

Description of Work

Producing avocado oil from overripe avocados

11 October 2006

1 General data

Name applicant:	JAMES KARIUKI
Legal name of company (if applicable)	INTERNATIONAL RESEARCH &DEVELOPMENT AFRICA LTD
Legal address (address, zip code, residence):	P.O. BOX 1871 00900 KIAMBU KENYA
Visiting address (address, zip code, residence):	IST FLOOR MAPA HOUSE KIAMBU; AND PLOT NO 7 AGRICULTURAL SOCIETY OF KENYA, JAMHURI PARK INTERNATIONAL SHOW GROUND. NAIROBI
Contact person:	JAMES KARIUKI
Telephone:	254 722 726 702
Fax:	
Email:	irdafrica@yahoo.com
Website:	

2 Short description of the tendering party

WE ARE A RESEARCH AND VALUE ADDING COMPANY. WE HAVE IDENTIFIED THE NEED FOR EXTRACTING AVOCADO OIL FROM AVOCADO FRUIT REJECTED BY FRUIT & HORTICULTURAL EXPORTERS TO EUROPE FROM THE SMALL SCALE PEASANT FARMER DUE TO OVERSUPPLY DURING THE HARVEST SEASON , FRUIT SIZE OR MINOR DAMAGES DURING HARVESTING.

WE HAVE INSTALLED A LOW COST APPROPRIATE FRUIT MALAXING SYSTEM (HEAT FRUIT PULP IN HOT WATER AT THE RIGHT TEMPERATURE) TO RELEASE THE OIL FROM THE RAPTURED OIL CELLS. THIS IS A WOOD ENERGY SAVING SYSTEM

WE GET A MIXTURE OF SOLID PULP/WATER/OIL.

WE ARE UNABLE TO OBTAIN A LOW COST THREE PHASE CENTRIFUGAL SEPERATOR AND DISK SEPERATOR.

IF THE SALT SOLUTION SEPERATES THE EMULSIFIED OIL FROM THE SOLIDS AND WATER; THEN THE OIL CAN BE DECANTED MANUALLY FROM THE SETTLED MASS OR MIXTURE PASSED THROUGH A FILTER PRESS TO REMOVE THE SOLIDS AND THEN THROUGH A DISK SEPERATOR TO .

3 Short description of the execution plan for the avocado-oil project, including an estimated timetable

1. MONTH 1 TO FRUIT SEASON MATURITY; VISIT THE FARMERS TO OFFER TO PURCHSAE FRUIT FROM THEM ON MATURITY..
2. ALLOW FOR SIMPLE OIL CONTENT TEST EQUIPMENT FOR THE FRUIT. YOU WANT TO PURCHASE FRUIT WITH MAX OIL YIELD POTENTIAL. YOU WILL GET NO OIL FROM UNRIPE MATURE FRUIT.
3. MAKE WOODEN CRATES WITH WITH ADEQUATE VENTILATION FOR HOLDING BOUGHT FRUIT TO BRING TO RIPE STAGE AS REQUIRED.
4. BUY FRUIT FROM FARMERS AS REQUIRED.
5. BRING FRUIT TO REQUIRED PROCESS PARAMETERS AND START TRIALS.

- 4 Explanation on local context. Give a brief explanation on the venue of the project and the organizations which will be involved in the execution of the project.

THE FRUIT WILL BE SOURCED FROM SMALL SCALE FARMERS IN THE KENYAN HIGHLANDS NEIGHBOURING NAIROBI CITY. A DISTANCE OF 12-120 KM FROM THE CITY CENTER.

THE FRUIT IS BOUGHT FROM THE FARMER PER KG WEIGHT. (FARMER HARVESTS WITH OWN LABOUR/FAMILY).

IN A COMMERCIAL INDUSTRIAL ENVIRONMENT EXTRACTION RATE IS 10-14 % OF WEIGHT PROCESSED.

THE FRUIT IS TRANSPORTED TO THE PROCESS CENTER FOR SORTING AND RIPENING.

THE FRUITS ARE DE STONED AND SKIN REMOVED. THE FRUIT IS PASSED THROUGH A NORMAL HAMMER MILL TO PRODUCE A FINE PASTE FOR FERMENTATION.

- 5 Involvement of local citizen. Please explain how this proposal will benefit local employees and what effect the execution of this project will have on the local neighbourhood.

