

**STRAIGHTFORWARD DEVELOPMENT SERVICES LTD**

# **Straightforward Development Services Limited**

## **Business plan**

**Title: Exploring the value of honeybees for sustainable livelihood in the Nyungwe landscape**



Project prepared by:

NDIMUKAGA MARC

Email: [lavamar50@yahoo.fr](mailto:lavamar50@yahoo.fr)

Phone: +250787230642

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## Executive Summary

I and my group coming from different backgrounds: agriculture, engineering and management with different skills and expertise in research and development and entrepreneurship decided to work together toward this great innovation: ***“Exploring the value of honey bees for sustainable livelihood in the Nyungwe landscape”***. It is for us an opportunity to carry out an agri-business based project that improves the livelihood of rural communities as well as sustaining the environment while improving agricultural knowledge. This project is focusing on exploring beekeeping potentials in and around Nyungwe National Park and valorising bee products as well as providing other services like bee pollination with the mission of ensuring the long term security and prosperity of the beekeeping industry in Rwanda in general and the Nyungwe landscape in particular. Products for the local market include honey (unsaturated at 80% according to Rwanda Development Board, 2012) and live bees (swarms) and in some extent bee wax. Products for exports consist of bee wax, propolis, pollen and royal jelly and in the long term honey.

## Personal Details

### **Promoter: Ndimukaga Marc**

Marc Ndimukaga has 7 years working experience both in for-profit and non profit organizations. Most recently, he was awarded a Conservation leadership Program/Future Conservationist Award and Alcoa Foundation Practitioner Fellowship Award. Marc worked as a Senior Conservation Officer with the Association pour la Conservation de la Nature au Rwanda, a BirdLife International partner in Rwanda and then later with Association pour la Promotion des Etudes d’Impact Environnementaux au Rwanda (APEIER) as a consultant before co-founding STRAIGHTFORWARD DEVELOPMENT SERVICES LTD, a private company dedicated to providing to Rwandan people with multi services of best quality. Marc has conducted many sessions voluntarily to promote volunteerism, biodiversity conservation and sustainable development in Rwanda and brought a positive reputation of his country through poverty alleviation in Rwanda. Through these experiences, he has developed managerial and analytical skills, along with strong aptitude for planning, implementing and coordinating various projects. He has broad knowledge of community development and biodiversity conservation in Rwanda. Marc holds a Master’s (Agri.) in Apiculture

from the University of Agricultural Sciences, Bangalore, India and a Bachelor's degree in Zoology from the National University of Rwanda. He also holds a postgraduate certificate in Beekeeping for poverty alleviation from Ghent University, Belgium. He was recently a Research Fellow at Agharkar Research Institute, Pune, India working on Rwandan propolis and its anti-bacterial, anti-inflammatory and anti-oxidant activities as well as working on Honey bee pollination and coffee production. He is currently a beekeeping expert with Rwanda Environment Management Authority in a project entitled "*Beekeeping as a tool for livelihood improvement, adaptation to climate change and biodiversity conservation*".

**References:**

**1. Dr. Gabriel HABİYAREMYE**

Dean, Faculty of Environmental studies  
Independent Institute of Lay Adventists of Kigali  
E-mail: habygaby@gmail.com  
Phone: +25078569860

**2. Mr. Bizimana Innocent**

President  
Association pour la Promotion des Etudes d'Impact Environnementaux au Rwanda (APEIER)  
Kigali-Rwanda  
E-mail : bizinnocent2012@gmail.com  
Phone: +250788561928

**3. Mr. Alphonse MUTABAZI**

Climate Change Program Manager  
Rwanda Environment Management Authority  
P.O. Box 7436, Kigali, **Rwanda**  
Email: mutalpo@hotmail.com  
mutalpo@gmail.com  
Cell. phone: +250 (0)785745057  
Skype adresse: alphonse.mutabazi  
<http://www.rema.gov.rw>  
<http://esp.ictp.it/personnel/associates/alphonse-mutabazi>

## **Mission & Vision Statement**

### **Mission Statement**

Always providing the services and products of quality that exceed our customers increasing expectations

### ***Vision Statement***

Our vision serves as our usher toward the success of every aspect of our business by describing what we need to accomplish in order to continue achieving sustainable and quality growth.

