TABLE OF CONTENTS

1. Executive Summary

Bodulo Mabote Investments is an agricultural business registered on the 20th March 2010 and is located in Lejweleputswa District; Free State. The business area is 60km from Kimberley and 130km from Bloemfontein. The business will earn its revenue from producing Red Meat and Vegetable to the targeted markets through effective management and operation.

Being born and breed on a Beef and Vegetables, we at early stage realised that integrating Castles growing and Vegetables into a farming operation can contribute to the economic and environmental sustainability of the whole farm. Cattles and Vegetables production will enhance the farm's biological diversity, and may fit economic and biological niches that would otherwise go unfilled.

The current land were the project is envisaged to happened is 1318ha divided into 12 camps with sufficient water, there is a 9ha under irrigation for planting of vegetables.

Financial projection attached shows that the project will be sustainable, viable and will create 6 x fulltime and most importantly will enhance food security in our country, it is characterised of basic food which are high in demand to a ready market that will always exist and set to growth as people flock to the urban areas and the population growth

2. Product – Fresh Produce Vegetables

2.1. Foreword

Despite its relatively small share of the total GDP, primary agriculture is an important sector in the South African economy. Agriculture remains a significant provider of employment, especially in the rural areas, and major earner of foreign exchange. The value of agriculture production in South Africa was R138 904 million in 2010, while its contribution to the GDP was approximately R60 billion. The primary agriculture sector has grown by an average of approximately 11,8 % per annum since 1970, while the total economy grew by 14,9% per annum over the same period, resulting in a drop in agricultural share of the GDP from 7,1%in 1970 to 2,5% in 2010. Agriculture's prominent, direct role in the economy is a function of backward and forward linkages to other sectors. Purchses of goods such as fertilisers, chemicals and implements form backwards linkage with the manufacturing sector, while forward linkages are established through the supply of raw material to the manufacturing industry. About 70% of agriculture output is used as intermediate products in the sector.Agriculture are there a crucial sector and an important engine of growth for the rest of the economy.

2.2. Benefit to user

Vegetables as group constitute an important component in a human diet. They are the most important source of minerals in addition to being excellent source of Vitamin A, C and B complex, this elements are essential for the proper functioning of different organs of the body and hence their deficiency in the diet have an adverse effect on the physiology of the human being, examples include inability of the eye to see normally in din lights caused by deficiency of vitamin A, a development of weak bones resulting from lack of calcium, shortage of iron in the diet causes a condition known as anaemia. Some vegetables can be good source of energy particularly root crops. Legumes and leafy vegetables are generally rich in protein. The contribution of vegetables as a source of fibre is very important, especially where low fibre diet is consumed. Although edible fibre is not considered a nutrient and is not absorbed by the body, it is the component of vegetables that assist in moving food through the alimentary canal by aiding the muscular action of intestines, thus preventing constipation; it also helps to satisfy the appetite.

2.3. Economic role of Vegetables

We are all aware of the nutritional of vegetables, but equally significant are the opportunities for employment and family income generated by vegetable production. Vegetable production is labour intensive and can generate 3-10 times the employment and income per hectare of land compared to that of cereals like maize. Vegetables also create a number of job opportunities in complementary business that arises such as marketing, processing and transportation. The demand for horticultural products is projected to grow significantly in the coming decades, due to an increase in the awareness of their nutritional importance and the resultant increase in their consumption; this offers an opportunity to absorb an ever-increasing unemployed labour force.

2.4. Specification of product

2.4.1. Pumpkins

Scientific name: Curcubita pepo and Cucurbita maxima

2.4.2. Cabbage

Cabbage is believed to have evolved from a wild form native to Europe, growing along the coast of the North Sea, the English Channel and Northern Mediterranean. Theoprastus discovered cabbage in 350 BC and the Greeks cultivated it as early as 600 BC and they believed that cabbage was a gift from the gods. Pliny reported a soft-headed form in ancient Rome and the Saxons and Romans probably cultivated it and introduced it to the British. The ardheaded types were only mentioned in the 9th century. The early Egyptians are said to have worshipped it. The plant was used for medicinal purpose to treat gout, stomach problems, deafness, headache and hangovers in the early days. Cabbage is now grown throughout the world.

2.4.3. Onion

Onions are broadly categorised into short-day, intermediate and long-day type. In South Africa, only short-day and intermediate-day onions are produced. The former are grown in the northern areas, as far as Kimberley, while the intermediate types are grown in the Eastern Cape. The short-day onions are generally straw-coloured, do not dry to a brown colour and have limited storage life, while the intermediates are copper-to brown-coloured, and have a long storage life under optimal production and post harvest.

Total onion production in South Africa is approximately 220 000 tons per year. The top production areas are Ceres (ca.22.2%), Brits (ca 20.9%), Limpopo Province (ca.20.9%) and the combine Free State and Northern Cape production areas (19.8%).

Between 25% and 30% of the total production is exported, mainly to Zimbabwe, Namibia and Angola with small volume going to Europe and other destination like Asia.

2.4.4. Green Beans

Green beans, otherwise known as snap or string beans, are the most edible pod beans. The lima beans are the most common shell been sold. Edamame, a shell bean, is also called an immature green soybean. The popularity of this bean has grown in the past decade and is now easily found frozen in most major supermarkets.

2.5. Selling proposition

Fresh produce vegetables are not seasonal and required as nutritional diet throughout the year. With the ever increasing population, movement to urban areas and the decreasing number of producers, the project is bound to succeed. Our unique selling proposition is quality production and travelling the extra mile to the satisfaction of our customers.

2.6. Source of revenue

The project will earn its revenue from strategic marketing of Fresh Produce Vegetables.

2.7. Potential development

There is an additional 15ha of dry land which could be developed, this will happened after the total amount of ABSA have being settled in order to procure a pivotal irrigation system and implements that can be cultivated, the production will therefore increase and so as job opportunities for the local society.

2.8. Export potential

There is huge export potential to Southern African countries, however due to the perishable nature of fresh produce vegetables it is not an ideal situation to export vegetables but possible with the current technologies. Canned vegetables have a lasting life cycle and may be export all over the world.