THE FARMERS WILL HAVE A READY MARKET AS SOON AS THE FRUIT RIPENS ON THE TREE WHICH GIVES MORE OIL YIELD. THE FARMER WILL EMPLOY HIMSELF TO HARVEST THE FRUIT AND THE FRUIT WEIGHED IN HIS PLOT PAID FOR AND COLLECTED. ONE SMALL VAN WILL COLLECT FROM MAY FARMERS IN THE SAME REGION.

AT THE PROCESS CENTER MANUAL LABOUR IS USED TO CLEAN, SORT, REMOVE THE STONE/SKIN.

SEMI SKILLED PEOPLE ARE EMPLOYED TO RUN THE EQUIPMENT.

THERE MUST BE BASIC MECHANISATION FOR THE PRODUCT TO MEET MARKET QUALITY AND PRICE COMPETITIVENESS FOR IT TO BE SOLD AT A PROFIT. IF THIS IS ACHIEVED THERE WILL BE INCENTIVES FOR CONTINUITY.

6 Continuation of the project after 2007. Explain how the project can be continued after 2007, which organizations are involved and which guarantees are in place (or will be put in place) to realize this.

IF WE CAN ECONOMICALLY PRODUCE COMMERCIAL QUANTITIES OF THE OIL FROM THE PROJECT WE SHALL CONTINUE TO ADVISE THE FARMERS TO INCREASE THE AVOCADO PLANTS ON THEIR PLOTS AS THE MARKET WILL BE SECURED.

WE ALREADY HAVE A MARKET FOR AVOCADO OIL AS AND WHEN PRODUCED.

WE WOULD LOVE TO LEARN HOW TO MAKE BIOLOGICAL PESTICIDES FROM THE AVOCADO SKIN AND SELL BACK A LOW COST BIOLOGICAL CONTROL AGENT TO THE FARMERS TO PRACTICE ORGANIC FARMING. WITH MORE FARMERS GROWING AVOCADO, THEY WILL START EATING IT AND ALSO BENEFIT FROM THE HEALTH AND NUTRITIONAL VALUES; LESS SICKNESS, HEALTHIER FAMILIES.

7 Estimated budget. Please provide a full budget of outgoing and incoming costs for the period of the start of the project until the end of the project.

WE ARE SURE THIS CAN BE ACCOMMODATED IN YOUR TOTAL PROJECT GRANT.

WE WOULD HAVE TO RE-EVALUATE THE ORIGINAL PROJECT AND DRAW A REQUIREMENTS LIST AS PER THE LOCAL REQUIREMENTS.

SOME OF THE CLASS IDEAS MAY NOT BE VERY PRACTICAL ON THE GROUND UNLESS IT IS A CLASS LABORATORY EXPERIMENT WITH NO COMMUNITY VALUE-ADDING REQUIREMENTS.

WE WOULD LIKE TO LEARN TOGETHER WITHIN THIS CLASS PROJECT AND MAKE A POSITIVE CHANGE IN THE PEOPLE'S LIVES.

WE WOULD IN CONJUNCTION WITH THE CLASS PRODUCE A PROFESSIONAL PROPOSAL IF YOU CHOOSE TO LINK WITH US.

8 Final remarks

I have read and agreed to the General terms and conditions Foundation Imagine Life Sciences.

9 Signature

Date	Place	Signature
22.05.2006	NAIROBI	James kariuki.

Amendment 1

International Research and Development (A) LTD was incorporated in 2001 to carry our research on appropriate locally affordable technology required to increase small scale/peasant agriculture farm yields and value to farm produce.

CONSTRAINTS

The following are some of the constraints identified as hampering small scale/peasant farm production and economic activity

- (1) Lack of basic weather information as most small scale/peasant farmers practice rain fed agricultural production.
- (2) Low farm gate prices received from middlemen/brokers/exporters. Sometimes farmers receive less payment for produce than production costs.
- (3) Lack of basic tools , power implements , production technologies , time and labor saving devices
- (4) Lack of basic information and resources to install manually operated small drip and trench irrigation systems to allow round the year crop production

SOLUTIONS

- (a) We have to date developed a low cost prototype manual wheel-hoe and wheel planter that increases individual farmers performance output 20 fold under ideal conditions and promote No Till agricultural methods. The project is at the production design drawing stage at the Kenya Industrial Research &Development Institute.
- (b) We have developed and applied for industrial patent to a process of producing clear beer from indigenous crops such as sorghum millet and maize that largely grow in semi arid and rain deficiency areas. This will create an incentive and ready market , steady prices for the farmers to grow the produce, generate income increase their food reserves available for consumption and produce low cost hygienic beer for the low income groups/population.
- (c) We have for the last five years been studying the avocado oil extraction process with a view of commercializing the avocado sub sector to produce value added by products and enhance demand and farm gate prices to the farmers. Avocado oil is a high value oil almost similar to olive oil and demand is high
- (d) We have produced and bought the basic machines and equipment required for Avocado oil extraction except the centrifugal separators required to produce world market grade avocado oil ;, economically utilize the by products and manufacture premium quality cosmetics for the elite market that is readily available locally and internationally.