## **Knowledge Addition**

### **Innovation element of the project**

The innovation in this project is to transform a hobby traditional beekeeping into a sustainable professional beekeeping that would result in hive products of high quality and quantity. In this framework, beekeepers will be provided with modern beekeeping equipments and necessary trainings to handle them on condition that bee products will be sold to beekeeping equipment providers. Honey produced will be processed according to their botanical and geographical origin which is of particular interest for honey grading and allows the identification of likely periods of unifloral and multifloral honeys, which have high commercial value. The current market in Rwanda is unsaturated up to 80% and is made of squeezed/mixed honeys of poor quality from unmanaged colonies as more than 95% of bee colonies in Rwanda are made of traditional bee hives. This innovation will also exploit other hive products rather than honey which are of grand importance. These include pollen and propolis which are not valorised in Rwanda. Pollen is a good source of proteins and can help to fight malnutrition but is harvested nowhere in Rwanda for this purpose. Propolis is an important hive product once distilled and in some extent fractionated, its extracts serve as a good anti oxidant, anti inflammatory and anti microbial agent. Its extracts are also used in cosmetic and pharmaceutical industries and can be used as bet to attract natural swarms.

### **Application of Knowledge**

Recognition and initial screening of various bee plants representing potential sources of nectar and pollen for the honey bees throughout the year, is an important pre-requisite for launching apiary industry in any locality. This knowledge dealing with microscopic analysis of the pollen contents of seasonal honeys and pollen loads from a locality, when supplemented with critical field studies involving phenology and floral biology, will provide reliable information regarding the floral types which serve as major or minor nectar and /or pollen sources for the honey bees. The pollen

spectrum of a honey is also an expression of its geographical origin and also gives a glimpse of major flowering plants in the area. It consists of honey pollen analysis which allows the identification of the main nectar sources used by bees for the production of honey in a region, classifying the honey botanically and geographically. The analysis of the evolution of honey pollen spectrum during the honey production period is extremely useful to detect the contributions of different nectar sources over the season. Queen rearing and swarms production are also the basis of scientific knowledge. This project consists of applying this knowledge and will contribute to the development of beekeeping industry in Rwanda.

### **Project Background**

The service of honeybees to mankind is enormous as they carry out pollination of different crop plants without which development of fruits and seeds cannot occur in cross pollinated crops. They are considered a very successful bee species due to their capacity to adapt to diverse environments and to out-compete many species of native bees. The least visible livelihood outcome is the pollination of flowering plants, both wild and cultivated: this is an outcome impossible to quantify. Honey is a traditional medicine or food in nearly all societies and whether sold in a simple way at village level or packaged more sophisticatedly, honey generates income and can create livelihoods for several sectors within a society. Beeswax is also a valuable product from beekeeping, although in some places its value is not well documented. Industrialized countries are net importers of beeswax, and the supply comes from developing countries. Therefore, honey bees play a critical role in the livelihoods of the rural communities in five native dynamics:

- (1) They generate income
- (2) Medicinal value of honey and other hive products is invaluable
- (3) They support agricultural activities through facilitating critical processes for example cross pollination and improves crop and seed yield
- (4) They contribute immensely to forests conservation efforts
- (5) They facilitate healthy linkages between biodiversity (insects and plants) towards sustainable livelihoods.

They can involve a low-investment and low-input business enterprise that directly generates economic gains for the participating members and integrate well with agriculture that forms the main economic activity for communities living in the rural areas.