3. Industry Analysis

3.1. Domestic production

There is a decline in the number of commercial producers and an increase in the population. Commercial farmers number fell from 66000 in the 1990's to 44000 in 2004 and 40000 in 2001. Of the South African population of 47.4 million people, 15.3 million are in the age group of 0 to 14 years, 28.4 million are in the age group of 15 to 60 years and there are 3.7 million people older than 60 years (Info: Stats SA). It is concluded that in order to provide a healthy diet to all the people in South Africa, current annual production will have to double per annum.

Horticultural crops, particularly vegetables are produced throughout South Africa. However the following areas are very important:

- The South- Western and Southern region of the Western Cape for deciduous fruit, grapes, wines and vegetables.
- The low-lying, sub-tropical areas of Mpumalanga and the Northern Province for subtropical crops, citrus and vegetables.
- The lower reaches of river valleys of the Eastern Cape for citrus and vegetables.
- The Upington area for export of grapes and wine.

Vegetables cultivated in South Africa are either supplied to on of the sixteen Fresh Produce Markets, local and chain retailers/Wholesales, directly to processors or they are sold at farm gate. Although the country has a comparatively large vegetables processing industry, there is scope for growth in processing activities for the domestic and export markets. Tomatoes are the most important vegetable crop, followed by Onions, Potatoes are also important in the fresh produce sector. Potato production 's gross value accounts for about 43% of major vegetables, 15% of horticultural products and 4% of total agricultural production (NDA,2003). Potatoes also benefit from being considered as both a stable starch and relish in different sectors of the South African population. There has been steady growth in speciality vegetable products, such as Asparagus, celery, lettuce and baby-marrows.

3.2. Important Stakeholders

National Empowerment Fund – Financial support to kick start the project.

The Department of Rural Development – Proactive Land Acquisition Strategy.

Department of Agriculture – Technical support.

Fresh Produce Markets (Mangaung & Kimberley) – Marketing of the product.

3.3. Growth Opportunity

The project has growth opportunity to canning (Vegetables in cans) that can be exported to other countries; furthermore the project may also have its own mini market in Kimberley or in Boshof.

3.4. Growth constraints

The high cost of inputs

Deteriorate of soil by natural disasters and global warming.

Fluctuation of market prices

3.5. Market segmentation

The segmentation of markets is extremely important from a marketing point of view because the two markets buys differently, consequently the composition of seller's market mix (Product, Price, Place, Promotion and Distribution) will depend upon whether it is directed towards the consumer market or business market.

Business users are business organisations that buy products to use in their own business to other products e.g. Fresh Produce Markets. The business user is total constitutes the '' Business Market"'.

Ultimate consumer uses the product for their own personal or household like a traditional ceremony.

4. Competitor Analysis

Large scale commercial farmers still dominate the majority of the supply to the National Fresh Produce Markets with up to 80% while small producers supply the remaining variable. These large producers have their own implements, reliable transport, further they are organised as union where they share information and support each other. Large producers offers quality products to the markets and their service is reliable and consistence.

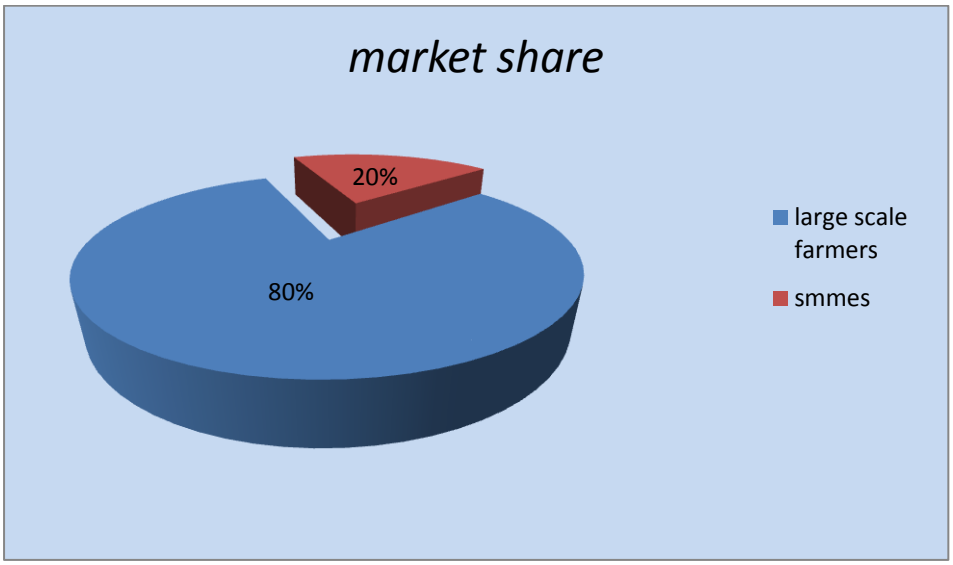
Large scale well established commercial white farmers still dominate the supply to the markets, the market have trust in their quality and consistency, they have experience in farming and better infrastructures on their farms, they have organised unions such as Potato South Africa, Bosmara Society, Dohne Merino Society etc were they share information and support each other. Their weakness is however the feedlot production system which is a problem to the health conscious South African, they also failed to market their products to black communities for traditional ceremonies and funeral undertakers.

4.1. Competitive Strategies

Strategy	**Description**
Target Market	The business will form alliance with Agents based at Fresh Produce Markets at a specific marketing fee
Production efficiency	The farm will focus of efficiency with the aim of reducing operational costs and satisfying the customers by always meeting their demands.
Differentiation	The farm will aim to differentiate its products

	from the products of other farmers through the use of technology and product quality.

4.2. Market share



Fiqure1, indicates that large scale well established farmers still dominate the *market****.***

4.3. Barrier to entry

There are substantial barriers concerning the direct trade of small scale farmers with supermarkets, this channel is extremely demanding and they prefer to rely on their developed supplier network as their main supply channels. Thus, National Fresh Produce Markets have allowed for the provision of alternative channels of inclusion of small scale farmers into the modern day markets, this goes well for these small producers of fresh produce, and can allow for further development in terms of standards protocol, production and possible export opportunity.

The continued use of Afrikaans only in the Agricultural Industry denies African farmers to valuable information.

The high start up capital required, the farming business requires patience as in most cases the return on investment may only be realised after a certain period of operation.

High input prices.

The fluctuating markets prices that control by supply and demand and are not reliable.

4.4. Market segmentation

The composition of seller mix (Product, Price, Place and Promotion) will be directed to business user. Our main target market with vegetables is the Fresh Produce Markets and Retailer.

