PREFEASIBILITY STUDY ON

SETTING UP FRUIT SQUASHING PLANT IN NIGERIA

DEVELOPED BY
STARTUP BUSINESS FOUNDATION

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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 fruit squashing 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.

The Fruit squashing 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 the setting up of fruit squashing facility in any parts of Nigeria that meets the critical investment criteria.

Fruits are an important source of energy and vitamins, however due to them being highly perishable and only growing in certain seasons call for need preservation. The most effective way of preserving fruits is by turning them into squash. These are drinks that are diluted to taste with water and are thus used a little at a time. The container must therefore be re-closeable and these products may contain a preservative, usually sodium benzoate, to prevent spoilage after opening. Squashes are made from at least 30% fruit juice mixed with sugar syrup.

With the increasing health awareness among many Nigerians, fruit consumption has automatically turned into a lifestyle, and they consume at least one litres of fruit juice every day. This therefore shows the market potential for the product. Nevertheless, these natural and organic fruit squash should be uniquely and attractively packaged and knowledge and expertise about the industry is required.

The production plant should be sited with consideration to proximity of the raw material source(s), basic infrastructure and markets. The estimated installed production capacity of the plant is 826,800 litres of squash per year at 60% capacity utilization.

1.1 SUMMARY OF TOTAL PROJECT COST

	DESCRIPTION	QTY	Unit price	Total
1	Land & building	1	560,000	560,000
2	Machinery & equipments		2,204,400	3,105,200
3	Utility equipment	2	550,000	850,000
4	Office equipment	2	350,000	350,000
5	Vehicle	1	2,240,000	2,240,000
	TOTAL CAPITAL COST		**5,904,400**	**7,105,200**
6	Working capital		1,100,000	1,100,000
7	10% Contingencies & preliminary expenses		820,520	820,520
	Total project cost		**7,824,920**	**9,025,720**

1.2 FINANCIAL ACCOUNTING RATIOS ANALYSIS

PERFORMANCE RATIOS AVERAGES

(a) Return on Sales =4%
(b) Return on Equity =733%
(c) Return on Investment =83%
(d) Positive NPV = **₦26,634,527**
(e) IRR =46.5%
(f) ARR =83.3%
(g) Payback Period = 1 year and 3 months.

PART II
MARKET ANALYSIS

2.1 INTRODUCTION

There is a high demand in densely populated areas and the Nigerian population is highly sensitized about the use of fruits through radios and other media channels. This proposed product has gain interest as a result of increasing literacy, health awareness and consciousness among the citizens. These raw materials includes but not limited to the following: Mango, oranges paw-paw, pineapple, banana, apple, guava, strawberry, watermelon, grapes, carrots, cucumber, garden egg etc.

2.2 MARKET AREA ANALYSIS

Fruit consumption is very nutritious to the body due to the minerals and vitamins it provides to the human body. The market for fruit is both huge locally and internationally. With your packaging, you can always export it in commercial quantities to places where fruit salad is in demand and make a lot of money due to the exchange rate. However, for the proposed of this prefeasibility study, only the local demand and consumption is considered.

Apparently, the success of this project is premised on the ability of the entrepreneur to seek vendors and distributors where can place large and sustained order on a daily basis and affordability of the raw materials.

2.3 TARGET AMRKET ANALYSIS

The proposed project is built on concept of supplies to resellers or distributor who then sales to the final consumer. In this case, the entrepreneur processes and packaged afterwards, supplies to marketers at a subsidized price. As part of incentives, the entrepreneur will provide the vendors or distributors with the mobile truck to easy the conveying of the products to the target market.

The entrepreneur should consider the establishment of the outlet in major road where there regular movement of people or main market, local stores, etc. mobile trucks or tricycles can as well be employed in the marketing of the products from one place to another.