With regard to bees' contributions to agriculture, about one-third of our total diet comes directly or indirectly from bee-pollinated crop plants. The art of rearing bees is referred to apiculture while keeping them refers to beekeeping. There are two groups of bees that produce honey and other hive products in Rwanda. The first group which is domesticated belongs to the *Apis* species with *Apis mellifera*, the only *Apis* species found in Africa. According to studies, there are two races of *Apis mellifera* in Rwanda namely *Apis mellifera scutellata* which inhabits lowland areas of the country at around 500-2400 m – between the range of *A.m.litorea* and *A.m.monticola*. Generally *A.m.scutellata* is regarded the African bee. The other bee race found in Rwanda, *A.m. monticola*, has a special position among honeybee races. It is the bee of the mountain rain forests at altitudes of 2000-3000m (11°C – 21°C). *A.m.monticola* drones are uniformly dark (as are many other bee species in higher altitudes). The second group of honeybees belongs to the group of stingless bees (*Meliponae*) not well documented in Rwanda but much more valued in other countries including the neighbouring Tanzania where people believe that honey produced by stingless bees has a very high medicinal value but honey production is very low compared to *A. mellifera*. Keeping these bees is referred to meliponiculture in contrast to apiculture.

So long as honey bee is an animal, beekeeping is generally treated as a form of animal husbandry in a broader sense of the word, and consequently in many countries and regions it is supervised specifically by the administrative structure which controls livestock industry within the larger sector of agriculture. It has been practiced in Rwanda for many years through successive generations and along inherited patterns. The activity has basically been traditional and of non commercial nature, where honey was used as a food product, medicine and for brewing traditional liquor. It is often promoted as being a pro-poor income generating activity for poor communities. Prior to the 1994 genocide, attempts were made to support the sector through modernizing systems and the Ministry of Agriculture and Animal Resources (MINAGRI) contracted ARDI, a national capacity building organization, in 1992 to undertake extension and training support of beekeepers. Subsequent support for the sector has mainly been through community based natural resource management projects around the protected areas with key organizations such as former ORTPN (now merged in

Rwanda Development Board), Wildlife Conservation Society (WCS) around Nyungwe National Park, International Gorilla Conservation Project (IGCP) around the Volcanoes National Park and ADAR project (now closed). Communities in these areas have been provided with some level of training, processing equipment and a number of modern hives with mixed results mainly due to the creation of unsustainable donor dependent supply chains. Production is mainly through traditional methods and the few modern techniques introduced have not been successful due to un-sustainable implementation methods. The introduction of modern hives namely the Kenya Top Bar Hive (KTBH) and Langstroth hive have been accompanied by severe flaws in design, quality, lack of appropriate hive management training for these, and inappropriate approaches to projects supported by unrealistic 'artificial markets' for products by project grant providers. Production and harvesting of honey and beeswax has been restricted to traditional harvesting techniques leading to low production, poor quality of products due to excessive use of smoke, poor post harvest handling and inadequate bulking mechanisms. Studies undertaken on the sector in 2004 by SNV Netherlands Development Organization Rwanda show that the production of traditional hives (which is in excess of 95% of the total hive population) per season was at an average of 3Kgs per hive, comparatively low compared to regional statistics for the same which translated to an average of 15kgs per season per hive. Recent information however peg the average production at 5Kgs per hive per season. The number of harvests equate to 2 per year, thereby translating to an average of 10kgs per hive. According to Rwanda Development Board (RDB), in 2012, there were 83,000 beekeepers with 93,000 beehives across the country. Nyungwe National Park has itself 1,493 beekeepers with more than 4,000 bee colonies mostly traditional.

Nevertheless, the potential of beekeeping is far too often not exploited in forest activities and development programs, because the benefits of bees and beekeeping are not well known or neglected by stakeholders. In spite of the great economic and biological importance of honeybees as pollinators of agricultural crops and natural vegetation, it has yet not been made an integral part of agriculture and forest management. There is little or no empirical evidence on the potential of honey bees' value for income generation and forest conservation in the Nyungwe landscape. The landscape remains underutilized, receives little support or recognition if any considering its potentials, and therefore assumes a peripheral role in relevance with contributions to improve the livelihood of communities around the park. Honeybees' contributions to rural people have hardly ever been assessed. In addition, the unsustainable management of honey bees would compromise

the livelihood of the population as well as biodiversity conservation especially flowering plants depending on honeybee's pollination and associated animals if there are no proper management of African honeybees as well as other pollinators.

