2008

Organic Cotton Farming

Pre-Feasibility Study






Urban-Econ Development Economists

1088 Pretorius Street, Hatfield, 0028

Tel: 012 342 8686

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1. Introduction

The agriculture sector has been identified as having the third largest comparative advantage in Lepelle-Nkumpi. Lepelle-Nkumpi has a very advantageous climate and land for the development of high-value organic products, which could also complement activities of a tourism cluster. The LED also identifies optimal plant species that could be farmed in the area – this includes tomatoes, cotton, soy beans, butternut, pumpkin, cabbages, onions and peppers, to name but a few.

The purpose of this pre-feasibility is to determine whether organic cotton farming in Lepelle-Nkumpi in the Grootfontein area will be an economically and socially sustainable project.

The remainder of this pre-feasibility is comprised of the following sections:

- Development Description
- Market analysis
- Risks, strengths and impact

2. Development Description

2.1 BACKGROUND TO ORGANIC FARMING

The International Federation of Organic Agriculture Movements[1] adopted the following definition for organic agriculture:

> *"Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather that the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved."*

Health, ecology, care and fairness are the fundamentals of organic agriculture that are embraced by IFOAM. Organic farming strictly excludes the use of synthetic fertilizers, pesticides and growth regulators and uses crop rotations, crop residues and organic inputs such as animal manure and legumes to feed the soil and supply plant nutrients (Diver, *et al*. 1999) thereby enhancing ecosystem health whilst minimising adverse effects on natural resources (Morrison, *et al*. 2005).

According to IFOAM, South Africa has 250 certified farms and 45,000 hectares of certified organic land, which account for 0.05% of the country's total agricultural area. Certified organic production started with rooibos tea, mangoes, avocados, herbs, spices and vegetables and has expanded to include a much wider range of products: organic wines, olive oil, speciality vegetables and berries, citrus, sub-tropical fruit and dairy products.

Organic Agricultural Association of South Africa
Coordinator: James Moffett
Tel: 011 7062672
Email: oaasa@anazi.co.za
Website: www.oaasa.co.za

There are two key organisations promoting organic agriculture in South Africa. The Organic Agricultural Association of South Africa (OASSA) and the Biodynamic Agricultural Association of South Africa (BDAASA) are both non-profit organisations whose

Biodynamic Agricultural Association of South Africa
Coordinator: Piet A. Gernaat
Tel: 011 8037191
Email: pietgernaat@hotmail.com
Website: www.bdaasa.org.za

[1] IFOAM, 2008. www.ifoam.org

intention is to further the organic movement by providing a network for all stakeholders.

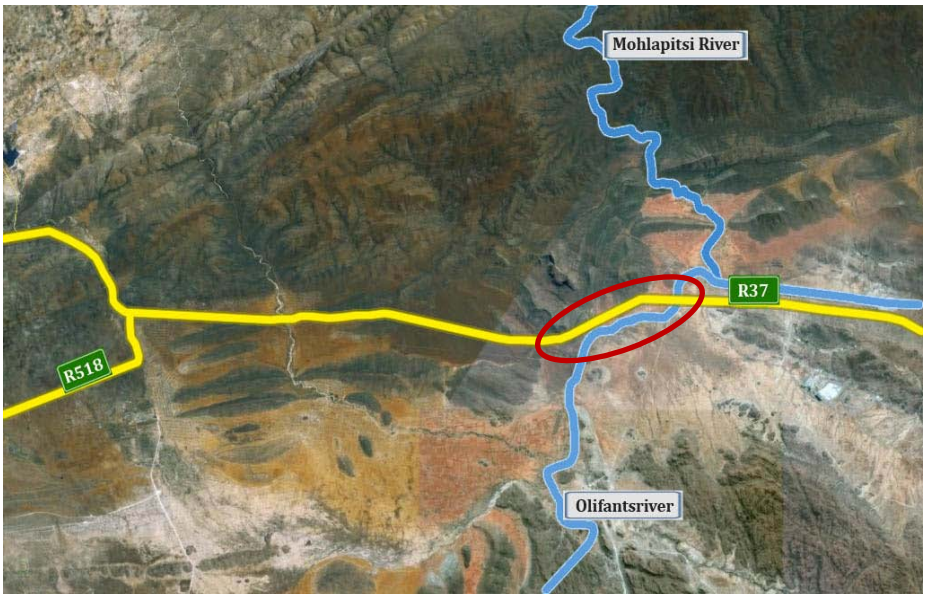
Africa's Farms Certified Organic (AFRISCO) is a driving force behind local organic certification. Its interim organic standards are based on the second draft (published in October 2001) of the South African National Department of Agriculture's new regulations under the Agricultural Product Standards Act of 1990[2]. The regulations are based on IFOAM standards and EU regulations, and cover crops, live stock, products from bee-keeping and processed products for human consumption.

