PREFEASIBILITY STUDY ON

SETTING UP CARBON PAPER MANUFACTURING UNIT OF 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 Carbon Paper business in the manufacturing 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 carbon paper business show 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.

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PART I

EXECUTIVE SUMMARY

This particular prefeasibility study is on setting up facility for the production of carbon paper in most suitable part of the country and in profitable manner.

Carbon paper is paper coated on one side with a layer of a loosely bound dry ink or pigmented coating, usually bound with wax. It is used for making one or more copies simultaneously with the creation of an original document. Evidently, the invention and adoption of computer in computation and record as well as photocopier have evidently affected the market. Nevertheless, to many artisans and traders carbon paper has been an integral part of their business transaction and record keeping. This therefore makes the product very lucrative.

The industrial location of the business should be based on the availability of cheap labour and market for the finished products.

The production capacity estimated at 4 cartons per day, each carton with 100 pieces.

1.1 SUMMARY OF TOTAL PROJECT COST

S/N	DESCRIPTION	COST TO BE INCURRED	COST TO BE INCURRED	TOTAL
1	Land & building	-	200,000	200,000
2	Machinery & equipments	-	661,500	661,500
3	Utility equipment	-	250,000	250,000
4	Office equipment	-	50,000	50,000
	TOTAL CAPITAL COST	-	**1,161,500**	**1,161,500**
5	Working capital	-	1,800,000	1,800,000
6	10% Contingencies & preliminary expenses	-	196,150	196,150
	Total project cost	-	**3,157,650**	**3,157,650**

1.2 FINANCIAL ACCOUNTING RATIOS ANALYSIS

PERFORMANCE RATIOS AVERAGES

(a) Return on Sales =9%
(b) Return on Equity = 1,462%
(c) Return on Investment = 536%
(d) Positive NPV = ₦60,168,747
(e) IRR =46%
(f) ARR =536%
(g) Payback Period = 9 months

PART II
MARKET ANALYSIS

2.1 INTRODUCTION

In carbon paper technology, the stick value or tendency for the carbon paper to adhere to the record sheets upon which the writing takes place is determined by collating the carbon sheet or sheets between two or more of the record sheets and writing on the uppermost record sheet, thereby causing some of the carbon ink coating to transfer from the carbon sheet to the record sheet disposed below. The force necessary to remove the carbon paper from the record sheets is then measured with a spring scale in the direction parallel to the plane of the papers.

2.2 MARKET AREA ANALYSIS

This is an inexpensive way of making multiple copies.

The amount of carbon paper ink coated on the base sheet depends upon the number of carbon copies required from the carbon paper. A greater number of copies may be expected through the employment of a heavier coating. The coating generally employs as a base, vegetable, mineral, animal or synthetic waxes such as carnauba, ceresine, beeswax and paraffin. The color may be produced by the use of a pigment or a dye carried in a vehicle such as mineral or vegetable oil. Filler may, if desired, be added to serve as an extender for the dye. The carbon paper ink can be applied by roller or knife coating methods, using a hot melt which is set by passing over chilled rollers.

2.3 INDUSTRY ANALYSIS

The global Carbon Copy Paper market is anticipated to rise at a considerable rate during the forecast period, between 2020 and 2025. In 2020, the market was growing at a steady rate and with the rising adoption of strategies by key players; the market is expected to rise over the projected horizon.

3.3 TARGET MARKET

The market for the carbon paper is readily available at different markets in the country. The market demand is more pronounced in the south-eastern part of the country that is predominated by artisans and traders. Therefore, the entrepreneur should target distributors and markets that can place bulk and sustained order.

PART IV
TECHNICAL ANALYSIS

3.1 PRODUCT DESCRIPTION

Carbon paper is an inexpensive reprographic device used to make a single copy concurrently with the original, as in credit card transaction receipts, legal documents, manuscripts, letters, and other simple forms.

Even up to the twentieth century, copying documents for business purposes was a difficult, labor-intensive process. Copy clerks, like the scribes of churches and government offices before them, were common in the business offices of the nineteenth century.