Given the socio-economic conditions in the Nyungwe landscape, forests conservation is closely linked to community issues and community management of natural resources. The market potential and value of ecosystem services is not well understood. Equally uncertain is the potential for developing viable investments. In addition, raising awareness about the value of ecosystem services provided by forests is an important first step. Although many efforts have been put and positive changes achieved so far for the development of apiculture coupled with biodiversity conservation in the Nyungwe landscape, there is still much to do to make beekeeping much more profitable.

Rwanda relies heavily on import to satisfy the national demand. Available statistics from RDB show that annual production was 311 tons in 2010 and Import has been significantly increased up to 1,614 MT in 2012 while the current demand is 1715 MT. In addition, the pollination role of bees remains ignored and other bee based products are less exploited and valorised as well as their role. Nyungwe landscape produces roughly 24 MT of honey. If traditional beekeeping is modernized with langstroth types, the production would go up to 203 MT.

The project is meant to promote Apiculture and nature conservation in the Nyungwe landscape while creating a sustainable livelihood for local communities. It sets out to promote beekeeping as an environmentally friendly and high income potential enterprise for small-holding farm families, to raise awareness of the risks of poor natural resource management, and promoting and encouraging fruit farming and tree planting as well as preserving natural habitats, both to provide forage for bee populations and to increase household earnings.

The objectives of this project are:

- To educate beekeepers regarding modern beekeeping (mass queen rearing and live bees production).
- To produce hive products of high quality

The expected outputs are:

- 1,4 93 beekeepers in the Nyungwe landscape educated about modern beekeeping
- Hive products ( honey, pollen, bee wax, propolis, etc.) produced

### Activities and methods

- **Training of beekeepers:** People with indigenous knowledge (traditional beekeepers) will receive training in modern beekeeping techniques i.e. bee selection, queen rearing, bee based products harvesting and processing and bee pollination. Training on mass queen rearing and swarms production will involve a demonstration apiary of 10 Langstroth hives and 10 Top bar hives. In this apiary, mass queen rearing for colony selection and multiplication, thus swarms production will be undertaken as well as studying the behaviour of honeybees in the purpose of selecting colonies of improved quality (high production, gentleness and diseases and pest resistance).
- **Hive products production and processing:** Hive products will be collected and bought from beekeepers who will receive SDS Ltd services. Honey will be processed and graded considering its botanical and geographical origin. Other hive products i.e. propolis, pollen and beeswax will also get processed and packed.

### Logical Framework

Narrative summary	Objectively Verifiable Indicators	Means of Verification
GOAL: To promote apiculture for rural livelihood improvement and nature conservation	Level of turnover and income in the apiculture sector	Beekeepers' records
PURPOSE: To develop market based beekeeping	Apiculture sector contribution to GDP and GNP	Census data
OUTPUTS:  Output1. 1 apiary for mass	Apiaries	Apiary, photographs

<p>queen rearing and swarms production established</p> <p>Output2: Floral calendar established</p> <p>1,493 beekeepers trained in modern beekeeping</p> <p>Output4: Hive products produced and processed established</p>	<p>A floral calendar</p> <p>Training report</p> <p>Production unit</p>	<p>Handbook of floral resources of the region</p> <p>Number of people trained</p> <p>A production plant</p>
<p>ACTIVITIES:</p> <p>Activity1. Establishment of an apiary for mass queen rearing and swarms production</p> <p>Activity2. Training of beekeepers in modern beekeeping</p> <p>Activity3. Hive products production and processing</p>	<p>1 apiary</p> <p>New queens reared</p> <p>New swarms produced</p> <p>Beekeepers' Performance, increase in honeybee products</p> <p>A production plant</p>	<p>Photos, report, site visit</p> <p>photos, report</p> <p>Site visit, photos, hive products</p>

