ESTABLISHMENT AND MANAGEMENT OF SMALL-SCALE ENTERPRISES: CHALLENGES FOR GRADUATE ENGINEERS IN NIGERIA

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ABSTRACT

This paper suggests establishment and management of small-scale enterprise as a solution to the problems of unemployment of engineering graduates in Nigeria. It discusses a procedural approach through which engineer-entrepreneur can establish a new business: the type of business he may invest in and the engineering management techniques to be adopted in such ventures. The use of procedural approach to establish small-scale enterprises is presented, taking cassava starch factory as a case study. Suggestions that can enhance small business chances of survival in Nigeria were proffered.

Keywords: Establishment and Management, Entrepreneur, Graduate engineers, Small-scale enterprises, Nigeria.

INTRODUCTION

In Nigeria, geometric increase in the number of idle hands in the population remained one of the present administration's greatest challenges. Engineering profession is not an exception to this unpleasant unemployment situation. Today the young graduate engineers are still roaming the streets seven to eight years after graduating (1). There is severe recession in manufacturing and service sectors to absorb these engineering graduates in the last decade. The engineering education also does not make the graduate engineers to be self-reliance (2). This development poses a further threat to the growth of the country. Somolu, Past President Nigerian Society of Engineers, (3) expressed his concern over the plight of young engineers and describes the situations as worrisome and unacceptable.

It has been reasoned that provision of small-scale enterprises is a viable solution to the unemployment problems of the graduate engineers. Establishment of small-scale enterprises will open up new employment opportunities for graduate engineers. These small-scale businesses are designed to mobilise local raw materials, local skills, local finance and local markets. The small-scale sector has a distinct advantage of low investment with high potential for employment generation (4). There is basically no linkage between the Nigerian small-scale enterprises and the Nigerian educational sector (5). That is why mass unemployment of engineering graduates exists side by side with knowledge-starved small-scale enterprises. The graduate engineers have a great role to play in the establishment of small-scale partnership business by virtue of their technical training and they should be encouraged becoming the small-scale industry entrepreneur by taking risk in establishing small-scale business such that our country "Nigeria" can gain economically and grow socially.

This paper expounds a procedural approach through which the graduate engineer can establish a small-scale enterprise. The rest of this paper presents some cases of the cassava starch factory and recommendations made to enhance small business chances of survival in Nigeria.

PROCEDURE FOR ESTABLISHING SMALL-SCALE ENTERPRISE

The following steps are required to fully plan setting up small-scale enterprise:

Step 1:Project idea Generation

The first step in starting a new business is to have a clear idea of the products/services upon which your business will be built. The major disciplines of engineering in Nigeria are Mechanical, Electrical, Civil and Chemical. All the other disciplines such as Agricultural, Petroleum, Industrial etc. are variants of the above four major disciplines. Engineer can be involved in manufacturing of many items reserved for small-scale sector. The items are listed below:

(1) **Food and Allied Industries**
Ice cream, pickles and chutneys, vinegar, bread, biscuits, poultry feed, synthetic syrups, ethanol, fruit juice, Soya milk, maize and cassava starch, jam and marmalade, oil milling, bone meal etc.

(2) **Textile products including hosiery**
Cotton vests knitted, cotton socks knitted, cotton under garments knitted, woollen cloths, under garments etc.

(3) **Art silk/Man-made fibre hosiery**
Synthetic knitted socks and stockings, vests, briefs cardigans, pullover etc.

(4) **Wood and wood products**
Sawn timber, wooden crates, sewing machine covers, furniture, tent poles, wood toys, particleboard, briqueting of sawdust, handles, etc.

(5) **Paper products**
Waxed paper, decorative papers, corrugated papers and boards, paper bags etc.

(6) **Leather and Leather products**
Sole leather, hides, shoes, leather garments, purses, handbags, watch straps etc.

(7) **Rubber products**
Rubberised cloth, canvas hoses, cycle and rickshaw tyres and tubes etc.

(8) **Plastic Products**
Full PVC footwear chappals, sandals, shoes, acrylic sheets, spectacle frames etc.

(9) **Injection moulding thermo plastic products**
Handles, soap cases, cups, lunch boxes, water jugs, tumblers, hairbrushes etc.

(10) **Chemicals**
Ammonium sulphate, cadmium acetate, cobalt nitrate, ferrous sulphate etc.

(11) **Dye stuff**
Basic dyes – basic yellow, basic green, basic blue etc.

(12) **Organic chemicals and drugs**
Tartrates, paracetamol, resin, sterate of zinc etc.

(13) **Glass and ceramic**
Fire clay, bricks and concrete blocks etc.

(14) **Roofing and flooring tiles**
Wooden, clay and granite tiles.

(15) **Mechanical Engineering excluding transport equipment**
C.I. manhole covers, weights, circlips, bright bars, local equipment etc.

(16) **Electrical machines, appliances and apparatus including electronics**
Transformers, boosters, voltage stabilisers, PVC wires etc.

