PREFEASIBILITY STUDY ON

SETTING UP MOSQUITO REPELLANT CREAM MANUFACTURING UNIT IN NIGERIA

DEVELOPED BY

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DISCLAIMER

ACKNOWLEDGMENT

Startup Business Foundation is thankful to all organizations and individuals who have helped in several ways in preparation of this prefeasibility study.

We also wish to extend our gratitude to all those who reviewed the content and provided valuable inputs for improving the quality, coherence, and content presentation of this prefeasibility study.

ABOUT THIS REPORT

This prefeasibility study is designed to provide potential and startups entrepreneurs' valuable information on setting up Mosquito Repellant Cream business in the food processing industry of Nigeria's market; aimed at encouraging and facilitating industrial activities across the country. It is our realization that industrialization is at the heart of economic development and that every effort has to be made to bring about industrial growth and encourage our people to be part of it.

Mosquito Repellant Cream business shows over 80% local content in terms of availability of raw material, equipment and machinery, manpower and other requirements.

The key areas covered in this report include:

i) Technical and economic analysis of the production, marketing and profitability of the project.

ii) Recommendations in respect of procurement of equipments and associated problems.

iii) Recommendation on suitable agronomic management practices to ensure efficient running of the projects.

iv) Detailed financial analysis including project cash flows for the projects.

This prefeasibility report provides a comprehensive and detailed coverage of the above terms of reference and is designed to facilitate investment decisions.

The implementation of this project will also impact positively on the economy of the immediate community where the project is located. This is in terms of employment-direct and indirect, skilled and unskilled. Government also stands to benefit from internal revenue from taxation.

In view of the result of the analysis using some economic indicators as stated in the proposed project, it is hereby recommended that the project is viable.

TABLE OF CONTENT

APPENIDIES

PART I

EXECUTIVE SUMMARY

This prefeasibility report is on producing cream that drives mosquitoes away from whoever applies the product.

Mosquitoes are a menace to human race as they transmit malaria parasites through their bite. They must therefore be kept at bay.

Mosquito Repellent has become a gripping market for new product developments and innovation where producers are trying to convince consumers through aggressive campaign and advertising that they should adopt mosquito repellent products to improve home hygiene and to be protected from mosquito borne disease. However, the risk involved in this business is healthy and safety which can be mitigated by employing qualified scientists.

This project is micro enterprise project and could be setup in any part of the country provided there is easy accessibility of raw materials that could meet the production capacity of the plant as well as market for the finished project.

The production projection is based on daily capacity of producing 3,500-150mgs of repellant cream which translates to 168,000 mgs annually.

1.1 SUMMARY OF TOTAL PROJECT COST

	DESCRIPTION	COST TO BE INCURRED	COST TO BE INCURRED	Total
1	Land & Building	-	400,000	400,000
2	Machinery & Equipments	-	91,400	314,500
3	Office Equipment	-	150,000	150,000
4	Vehicle	-	3,400,000	3,400,000
	TOTAL CAPITAL COST	-	**4,041,400**	4,264,500
5	Working capital	-	2,400,000	2,400,000
6	10% Contingencies & preliminary expenses	-	666,450	666,450
	Total project cost	-	**7,107,850**	**7,330,950**

1.2 FINANCIAL ACCOUNTING RATIOS ANALYSIS

PERFORMANCE RATIOS AVERAGES

(a) Return on Sales =13%
(b) Return on Equity = 164%
(c) Return on Investment =75%
(d) Positive NPV = ₦19,047,865
(e) IRR =47%
(f) ARR =75%
(g) Payback Period = 1 year and 11 months

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PART II
MARKET ANALYSIS

2.1 INTRODUCTION

The market is wide since malaria is one of the biggest killer diseases in Nigeria. The people who feel uncomfortable by sleeping under mosquito nets can easily switch to repellant creams. The demand for mats is understood to be growing very fast in the rural areas, whereas in urban areas the vaporizers are replacing mats and coils. In terms of the total market spread, the urban share was about 70%.