### Environmental issues

Environmental sustainability demands that ecosystems are not damaged beyond their capacity to maintain their own biological processes, functions, biodiversity and natural productivity. For humans, sustainability is the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs. In the areas where the acquisition of honey

bees depends on wild colonies and the nectar sources depend on natural vegetation, the basic elements of apiculture derive from the richness of the nature that provides two resources (nectar and pollen). Therefore the closer the relationship between life and apiculture becomes, the much higher the consciousness of conservation of forest and natural vegetation is raised. People eventually come to realize through experience that unless they conserve and manage the natural ecosystem appropriately, apiculture itself would not be able to keep on going any more. Since apiculture depends partly on swarms of wild colonies, the necessity of conservation of wild bee colonies as the source is recognized. As activities resulting from the recognition, the conservation of natural vegetation, habitat of wild bee colonies, for their breeding grounds can be cited. In the apiculture which depends on the natural vegetation for nectar/pollen sources, the richness of natural vegetation assures the richness of the nectar source and sustains the honey production. The ecological structure like this can be recognized most readily by beekeepers from the viewpoint of economics that the natural vegetation as nectar sources is equivalent to the production of honey, and constitutes the most important element in the principle of conservation. When the activities of apiculture is introduced and developed, the more heavily a region depends on the natural environment for nectar sources, the higher can become the level of improvement of awareness of conservation of natural vegetation (recognition that it is important to respect the forest preserve and to protect the remaining vegetation, from the viewpoint of conservation of nectar sources), and the level of responsive actions of the residents there. Beekeepers that have got conscious of the reduction of natural nectar sources will become cooperative for the cause of restoration of natural vegetation. The activity of apiculture on its own increases the number of individual honey bees, and hence promotes the pollination by their intermediary visits, increases the seed production by plants of nectar sources and thus assists the acceleration of restoration of vegetation.

**Description of Product/Service /Social Benefits from your Project**

This project is providing direct employment for project managers and beekeeping equipment providers. Beekeepers supported by this project will find their earnings increase from hive products sales. Honey and pollen will contribute to food security for beekeepers and their family as well as the wider community. The table below summarizes key products and services to be provided in the immediate as well as in the future.

Initial products	Future products
Different types of honey (liquid honey, comb honey and chunk honey)	Bee Venom
Pollen	Royal Jelly
Beeswax	Propolis by-products
Propolis	Beeswax by-products
Swarms	Honey by-products
Initial services	Future services
Pollination	Education program

### Marketing Plan

Honey is the main beekeeping product throughout Rwanda and other hive products remain undervalued. The current demand of honey in Rwanda is 1715 MT while in 2010, the annual production was 311 MT. In 2012, Rwanda has imported 1614 MT of honey. This shows a huge gap between demand and supply but it is an investment opportunity in the beekeeping sector.

Based on figures shown above, the domestic market is guaranteed. In the absence of modern processing facilities in Rwanda, the country is unable to realize the optimum value of bees since unprocessed raw honey has marginal market value. This business will concentrate to saturate the current deficit. The table below shows hive products to be produced.

Hive product
Honeys (Liquid honey, Comb honey and chunk honey)
Pollen
Beeswax
Propolis
Live bees

Quality control and standardization of honey are essential to get royalty of consumers. For example, export to European Union (EU) and some other countries, it is mandatory to control the level of pesticides and insecticidal residue in the finished product. Further, some countries insist for a

certificate validating the purchase of honey from the disease free colony. Presently there is no disease surveillance system in Rwanda and honey collected is stored unscientifically and in an unhygienic manner which increases the propensity for contamination and deterioration and resulting in an unfit product to be appreciated by consumers. A modern honey processing plant with quality control functions and capabilities to produce refined, high quality product is an imperative requirement for this business. This would position Rwanda as a key honey processing center in east Africa and would assist in realization of higher value margins for the final product.

### **Competitor Analysis**

Products of high quality for example graded honey are of high value on the market. The existing market consists of squeezed/mixed non graded honey from unmanaged colonies which are low quality on the market. This business is to bring on the market products of high quality as well as new products. With the example of honey, it will get graded based on pollen frequency to reveal and label a honey sample as to the major and minor plant foraging sources that were used by the honeybees and this leads the product much more competitive on the market. This information has important commercial value because consumers prefer honey collected from some plants and those types command a premium price (i.e., Acacia, Eucalyptus honeys, etc.). Even non-premium grades of honey often need to be examined for legal reasons because they must be correctly labelled as to type before being marketed. Another factor generally required by consumers is the determination of the honey geographical origin. Because of trade agreements, import tariffs, and legal trade restrictions, most of the leading honey-producing nations of the world require accurate labeling of honey before it can be sold. New products like comb and chunk honey is also appreciated by many consumers.