The South African organic agricultural sector has also been receiving support from the following external organisations amongst others:

- African Organic Farming Foundation (AOFF)
- Centre for the Promotion of Imports from Developing Countries (CBI)
- Food and Agriculture Organisation (FAO)
- International Federation of Organic Agriculture Movement (IFOAM)
- International Trade Centre (ITC)

2.2 PROJECT LOCATION

Various areas towards the north-eastern side of the Municipality along the Olifantsriver on the southern boundary have been identified as having potential for agricultural developments.



The map indicates the proposed site for the project. It is evident from the map that there is enough water for the development, seeing as it is located along the Olifantsriver.

The site is also accessible from the R37 connecting

2 See http://www.afrisco.net/

Lydenburg and Polokwane.

Source: Google Earth

2.3 PROJECT DETAILS AND INFRASTRUCTURE NEEDS

Organic cotton farming is based on a systems approach involving the integration of many practices into a larger system. Cover crops, strip cropping, grazing and crop rotation are some of the practices used for good soil and biodiversity management and assist in pest control and self-sufficient fertility (Guerena & Sullivan, 2003). Therefore, cotton will be one of several crops the organic farmer could grow.

In order to market a crop as organic, one must be certified through a third party, which involves on-farm inspections and paying a certification fee. Thereafter organic lands must be managed using organic practices for 36 months prior to harvesting the first certified organic crop. During this "transition period" the soil adjusts to the new system (Martin, 2006).

It is suggested that sunn hemp be planted as a cover crop to prepare the land and provide the soil with the needed nutrients and organic matter. This green manure will then be plowed into the ground after it has grown for a specific time to protect and improve soil fertility before planting the first cotton seeds. This could improve yield by almost 30%[3].

Organic production begins with organically grown seeds. Untreated seeds may also be used if certified organic seeds cannot be located, as long as they are not derived from genetically modified plants. Most certifiers will accept proof that growers have tried unsuccessfully to buy organic material from at least three different suppliers as evidence of unavailability[4].

Crop rotation is considered fundamental to successful organic farming. Not only does it diversify the whole farm system both economically and biologically, but it is also a means of pest control, it affects

3 According to Mr. Randolph Meyer from Profert fertilizers

4 Appropriate Technology Transfer for Rural Areas (ATTRA): Organic cotton production. www.attra.ncat.org

the fertility of the soil and could improve yield by up to 11%[5]. A standard recommendation for an effective rotation is a minimum two-year planting of a non-host species (Lakhal *et al*, 2008). Cotton crops could be rotated by a choice of the following optimal plant species:

- Tomato
- Legumes such as soy beans & lentils
- Pumpkin
- Red pepper

In order to diversify the crop, it is suggested that the land be used to cultivate cotton, pumpkin and tomatoes simultaneously. This will also ensure an income for the farmer while waiting for the main crop of cotton.

It is suggested that drip irrigation be used as this type of irrigation is best suitable for cotton prodution, and is also more cost effective and water efficient than other methods of irrigation. According to Mr. Randolph Meyer, the same amount of water used to irrigate a hectare of land, when using centre pivot irrigation, can be used to irrigate four hectares of land when using drip irrigation. This is because with this system, drops of water are delivered at or near the root zone of plants, minimising evaporation and runoff if managed properly.