PART III
TECHNICAL ANALYSIS

3.1 PRODUCTION DESCRIPTION

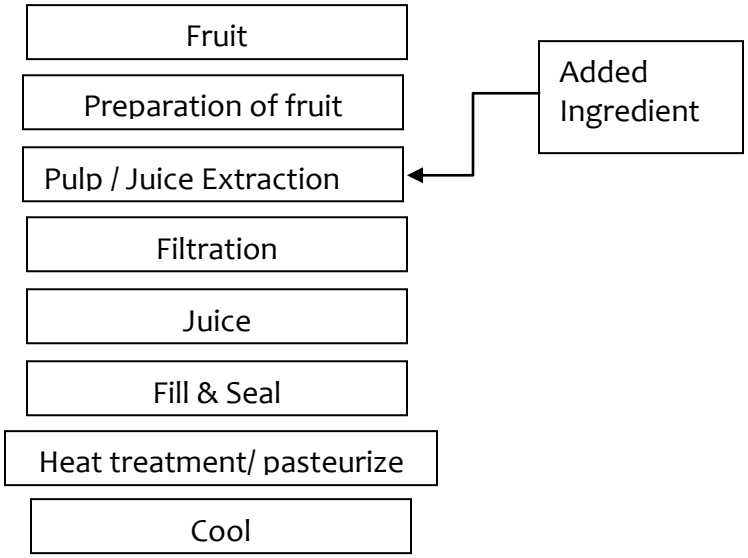
Fruit juices are made from pure filtered fruit juice with nothing added. Sodium benzoate can be added as a preservative to extend the shelf life, but this is not essential. Properly pasteurised juice has a shelf life of several months. Most fruits can be used to make juice. The most popular ones are pineapple, orange, mango, grapefruit and passion fruit.

Squashes and cordials are concentrated, sweetened drinks made from a 30% mix of fruit pulp and sugar syrup. They are diluted before drinking. The sugar concentration must be high enough (12-14%) to preserve the squash after the bottle has been opened. Some juices, such as guava juice are not filtered after pulping. They are bottled and sold as fruit nectars.

3.2 SUITABLE LOCATION

This project can be sited in any part of Nigeria provided there is large quantity availability of fruit that meet the production capacity of the plant.

3.3 PRODUCTION PROCESS FLOW CHART



3.4 PRODUCTION TECHNOLOGY

The production process is very simple as it involves squeezing, filtering, boiling and preservation. Good quality ripe fruits are washed, peeled and cleaned. Then the juice is extracted from fruits and is filtered to remove seeds and fibres. Then the juice is processed and sterilized and then syrup of sugar preservatives is added and this mixture is stirred till a uniform solution is formed. After, the bottling and packing is done.

3.5 PRODUCTION CAPACITY

The establishment of the project is aimed at producing a capacity of 826,800 litres of squash per year at 60% capacity utilization and working 312 day annually.

3.6 RAW MATERIALS

The basic raw materials which are natural fruits could be locally sourced from any parts of Nigeria, where there are large producers of the commodity.

3.7 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, Bank of Agriculture (BOA), Nigeria Export-Import (NEXIM) Bank, International Finance Corporation (IFC), grants etc., though the conditions and criteria for accessing the loans and grants varies.

PART IV

4.0 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.

4.1 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. The installed capacity has estimated capacity of 826,800 litres per annum at 60% capacity utilization, working 312 days annually.
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 26,634,527**

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 **46.5%.** 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 **83.3%.**

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.

4.2.6 PAYBACK PERIOD

The payback period of any project is the length of time it would take the business investors to recover the capital invested in a project in spite of asset replacement. For this particular project the capital investment is expected to be fully recovered in about 1 year and 4months.