### **SWOT Analysis**

#### **Strengths**

- Skilled personnel in beekeeping industry
- Team working and commitment
- Resilience
- Horticultural industry that depend on pollination services, creating strong demand for these

services.

- Pollination services provide a valuable service to agriculture beyond the value of the paid service.
- Industry is highly versatile so that we can serve our clients in many different areas.
- Industry has a large range of expertise in all areas of beekeeping.
- Rwanda has a diverse bee flora.

### **Weaknesses**

- Disease and hive pests can be transferred across large distances due to the high mobility.
- Farmers are not able to readily recognize the quality and value of an experienced pollinator before purchasing the services.
- Risk to hive strength from pesticide spray.
- Industry fragmented.
- African honey bee has an aggressive and absconding behavior.
- Limited financial means

### **Opportunities**

- Viable market
- Favorable government policy regarding entrepreneurship

### **Threats**

- There is a high risk from other honey producers bringing pests and diseases into Rwanda.
- There is a lack of understanding within stakeholders on the pest and disease risk associated with bees.
- Risk of *Varroa* mite detected in Rwanda recently.
- Competition with other companies in beekeeping industry

### **Operations**

- **Location analysis:** The project is targeting beekeepers around Nyungwe National Park. The park is rich in bee forage and therefore it is an ideal place for beekeeping development.

- **Equipments:** To get a refined high quality honey, a modern processing plant with sophisticated equipments and adequate capability for large scale production is a must. It would comprise a quality control laboratory to assist in complying with the international quality standards and a processing compound having 4 key modules:

1. Collection Center
2. Processing Zone
3. Bottling and Packaging Unit
4. Warehouse

The key equipments of the plant are:

Name	Quantity	Activity associated
<b>Quality control laboratory</b>		
Refractometer	2	To measure the quantity of water in honey
Microscope mounted with camera	1	To be used in melissopalynology (Honey-pollen analysis)
Slides	5 Boxes	To make reference slides
Centrifuge machine	1	To be used in melissopalynology (Honey-pollen analysis)
Centrifuge tubes	5 boxes	To be used in melissopalynology (Honey-pollen analysis)
Eppendorf tubes	5 boxes	To be used in melissopalynology (Honey-pollen analysis)
Conical flasks	10	To be used in melissopalynology (Honey-pollen analysis)

Measuring cylinder	5	To be used in melissopalynology (Honey-pollen analysis)
PFA Beaker	5	To be used in melissopalynology (Honey-pollen analysis)
Haemocytometer (Fusch-Rosenthal counting chamber)	2	To be used in melissopalynology (Honey-pollen analysis)
Utility tray	2	To be used in melissopalynology (Honey-pollen analysis)
Micro Tip	5	To be used in melissopalynology (Honey-pollen analysis)
Micro Tip Box	5	To be used in melissopalynology (Honey-pollen analysis)
Micropipette	2	To be used in melissopalynology (Honey-pollen analysis)
Wash bottle	2	To be used in melissopalynology (Honey-pollen analysis)
Reagents (Alcohol, Glacial acetic acid, acetic anhydride and concentrated sulphuric acid)	5L each reagent	To be used in melissopalynology (Honey-pollen analysis)
<b>Processing plant</b>		
Gravity Clarifiers	1	To ease separation of pure honey and impurities
Heating filtering and storage tank	1	To ease honey filtering and storage
Honey filters	1	To remove impurities from honey
Extractor	1	To extract honey from honey combs

Maturateur	1	For honey filtering and storage
Bottling and sealing machine	1	For bottling
Honey bottles/jars	20,000 pieces	To store both liquid and chunk honeys
Honey Pumps	1	To pump honey
Storage tanks	1	To store pure honey
Cardboard boxes	1,000 boxes	To store comb honey
Comb foundation machine	1	To make comb foundation

#### Apiary equipments

<b>Name of equipment</b>	<b>Quantity</b>
Protective clothing	340
Hives (Langstroth)	1,493
Swarms	1,493
Comb foundation	750 kgs
NUC boxes	500
Queen excluders	1,493
Feeders	1,493
Smokers	170
Queen cages	170
Queen catchers	170

Pollen trap	1,493
Photographic equipment	1
Queen markers	85
Propolis collecting mats	1,493
Brush	170
Hive tool	340
Food supplement (Sugar)	2,000Kgs

- **Labor:** This project is managed by a coordinator, a field officer, an administration and finance officer, 2 beekeeping technicians and beekeepers.