2.2 MARKET OUTLOOK

The global insect repellent market is expected to generate $ 9,615.7 million by 2026, growing at a CAGR of 6.8% from 2019 to 2026. Insect repellent is a chemical substance applied to skin, clothing, or other surfaces, which discourages insects from landing or climbing on that surface. Insect repellents help prevent and control the outbreak of insect-borne diseases such as malaria, zika, Lyme disease, dengue, bubonic plague, river blindness, and west Nile fever.

Increasing global warming and waste has also led to a rise in the insect borne diseases due to increase in the number of insects. This, in turn, increases the demand for repellents.

As consumers have become extremely health conscious these days, the insect repellent market demand has witnessed a significant growth. Rising consumer awareness regarding insect borne diseases due to increasing waste from commercials facilities or households is anticipated to propel the insect repellent market share growth during the forecast period. Furthermore, rising insect borne diseases due to increasing number of mosquitoes has positively impacted the insect repellent market growth.

2.3 DOMESTIC DEMAND ANALYSIS

The urban share of mosquito repellents is 70%, which shows that with increasing affluence among the urban population, more and more people are purchasing mosquito repellents as a precautionary measure against diseases spread by mosquitoes. The mosquito repellent market is one of the rapidly growing vibrant markets in FMCG sector Nigeria. Due to increase awareness regarding vector borne disease, the demand for mosquito repellent products like coils, strips, liquid vaporizers, etc. are rising than before, thereby providing high momentum to the Nigerian Mosquito repellent market.

This offers potential entrepreneurs opportunity to explore the local market and create a market niche for themselves. With quality product and good packaging, the product would be profitably sold in the various supermarkets, stores and public markets in different cities. However, the entrepreneur should adhere strictly to NAFDAC rules and guidelines.

PART III
TECHNICAL ANALYSIS

3.1 PRODUCT DESCRIPTION

The cream is applied on the exposed parts of the body e.g. the face and neck; the legs, the hands, and it remains effective for about 10 hours. The insect repellent market is segmented on the basis of insect type and product type. By insect type, it is divided into mosquito, bugs, fly repellent, and others. On the basis of product type, it is categorized into vaporizers, spray, cream, and others. However, for the purposes of this prefeasibility study, the cream under the product type is been used in production and computation.

3.2 SUITABLE LOCATION

This project can be sited in any rural, semi urban and urban cities in Nigeria with consideration to proximity to source of raw materials and market availability to meet the production capacity of the plant.

3.3 RAW MATERIALS

The major raw material for the production of repellent cream is essential oil, white mineral oil and petroleum jerry. Each of these raw materials is locally available.

3.4 PRODUCTION PROCESSES

Snow white petroleum jelly is heated and melted in stainless steel air-tight vessel and when it reaches a boiling point, mosquito repellent essential oil is added and allowed to mix thoroughly. Color may be added if desired. After, the solution is filled in plastic containers and placed on trays to cool. These are later cleaned, labeled and packed in dozens and sealed for dispatch to the market.

3.5 PRODUCTION CAPACITY

The installed capacity of the plant has an estimated capacity of daily capacity of producing 3,500-150mgs of repellant cream which translates to 168,000 mgs working 312 days per annum. This is said to be at 60% production capacity.

3.6 SOURCES OF FUNDS

The project can be funded through a number of sources which include but not limited to the following; Agric-Business, Small & Medium Scale Investment Scheme (AGSMEIS), Bank of Industry, International Finance Corporation (IFC), grants etc., though the conditions and criteria for accessing the loans and grants varies.

PART IV
FINANCIAL ANALYSIS

Basically, the financial section of this prefeasibility study consists of three financial statements: Income statement, Balance sheet, Cash flow projection. This section determines whether or not the project is viable using some economic indicators such as Net Present Value (NPV), Internal Rate of Return (IRR), and payback period as are detailed in the appendices below.