4.5. Recent Development

The recent departure of South African white farmers to Georgia and Congo whereby they have being given hectares of agricultural land pose a serious threat to food security in South Africa.

The Department of Agriculture, Forestry and Fisheries (DAFF) has observed a general culture of non compliance by Producers, Packers, Sellers and retailers with respect to the regulations relating to the grading, packing and marketing of fresh vegetable intended for sale in South Africa throughout the National Fresh Produce Markets and retailers.

Regulation R69 of 13th February 2009 framed under the Agriculture Product Standards Act (APS Act)1990 (Act no 119 of 1990) was compiled by the end of December 2010. The aforementioned regulations came into force on the 13 February 2009 through Government Gazette no. 31828 which implies that due compliance by the Fresh Produce industry was immediately expected.

Fresh Vegetables shall be packed in accordance with section 6 and shall be marked in accordance with Section 10 of regulation R69 of the APS Act. Producers are obliged to apply for a producers code or Pack-house code from the DAFF which is a marking requirement for traceability purposes. Producers are to ensure that containers that are packed with fresh vegetables are marked clearly and legibly with prescribed particulars.

The first batch of products which the DAFF inspectors focused on were Carrots, Butternuts, Peppers, Cucumbers, Beetroots, Green Beans, Broccoli, Sweet Potatos, Asparagus, Mushrooms and Cabbages. Products such as Garlic, Tomatoes, Potatoes and Onion are already regulated and need to be fully complied with.

5. Supply Analysis

Producers deliver their fresh produce to Market Agents (14 in total of which 4 is under black ownership) who sell the fresh produce to buyers at a negotiable 7.5 % commission. Markets Agents strive towards ongoing relationships with supplying farmers and all of the Agents operating on this market have a combination of small-and commercial fresh produce suppliers. Verbal contracting is applied between Agents and the supplying Producers that they have recruited. The fresh Produce Producers are responsible for the grading, packaging and transport of product to the Market. After the product delivered to the market had been sold, the farmer will receive their sales income within three days to four days. On the market sales staff of the Market Agents negotiates with fresh produce buyers to secure sales with buyers, under the guidelines and margins set by the relevant Market Agent. According to the Market Agents the proposition of fresh produce received from emerging- and small scale producers, vary throughout the year, depending on the season. Problems experienced by Markets Agents on the markets included the theft of produce on trading floor, shortage of trading space due to the growth in the fresh produce market, as well as language and culture gaps in certain cases. Good communication with farmers, networking, maintaining long term relationships and the provision of advice regarding various aspects (Production, distribution,

grading, packaging, storage and marketing) are critical issues for the Markets Agents. In terms of the future, the Market Agents anticipated industry growth and increased participation of emerging farmers in the Mangaung Fresh Produce Market.

According to a study commissioned by the Mangaung Fresh Produce Market the total fresh produce turnover in South Africa amounts to R40 billion per annum, of which ; R20 billion 50% of total value, is consumed at source- R6 billion, 8% of total value, is sold through all the fresh produce markets in South Africa.

R1.8 billion +_ 80000 tonnes, is sold by the Mangaung Fresh Produce Markets annually including the fresh produce sold to informal traders to the value of R900 million per annum. On average trading day, they could see 2000 pedestrians 2900 trucks, 4 light vehicle; 15 000 people and 10 transactions. The market deals with unregistered buyers (informal traders/ Hawkers), registered buyers and guarantee (big) buyers by means of smart card debit system. Buyers on the market have acquired a smart debit card to do purchases on the market.

Mangaung Fresh Produce plays an in important role in the South African Produce supply chain, in terms of price determination and being a distribution point for fresh produce. Factors influencing price determination include supply, demand and Fresh Produce quality available on the market. The Fresh Produce price determined on the market, serves as reference price for many role-players in the fresh produce supply chain.

5.1. Quality, grades and standards

In order to ensure that the produce sold at the market is safe for consumption; random fresh samples are sent to an independent laboratory on a weekly basis, testing for residues and contamination that may be found on the produce, Product grading is a critical component of price determination on the market. However, only garlic and potatoes are still officially graded on the market while the grades for the other fresh produce are based on experience and negotiations. The fresh produce quality standards that were originally developed by the marketing authority serve as a reference point. According to some of the interviewed market agent's personnel, the size of producers did not guarantee good quality produce. Thus, both emerging and commercial farmers were able to comply with product standards and consequently there was no need to compromise of fresh produce quality due to the role of emerging farmers.

Many potato processors (E.g. McCain, Simba, Willard's) engage with contract farmers, but also procure first grade potatoes from the market to top up their raw material level in cases of shortage or natural disasters. Other major business buyers on the market include Pick n Pay, Fruit and Veg City, Tiger Brands, Spar and Fresh mark. The quality of product procured by these buyers on the market depends on consumer needs, availability and market price.

5.2. Market information

The communication of market information is extremely important component of the functioning of the market. In order to supply market information as widely as possible, the Johannesburg Fresh Produce Market is developing a SMS based system, this will enable the market to supply producers with up to date market data on a regular (and relatively cheap) basis to a wide range of producers, including emerging farmers with cell phone access.

5.3. Fresh produce in some of South Africa neighbouring countries.

Buyers at the Mangaung Fresh Produce Market include buyers from Lesotho.

6. Operational Analysis

NB: Soil samples will be regularly sent to laboratories to determine any deficiency in nutrition and soil disease.

Water will also be tested

The Fresh Produce Vegetable is under irrigation.

6.1. Pumpkins

6.1.1. Soil preparation

The soil should be ploughed to a depth of 15cm, especially if it contain sods or clay, at least one month before planting, special care should be taken to remove from the land any portion of the diseased plant which might affect the new plants. About two weeks before planting, the soil should be harrowed, rolled and dragged until it is smooth and mellow. It is then ready to be laid off in rows properly spaced to accommodate the vegetable.

6.1.2. Planting

Planting on raised bed promotes drainage, so the roots do not have to deal with constant wetness, which leads to disease problems. The seeds can be planted directly in the site where they will mature. Pumpkins are usually planted in hills. Plant two to three seeds per hill, about 2,5 cm deep and later thin to one plant per hill. Spacing varies with variety and vine size. Plants bush or shortvined varieties (these must be 0,5m to 1m apart in the row and 1m to 1,5m between rows.