APPENDIX
TOTAL PROJECT COST

	DESCRIPTION	QTY	Unit price	Total
	LAND & BUILDING			
1	Factory rentage	1	560,000	560,000
	Sub total	**1**	**560,000**	**560,000**
	MACHINERY & EQUIPMENTS			
2	Fruit washing tanks	3	80,000	240,000
3	Juice extractors (50lts)	2	376,000	752,000
4	Steam jacketed Kettles (30ltres)	2	174,000	348,000
5	Stirrer	1	131,200	131,200
6	Baby boiler (30kgm)	1	521,600	521,600
7	Bottle washing & filling machine	1	660,000	660,000
8	Testing equipments	1	261,600	261,600
9	SS Utensils		-	86,800
10	Storage racks		-	104,000
	Sub total		**2,204,400**	**3,105,200**
	UTILITY EQUIPMENT			
11	Generating set	1	250,000	250,000
12	Refrigerators	2	300,000	600,000
	Sub total	**2**	**550,000**	**850,000**
	OFFICE EQUIPMENT			
13	Computer and printer	1	150,000	150,000
14	Furniture & fittings	1	200,000	200,000
	Sub total	**2**	**350,000**	**350,000**
	VEHICLE			
15	Delivery Van	1	2,240,000	2,240,000
	Sub total	**1**	**2,240,000**	**2,240,000**
	TOTAL CAPITAL COST		**5,904,400**	**7,105,200**
16	Working capital		1,100,000	1,100,000
17	10% Contingencies & preliminary expenses		820,520	820,520
	Total project cost		**7,824,920**	**9,025,720**

APPENDIX II
ESTIMATION OF WORKING CAPITAL REQUIREMENT

N'

Year of Commercial Operation	**1 week**
% Capacity Utilization (Inventory)	**60%**
1 week stock of raw material	750,000
1 Day stock of finished products	250,000
Work in Progress	
Bank/ Cash (5% sales of the products)	-
Working capital	**1,100,000**

APPENDIX III
FINANCING PLAN

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DESCRIPTION	EXISTING	PROPOSED	TOTAL
Equity	1,025,720	-	1,025,720
Term loan from	-	8,000,000	8,000,000
Total project cost	**1,025,720**	**8,000,000**	**9,025,720**
% Contribution	**15%**	**75%**	**100%**

APPENDIX IV
TERM LOAN REPAYMENT SCHEDULE

LOAN AMOUNT: 8,000,000 (Eight 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	8,000,000	1,600,000	960,000	2,560,000
2	6,400,000	1,600,000	768,000	2,368,000
3	4,800,000	1,600,000	576,000	2,176,000
4	3,200,000	1,600,000	384,000	1,984,000
5	1,600,000	1,600,000	192,000	1,792,000
Total		**8,000,000**	**2,880,000**	**10,880,000**

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

POSITION	No	Unit Scale	Scale/ Month	Scale / Year
DIRECT LABOUR				
Factory Manager	1	80	80	960
Production Manager	1	60	60	720
Unskilled labour	2	30	60	720
Sub total	**4**	**90**	**120**	**2,400**
INDIRECT LABOUR				
Accounts/ Admin	1	50	50	600
Marketing Officer	4	50	200	2,400
Driver	1	40	40	480
Sub total	**6**	**130**	**170**	**3,480**
Total on staff (1st year)	**14**	**220**	**290**	**5,880**

APPENDIX VI
ESTIMATE OF ANNUAL DEPRECIATION ALLOWANCE
N'

ITEMS	INITIAL VALUE	DEPRECIATION (20%)
Machinery and Equipments	3,105,200	621,040
Utility Equipments	850,000	170,000
Office Equipments	350,000	70,000
Vehicle	2,240,000	448,000
TOTAL	**6,545,200**	**1,309,040**

APPENDIX VII
ESTIMATION OF ADMINISTRATIVE / OVERHEAD EXPENSES
N'000

COST ITEM	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Selling and Distribution	3,800	4,180	4,560	5,016	5,016
Fuel / Diesel	5,800	6,680	7,560	8,616	8,616
Repairs & Servicing	1,800	1,980	2,160	2,376	2,376
Utilities (water & electricity)	1,800	2,080	2,360	2,696	2,696
TOTAL	**13,200**	**14,920**	**16,640**	**18,704**	**18,704**

APPENDIX VIII
ESTIMATION OF PRODUCTION AND OPERATION COSTS

Cost Item	Units	@	Qty/ day	Pdn cost/ day	Pdn cost/ mth	Pdn cost/yr
Direct Costs						
Fruits	Kgs	90	3,200	259,200	6,739,200	8,0870,400
Sugar	Kgs	360	200	72,000	1,872,000	22,464,000
Preservatives	Kgs	750	10	7,500	195,000	2340,000
Packing materials	Pcs	21	1,500	31,500	819,000	9828,000
Sub-total			**4,910**	**370,200**	**9,625,200**	**115,502,400**