ASSUMPTIONS

1. Assuming that the project will last for the period of five years and the salvage value at the end of the project life ignored.
2. The Machineries, Equipments and Utility Equipment have uniform depreciation of 20%.
3. Production costs assumed 312 days per year with daily capacity of producing 3,500-150mgs of repellant cream.
4. The proposed capacity utilization are 60% in the first year of commercial production, 70%, 80% in the 2nd and 3rd year respectively and 90% in the 4th and 5th years.
5. Raw materials will be sourced locally and Market for the product is readily available.
6. Staff and labour cost will increase by 10% yearly.
7. Prices and unit costs are assumed unchanged in the five years of projection.
8. The valuation currency used is Naira.

4.2 ACCOUNTING /FINANCIAL ANALYSIS

4.2.1 NET PROFIT

The projected Annual Trading Profit and Loss Account is proposed to make the following Net Profit after tax during the corresponding projected periods – all things being equal.

4.2.2 NET PRESENT VALUE (NPV)

NPV is one of the four methods of discounted cash flows techniques which state that money that is immediately available for use, has a greater value than same amount receivables in future date.

Using this method however, all net cash inflows will be discounted to present value using the estimated interest rate of 60% discount factor. At **12%** discount factor the project produced a positive **NPV NGN 19,047,865**

4.2.3 INTERNAL RATE OF RETURN (IRR)

This is the discount rate which gives zero NPV or the rate which equates the present value of cash inflows with present value of cash outflows of the project.

The cash flow of this project was discounted systematically until the NPV of the project finally become zero. The project produces the **IRR** of **46.9%.** Thus, the project accepted as being viable. This is because **IRR** is more than the cost of capital.

4.2.4 ACCOUNTING RATE OF RETURN (ARR)

ARR uses accounting information as revealed by financial statements (Income Statement) to measure profitability of the project under consideration. The forecast **ARR** of the project is **75%.**

4.2.5 PROFITABILITY INDEX (PI)

This is the present value of future cash flows over the present value of cash outlays. The project PI further confirm the viability of the project , because as the rules of the accepting and rejecting hold, a project should be accepted if the PI is equal or greater than one (1). Consequently, the PI of this project is **1.72** and thus recommended as being viable to be accepted for financing.

APPENDIX I
TOTAL PROJECT COST

	DESCRIPTION	QTY	Unit price	Total
	LAND & BUILDING			
1	Factory rentage	1	400,000	400,000
	Sub total	**1**	**400,000**	**400,000**
	MACHINERY & EQUIPMENTS			
2	Production Utensils	1	-	62,500
3	Tables	2	65,000	195,000
4	Basins	4	600	3,000
5	Jerrycans	2	800	4,000
6	Charcoal Stove	3	25,000	50,000
	Sub total		**91,400**	**314,500**
	OFFICE EQUIPMENT			
8	Furniture & fittings	1	150,000	150,000
	Sub total	**2**	**150,000**	**150,000**
	VEHICLE			
9	Delivery van		3,400,000	3,400,000
	Sub total		**3,400,000**	**3,400,000**
	TOTAL CAPITAL COST		**4,041,400**	4,264,500
9	Working capital		2,400,000	2,400,000
10	10% Contingencies & preliminary expenses		666,450	666,450
	Total project cost		**7,107,850**	**7,330,950**

APPENDIX II
ESTIMATION OF WORKING CAPITAL REQUIREMENT

N'

Year of Commercial Operation	2 weeks
% Capacity Utilization (Inventory)	60%
1 week stock of raw material	1,800,000
1 Day stock of finished products	600,000
Work in Progress	-
Bank/ Cash (5% sales of the products)	-
Working capital	**2,400,000**

APPENDIX III
FINANCING PLAN

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DESCRIPTION	EXISTING	PROPOSED	TOTAL
Equity	3,330,950	-	3,330,950
Term loan from	-	4,000,000	4,000,000
Total project cost	3,330,950	**4,000,000**	**7,330,950**
% Contribution	**15%**	**75%**	**100%**