The seeds can also be grown occasionally in seed trays. Sowing can begin outdoors in August, although September to November is the most favourable period countrywide, except for the low veld where seed is sown in autumn and winter.

6.1.3. Fertilisation

The plant respond to liberal dressing of manure and compost, which also hep the soil to retain moisture. Pumpkins appreciate to be treated generously through their growth period. Good feeding for pumpkins is liquid manure applied at interval of 2 weeks to 3 weeks, starting when the first flower buds open. Apply 5l per planting station following a good watering. A bit of additional feeding with 2:3:2 or 2:3:4 at a rate of 25g to 50g per plant when flowering starts and then again four weeks later will be beneficial. With a new hybrid pumpkin cultivar, STAR 7001, fertilisation with

a mixture of 2:3:2 (22) and superphosphate in a ratio of 6:4 at a rate of 600kg/ha, followed by two potassium nitrate (KN03) topdressing of 75kg each hectare, has proved to produce yields of 70t/ha.

Fertilisation	Application	Fertile soil	Infertile soil
1. 2:3:2	At planting	400	800
2. LAN	At 6 weeks	150	250

6.1.4 Irrigation

The first irrigation should be given immediately after planting, with the second and subsequent irrigations given at weekly intervals or even more frequently, depending upon the need, however, waterlogghing should avoided at all times. In the absence of rain, the plant should be watered generously; pumpkins prefer their water applied under the foliage. Regular wetting of the foliage encourages mild dew and also removes bait deposits once the fruit has set.`

6.1.5. Weed Control

Pumpkins require frequent weeding. The weeding may be performed 15 days to 20 days after seed sowing. A total of three weeding operations will be required. Herbicides can also be used for this purpose. For annual and perennial grasses on pumpkins, apply 1, 5 l/ha of haloxyfop-Rmenthyl ester. Dosage depends on grass species. Apply when annual grass species are in the 2 leaf to 6 leaf stage.

6.1.6. Pest Control

Pumpkins flies

Damage

Adults sting young fruit to lay eggs and cause sunken brown spots. White maggots developed inside the fruit.

Control As the adult flies neither suck nor chew the foliage, they are controlled by baiting. The bait mixture is splashed onto the leaves in coarse droplets. To obtain satisfactory control, it is most important to begin baiting when the first flowers appear and to do it consistently each week after heavy rain.

The following bait is effective:

Apply mercaptothion at a rate of 35L to 40L mixture per hectare as a coarse droplet spray on the underside of the foliage, which is 300g mercaptothion and 8 kg sugar in 35L to 40L water. Proper crop rotation is essential in pumpkins to reduce potential pest problems, never grow pumpkins on land that has been planted with any other cucurbit crops such as watermelon, squash. Etc. Within

the last three years. Proper rotation with no-cucurbit crops will help prevent potential problems from carryover of disease organisms on plant material.

6.2. Cabbage

6.2.1. Propagation

Cabbage is propagated from seeds.

6.2.2. Soil preparation

The land should be clean cultivated eight weeks before planting and the ground must be plough deeply, immediately before planting, with a disk harrow or the other suitable implements to a depth of 450 to 600mm. The soil should be fumigated two weeks before3 p-planting time if necessary to control nematodes.

6.2.3. Planting

Cabbage may be planted by direct-seeding or transplanting of seedling. If direct seeding is to be used, about 2 kg of seed per hectare may be required. Seedling should be transplanted as soon as they reach the desired size and only well- hardened, young, stocky plants should be used. Transplant is done on moist soil. The soil around the root should be firmed and irrigated as soon as possible after the seedling rare set. In wet areas Cabbage should be planted on raised beds or ridges to reduce water-looing and stem or root diseases. Plant population and spacing influence head size, head shape and yield. Cabbage forms smaller and slightly more pointed heads when they are spaced closely. Plant populations of 40 000 to 45 000 per hectare are suggested for large-headed types while for cultivars with medium-sized heads, populations of 55 000 to 65 000 plants per hectare are said to be ideal.

For baby Cabbage, population of 80 000 to 100 000 plants per hectare are recommended. It is recommended that large-headed cultivars should be planted 600 to 700mm apart between rows and 450mm apart within rows. Smaller- headed varieties are planted 600 x 300 mm apart.

6.2.4. Fertilisation

Cabbage is heavy feeder and requires supplemental fertilisation in the form of manure or compost, nitrogen, phosphorus and potassium. Fertilisation programmes should be based on soil analysis and should be developed for each field. Cabbage requires 200 to 250 kg nitrogen per hectare. Nitrogen is supplied in split applications, where 50% to 66% is broadcast and plough in just before planting. The application is made together with phosphorus and potassium. The remainder is side-dressed two to three weeks after planting and again three weeks later or applied once-off at about six weeks. If a fertiliser mixture is preferred, 1500kg of 2:3:2 (22) and 100kg potassium per hectare may be broadcasted before planting. A top dressing of 300kg LAN should be applied approximately four weeks after transplanting and again 4 weeks later if required. Cabbage also needs micronutrients for proper growth and development. The crop has a high requirement of calcium and deficiencies of this nutrient may occur on acid soils, on soils with very high potassium or on very dry soils. Foliar sprays of calcium nitrate can be used to supply calcium. Magnesium may also be deficient on acid soils, on

very light soils or on soils that are very high in potassium. Spraying the plants with 5kg magnesium per hectare can rectify the problem. Cabbage is very susceptible to molybdenum deficiency. Plants should be sprayed with 125g of sodium- or ammonium molybdate in 500L of water per hectare as soon as signs of deficiency are noticed. The availability of molybdenum may be increased by providing enough lime prior to planting. Iron may be applied with a foliar spray with 1% iron sulphate or chelelate. The deficiency of iron is common on calcareous. Alkaline soil. Manganese deficiencies are prevalent on soils with a ph of more than 5, 5. A foliar spray of 5kg per hectare of manganese sulphate or 2 to 3kg/ha of manganese oxide is suggested as soon as symptoms of deficiency are observed. Cabbage may have boron deficiencies in areas with high rainfall. Three kilograms of Solubor are effective in controlling boron deficiency.

6.2.5. Irrigation

Cabbage should be irrigated immediately after sowing or transplanting. Thereafter, irrigation should be applied at intervals of 10 to 12 days in heavy soils of eight.