5 Appropriate Technology Transfer for Rural Areas (ATTRA): Organic cotton production. www.attra.ncat.org

3. Market Analysis

3.1 TRENDS

There are indications of strong growth in the sale of organic products, organic cotton clothing in particular. According to Organic Exchange[6], the global organic cotton market has undergone tremendous growth since 2001. Consumer awareness of and demand for organic cotton has increased significantly. Furthermore, this trend is expected to continue into the future as more and more consumers seek organic and sustainable lifestyles.

Organic exchange reports that global sales of organic cotton products increased by 85% between 2005 and 2006 and 83% between 2006 and 2007. The most popular organic cotton products, by virtue of sales, are items of clothing.

The organic cotton trend began in South Africa, when Woolworths launched its first 100% organic cotton clothing line in 2004.[7] Woolworths has since spearheaded a movement for the local production of organic cotton. This dream has since been realized, with South Africa's first organic cotton harvest now being harvested in Limpopo and there are plans for large-scale production in South Africa by 2010.[8]

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6 Organic Exchange, Organic Cotton Market Report, 2007. http://www.organicexchange.org

7 ComMark, Organic Cotton Farming in South Africa: Business Case Development and Demonstration Pilots, 2008

8 ComMark, Organic Cotton Farming in South Africa: Business Case Development and Demonstration Pilots, 2008

Lepelle-Nkumpi is strategically located in close proximity to Gauteng, which implies minimal transportation costs should a clothing production initiative be implemented in the economic hub of the country.

3.2 SUPPLY ANALYSIS

The organic cotton industry in South Africa provides lucrative opportunities to cotton farmers, as there is only one other producer of organic cotton in South Africa – Hannaline Farms near Musina in Limpopo. At the moment only pilot projects have been undertaken for organic cotton farming and the first organic cotton planted on a commercial scale was harvested on 29 May 2008[9].

Woolworths, in co-operation with ConMark, Cotton SA, the Organic Exchange and the Agricultural Research Council (ARC's) Institute for Industrial Crops, had established this project in 2004 to produce clothing made from 100% organic cotton[10].

3.3 DEMAND ANALYSIS

Consumers are becoming more aware of living a "green" lifestyle, therefore companies around the world are using organic cotton and other organic products to reduce the negative impact on the environment. Organic fibre production must continue to increase at a rate of 40% per year to meet projected demand[11].

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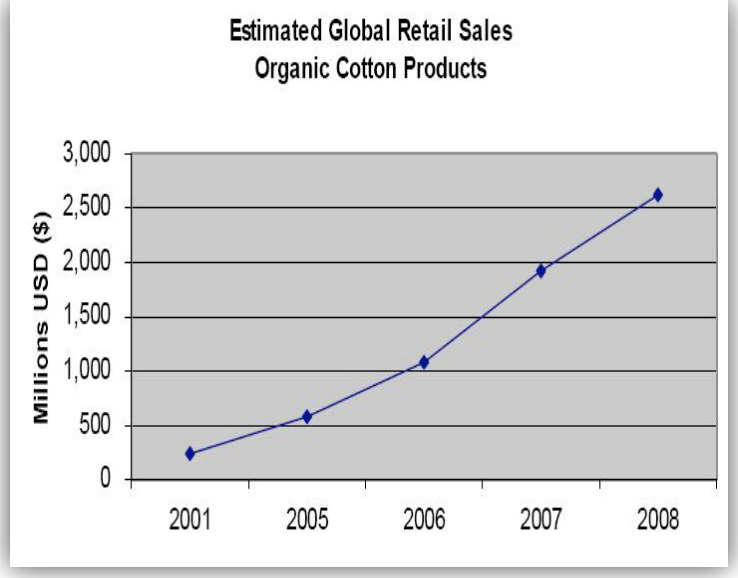
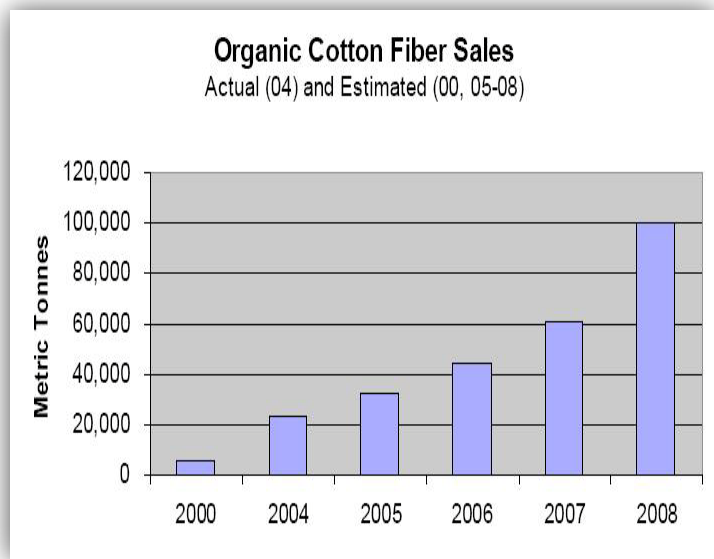