APPENDIX IV
TERM LOAN REPAYMENT SCHEDULE

LOAN AMOUNT: 4,000,000 (Four Million Naira)
TYPE : ANY LOCAL AVAILABLE SME FUND
INTEREST RATE USED: 12%
REPAYMENT: 5 YEARS EQUAL INSTALLMENT (Annually)

YEAR	OPENING BALANCE	REPAYMENT	INTEREST DUE	TOTAL YEAR INTEREST
1	4,000,000	800,000	480,000	1,280,000
2	3,200,000	800,000	384,000	1,184,000
3	2,400,000	800,000	288,000	1,088,000
4	1,6000,000	800,000	192,000	992,000
5	800,000	800,000	96,000	896,000
Total		**4,000,000**	**1,440,000**	**5,440,000**

APPENDIX V
FORECAST STAFFING SCHEDULE (1ST OPERATIONAL YEAR)
N'000

POSITION	No	Unit Scale	Scale/ Month	Scale / Year
DIRECT LABOUR				
Factory Manager	1	60	60	720
Production manager	1	60	60	720
Unskilled labour	2	30	60	720
Sub total	**4**	**150**	**180**	**2,160**
INDIRECT LABOUR				
Accounts/ Admin	1	50	50	600
Marketing Officer	2	40	80	960
Driver	1	40	40	480
Sub total	**4**	**130**	**170**	**2,040**
Total on staff (1st year)	**8**	**280**	**350**	**4,200**

APPENDIX VI
ESTIMATE OF ANNUAL DEPRECIATION ALLOWANCE
N'

ITEMS	INITIAL VALUE	DEPRECIATION (20%)
Machinery and Equipments	314,500	62,900
Office Equipments	150,000	30,000
Vehicle	3,400,000	680,000
TOTAL	**3,864,500**	**772,900**

APPENDIX VII
ESTIMATION OF ADMINISTRATIVE / OVERHEAD EXPENSES
N'

COST ITEM	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Selling and Distribution	1,328,400	1,394,820	1,461,240	1,534,302	1,534,302
Repairs & maintenance	226,800	238,140	249,480	261,954	261,954
Miscellaneous	900,000	945,000	990,000	1,039,500	1,039,500
TOTAL	**2,455,200**	**2,577,960**	**2,700,720**	**2,835,756**	**2,835,756**

APPENDIX VIII
ESTIMATION OF PRODUCTION AND OPERATION COSTS

Cost Item	@	Qty/ day	Pdn Cost/ day	Pdn Cost/ mth	Pdn Cost/yr
Direct Costs					
Essential Oil	13,500	1	13,500	351,000	4,212,000
White Mineral Oil	9,000	3	9,000	67,080	804,960
Petroleum Jerry	120,000	4	120,000	479,700	5,756,400
Labels	3	256	3	19,968	239,616
Plastic Containers	150	256	150	998,400	11,980,800
Sub-total	**142,653**	**268**	**142,653**	**1,916,148**	**22,993,776**

APPENDIX IX
ESTIMATION OF RAW MATERIAL/PRODUCTION COST AND SALES

Year of Commercial Production	Year 1	Year 2	Year 3	Year 4	Year 5
% Capacity Utilization	**60%**	**70%**	**80%**	**90%**	**90%**
1. Output					
Mosquito Repellent Cream (ltrs)	168,000	184,800	201,600	221,760	221,760
Total output	**168,000**	**184,800**	**201,600**	**221,760**	**221,760**
2. Cost of Production	**N'**	**N'**	**N'**	**N'**	**N'**
Mosquito Repellent Cream@N136 (ltrs)	22,993,776	25,293,154	27,592,531	30,351,784	30,351,784
Total cost of production	**22,993,776**	**25,293,154**	**27,592,531**	**30,351,784**	**30,351,784**
3. SALES					
Mosquito Repellent Cream@N225 (ltrs)	37,800,000	4,1580,000	45,360,000	49,896,000	49,896,000
TOTAL SALES/ TURNOVER	**37,800,000**	**4,1580,000**	**45,360,000**	**49,896,000**	**49,896,000**