3.2 RAW MATERIAL

A typical piece of carbon paper consists of a sheet of paper that has been impregnated with carbon and sandwiched between two sheets of regular paper. All components are standard, except for the coated sheet that performs the reprography. Its coating is made up of several materials, the most important of which is carbon black. Carbon black is a very fine, spherical, amorphous form of carbon that is not as crystalline as graphite. Mostly carbon, it also contains small amounts of oxygen, hydrogen, and sulfur. The carbon black adheres to the paper with the help of various waxes.

3.3 PRODUCTION PROCESS

The process involves preparation of coating mix, coating on the paper surface, and cutting it into sizes for the market.

The key ingredient in carbon paper is carbon black. To make it, air and a hydrocarbon (such as petroleum oil) are fed into a furnace. In the furnace, part of the petroleum oil undergoes combustion, helping to raise the temperature up to 3,000 degrees Fahrenheit and causing the unburned hydrocarbon to decompose to carbon black. The carbon black is then cooled with water and recovered by putting in a centrifugal cyclone or bag filter.

A good carbon paper should be clean and non-smutting. The coating should be applied evenly and smoothly and there should be no pin holes or other imperfections in the backer sheet. It should lie flat on a smooth surface for ease of handling by the operator.

3.4 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, 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.

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. Production costs assumed 312 days per year with a daily capacity of 5 cartons carbon papers
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 60,168,747**

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 **46.2%.** 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 **536%.**

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	200,000	200,000
	Sub total	**1**	**200,000**	**200,000**
	MACHINERY & EQUIPMENTS			
2	Coating machine	1	300,000	300,000
3	Printing machine	1	205,000	205,000
4	Paper cutting machine	1	50,000	50,000
5	Ball mill	1	106,500	106,500
	Sub total	**4**	**661,500**	**661,500**
	UTILITY EQUIPMENT			
	Generating set		250,000	250,000
	Sub total		**250,000**	**250,000**
	OFFICE EQUIPMENT			
8	Furniture & fittings	1	50,000	50,000
	Sub total	**2**	**50,000**	**50,000**
	TOTAL CAPITAL COST		**1,161,500**	**1,161,500**
9	Working capital		1,800,000	1,800,000
10	10% Contingencies & preliminary expenses		196,150	196,150
	Total project cost		**3,157,650**	**3,157,650**

APPENDIX II
ESTIMATION OF WORKING CAPITAL REQUIREMENT

N'000

Year of Commercial Operation	2 weeks	Year 2	Year 3	Year 4	Year 5
% Capacity Utilization (Inventory)	60%	70%	80%	90%	90%
1 week stock of raw material	800	8,194	11,713	15,530	15,530
1 Day stock of finished products	600	3,443	4,887	5,376	5,376
Work in Progress	400	1,071	1,098	1,169	1,169
Bank/ Cash (5% sales of the products)	-	2,287	2,516	2,768	2,768
Working capital	**1,800**	**11,248**	**13,192**	**15,419**	**15,419**

APPENDIX III
FINANCING PLAN

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DESCRIPTION	EXISTING	PROPOSED	TOTAL
Equity	1,157,650	-	1,157,650
Term loan from	-	2,000,000	2,000,000
Total project cost	**1,157,650**	**2,000,000**	**3,157,650**
% Contribution	**15%**	**75%**	

APPENDIX IV
TERM LOAN REPAYMENT SCHEDULE

LOAN AMOUNT: 2,000,000 (Two Million Naira Only)
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	2,000,000	400,000	240,000	640,000
2	1,600,000	400,000	192,000	592,000
3	1,200,000	400,000	144,000	544,000
4	800,000	400,000	96,000	496,000
5	400,000	400,000	48,000	448,000
Total		**2,000,000**	**720,000**	**2,720,000**

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
Unskilled labour	4	30	120	1,440
Sub total	**5**	**120**	**180**	**2,160**
INDIRECT LABOUR				
Accounts/ Admin	1	50	50	600
Marketing Officer	2	40	80	960
Sub total	**4**	**130**	**170**	**1,560**
Total on staff (1st year)	**8**	**280**	**350**	**4,720**

APPENDIX VI
ESTIMATE OF ANNUAL DEPRECIATION ALLOWANCE
N'

ITEMS	INITIAL VALUE	DEPRECIATION (20%)
Machinery and Equipments	661,500	132,300
Utility Equipment	250,000	50,000
Office Equipments	50,000	10,000
TOTAL	**961,500**	**192,300**