(17) **Bicycle parts, survey instruments, sports goods, stationery items, clocks, watches, motor parts, machine parts etc.**

(18) Information system
Internet services, software development, computer training, type setting, cloning and sales of computers and related products etc.

(19) Consulting
Provision of high-level professional advice in engineering through design work, project development and or monitoring etc.

(20) Services
Services in the area of supply of engineering inputs and repair/ maintenance of engineering equipment, system and structures, hiring of equipment, skill acquisition centre etc.

Step 2:Projects Ideas Evaluation

Evaluation of project idea can be done at primary (pre-feasibility) level and at a final (feasibility) level. A primary assessment will determine if the entrepreneur can meet the project's requirement of (6):
(a) The level of investment required
(b) The type of technical or engineering skill involved
(c) The market demand for the product or services.

If only the answers to the primary evaluation are satisfactory can the feasibility studies be done. The techniques of feasibility studies are well known and well covered in such works as Aderoba (7), Clifton and Fyffe (8) and OECD manual (9) which lays emphasis on project analysis in developing countries. Feasibility study is essential into such following areas:

(a) Financial (Data) analysis
Financial analysis is very paramount to the continued existence of any organisation. Such analysis includes fiscal investments, operating or working expenses and contingency funds. Financial analysis is carried out to determine financial requirement of the business. The common type of financial analysis is financial expenditure and financial income. Similarly, projected sources of revenues, and projected analysis of sales volumes should be compiled

(b) Personnel Requirement Analysis
Efficient and effective organisation is made up of good people with various skills and talent. To achieve this, qualified people are recruited to match the personnel requirement in a work place and are assigned to a set of activities necessary for the functioning of the business. This forms the basic organogram of the business. Also formal communication structure is designed as a co-ordinating path for the various positions.

(c) Market potentials for the products or services
The entrepreneur should thoroughly identify and know its market. Market potentials for the product or service are determined by collecting relevant information about the potential users/customers of the products or services. The information collected is analysed to determine the market potentials Information from the market potential enables the entrepreneur to determine financial requirements for the business and to know if he can meet the requirement.

(d) Analysis of competition
The success of small-scale enterprise depends on its good SWOT analysis and in predicting future strategies of its competitors. A new business cannot survive unless it offers and maintains competitive advantages such as superior product, better service, shorter delivery term and relatively low price. To face the competitors effectively, small-scale entrepreneur should scan it environment properly for threats such as competitor's price, quality, etc in order not to allow competitor's product to outshine it products.

(e) Restrictions
The entrepreneur should identify government restriction, decrees, edits and regulations which may hinder the business operations by visit the Federal Ministry of Information to gather information on restrictions prohibiting his potential business.

Step 3 Detailed Project and design

This involves a detailed specification of all the facilities necessary to satisfy performance specifications and functional requirements of the proposed project. It includes total specifications of:

(a) plant and machinery
(b) building and infrastructures
(c) management and information systems
(d) Marketing or promotional systems
(e) Production or operational systems
(f) Financial policies

Aderoba (6) advised that Engineer-entrepreneur should avoid the usual temptation of rushing into implementation without a project design, which is unrealistic under the prevailing economic environment in Nigeria. Aderoba (10), Idris and Aderoba (11) have developed appropriate models, which can be implemented manually or by computer for phasing out the procurement of machines and the development of physical infrastructures through reinvested earnings.

Step 4 Project Implementation and control

Major activities, which need to be carefully prepared and scheduled for the implementation of setting up of small-scale enterprise using Critical Path Method (CPM), include (6):

- Capital formation through savings and loans.
- Enterprise formations as a legal entity preferably as a limited liability company.
- Development of land, buildings and infrastructural facilities.
- Procurement and installation of plant, machinery and equipment.
- Procurement of raw materials.
- Requirement and training of personnel
- Commissioning the factory by bringing the new facilities, organisation and systems up to the target standards of initial output and operational efficiency as quickly as possible.

3. MANAGEMENT OF SMALL-SCALE ENTERPRISES

The important factors in the operation of the small-scale enterprises are (4, 12):

(a) Personnel selection

The best approach to staffing is to have effective staff selection methods. The methods to adopt include invitation for application for employment, conducting interview for those invited for employment and final selection based on merit.

(b) Staff motivation

The methods of motivating workers effectively include: enrichment of job, job rotation, proper apportion of jobs to the specifications, remuneration, which include prizes, awards, scholarships and gifts, as well as creating a good working environment.

$$\therefore M = \sum_{i=1}^{10} C_i \qquad \text{...eqn. 1}$$

(c) Adopting effective costing methods.