9 *Farmers* Weekly: Organic cotton now grown commercially (p19), 20 June 2008.

10 ConMark, *Organic Cotton Farming in South Africa: H*arvesting of first *locally grown organic cotton crop, 2008*

11 *Woolworths Holdings Limited, Woolworths spearheading South Africa's own organic cotton industry. www.woolworthsholdings.co.za*

Source: Organic Cotton Market Report, 2006



To meet the growing demand for organic cotton products by brands and retailers, more manufacturers have entered the market. Manufacturer demand for organic fibre increased from 5,720 metric tons in 2000 to 32,326 metric tons in 2005, an estimated annual average growth rate of 93%[12]. It is estimated that in 2008 manufacturer demand for organic cotton fibre will be 99,662 (as can be seen in the figure).

Source: Organic Cotton Market Report, 2006

Woolworths, the world's third largest consumer of organic cotton[13], has been sourcing all the organic cotton used from outside South Africa. They are now committed to promote the use of organic cotton and also to grow the local organic cotton industry[14].

The sale of organic food in South Africa has grown from an estimated five million rand before 2003 to a staggering R 155 million in 2005, with expected increases in the years to come[15]. Organic products are widely available in supermarkets and chains such as Pick 'n Pay, Checkers and Woolworths.

12 Organic Exchange, Organic Cotton Market Report, 2006

13 ConMark, Organic Cotton Farming in South Africa: SA's first organic cotton harvest on the go, 2008

14 ConMark, Organic Cotton Farming in South Africa: SA's first organic cotton harvest on the go, 2008

15 Organic (Ltd) News, Quiet Organic Revolution in South Africa

Organic farmers are assured of a market for their output; with the sophisticated, health-conscious end of the South African market vying for supply as well as the opportunities presented by European and American export markets.

3.4 TARGET MARKET

Woolworths was announced to be the world's third largest consumer of organic cotton at the 5th annual Organic Exchange Conference, held in Monterey, California[16]. Woolworths, together with its supply chain partners and the Organic Exchange, is developing a comprehensive business model for organic cotton farming in South Africa[17] that includes:

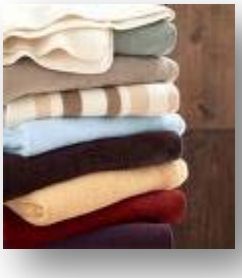
- Developing organic farming on a commercial scale
- Looking to create an empowerment model for small-scale organic cotton farming for previously disadvantaged farmers
- Developing local infrastructure for technical support, training and development
- Creating a benchmark model for other African countries

This means that organic cotton produced in Lepelle-Nkumpi could be part of the value-chain for the production, marketing and retailing of organic cotton in South Africa.

Organic food products produced as rotational crops could be supplied to chains such as Pick 'n Pay, Checkers and Woolworths, who widely supply organic products.

