to create a project where individuals can be employed, poverty alleviated and people upskilled, with little concentration on economics and the viability thereof, this project is deemed feasible and viable.

However as it is Trade and Investment Limpopo's objective to develop economically viable projects in Limpopo Province where investors, both Local and Foreign, are attracted it is of great importance to show potential stakeholders the Economic viability of an Investment opportunity.

The above Commercial Master Budgets have detailed all input costs associated with the development of a crop such as this concentrating on Aloe Gel. As can be seen from these Commercial budgets the Development, Funding and Management of an Aloe processing plant and indeed farm in Limpopo Province for commercial production is economically viable and feasible.

Over and above The South African Governments focus on Rural Development this proposed project also shows the economic viability of the crop thus fulfilling both requirements associated Government objectives and that of Investors.

The proposed Aloe facility will provide investment opportunity to both local and international investors and stakeholders and for this reason it is our recommendation that Trade and Investment Limpopo pursue this venture as it is guaranteed to provide investors with a sustainable and profitable business where their capital can grow and their initial investment will develop so as to allow for further development and business opportunities in the future.

We believe Aloe Production and Processing to be a new and exciting Agricultural activity that is globally on the increase both in production and sales. In addition we believe that if South Africa and especially Limpopo Province can establish a project such as this in the near future they can become one of the global market leaders in the production of Aloe and the sale of its by-products.

In conclusion the production of Aloe for Gels and Sap is deemed to be economically viable.

DISCLAIMER

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