APPENDIX X
FORECAST INCOME STATEMENT (PROFIT & LOSS ACCOUNT)

Year of commercial operation	Year 1	Year 2	Year 3	Year 4	Year 5
% Capacity Utilization	60%	70%	80%	90%	90%
1. **SALES**	N'	N'	N'	N'	N'
Gross Sales	37,800,000	4,1580,000	45,360,000	49,896,000	49,896,000
VAT @ 5%	1,890,000	2,079,000	2,268,000	2,494,800	2,494,800
Net Revenue	**35,910,000**	**39,501,000**	**43,092,000**	**47,401,200**	**47,401,200**
2. **OPERATION COST**					
Cost of Raw materials consumed	22,993,776	25,293,154	27,592,531	30,351,784	30,351,784
Staff and labour	4,200,000	4,410,000	4,620,000	4,851,000	4,851,000
Admin. & Overhead Expenses	2,455,200	2,577,960	2,700,720	2,835,756	2,835,756
Depreciation	772,900	772,900	772,900	772,900	772,900
Total Operating Cost	**30,421,876**	**33,054,014**	**35,686,151**	**38,811,440**	**38,811,440**
3. **OTHER COSTS**					
Interest on Term Loan (12%)	480,000	384,000	288,000	192,000	96,000
Loan Repayment	800,000	800,000	800,000	800,000	800,000
Total (Other Costs)	**31,701,876**	**34,238,014**	**36,774,151**	**39,803,440**	**39,707,440**
Profit Before Tax	4,208,124	5,262,986	6,317,849	7,597,760	7,693,760
Corporate Tax @ 12%	504,975	631,558	758,142	911,731	923,251
Profit after tax (NET PROFIT)	**3,703,149**	**4,631,428**	**5,559,707**	**6,686,029**	**6,770,509**
% Return on Sales	0.10	0.12	0.13	0.14	0.14
% Return on Equity	0.50	0.63	0.76	0.91	0.92
% Return on Investment	1.11	1.39	1.67	2.00	2.03

APPENDIX XI

FORECAST HIGH RATE AND LOW RATE COMPUTATION

Year	C/F	DF 12%	NPV
	N'		N'
0	(7,330,950)	1	(7,330,950)
1	3,703,149	0.893	3306912.057
2	4,631,428	0.797	3691248.116
3	5,559,707	0.712	3958511.384
4	6,686,029	0.636	4252314.444
5	6,770,509	0.567	3838878.603
Total Profit	**27,350,822**		**19,047,865**
Average Profit	**5,470,164.40**		

Year	C/F	DF 60%	NPV
	N'		N'
0	(7,330,950)	1	(7,330,950)
1	3,703,149	0.625	2314468.125
2	4,631,428	0.3906	1809035.777
3	5,559,707	0.2441	1357124.479
4	6,686,029	0.1526	1020288.025
5	6,770,509	0.0954	645906.5586
Total Profit	**27,350,822**		**7,146,823**
Average Profit	**5,470,164.40**		

APPENDIX XII

FORECAST IRR AND ARR COMPUTATION

$$IRR = a + \left(\frac{A}{A+B}\right) * (b-a)$$

Where

a = 12%

b= 60%

A = 19,047,865

B= 7,146,823

$$12\% + \frac{19,047,865}{19,047,865 + 7,146,823} (60-12)$$

12% + 34.9

46.9%

$$ARR = \frac{\text{Estimated Average Profit}}{\text{Estimated initial investment}} * 100$$