Job Title	Duties	Qualifications	Type of employment
Coordinator	Coordinate all project activities	MSc in Apiculture	Full time
Field officer	Plan and coordinate operations related to the project	BSc in Agriculture or Botany	Full time
Administration and Financial Officer	Finance and management of project income and expenditures	BSc in Management with skills and experience in accounting and marketing	Full time

Beekeeping technicians	Assist beekeepers on daily basis	A2 with extensive experience in beekeeping	Full time
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### Capital Requirements

This business is requiring a capital of **466,354,010Frw** for the business to run. **34,649,595Frw** is being financed by SDS Ltd and of **431,721,095Frw** is being sought from Donors, investors in this business and Bank loan.

### Budget outline

Item	Quantity	Unit price (Frw)	Source of funding		Total
			Donors/Bank loan	SDS	
<b>Start up fund</b>					
Quality control laboratory equipment					
Refractometer	2	69,500	-	139,000	139,000
Microscope mounted with a camera	1	1,077,250	-	1,077,250	1,077,250
Microscope slides	5 Boxes	4,685	-	24,325	24,325
Centrifuge machine	1	625,500	-	625,500	625,500
Centrifuge tubes	2 boxes	69,500	-	139,000	139,000
Eppendorf tubes	1,000 pieces	35	-	1,750	1,750
Conical flasks	10	20,850	-	208,500	208,500
Electronic balance	1	20,850	-	20,850	20,850

Measuring cylinder	5	4,170	-	20,850	20,850
PFA Beaker	5	6,950	-	34,750	34,750
Haemocytometer (Fusch-Rosenthal counting chamber)	2	34,750	69,500	-	69,500
Utility tray	2	10,425	-	20,850	20,850
Micro Tip (pieces)	1,000	14	-	14,000	14,000
Micro Tip Box	5	695	-	3,475	3,475
Micropipette	1	69,500	69,500	-	69,500
Wash bottle	2	3,475	-	6,950	6,950
Reagents (Alcohol, Glacial acetic acid, acetic anhydride and concentrated sulphuric acid)	5L each reagent	-	-	208,500	208,500
<b>Sub-total</b>			<b>139,000</b>	<b>2,545,550</b>	<b>2,684,550</b>
<b>Processing plant equipment</b>					
Processing equipments	1 unit	13,900,000	13,900,000	-	13,900,000
Honey extractor	1	556,000	556,000	-	556,000
Maturateur	1	208,500	208,500	-	208,500
Honey bottles/jars	20,000	139	2,780,000	-	2,780,000
Cardboard boxes	1,000	556	556,000	-	556,000
Analytical balance	1	417,000	-	417,000	417,000
Comb foundation	1	625,500	625,500	-	625,500