APPENDIX VII
ESTIMATION OF ADMINISTRATIVE / OVERHEAD EXPENSES
N'

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	1,800	2,680	3,560	4,616	3,616
Repairs & Servicing	1,800	1,980	2,160	2,376	2,376
Packaging materials	2,800	3,080	3,360	3,696	3,696
TOTAL	**10,200**	**11,920**	**13,640**	**15,704**	**14,704**

APPENDIX VIII
ESTIMATION OF PRODUCTION AND OPERATION COSTS

Cost Item	Units	@	Qty/ day	Pdn cost/ day	Pdn cost/ month	Pdn cost/yr
Papers	Grams	780	500	390,000	10,140,000	121,680,000
Dyes and waxes	Ltrs	1,350	10	13,500	351,000	4,212,000
Oil	Ltrs	1,200	4	4,800	124,800	1,497,600
Sub- totals		**3,330**	**514**	**408,300**	**10,615,800**	**127,389,600**

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					
Carbon paper (grms)	156,000	171,600	187,200	205,920	205,920
Total output	**156,000**	**171,600**	**187,200**	**205,920**	**205,920**
2. Cost of Production	**N'**	**N'**	**N'**	**N'**	**N'**
Carbon paper (grms) @N816.6	127,389,600	140,128,560	152,867,520	168,154,272	168,154,272
Total cost of production	**127,389,600**	**140,128,560**	**152,867,520**	**168,154,272**	**168,154,272**
3. SALES					
Carbon paper (grms) @N1,080	168,480,000	185,328,000	202,176,000	222,393,600	222,393,600
TOTAL SALES/ TURNOVER	**168,480,000**	**185,328,000**	**202,176,000**	**222,393,600**	**222,393,600**

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	168,480,000	185,328,000	202,176,000	222,393,600	222,393,600
VAT @ 5%	8,424,000	9,266,400	10,108,800	11,119,680	11,119,680
Net Revenue	**160,056,000**	**176,061,600**	**192,067,200**	**211,273,920**	**211,273,920**
2. OPERATION COST					
Cost of Raw materials consumed	127,389,600	140,128,560	152,867,520	168,154,272	168,154,272
Staff and labour	4,720,000	5,192,000	5,664,000	6,230,000	6,230,000
Admin. & Overhead Expenses	10,200,000	11,920,000	13,640,000	15,704,000	14,704,000
Depreciation	192,300	192,300	192,300	192,300	192,300
Total Operating Cost	**142,501,900**	**157,432,860**	**172,363,820**	**190,280,572**	**189,280,572**
3. OTHER COSTS					
Interest on Term Loan (12%)	240,000	192,000	144,000	96,000	48,000
Loan Repayment	400,000	400,000	400,000	400,000	400,000
Total (Other Costs)	**143,141,900**	**158,024,860**	**172,907,820**	**190,776,572**	**189,728,572**
Profit Before Tax	16,914,100	18,036,740	19,159,380	20,497,348	21,545,348
Corporate Tax @ 12%	2,029,692	2,164,408.8	2,299,125.6	2,459,681.7	2,585,441.7
Profit after tax (NET PROFIT)	**14,884,408**	**15,872,331**	**16,860,254**	**18,037,666**	**18,959,906**
% Return on Sales	0.0929950	0.090152147	0.087783101	0.085375735	0.089740
% Return on Equity	12.85743359	13.71082037	14.56420714	15.5812778	16.37792618
% Return on Investment	4.71376118	5.026627777	5.339494371	5.712370351	6.004435

APPENDIX XI

FORECAST HIGH RATE AND LOW RATE COMPUTATION

Year	C/F	DF 12%	NPV
	N'		N'
0	(3,157,650)	1	(3,157,650)
1	14,884,408	0.893	13291776.34
2	15,872,331	0.797	12650247.81
3	16,860,254	0.712	12004500.85
4	18,037,666	0.636	11471955.58
5	18,959,906	0.567	10750266.7
Total Profit	**84,614,565**		**60,168,747**
Average Profit	**16,922,913**		