3.5 PRODUCTS

Organic cotton fibre is used in a variety of items including:



- Personal care items e.g. cotton wool
- Home furnishings e.g. towels, bed-linen
- Children's' products e.g. nappies
- Clothes
- Stationery and note cards

16 ConMark, Organic Cotton Farming in South Africa: SA's first organic cotton harvest on the go, 2008

17 ConMark, Organic Cotton Farming in South Africa: SA's first organic cotton harvest on the go, 2008

Organic cotton seed could also be used as animal feed and organic cotton seed oil is also used in some food products e.g. cookies and chips.

If the organic cotton crops are rotated with tomatoes, the produce could be sold as fresh tomatoes or could undergo further processing. Legumes could be used as animal feed for organic livestock or otherwise.

4. Risks, Strengths & Impact

4.1 WEAKNESSES & THREATS

Potential weaknesses of the proposed organic farming project include the following:

- Cotton has many pests that must be controlled without conventional pesticides under an organic system
- Weed control options are limited to those done without synthetic herbicides
- Defoliation can be a major challenge, with limited options to accomplish the task
- Transitioning from conventional crop production to organic cotton is fraught with risk
- The transition process takes three years before the fields can be certified as organic
- In the absence of institutional support and infrastructure, organic growers are unable to move organic cotton around as easily as do conventional growers
- Organic production costs could be higher than those of conventional cotton production

4.2 STRENGTHS

The following strengths for the implementing of the proposed organic farming project are identified:

- Suitable weather conditions
- Labour intensive procedures which entail the training and development of a large number of local community members
- Consumer awareness of living a “green” lifestyle
- Consumers are willing to pay premium prices for organic products
- Organic agriculture could improve farm income because farmers can earn premiums for organic products while lowering production costs through elimination of synthetic pesticides and fertilizers
- Eco-tourism potential
- Organic farming offers the potential to reduce the emissions of agricultural greenhouse gases (carbon dioxide, nitrous oxide and methane) and their annual external costs
- Organic farming offers significant potential to counter climate change through the development of the soil as a major carbon sink
- Organic farming is more energy efficient per hectare because of the non-use of nitrous fertilizers
- Organic farming causes less air contamination because pesticide sprays are not used and ammonia volatisation is reduced because of the non-use of nitrous fertilizers

- Waste is generally lower in organic farming since the system relies less on external inputs, is less intensive and avoids the routine use of agro-chemicals
- Increased water retention as a result of the higher soil organic matter
- Reduced risk of drought – under drought conditions crops in organic agriculture systems produce higher yields than comparable conventional systems
- Less long-term yield variability
- Lower economic losses
- Less water pollution caused by nitrates in groundwater and pesticide contamination
- Avoid and reduce flood damage – better water retention and drainage because of higher levels of organic matter in soil
- Reduced soil erosion
- Conserving and increasing biodiversity through crop rotations and intercropping
- Organic farming can yield up to three times as much food as conventional farming on the same amount of land[18]

4.3 POTENTIAL IMPACT

The impact of the implementation of the proposed organic farming project is assessable in terms of the socio-economic effect it will have on a local level. Socio-economic effects can be determined by the following elements of a project:

- Labour intensiveness
- Permanent job placement
- Skills transfer
- Sustainability

The significance of the project lies within the large number of labourers that will be involved in the farming process. Organic farming requires more manual labour than conventional farming. Labourers are needed for:

- Soil preparation
- Cultivation
- Manual weeding
- Managing the drip irrigation
- Manual harvesting
- Cotton stripping

18 University of Michigan, Organic farming can feed the world

- Other post harvest and processing activities

Labour intensiveness leads to increased employment opportunities created in the local community. The project will create job opportunities, promote entrepreneurship and curb poverty through income generation and skills training of the labourers of the project. This in turn leads to the bettering of the lives of project owners, their households and those of the community at large.

Furthermore, the organic farming could lead to improved food security, increased productivity, diversification of agricultural production and additional income by marketing of other crops. Farmers also have the benefits of higher profits and less health risks through avoidance of chemical pesticides.

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