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					
Fruit squashes (kgs)	433,020	476,322	519,624	571,586	571,586
Total output	**433,020**	**476,322**	**519,624**	**571,586**	**571,586**
2. Cost of Production	**N'**	**N'**	**N'**	**N'**	**N'**
Fruit squashes @N266.7 (kgs)	115,486,434	127,035,077	138,583,721	152,441,986	152,441,986
Total cost of production	**115,486,434**	**127,035,077**	**138,583,721**	**152,441,986**	**152,441,986**
3. SALES					
Fruit squashes @ N400 (kgs)	151,557,000	166,712,700	181,868,400	200,055,100	200,055,100
TOTAL SALES/ TURNOVER	**151,557,000**	**166,712,700**	**181,868,400**	**200,055,100**	**200,055,100**

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	151,557,000	166,712,700	181,868,400	200,055,100	200,055,100
VAT @ 5%	7,577,850	8,335,635	9,093,420	10,002,755	10,002,755
Net Revenue	**143,979,150**	**158,377,065**	**172,774,980**	**190,052,345**	**190,052,345**
2. OPERATION COST					
Cost of Raw materials consumed	115,486,434	127,035,077	138,583,721	152,441,986	152,441,986
Staff and labour	5,880,000	6,468,000	7,056,000	7,762,000	7,762,000
Admin. & Overhead Expenses	13,200,000	14,920,000	16,640,000	18,704,000	18,704,000
Depreciation	1,309,040	1,309,040	1,309,040	1,309,040	1,309,040
Total Operating Cost	**135,875,474**	**149,732,117**	**163,588,761**	**180,217,026**	**180,217,026**
3. OTHER COSTS					
Interest on Term Loan (12%)	960,000	768,000	576,000	384,000	192,000
Loan Repayment	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000
Total (Other Costs)	**136,835,474**	**150,500,117**	**164,164,761**	**180,601,026**	**180,409,026**
Profit Before Tax	**7,143,676**	**7,876,948**	**8,610,219**	**9,451,319**	**9,643,319**
Corporate Tax @ 12%	857,241	945,233	1,033,226	1,134,158	1,157,198
Profit after tax (NET PROFIT)	**6,286,435**	**6,931,714**	**7,576,993**	**8,317,161**	**8,486,121**
% Return on Sales	0.04366212	0.043767159	0.04385469	0.043762474	0.04465149
% Return on Equity	6.12880209	6.757901026	7.3869991	8.108607339	8.27333066
% Return on Investment	0.696502316	0.76799571	0.83948901	0.921495539	0.94021538

APPENDIX XI

FORECAST HIGH RATE AND LOW RATE COMPUTATION

Year	C/F	DF 12%	NPV
	N'000		N'000
0	(9,025,720)	1	(9,025,720)
1	6,286,435	0.893	5,613,786.455
2	6,931,714	0.797	5,524,576.058
3	7,576,993	0.712	5,394,819.016
4	8,317,161	0.636	5,289,714.396
5	8,486,121	0.567	4,811,630.607
Total Profit	**37,598,424**		**26,634,527**
Average Profit	**7,519,685**		

Year	C/F	DF 60%	NPV
	N'000		N'000
0	(9,025,720)	1	(9,025,720)
1	6,286,435	0.625	3,929,021
2	6,931,714	0.3906	2,707,527
3	7,576,993	0.2441	1,849,543
4	8,317,161	0.1526	1,269,199
5	8,486,121	0.0954	809,576
Total Profit	**37,598,424**		**10,564,868**
Average Profit	**7,519,685**		