Days in light soils and the schedule should be followed until the heads are fully developed and firm. Young plants should receive enough water for vegetative growth before forming heads. Excess moisture when the heads have formed may cause them to crack.

6.2.6. Weed Control

Weeds are controlled mechanically or by hand as well as chemically through the application of registered herbicides. Mechanical cultivation should be done during land preparation until the plants are about half-grown. The first cultivation should be done two to three weeks after transplanting.

6.3. Onion

Most a necessity when long-term storage and shipping under ambient are envisaged. The concentration and timing of application are critical, as high concentration and premature applications lead to development of soft bulbs which are prone to decay.

6.3.1. Soil and Climate requirement

The best result can be obtained on loamy soils which are deep and well drained to a depth of 120 cm, with a ph between 5,5 and 6,5. Onions grow best in temperature ranging from 18 to 22 Celcius Degree, higher temperature will promote bulb formation, while lower temperature will induce flowering.

6.3.2. Planting

Onions can be sown directly or seedling can be transplanted. After the transplanting, keep the soil moist for the first 5 days to overcome transplanting shock.

6.3.3. Fertilisation

During soil preparation, work in 100g of 2:3:2 (22) or 2:3:4 (30) per 1m2. Use 10g LAN per 1 m2 as well as 10g KCI per square metre 3 weeks after transplanting and again 6 weeks after planting.

6.3.4. Irrigation

Onion requires approximately 400 to 600mm of water during the growing season. Don't irrigate onion for 3 weeks before harvesting.

6.3.5. Weed Control

Weeds are pulled out by hands. Mechanical weed control can also be used. Use only registered herbicides**.**

6.3.6. Pest and Disease control

Thrips are very small insects which feed on leaves by sucking plant sap. Registered chemicals, good cultural practices (such as proper crop rotation) as well as field sanitation are the three mechanisms that should be integrated to control all the pests and disease affecting the crop. Proper sanitation should include the removal and destroying of all the disease plant material.

6.3.7. Harvesting

- Harvesting maturity is normally determined by the extent to which the tops have fallen. Bulbs which are harvested very late have a shorter storage life, however, they will also be significantly bigger than bulbs from early harvest, and therefore there will always be a compromise between maximum yield per hectare and maximum storage potential of crop.
- Curing bulbs will be lifted and stacked in windows to dry, this take place anywhere from two to eight weeks, depending on factors such as rainfall, maturity at harvest etc. The dried foliage of the bulb is then clipped, and bulbs are store in bins until grading and packing.

6.4. Green Beans

6.4.1. Climate requirement

The bean is warm season crop which is very sensitive to frost but dislikes hot conditions. It can be grown only during the frost-free portion of the year. Optimum mean temperatures are 15 to 27 Celsius degree. At temperature of 5 Celsius degree and lower, beans have a poor quality, with short, puffy, malformed pods; this can be a serious problem where beans are grown over winter in cooler frost-free areas. Temperature above 35 Celsius degree, especially when accompanied by hot, dry winds, may cause excessive shedding of flowers and young pods, resulting in poor yields. Ideal temperatures for germination are 20 to 30 Celsius degree, when plants should emerge within 5 to 10 days; minimum temperature for germination is 10 Celsius degree. During the summer, when periods of cool, cloudy weather encourage tender leaf growth are followed by hot dry days, the growing leaves are susceptible to sunburn and dieback.

6.4.2. Soils

Beans can generally successfully cultivated on a wide variety of soil types, ranging from sands to relatively heavy clays, provided they are well-drained to at least 400mm. Sandy-loam to loam soil are preferred. Soil which tends to crust should be avoided, because they may seriously reduce emergence, as well as detrimentally affecting subsequent growth. Green beans are amongst the

most sensitive vegetables to brackish condition and to high boron content in the soil. The ideal ph (chic) is between 5, 5 and 6,0.

6.4.3. Plants spacing and seeding rate

Dwarf beans are planted 40 to 70 mm apart in rows drain 450mm to 600mm apart. The closer spacing are generally preferred. With runners, spacing of 100mm to 150mm within the rows, and 900mm to 1000mm between the rows, is employed. Seed is planted directly in the field, to a depth of 30mm to 50 mm in sandy soil, and 20 to 30 mm in heavier soil, at the rate of 75 kg to 110kg per hectare for bush beans, and about 50kg per hectare for runner beans.

6.4.4. Land preparation

Prepare land to a good depth and tilth. Take care not to over-work and pulverise the soil, because this can increase soil capping.

6.4.5. Time of planting

Sep to Jan

August to March

6.4.6. Fertilisation requirement

The approximately absorption of major nutrients by relatively good crop and bush green.

	N	P	K
15 tons/ha Plants	100 50	10 6	55 45
total	150	16	100

Bearing in mind that this leguminous crop fixes some of its own nitrogen requirements, and that the plants are almost invariable ploughed back into the soil after harvest, it is clear that the fertiliser requirement are relatively low. Provided the soil phosphorus(P) and potassium (K) levels are reasonable high, the recommended application would be 70 kg nitrogen (N) and 40 kg per hectare at planting. A light top-dressing of nitrogen (30 kg N/ha), two or three weeks after emergence, may sometimes be advisable. For runner beans the fertiliser rates could be increased by about 25%. One or two extra light side dressing of nitrogen would normally be beneficial for pole beans. A general fertiliser programme could be 250 to 500 kg 2:3:4 (30)/ha at planting, followed by 200 to 250 kg LAN 3 weeks later.

6.4.7. Irrigation

Rapid, uninterrupted growth is necessary for good yields. Wet the soil to a depth of 450 mm before planting, and do not re-wet until the plants have emerged, unless the topsoil in which the seed occurs dries out excessively. During the first half of the growing season (about four weeks in most instances), wet the soil to a depth of 450 mm only when the depletion of the available soil moisture approaches 80%, this allows the development of a deeper and more extensive root-system without normally detrimentally affecting yield or quality. Thereafter, wet the soil to a depth of 600 mm when no more than half the available soil moisture has been utilised. Maintaining soil moisture from early

flowering is essential. During hot weather, about 35mm every 10 to 14 days during early growth, and at weekly intervals from flowering onwards, should meet the crop water requirements.