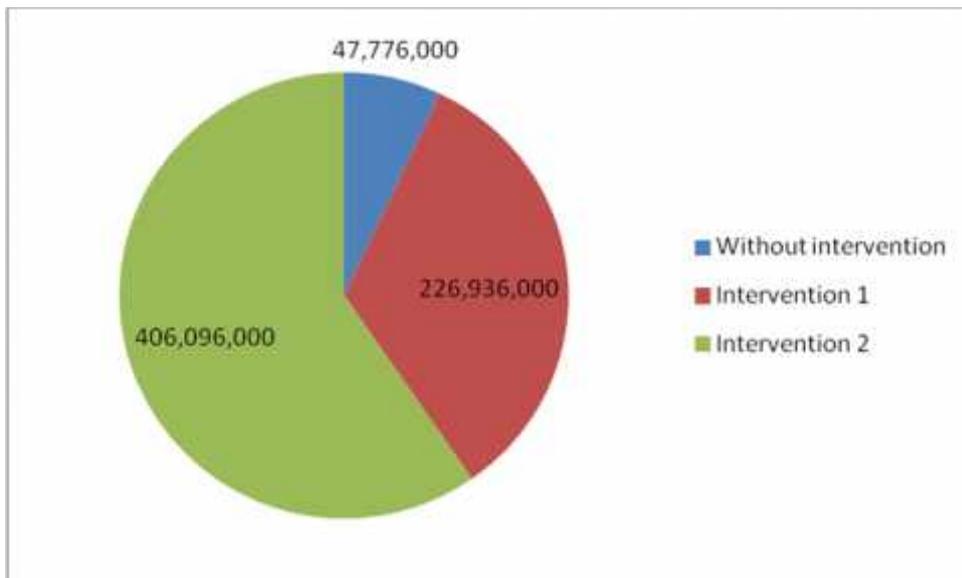
machine					
Cut Comb honey kit	10	69,500	695,000	-	695,000
<b>Sub-total</b>			<b>19,321,000</b>	<b>417,000</b>	<b>19,738,000</b>
<b>Beekeeping equipment</b>					
Hives	1,493	27,800	40,949,400	556,000	41,505,400
Swarms	1,493	6,950	10,237,350	139,000	10,376,350
Queen cages	170	2,085	350,280	20,850	354,450
Hive tools (Hive openers and knives)	170	1,390	233,520	2,780	236,300
Smokers	170	6,950	1,167,600	13,900	1,181,500
Comb foundation	750 kg	6,950	5,143,000	69,500	5,212,500
Brushes	170	2,085	350,280	4,170	354,450
NUC boxes	500	15,000	7,152,500	347,500	7,500,000
Queen excluders	1,493	3,475	5,118,675	69,500	5,188,175
Feeders	1,493	5,560	8,189,880	111,200	8,301,080
Queen catchers	170	2,085	350,280	4,170	354,450
Pollen traps	1,493	2,085	3,071,205	41,700	3,112,905
Queen markers	85	5,000	415,000	10,000	425,000
Propolis collecting mats	1,493	2,000	2,958,200	27,800	2,986,000
Protecting clothing	340	34,750	11,745,500	69,500	11,815,000
Food supplement (Sugar)	2,000 kgs	1,000	1,900,000	100,000	2,000,000

Apiaries (10m x 2m)	34	500,000	16,500,000	500,000	17,000,000
<b>Sub-total</b>			<b>115,832,670</b>	<b>2,087,570</b>	<b>117,903,560</b>
Raw material					
Raw honey	203,048 kg	1,050	204,199,900	9,000,500	213,200,400
Raw propolis	1,000kg	6,950	6,255,000	695,000	6,950,000
Raw beeswax	5,000kg	2,085	10,008,000	417,000	10,425,000
Raw pollen	1,500kg	3,475	4,691,250	521,250	5,212,500
<b>Sub-total</b>			<b>225,154,150</b>	<b>10,633,750</b>	<b>235,787,900</b>
Administrative cost					
Allowances	24 months	2,800,000	53,200,000	14,000,000	67,200,000
Professional Fees	24months	100,000	1,584,070	815,930	2,400,000
Utilities	24months	200,000	4,260,000	540,000	4,800,000
Telephone	24months	200,000	4,440,000	360,000	4,800,000
Stationery/Office Expenses	24months	60,000	929,175	510,825	1,440,000
Rent & Rates	24months	200,000	2,961,030	1,838,970	4,800,000
Travels & Transportation	24months	200,000	3,900,000	900,000	4,800,000
<b>Sub-total</b>			<b>71,274,275</b>	<b>18,965,725</b>	<b>90,240,000</b>
<b>Grand Total</b>			<b>431,721,095</b>	<b>34,649,595</b>	<b>466,354,010</b>

## Financial Plan

### Financial Projections

This business will make money from honey and other hive products sales. Start up funds will come from the company itself. Gross profit are projected to **406,096,000 Frw** each year (intervention 2).



### Cost Management

Our plan to control costs will be to maintain a high quality of our products and stock control to avoid cost overrun. The fund is being managed according to rules and regulations governing the company having ownership of the business.