APPENDIX XII

FORECAST IRR AND ARR COMPUTATION

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

Where

a = 12%

b= 60%

A = 26,634,527

B= 10,564,868

$$12\% + \frac{26,634,527}{26,634,527 + 10,564,868} (60-12)$$

12% + 34.5

46.5%

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

$$ARR = \frac{7,519,685 * 100}{9,025,720}$$

83.3%

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	1,025,720	-	-	-	-	-
Term Loan	8,000,000	-	-	-	-	-
Gross Revenue	-	143,979,150	158,377,065	172,774,980	190,052,345	190,052,345
Total Receipts	**9,025,720**	**143,979,150**	**158,377,065**	**172,774,980**	**190,052,345**	**190,052,345**
B) CASH PAYMENTS						
Capital Payment						
Machinery & Equipments	3,105,200	-	-	-	-	-
Utility Equipment	850,000	-	-	-	-	-
Office equipments	350,000	-	-	-	-	-
Vehicle	2,240,000	-	-	-	-	-
TOTAL	**6,545,200**	-	-	-	-	-
(ii) Operating Expenses						
Depreciation	-	1,309,040	1,309,040	1,309,040	1,309,040	1,309,040
Change in working capital	3,176,600	134,566,434	148,423,077	162,279,721	178,907,986	178,907,986
Sub total	**3,176,600**	**135,875,474**	**149,732,117**	**163,588,761**	**180,217,026**	**180,217,026**
(iii) Financial Expenses						
Repayment of Term Loan	-	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000
Interest on Term Loan	-	960,000	768,000	576,000	384,000	192,000
Value Added Tax	-	7,577,850	8,335,635	9,093,420	10,002,755	10,002,755
Corporate Tax	-	857,241	945,233	1,033,226	1,134,158	1,157,198
Sub total	-	**10,995,091**	**11,648,868**	**12,302,646**	**13,120,913**	**12,951,953**
Total cash payment (ii)-(iii)	**3,176,600**	**124,880,383**	**138,083,249**	**151,286,115**	**167,096,113**	**167,265,073**
Net cash flow c/f	3,176,600	124,880,383	138,083,249	151,286,115	167,096,113	167,265,073

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	3,105,200	-	-	-	-	-
Utility equipment	850,000					
Office Equipment	350,000					
Vehicle	2,240,000	-	-	-	-	-
Value at Acquisition		6,545,200	6,545,200	6,545,200	6,545,200	6,545,200
Less Cumulated Depreciation	-	1309040	2618080	3927120	5236160	6545200
Net fixed assets	**6,545,200**	**5,236,160**	**3,927,120**	**2,618,080**	**1,309,040**	**0**
(ii)Current Assets/ liability						
Stock of Raw Materials	3,176,600	17,689,730	24,552,485	26,151,582	27,370,002	30,223,063
Debtors /prepayment	-	1,453,000	2,098,000	3,308,000	4,139,000	5,653,000
Bank and Cash Balances	-	4,150,024	5,160,031	6,170,539	7,180,674	7,180,741
Creditor / accruals	-	(14,074,000)	(16,039,000)	(18,947,000)	(21,013,000)	(24,785,000)
Company Tax	-	857,241	945,233	1,033,226	1,134,158	1,157,198
Net current assets	**3,176,600**	**10,075,995**	**16,716,749**	**17,716,347**	**18,810,834**	**19,429,002**
TOTAL NET ASSETS	**9,721,800**	**15,312,155**	**20,643,869**	**20,334,427**	**20,119,874**	**19,429,002**
(ii) **FINANCED BY**						
Equity Capital	1,025,720	1,025,720	1,025,720	1,025,720	1,025,720	1,025,720
P&L	-	6,286,435	6,931,714	7,576,993	8,317,161	8,486,121
Retained Profit	-	-	6,286,435	6,931,714	7,576,993	8,317,161
SHAREHOLDERS FUND	1,025,720	**7,312,155**	**14,243,869**	**15,534,427**	**16,919,874**	**17,829,002**
Long Term Loan	8,000,000	8,000,000	6,400,000	4,800,000	3,200,000	1,600,000
TOTAL EQUITY & LIABILITY	**9,025,720**	**15,312,155**	**20,643,869**	**20,334,427**	**20,119,874**	**19,429,002**