6.4.8. Herbicides

The following herbicides are registered for use:

Ben dioxide (sold as Basagran) is used as a post- emergent, after the first trifoliate leaf of the bean plant has fully expanded, against annual broad-leafed weeds; some crop damage is sometimes evident, especially when used under low humidity condition. Basgran may have a slight effect against yellow nutsedge. Cycloxydim (focus Ultra), fluazifop-P-butyl 9 Grasses or Fusilade Super).

Bollworm nematode Aphids CMR beetles Plusia looper red spider mite other beetle seed maggots bean fly stinkbugs Thrips.

6.4.9. Diseases

There are several registrations for chemical use against bean disease.

Rust dumping off anthracnose bacterial blights Sclerotinia rot virus disease Copper- based are to control bacterial blights, which are favoured by prolonged, wet growing conditions. Dissemination of the bacteria is by rain splatter, and the production of good-quality seed, free of the causal bacteria, has greatly reduced the problem. The incidence of anthracnose has also diminished with the availability of good quality seed. A number of preventive and systemic fungicides are registered for control rust, which gain in importance with the late summer and autumn. Sclerotinia rot is encouraged by cool, crowded growing conditions. The white fungal growth infects flowers and spread quickly to all parts, especially stem and pods near the ground. Procymidone (sold as Sumisclex) is registered for control of the rot, and is applied twice, commencing at early flowering stage.

6.4.10. Length of crop

Most bush bean cultivars will reach picking maturity within 50 to 60 days when grown during warmer months, but cropping may be delayed for up to three or four weeks under cooler conditions. The crop is usually harvested over a two or three-week period. Runner bean cultivars usually take 10 to 14 days longer to reach maturity, and are harvested over a four-to six – week period.

6.4.11. Harvesting and picking

Selective harvesting of well –developed but young pods, before the seeds have developed appreciably, is usually practiced. Frequent picking, about twice a week under warm condition, ensures a better quality and, unless the plants are damaged in the processes, a higher yield, than when picking is less frequent. Ensure that plants are disturbed as little as possible during harvesting, as rough handling can severely reduce size and quality of later picks. Pack fairly tightly in green mesh pockets, holding about 10kg of product, for marketing, but ensure that pods are not damaged in the process. The use of cartons holding about about 5kg, and various other containers, which also protect the product better than mesh products, are generally finding more favour, particularly on the large National Markets, The 5kg cartons, for example, at present account for about 75% of all

bean sales on the Mangaung Market, with nearly 10% as pre- packs, and only 2 % to 3% in 10kg pockets. The preference at market outlets and the cost/return indications should be investigated.

6.5. Rotational Strategy

Crop rotation is practice of growing different crop on the same land in a regular recurring sequence. The succeeding crop belongs to a different family than the previous one. Effects of crop rotation are as follows:

- Higher diversity in plants production and thus in human and livestock nutrients.
- Reduction and reduced risk of pest and weed infestation.
- Greater distribution of channels or biopores created by diverse root.
- Better distribution of water and nutrients through the soil profile.
- Exploration for nutrients and water of the whole soil profile by roots of many different plants species resulting in an optimal use of the available nutrients and improved balance of N/P/K from both organic and mineral source.
- Increased human formation.

6.5.1. Means and practices of crop rotation

- Crop rotation plan/ design should be guided by the set objectives i.e. food and fodder production (grain, leaf, and stalks), residue production, pest and weed control, nutrients uptake and biological subsurface mixing/ cultivation, etc.
- For better result: appropriate/improved seeds as well as high residue production of above ground and below-ground biomass**.**

6.5.2. Advantages or benefits of crop rotation

- It improves the soil structure and reduces depletion/erosion: Some crops have strong, deep roots. They can break up hardpans, and tap moisture and nutrients from deep in the soil. Others have many fine, shallow roots. They tap nutrients near the surface and blind the soil. They form many tiny holes so that air and water can get into soil.
- It increases soil fertility: Legumes (such as groundnuts and beans) fix nitrogen in the soil. When their green parts and roots rot, this nitrogen can be used by other crops such as maize. The result is higher more stable yield, without the need to apply expensive inorganic fertilisers.
- It help control weeds pests and disease hence reduce reliance on synthetic chemicals: planting same crop season after season encourages certain weeds, insects and disease, planting different crops break their life cycle and prevents them from multiplying.
- It producers different types of out put: Growing a mix of grain, beans, vegetables and fodder means a more varied diet and more types of produce to sell.

- It reduces risk: A single crop may fail because of drought. It may be attacked by pests. Or its market price may be low when time comes to sell. Producing several different crops reduces these risks.
- Crop rotation may also replace ploughing the soil since it helps aerate, the soil, recycles nutrients, and help control weeds, pests and disease hence perfectly fitting within the ideals of conservation agriculture.
- Intercropping, strip cropping and relay cropping bring many of the same advantages as rotation. Even so, it is a good idea to rotate crops even if you use these approaches.

Which crop should not be planted together or in rotation?

The table below indicates which crop are in the groups that suffer from the same pest and disease problems and which should therefore not be planted in rotation.

Group 1	**Group 2**	**Group 3**	**Group 4**	**Group 5**	**Group 6**	**Group 7**
Cucumber	Broccoli	Eggplant	Beetroot	Corn	Beans	Garlic
Gourds	Brussels	Pepper	Spinach	Cereal	Peas	Leeks
Musk melon	Sprouts	Potato	Beet			Onion
Pumpkin	Cabbage	Tomato	Carrots			
Summer squash	Collards		Lettuce			
Watermelon	Kole		Parsnips			
Winter squash	Kohlrabi					
	Radsh					

7. SWOT Analysis

7.1. Strength

- The farm is available with Vegetables infrastructure in place.
- There is a 9ha under irrigation for planting of Vegetables.
- There is strong sufficient water.
- The farm has the right soil type and temperature for the envisaged Vegetables.
- There is Market agreements with Agents at Mangaung and Kimberley Fresh Produce.
- The farm is located between two major cities, approximately 60km from Kimberley and 130 km from Bloemfontein were Markets are based.
- The Extension Officer from the Department of Agriculture is based in Boshof which is 10km from the farm for technical support.

7.2. Weakness

- Financial constraints to pull the project.

