

GLOBAL ENTERPRISE EXPERIENCE COMPETITION 2012



Drumstick Biodiesel

Sustainable Oil Production in Rwanda

TEAM 20

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Executive Summary

This proposal wishes to focus primarily on the development of a business (Drumstick Biodiesel) which would produce clear, odorless oil from Moringa Oleifera seeds which will then be used as biodiesel, and to generate, promote and enhance productivity and financial gains to both developing and developed nations. The introduction of renewable technology is mutually beneficial to both the developed and developing countries – promoting growth in rural economies and also reducing greenhouse emissions.

This business plan gives a concise account of the plausibility of biodiesel production in Rwanda. Analyzing global biodiesel production and consumption we have seen a gap in the market which Drumstick Biodiesel aims to fill with this venture. Analyzing the current market we have identified the key risks and barriers and propose the following marketing and manufacturing strategy in order to facilitate the cultivation and production of a sustainable biodiesel.

Business Overview

Drumstick Biodiesel is a proposed business that aims to link developed and developing countries through mutual benefit, creating a more sustainable future for Rwandan farmers both economically and environmentally. The proposed concept consists of two main components – firstly to initiate sustainable Moringa Oleifera plantations from where farmers can cultivate seeds pods. The second part of the business concept concerns the manufacturing of a biodiesel from said seed pods which will be marketed to developed nations, Europe in particular.

The company will introduce effective sustainable farming, training Rwandan farmers how to most efficiently and effectively cultivate and harvest the Moringa Oleifera seed pods, also facilitating the founding of networks between the Rwandan farmers and the European Biodiesel Board in order to develop good future relationships to take advantage of the European expanding biodiesel requirements.

The Product

Our product is a sustainable biodiesel produced from Moringa Oleifera seeds, cultivated and harvested by farmers in Rwanda. The manufacturing process will convert the oil yielded from the Moringa Oleifera seeds into biodiesel - a clean burning alternative fuel that contains no petroleum, is biodegradable, non-toxic, and free of sulphur, which can then be used in most diesel equipment with no modification.

Drumstick Oil will assist in the entire production process, from farmer education on cultivation through to harvesting, and processing of the seed pods into biodiesel, which will allow for greater quality control and better relationships between the farmers, Drumstick Oil, and consumers.

Moringa Oleifera - the Tree of Life

The Moringa Oleifera tree – commonly called the Tree of Life or the Miracle Tree due to its multitude of benefits and uses – is a slender, drought resistant tree that can grow up to 9 metres on reaching maturity. It is a very adaptable plant, growing best in dry, sandy soil and tolerating poor soil. Virtually every part of the tree can be used; the leaves can be eaten fresh or cooked and have significant quantities of Vitamin A, B, C, calcium and protein; the bark yields a coarse fibre, and the seed pods yield 50-60% of a clear burning non-edible oil that is clear burning and can be used to create biodiesel. The Moringa Oleifera has a higher recovery and quality of oil than comparable crops, and has no direct competition for food crops as it is an edible source of fuel, with no direct competition with existing farmland as trees can be grown for both purposes simultaneously

Objectives

Drumstick Biodiesel's objectives are two-fold – firstly to support indigenous Rwandan farmers by training them how to harness their agricultural potential and providing them with a sustainable income, and secondly to promote sustainability and contribute to a lower global carbon footprint.