$$ARR = \frac{5,470,164.40 * 100}{7,330,950}$$

75%

APPENDIX XIII
CASH FLOW PROJECTION

Year of Comm. Production	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
% Capacity Utilization		60%	70%	80%	90%	90%
A) CASH RECEIPTS	**N'**	**N'**	**N'**	**N'**	**N'**	**N'**
Equity Capital	3,330,950	-	-	-	-	-
Term Loan	4,000,000	-	-	-	-	-
Gross Revenue		35,910,000	39,501,000	43,092,000	47,401,200	47,401,200
Total Receipts	**7,330,950**	**35,910,000**	**39,501,000**	**43,092,000**	**47,401,200**	**47,401,200**
B) CASH PAYMENTS						
Capital Payment						
Machinery & Equipments	314,500	-	-	-	-	-
Utility Equipment	150,000	-	-	-	-	-
Office equipments	3,400,000	-	-	-	-	-
TOTAL	**3,864,500**	-	-	-	-	-
(ii) Operating Expenses						
Depreciation	-	772,900	772,900	772,900	772,900	772,900
Change in working capital	3,466,450	29,648,976	32,281,114	34,913,251	38,038,540	38,038,540
Sub total	**3,466,450**	**30,421,876**	**33,054,014**	**35,686,151**	**38,811,440**	**38,811,440**
(iii) Financial Expenses						
Repayment of Term Loan	-	800,000	800,000	800,000	800,000	800,000
Interest on Term Loan	-	480,000	384,000	288,000	192,000	96,000
Value Added Tax	-	1,890,000	2,079,000	2,268,000	2,494,800	2,494,800
Corporate Tax	-	504,975	631,558	758,142	911,731	923,251
Sub total	-	**3,674,975**	**3,894,558**	**4,114,142**	**4,398,531**	**4,314,051**
Total cash payment (ii)-(iii)	**3,466,450**	**26,746,901**	**29,159,456**	**31,572,009**	**34,412,909**	**34,497,389**
Net cash flow c/f	3,466,450	26,746,901	29,159,456	31,572,009	34,412,909	34,497,389

APPENDIX XIV
BALANCE SHEET PROJECTION

Year of comm. Operation	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
ASSETS	**N'000**	**N'000**	**N'000**	**N'000**	**N'000**	**N'000**
(i) Fixed assets						
Machinery and Equipments	314,500	-	-	-	-	-
Utility equipment	150,000	-	-	-	-	-
Office Equipment	3,400,000	-	-	-	-	-
Value at Acquisition	-	3,864,500	3,864,500	3,864,500	3,864,500	3,864,500
Less Cumulated Depreciation	--	772900	1545800	2318700	3091600	3864500
Net fixed assets	**3,864,500**	**3,091,600**	**2,318,700**	**1,545,800**	**772,900**	**0**
(ii)Current Assets/ liability						
Stock of Raw Materials	1,650,000	6,918,450	11,959,354	14,602,888	17,008,843	19,461,998
Debtors /prepayment	-	1,453,000	2,098,000	3,308,000	4,139,000	5,653,000
Bank and Cash Balances	4,336,000	4,150,024	5,160,031	6,170,539	7,180,674	7,180,741
Creditor / accruals	-	(4,074,000)	(6,039,000)	(8,947,000)	(11,013,000)	(13,785,000)
Company Tax	-	(504,975)	(631,558)	(758,142)	(911,731)	(923,251)
Net current assets		**7,942,499**	**12,546,827**	**14,376,285**	**16,403,786**	**17,587,488**
TOTAL NET ASSETS	**7,330,950**	**11,034,099**	**14,865,527**	**15,922,085**	**17,176,686**	**17,587,488**
(ii) FINANCED BY						
Equity Capital	3,330,950	3,330,950	3,330,950	3,330,950	3,330,950	3,330,950
P&L	-	3,703,149	4,631,428	5,559,707	6,686,029	6,770,509
Retained Profit	-	-	3,703,149	4,631,428	5,559,707	6,686,029
SHAREHOLDERS FUND	**3,330,950**	**7,034,099**	**11,665,527**	**13,522,085**	**15,576,686**	**16,787,488**
Long Term Loan	4,000,000	4,000,000	3,200,000	2,400,000	1,600,000	800,000
TOTAL EQUITY & LIABILITY	**7,330,950**	**11,034,099**	**14,865,527**	**15,922,085**	**17,176,686**	**17,587,488**