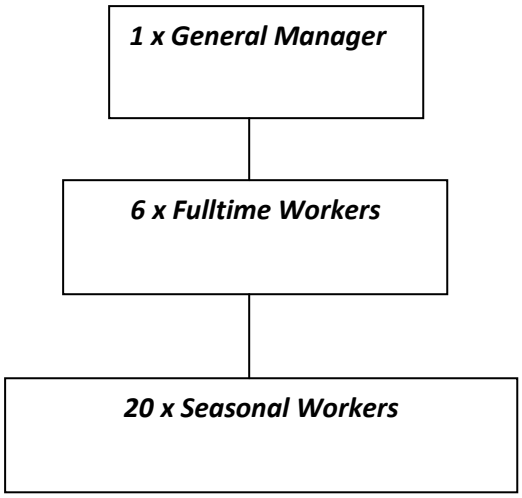
7.3. Opportunity

- Diversify in terms of product offering and targeted markers.
- Increase prices through better coordination.
- Increase production quantity and quality and sales through better technical and business skills**.**

7.4. Threats

- Farmers producing the same products in the area.
- Basic survival is a struggle for many emerging farmers.

8. Human Resource and Management



8.1. Leaning and development

Learning& development objective	Strategies
To be one of the best farm employee.	Match values and principles of all farm workers with those of the business.
To attract the best farm skills and talents to the business.	Head hunt and remunerate employees based on performance.
To retain the best skills and talents.	Create conducive and motivating work environment.
To increase use of farm technology in order to enhance competitive advantage.	Employee training in the use of the latest farm technology.

8.2. Socio Economic Benefit

8.2.1. Job Creation

The following job creation will be realised:

6 x Fulltime Employers

8.2.2. Poverty alleviation

The project will address the issue of imbalance land ownership in South Africa, alleviate poverty through job creation and enhance food security in our country.

8.2.3. Woman participation

3 x Woman will be fulltime employed.

8.2.4. Skills transfer

The 3 fulltime employees will receive training on Beef and Vegetable production

8.2.5. Households to benefit

Approximately 13 household will benefit from this project.

9. Risk Analysis

Market risk: Changes in consumer preference, price fluctuation, over supply.	Engagement with all relevant stakeholders.
Policy risk: change in tariff regime, marketing arrangements, trade policy.	Engagement with all relevant stakeholders
Social risk: labour action, personal circumstances.	Provision of conducive working environment and attractive remuneration.

10. Market Analysis-

10.1. Target Market Analysis

The 16 National Fresh Produce Markets are not only the main distribution channels but also act as the primary reference point in price determination, as Local Government owned institution; these Fresh Produce Markets have a role to play in empowering the emerging sector of economy.

Opportunity have arisen in terms of scale farmers with introduction of critical training and market information being made available to them, and with Fresh Produce Market linking these small farmers with service suppliers.

The recent introduction of satellite markets has benefitted the producers as it brings the producer closer to customers and provides convenience and better customer satisfaction.

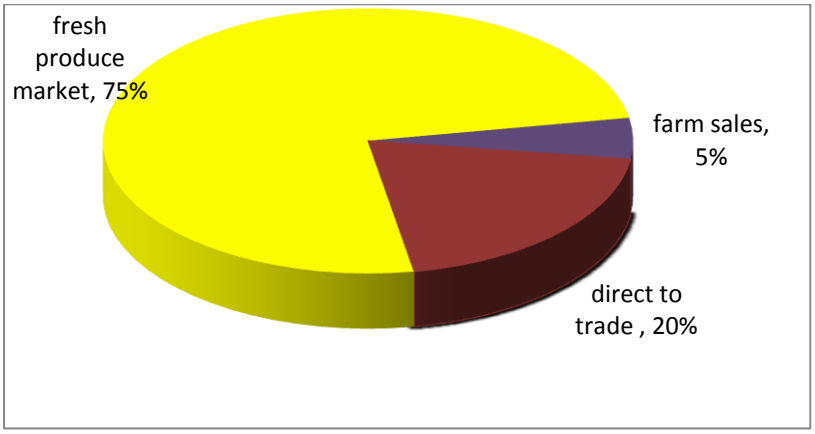


Figure2 shows 75% of the vegetables will be market through the Fresh Produce Market, while 20% to trade or retailers and 5% direct from the farm

10.2. Target Market and Geographic Coverage.

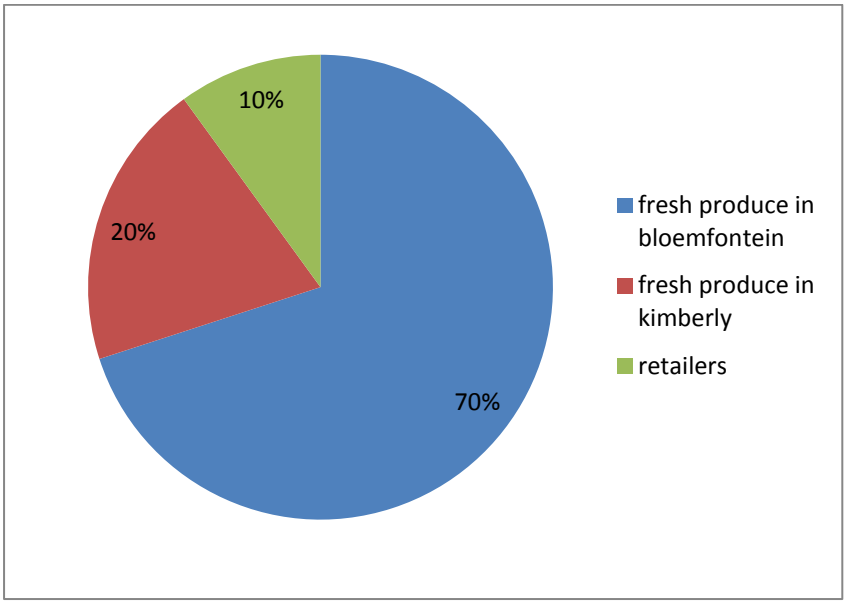


Figure3, Shows Bloemfontein (Mangaung) is our largest target, follows by Kimberley and then retailers in both cities.

Mangaung Fresh Produce (Bloemfontein) is one of the four medium markets in South Africa while Kimberley one of the six smaller markets.

10.3 Bargaining powers of customers

Producers market directly to Fresh Produce Markets and Retailer; therefore many significant and beneficial aspects can be taken advantage of, in particularly the following: security of payments, lower marketing costs in return for them is lower prices, convenience, less handling and better quality.

Vegetables buyers or consumers have a relatively high bargaining power within the industry, demands for Vegetables is therefore largely reflected by consumers consumption patterns, customers preference, social appetite, belief and viewpoints per unique geographical location.