This would be a most effective method of natural wealth distribution from the affluent wealthy end product users to the poor small scale /peasant avocado tree farmers.

This project will also enable the small scale farmers access affordable low cost bio pesticides when production is implemented from the avocado skin dry fermentation.

We have the basic equipment to produce soaps, cosmetics, lotions etc.

LEGAL STATUS

Attached is a copy of the certificate of incorporation for International Research & Development (Africa) Ltd.

We have also attached the following;

- 1, Laboratory analysis Avocado fruit in season Hass Variety.
2. Kenya Bureau of standards Avocado oil requirement.
3. Copy Patent Application.
4. Pro forma invoice SEPERATOR MANUFACTURER.& local clearing charges.
5. Pro forma invoice Industrial process Equipment for same capacity for comparison purposes.

IMPLEMENTATION PLAN FOR THE AVOCADO PROJECT. 2006/2007

August	Place order and open LC for the centrifugal separators – Lead time 2 months.
August	Prepare Avocado fruit reception/sorting/weighing and ripening and washing process equipment layout areas
September	Install all electrical wiring and controls to new hammer mill for producing avocado paste
September	Provide and arrange work stations for workers to cut / separate the seed from avocado fruit and remove excess flesh from the skin
October/November	Complete equipment and machinery installation , commissioning and purge the system.
October/November	Purchase mature avocado from the farmers and prepare to ripen.
October /November	Trial production ;avocado oil
December	Economic evaluation of the production process, yields and statistics
December	Trials, toilet soap production.

December	Trial lotions, creams and shampoo production.
January 2007	Package development.
January	Sample market and determine pricing structures.
January/February	Market introduction of by products.
February /March	Avocado flesh by product Technical analysis and utilization assessment
March	Trial production market and use of the avocado flesh for animal feed.
April	Trial Bio pesticide from the avocado.
April /November	Commercial production and marketing of avocado oil and by products from the fruits seasonal crop
April	Trial evaluation and certification of Bio products until authorized for use
August/December	Analyze and evaluate economic impact of the project.

BUDGET ESTIMATES

Year 2006

August – September	Purchase centrifugal separators FOB Nairobi	20,000 USD
September - October	Participate in the Nairobi International Trade Fair	2,000 USD
October	Machinery installation and commissioning	2,000 USD
October/November	Initial fruit purchase	2,000 USD
October/December	Processing costs and value adding inputs	1,000 USD
December/January	Packaging material	2,000 USD
October/November/December	Labour 300 USD per month	1,500 USD

2007 (Season) It is expected the project will be self sustaining from production sales at this point

Start purchasing crop in April 2007. 2,000 USD per week.

The costs of product development Bio pesticides and annual feed will be financed by production sales profits.

OWN CONTRIBUTION

- (1) Building/Rent/power/ water and telephone.
- (2) All other machinery except the centrifugal separators.
- (3) From March 2007 we shall fund the crop purchase and delivery from the farmers.
- (4) Well situated premises inside the Nairobi International Trade Fair grounds run by the Agricultural Society of Kenya. The premise will double as a display and educational centre during the trade fairs and throughout the year for the avocado farmers.

Schedule of plant and equipment currently available on site:-

- 1) One (1) stainless steel insulated 500litres capacity malaxing pot with a mechanized stirrer, energy source: wood fuel/product waste or gas cooker. Very efficient, we use this for the trials and as a vessel for making lotions and creams
- 2) One (1) Perkins Industrial boiler wood/coal/ furnace oil fired with a capacity of 10,000lbs steam per hour.
- 3) One (1) soap plodder with a capacity of 3tonnes of soap per 8hr shift
- 4) One (1) 200litre capacity ribbon blender.
- 5) Set of bronze soap noodle dies
- 6) Set of bronze soap bar dies
- 7) One (1) toilet soap tablet stamper, can produce 60 toilet soap tablets per minute
- 8) One (1) 5000 litre stainless steel tank with motorized stirrer can be used for finished oil storage, filling and packing
- 9) One (1) 20hp hammer mill to mash avocados flesh
- 10) One (1) 17,000litre stainless steel tank with steam coil and steam jacket and motorized stirrer .This vessel can be used for various processes even avocado paste malaxing on a large scale with the big boiler.
- 11) Nine (9) 3000litres black plastic tanks can be used for water and oil storage
- 12) One (1) 32 plate industrial filter press
- 13) Four (4) 8x4ft working table with stainless steel worktops.
- 14) The premises is connected to a 3 phase 415V 50hz power supply