Social Objectives

- Develop a sustainable source of income for Rwandan farmers
- Develop a thriving integrative industry from cultivation to production and manufacturing enabling the transition from subsistence livelihoods to a cash economy
- Foster rural development and aid agricultural education

Environmental Objectives

- Address issues of land use change in order to strengthen and restore degraded agricultural land across Rwanda
- Help to halt desertification through the development of Moringa Oleifera plantations
- Contribute to reducing global warming gas emissions through the provision of a sustainable alternative to regular diesel

Market Analysis

Target Market

Although Europe comprises an overwhelming 68% of biodiesel consumption worldwide, production levels are low. As such, we have chosen to enter the market in Europe, with Italy our primary target market. The graph below illustrates biodiesel consumption in Europe, and it is evident that Italy has the most potential, demonstrating high growth rates of biodiesel consumption. The Italian Association of Biodiesel Producers is made up of 24 different companies who all focus on using Biodiesel because of the environmental benefits. Because the manufacture of Drumstick Biodiesel inflicts considerably less harm to the environment than any of our competitors due its lack of strain on land without cannibalizing food sources, this is our proposed market entry target. Combining this with the close proximity of Europe to Rwanda, there is much potential for biodiesel in Europe, the market of which seems to be growing at a steady rate.

TOP 10: Biodiesel Consumption

COUNTRY	CONSUMPTION 2009 (IN THOUSANDS OF BARRELS)	CONSUMPTION 2010 (IN THOUSANDS OF BARRELS)	GROWTH RATE (%)
Austria	10.2	10.3	.98
Belgium	6.2	6.4	3.23
Poland	NA	12	NA
Czech Republic	NA	3.8	NA
Spain	20	26	30
United Kingdom	18	18	0
France	45	40	-11.1
Germany	49	50.5	3.1
Italy	23.3	30	28.8
Netherlands	5.2	2.1	-59.6

(Numbers taken from Index Mundi)

Risks & Barriers

- Competitors: The Italian Association of Biodiesel Producers imports 20% Soybean oil and 70% rapeseed oil feed from producers in the USA, Germany, The Netherlands, and France
 - Cold weather can be debilitating to the health of the Moringa Oleifera tree
 - Fast oil extraction and proper storage is necessary to maintain oil quality
 - Bio-ethanol replacing biodiesel as a fuel alternative
 - Negotiations with the Italian Association of Biodiesel Producers have the potential to be quite risky
 - The price of biodiesel at present is more expensive than conventional fuel
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Competitive Advantage

The Moringa Oleifera oil has a better oxidative stability than most other feed-stocks, making it more reliable than alternatives. Biodiesel produced from Moringa Oleifera trees also contain one of the highest Cetane ratings for all biodiesels which is a universal measure of the quality of a fuel leading to improved fuel efficiency, reduction of harmful emissions, and less wear and tear on both car starter and batteries. Yet the trees require less maintenance, less nutrients from the ground, and less water, which makes the trees cheaper to cultivate, and less susceptible to drought. This gives us a price point advantage whereby we will be able to offer a higher quality, more environmentally efficient form of biodiesel for a comparable price.

Business Strategy

Production Strategy

Rwanda is our chosen nation in which to introduce Moringa Oleifera cultivation because: (a) the climate suits necessary requirements for optimum growth, and (b) the development of agriculture in Rwanda is an area that will result in being mutually beneficial for both the developing Rwandan economy and more developed nations who will ultimately benefit from the availability of alternative sustainable fuel choices.

The trees will be introduced in a reforestation scheme where local farmers who will be taught sustainable farming methods concerning the use, cultivation, and extraction process of the seed pods. Production facilities will be on-site entailing seed extraction, processing, and shipment to European consumers. Drumstick Biodiesel will be using the seed pods for oil extraction, but the rest of the tree is extremely nutritional also – farmers will be able to supplement their income with ready access to Moringa Oleifera leaves which are high in nutritional value, hopefully providing a source of food and lowering rates of malnutrition throughout Rwanda.

Marketing & Sales

As production will be centered in Rwanda, we propose to take advantage of the European Development Fund in which Rwanda is a participant, and as such is favored with a budget for rural and infrastructure development. With European Union support Drumstick Biodiesel aims to take advantage of the existing cooperation between Europe and Rwanda, marketing the Moringa Oil biodiesel as a product with a huge opportunity to not only assist with poverty reduction in Rwanda, but also as an opportunity for further internationalization.