The farmer is largely depend on the consumer, the consumer ability to purchase is influence by his/her income level, current debt situation and prices willing to pay.

10.**4 Distribution Channels**

The distribution channels within South Africa are diversifying leading to ample choice of market option for farmers.

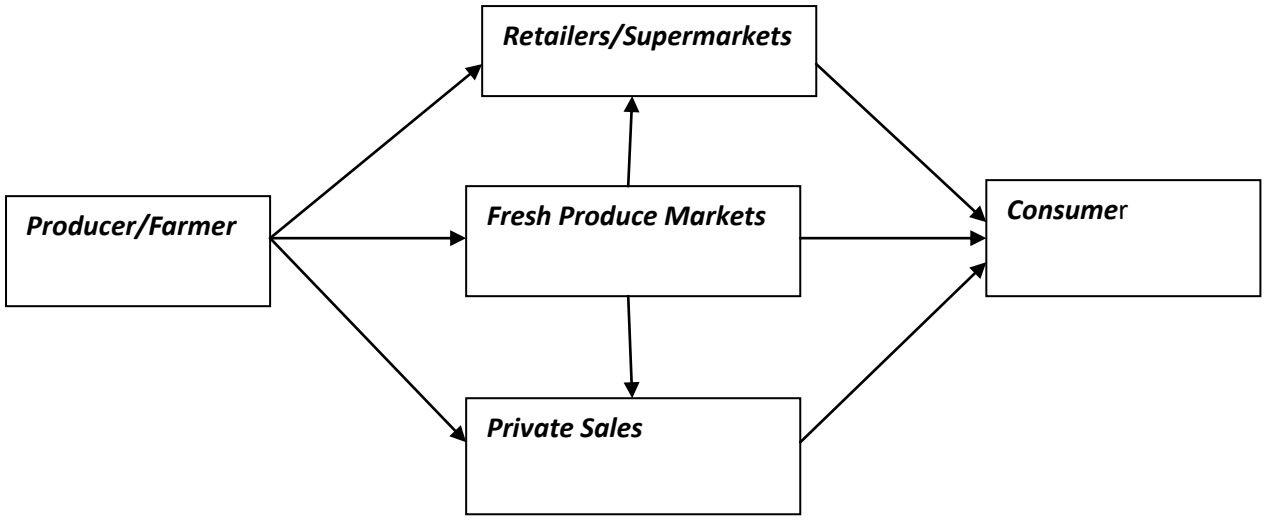


Figure 4, shows vegetable channels before reaching the consumer

Local (Municipality) authorities around South Africa own a total of 17 Fresh Produce Markets. The Markets form the primary distribution channel for vegetables. Although the world economy remains uncertain global food supply and demand are favourable, so farmers can expect product prices at current or higher levels in the coming years.

The role of the Fresh Produce Market was (and still is) to provide the necessary and obvious facilities to compensate for and cover the growing gap in the market that was emerging. The provision of these FPMs was to allow for equal trade opportunities for large scale, commercialised producers and smallholder farmers producing small quantities of produce. The implementation of these markets started as a Government Act. They are legally bound to allow anyone to engage in trade without discrimination base on size, colour or origin. The FPMs have allowed for small scale farmers to find a market and sell their products easily, as the barriers to entry into the market would otherwise be near impossible, as large corporate buyers and marketing agents are not interested in procuring small, fluctuating quantities.

10.5. Marketing Strategy and Budget

The marketing is done strategically by the Agents based at the Fresh Produce Markets at a fee of 12, 5% (Market + Agent) for all crops, the fees are therefore deducted from the price of the vegetables.

Product	***Price***	***Place***	***Promotion***
Cabbage	*1ha yield 75 tons under irrigation* *75tons x 9ha = 675 tons/9ha* *1ton = R1 731.67* *R1 731.67 x 675 =* ***R1 168 877.25***	*Fresh Produce Markets in Bloemfontein and Kimberley*	*Market arrangements*
Onions	*1ha yield 60 tons under irrigation* *120 tons x 2ha = 120tons/2ha* *1ton = R2585.53.53* *R2585.53 x120 =* ***R310 263.60***	*Fresh Produce Markets in Bloemfontein and Kimberley*	*Market arrangements*
Green Beans	*1ha yield 12 tons under irrigation* *12 tons x 2ha = 24tons/2ha* *1ton = R6 892.14* *R6892.14 x24 =* ***R165 411.36***	*Fresh Produce Markets in Bloemfontein and Kimberley*	*Market arrangements*
Pumpkins	*1ha yield 40 tons under irrigation*	*Fresh Produce Markets in Bloemfontein and Kimberley*	*Market arrangements*

	40 tons x 2ha = 80tons/2ha *1ton = R1617.18* *R2217 x80 =* ***R129 374.40***		

Market Times:

Cabbage = through the year

Onions = October/November

Green Beans = December

Pumpkins = March/ April

Source: Abstract Agricultural Statics 2011, Department of Agriculture, Forestry and Fishery.

And Farmers Weekly Market Analysis (24 August 2012)

11. Financial/ Economic Analysis

Financial Objective and Strategies

Financial Objectives	Strategies
To achieve sales of no less than R1 630 267.00 annually and meet all the business financial obligations.	Effective utilisation of production systems, targeting the right customers in the market and determine the right sales mix of the product and services offered by the business**.**
To achieve an annual gross profit of no less than R1 114 467.00	As above**.**
To achieve a net profit after tax of not less than R220 204.58	As above.
To successfully do an annual loan repayment.	Responsible financial management and good corporate governance.
To ensure accountable, transparent and responsible financial management based on sound business management**.**	Procument policy

B. Assumptions

Cabbage yield per ha under irrigation	=	*70 tons*
Cabbage producer price	=	*R1 731.67/ton*
Onion yield per ha under irrigation	=	*60 tons*
Onion producer price	=	*R2 585.53/ton*
Green Beans yield per ha under irrigation	=	*12 tons*
Green Beans producer price	=	*R6 892.00/ton*
Pumpkins yield per ha under irrigation	=	*40 tons*
Pumpkins producer price	=	*R1 617.18/ton*

Source: Abstract Agricultural Statistics 2011, Department of Agriculture, Forestry and Fishery and Farmers Weekly Market Analysis (24 August 2012)