INTERNATIONAL RESEARCH DEVELOPMENT AFRICA LTD

RE: 2 SETS OF STAINLESS STEEL SEPARATORS; Local Clearing Charges.

FOB	USD	14,000/=
FREIGHT	USD	500/=
INSURANCE @ 1.5%	USD	<u>217.5/=</u>
C/F	USD	14717.50

EXCHANGE RATE @ 74	Kshs	1,089,095/=
DUTY @ 10%	Kshs	108,909.50/=
VAT @ 16%	Kshs	191,681/=
IDF fee @ 2.75%	<u>Kshs</u>	<u>29,951/=</u>
TOTAL DUTY + VAT + IDF	Kshs	330,542/=

Port charges Approximate	Kshs	28,000/=
Shipping charges	Kshs	28,000/=
C/F fee	Kshs	25,000/=
Transport MSA-NBI	<u>Kshs</u>	<u>22,000/=</u>
	Kshs	433,542/=

KEBS inspection fee USD 100/= PAYABLE TO INTERTEK CHINA
ON PRODUCTS INSPECTION IN THE FACTORY.



No. C. 94324


CERTIFICATE OF INCORPORATION

I hereby Certify, that—

INTERNATIONAL RESEARCH & DEVELOPMENT (AFRICA) LIMITED

is this day Incorporated under the Companies Act (Cap. 486) and that the Company is LIMITED.

Given under my hand at Nairobi this TWENTY FIFTH day
of JUNE Two Thousand AND ONE.


Snr. Dy. Registrar of Companies

Amendment 2

1. Avocado Oil: Uses

It has been scientifically established that avocado oil is a Healthy oil and in the same category as olive oil.

It has also been scientifically established that avocado oil is a premium beauty care product's ingredient and has been incorporated in various premium commercial products.

As soon as we can produce commercial quantities of Avocado oil, it will be extremely important that we are able to move it into the commercial market either as

1. Premium edible oil.
2. Crude export oil
3. Avocado cosmetic by products.

We cannot rule out any or other uses of the Avocado oil.

Commercialization of the project will ensure funds are available to buy more Avocado fruits from the farmers for processing and ensure the project's commercial continuity.

2. Extraction method

We shall only use the heating (malaxing) and centrifugal extraction of the oil process.

We do not have the capacity to use the solvent extraction process.

3. The Budget

We have attached a budget in US Dollars.

4. We have attached an estimate projected budget for the year 2007 including projected incomes.

5. Avocado purchases period: Avocado season.

Avocado is normally available from March to August (previous July/August flowers). Cultivar Hass which is our main crop can extend up to October. Sometimes there is also an off season crop from December – March (from previous April/May flowers).

There are three commercial cultivars Hass, Fuerte and to a less extent Pinkerton.

Our commercial intake shall be mature high oil content fruit during the season. We shall purchase, process capacity crop daily as is available and suitable for oil extraction. This

is atleast for 8 months in the year. There is a possibility of all year availability from the off season crop when the March/April short rains

6. Avocado Prices

We foresee purchasing avocado at between 0.13 – 0.2USD per kg.

Avocado for the export market is 0.2USD per Kg and 0.07USD per kg. For the local domestic consumption market.

7. Machinery Prices

The huge price difference between the machines from France and the machines from China is due to the following:-

1. We have locally acquired and adopted all other process vessels and equipment except for the 3 & 2 phases' centrifugal separators.
2. Generally productions costs of machinery in France are higher than in China and the equipment from France has a hefty Brand name markup in price. It is like comparing prices for the new 4 x 4 PORCHE and the new 4 x 4 Hyundai. Both will take you shopping, one at a very steep premium.

Our production capacity and methods are in tandem with the capacity of the Chinese separators.

8. Salaries & Personnel

There was a typing error. I estimate 500USD per month for 3 months salaries.