Year	C/F	DF 60%	NPV
	N'		N'
0	(3,157,650)	1	(3,157,650)
1	14,884,408	0.625	9302755
2	15,872,331	0.3906	6199732.489
3	16,860,254	0.2441	4115588.001
4	18,037,666	0.1526	2752547.832
5	18,959,906	0.0954	1808775.032
Total Profit	**84,614,565**		**24,179,398**
Average Profit	**16,922,913**		

APPENDIX XII

FORECAST IRR AND ARR COMPUTATION

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

Where

a = 12%

b= 60%

A = 60,168,747

B= 24,179,398

$$12\% + \frac{60,168,747}{60,168,747 + 24,179,398} (60-12)$$

12% + 34.2

46.2%

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

$$ARR = \frac{16,922,913}{3,157,650} * 100$$

536%

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	1,157,650	-	-	-	-	-
Term Loan	2,000,000	-	-	-	-	-
Gross Revenue		160,056,000	176,061,600	192,067,200	211,273,920	211,273,920
Total Receipts	**3,157,650**	**160,056,000**	**176,061,600**	**192,067,200**	**211,273,920**	**211,273,920**
B) CASH PAYMENTS						
Capital Payment						
Machinery & Equipments	661,500	-	-	-	-	-
Utility Equipment	250,000	-	-	-	-	-
Office equipments	50,000	-	-	-	-	-
TOTAL	**961,500**	-	-	-	-	-
(ii) Operating Expenses						
Depreciation	-	192,300	192,300	192,300	192,300	192,300
Change in working capital	2,196,150	142,309,600	157,240,560	172,171,520	190,088,272	189,088,272
Sub total	**2,196,150**	**142,501,900**	**157,432,860**	**172,363,820**	**190,280,572**	**189,280,572**
(iii) Financial Expenses						
Repayment of Term Loan	-	400,000	400,000	400,000	400,000	400,000
Interest on Term Loan	-	240,000	192,000	144,000	96,000	48,000
Value Added Tax	-	8,424,000	9,266,400	10,108,800	11,119,680	11,119,680
Corporate Tax	-	2,029,692	2,164,408.8	2,299,125.6	2,459,681.7	2,585,441.7
Sub total	-	11,093,692	12,022,809	12,951,926	14,075,362	14,153,122
Total cash payment (ii)-(iii)	**2,196,150**	**131,408,208**	**145,410,051**	**159,411,894**	**176,205,210**	**175,127,450**
Net cash flow c/f	2,196,150	131,408,208	145,410,051	159,411,894	176,205,210	175,127,450

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	661,500	-	-	-	-	-
Utility equipment	250,000	-	-	-	-	-
Office Equipment	50,000	-	-	-	-	-
Value at Acquisition	-	661,500	661,500	661,500	661,500	661,500
Less Cumulated Depreciation	-	132300	264600	396900	529200	661500
Net fixed assets	**661,500**	**529,200**	**396,900**	**264,600**	**132,300**	**0**
(ii)Current Assets/ liability						
Stock of Raw Materials	1,800,000	18,013,526	34,062,867	36,593,222	38,876,278	42,091,923
Debtors /prepayment	-	3,453,000	4,098,000	5,308,000	6,139,000	7,653,000
Bank and Cash Balances	696,150	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	-	(2,029,692)	(2,164,408.8)	(2,299,125.6)	(2,459,681.7)	(2,585,441.7)
Net current assets	**2,496,150**	**19,512,858**	**35,117,489**	**36,825,635**	**38,723,270**	**40,555,222**
TOTAL NET ASSETS	**3,157,650**	**20,042,058**	**35,514,389**	**37,090,235**	**38,855,570**	**40,555,222**
(ii) FINANCED BY						
Equity Capital	1,157,650	3,157,650	3,157,650	3,157,650	3,157,650	3,157,650
P&L	-	14,884,408	15,872,331	16,860,254	18,037,666	18,959,906
Retained Profit	-	-	14,884,408	15,872,331	16,860,254	18,037,666
SHAREHOLDERS FUND	**1,157,650**	**18,042,058**	**33,914,389**	**35,890,235**	**38,055,570**	**40,155,222**
Long Term Loan	2,000,000	2,000,000	1,600,000	1,200,000	800,000	400,000
TOTAL EQUITY & LIABILITY	**3,157,650**	**20,042,058**	**35,514,389**	**37,090,235**	**38,855,570**	**40,555,222**