We will market directly to potential organisations and consumers, building an alliance between the European Biodiesel Board and Drumstick Biodiesel for mutual benefit. We will benefit from the EBB's knowledge of the European biodiesel market, and the EBB will gain a continuous supply of biodiesel at a comparable price for which there is a current gap in the market due to the scarcity of arable land suitable to cultivate suitable potential oil-stocks.

Growth Strategy

The European Union issued a mandate that 10% of all fuel must be bio-fuel by 2020. This market growth guarantees sustainability and longevity to Drumstick Biodiesel. As Drumstick Biodiesel expands to other European markets, because of the versatility of Moringa Oliefera which can be grown almost anywhere there is huge potential for expansion in the future. Imports are responsible for 51% of biodiesel sales in Italy, with biodiesel much more popular than bio-ethanol. Being at the forefront of Moringa Oliefera innovation, Drumstick Biodiesel has the potential to train other suppliers in cultivation and production.

Financials

Finance Strategy

We will aim to keep costs at a minimum without compromising on biodiesel quality. We will raise the required capital through low interest government loans through the World Bank and the European Union. The Rwandan government and the World Bank have signed a loan agreement worth US\$12.99 million to scale up of agriculture sector programs in 2012. Thus, the starting capital of Drumstick Biodiesel will be funded through low interest government loans, secured due to the Rwandan government initiatives to promote the agriculture sector. In the second year Drumstick Oil will turn over profit which will then be able to be reinvested in production expansion in Year 3.

Estimated Start-Up Costs

	COST (USD)	QUANTITY	TOTAL COST (USD)
Farm land	(per acre) \$1,300	500	\$65,000
Seed cleaner	\$6,000	1	\$6,000
Oil seed press	\$8,000	1	\$8,000
Operating Expenses	\$2,000		\$2,000
TOTAL COST			\$81,000

The main start-up costs will be the farmland and the oil seed press and seed cleaner machines which are necessary for biodiesel production. Drumstick Biodiesel will start with a mid-range seed cleaner which cost \$5,000-\$7,000. Arable land in Rwanda is around USD\$1,300 per acre – starting with 500 acres Drumstick Oil aims to purchase more land as revenue and profits increase.

Workers are to be paid \$700 annually which - well above the minimum wage of \$496 set by the Rwandan government - will hopefully improve lives of workers. As the business starts to pick up, wages are expected to increase based on future revenue which is shown in the cash flow calculation below.

Projected Financial Statements

Drumstick Biodiesel Yearly Biodiesel Production = 133.85L/acre Sale price per L = \$1.30

$$133.85 \times 500 = 66925L \quad 66925L \times \$1.30 = \$87,000$$

(Figures denoted are in USD)

BALANCE SHEET			
ASSETS		EQUITY	
Cash	\$1,000	Capital	\$72,000
Land	\$65,000		
Equipment	\$14,000		
Operating Expenses	\$2,000		
TOTAL	\$72,000		\$72,000

PROJECTED INCOME STATEMENT			
	YEAR 1	YEAR 2	YEAR 3
Revenue	-	\$87,000	\$1,204,000
COGS	(\$14,000)	(\$15,400)	(\$16,900)
Operating Expenses	(\$2,000)	(\$2,000)	(\$2,000)
<ul style="list-style-type: none"> Income tax excluded 			
NET INCOME	(\$16,000)	\$69,600	\$1,185,100

PROJECTED CASH FLOW STATEMENT				
		YEAR 1	YEAR 2	YEAR 3
Cash flow from operation activities	Cash received from sales	-	\$87,000	\$1,204,000
	Cash paid for expenses	(\$16,000)	(\$17,400)	(\$18,900)
Cash flow from Investment Activities	Purchase of land	(\$65,000)	0	(\$2,600)
	Purchase of equipment	(\$14,000)	0	(\$1,400)
TOTAL CASH FLOW		(\$95,000)	\$69,600	\$1,181,100

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