These are standard wages for

3 workers @ 120 USD

1 Mechanic @ 140 USD

We shall also increase the work force during trials and commissioning as and when required as estimated in the production workforce budget estimates.

I foresee a solid growth rate, upgrading of capacity and quality of products produced after 2007.

Once we are comfortable in the oil production and marketing, we shall look at the processes required for production of stock feed and bio pesticides from the avocado flesh and skin and we will continue fulltime research and development on these products in conjunction with local government research facilities

(iii) Management Salaries Monthly

1. General Manager	=	\$ 1667
2. Production manager/Chemical/food technologist	=	\$ 833
3. Chief Accountant	=	\$ 555
4. 2 No. Accounts clerk	=	\$ 417
5. Store keeper	=	\$ 250
6. Field crop Liaison officer	=	\$ 417
7. Research and Development Scientist	=	\$ 1319
8. Receptionist	=	<u>\$ 347</u>
	=	\$ 5805

3. START UP FUNDING FOR PLANT PURCHASES, INSTALLATIONS AND COMMISSIONING

During the months of September/October 2006, and up to the month of March 2007 the following initial capital expenses will have been spent:

(i) Purchase of 2 No. centrifugal separators FOB Nairobi	\$18,000
(ii) Participation in Nairobi International Trade Fair to introduce the project to farmers	2,000
(iii) Machinery installations and commissioning	2,000
(iv) Initial Fruit purchases (October/Nov. to March 2007)	4,000
(v) Production inputs, tool etc	1,000
(vi) Packaging material (Dec.2006 – Jan.2007)	2,000
(vii) Labour costs – October, November, December to March	<u>3,000</u>
Total	<u>US\$32,000</u>

INTERNATIONAL RESEARCH & DEVELOPMENT AFRICA LIMITED

ESTIMATED BUDGET FOR THE PROPOSED AVOCADO OIL PRODUCTION NPROJECT

CURRENCY \$	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH
-------------	-------	-----	------	------	------	-------	------	------	------	------	------	-------

PRODUCTION IN KGS	12.000	12.000	12.000	12.000	12.000	12.000	12.000	12.000	6.000	6.000	6.000	6.000
-------------------	--------	--------	--------	--------	--------	--------	--------	--------	-------	-------	-------	-------

MARKET PRICE FOR
CRUDE AVO. OIL
CURRENTLY US\$2
PER KG

SALES IN US\$	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000	12.000	12.000	12.000	12.000
---------------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------

PRODUCTION COSTS:												
Avocado fruits	2040	2040	2040	2040	2040	2040	2040	2040	1020	1020	1020	1020
Labour Costs	1658	1658	1658	1658	1658	1658	1658	1658	1982	1982	1982	1982
Electricity	360	360	360	360	360	360	360	360	250	250	250	250
Packaging materials	1250	1250	1250	1250	1250	1250	1250	1250	625	625	625	625
Marketing	200	200	200	200	200	200	200	200	200	200	200	200
Financial costs	100	100	100	100	100	100	100	100	100	100	100	100
Motor vehicle purchases	-	-	-	-	-	-	-	1375	960	960	960	960
communications	416	416	416	416	416	416	416	416	416	416	416	416
Research and Development	1000	1000	1000	1000	1000	1000	1000	1000	500	500	500	500
Environmental compliance	200	200	200	200	200	200	200	200	100	100	100	100
Medical expenses	139	139	139	139	139	139	139	139	139	139	139	139
Plant maintenance	150	150	150	150	150	150	150	150	100	100	100	100
Management salaries	5805	5805	5805	5805	5805	5805	5805	5805	5805	5805	5805	5805
Heating fuel	722	722	722	722	722	722	722	722	360	360	360	360
Sationery and office supplies	172	172	172	172	172	172	172	172	172	172	172	172
Audit legal & other												
Pro. Fees	-	-	560	-	-	-	-	-	-	-	560	-
Licences and standards	347	69	69	69	69	69	69	69	69	69	69	69
Travel Accom. And												
entertainment	416	416	416	416	416	416	416	416	216	216	216	216
Trade and exhibitions	-	-	-	2000	-	-	2000	-	-	2000	-	-
Taxation	2146	2146	2146	2146	2146	2146	2146	2146	-	-	-	-
TOTAL PAYMENTS	17121	16843	17403	18843	16843	16843	18843	18218	13014	15014	13574	13014
PROFIT FOR THE MONTH	6.879	7.157	6.597	5.157	7.157	7.157	5.157	5.782	-1.014	-3.014	-1.574	-1.014