A typical small-scale job shop cannot afford a separate cost-estimation department and often has no systematic arrangement for cost-estimation. Small-scale outfit will survive if the entrepreneurs adopt good technique. The concept of machine hour rate is very important in the utilisation of machines. It is often convenient to express the cost of production in terms of machine hour rate. Machine hour rate is the total cost of using a machine in an hour. The major cost elements for machine hour rate (M) estimation of a machine in job shop/ manufacturing plant (13) include: wages of direct operator per hour (C_1); cost of overhead per machine per hour (C_2); Machine cost per hour (C_3); machine repair and maintenance cost per hour (C_4); cost of work space per hour (C_5); repair and maintenance cost of floor per hour (C_6); installation cost per hour (C_7); insurance cost per hour (C_8); power consumed per machine per hour (C_9) and tools consumption per hour (C_{10}).

$$C_{ij} = M_i t_{ij} \qquad \text{.....eqn.2}$$

In general, the cost of a machine-based production activity is given as:

Where: C_{ij} = Cost of machine–activity i on job j

M_i = Periodic rate for main machine used for activity i.

t_{ij} = Machine time for job j on activity i.

Products made on the machine are then charged at this hourly rate based on machining time involved.

(d) Profitability & Break-even Analysis

The following ratios are normally employed in order to minimise cost or maximise profit in any enterprise:

(i) Gross profit Margin (GPM) = [Gross profit/ Sales]×100%.....eqn. 3

(ii) Net profit Margin (NPM) = [Net profit × Sales] × 100%.....eqn. 4

(iv) Break-even Analysis graphs should be prepared periodically as to provide information on current state of his business. At break-even point, the quantity break-even point.

$$Q_{BEP} = FC/(P - VC) \ldots\ldots\ldots\ldots \text{ eqn. 5}$$

Where: FC = Fixed cost,
VC= Variable cost per unit
P = selling price per unit.

(e) Value Analysis and Value Engineering utilisation

Value analysis examines the design, function and cost of each component in order to produce it economically without decreasing its utility, function or reliability. It is normally applied to existing rather than new product. In order to reduce cost and increase productivity of the enterprise, the entrepreneur should select reliable materials and improve production method. Value engineering is the application of the concepts of value analysis at the design or premature stage of the component parts with a view to cutting down the unnecessary costs, without impairing the function or utility of the product (4). This entails having a consortium of experts in the various aspects of the business who have to criticise the design and offer helpful modifications that the designs collate and use in improving the product design.

(f) Sales Forecast

Forecasts are necessary in sales analysis, market planning, production planning, budgeting, logistics planning, product planning, inventory control, material requirement planning, purchasing and strategic planning. The main important factors to be considered when making forecasting are government policy, competition, economic positions, natural causes, changes in marketing methods and lack of trained forecasters (14). Forecasting techniques could be grouped into two major heading namely quantitative and qualitative. The quantitative technique includes moving average smoothing, box jerkins, time series etc, whereas the qualitative consists of executive opinion, expert opinion, market survey, historical analogy, expected market share, group opinion among others (15). Entrepreneur should apply market survey and group opinion to determine the demand of newly introduced products and later applies other techniques when there are production data. Qualitative technique is less effective than the quantitative method of forecasting in Nigerian companies (14). Entrepreneurs need to venture into a combination of techniques in order to ensure accuracy. Time series analysis provide opportunity for the evaluation of sales force performance using forecasting model to estimate/obtain performance standards for the firms of seasonal consumer goods (16). Engineer should update the forecasting models from time-to-time and in some cases he must rely mainly on non quantitative forecasting methods such as: consumer surveys and market tests, and any other early warning.

(g) Marketing

Marketing function is a vital phase of the business. Without marketing function, goods and services cannot be sold. Marketing function include market research, sales forecasting, advertising, sales promotion, selling, packing, servicing and handling of inquires and orders from customers (4). A carefully selected group of variables in marketing is required to be able to perform the aforementioned activities effectively and efficiently (17). It is possible to adapt speedily and profitably to changes in the marketing environment by using the marketing mix (product, price, place and promotion) as a tactical tool of the firm's marketing plan. The small-scale enterprises must integrate all the components of the marketing programme into co-ordinated marketing mix. As the business expands, it may be necessary to engage the services of an effective manager who will adopt the necessary marketing promotion to gain the market and advertising to reach a wider market.

(h) Equipment Maintenance

The engineer-entrepreneurs should ensure that production machines are adequately maintained by having an effective maintenance unit attached to the enterprises. The maintenance unit should ensure that there is an adequate preventive maintenance which entails taking necessary steps such as lubrication, inspection, adjustment etc to prevent future breakdown of the machines/equipment and breakdown maintenance which entails the actual repair of the machines/equipment when they have broken down completely. Breakdown maintenance is very expensive in terms of losses of man and machine hours. However, majority of small-scale firms cannot afford in-house maintenance unit. Small-scale enterprises should employ outside contractors for their maintenance such as equipment repairs, lighting and ventilation.

CASE STUDY OF CASSAVA STARCH FACTORY

This study was conducted by the authors who were interested in establishing a factory for the production of starch from cassava. Most of the industrially available starch is being imported into the country, however examining what are involved in terms of manpower, finance, raw materials and equipment, there is not much sophistication required to produce industrial starch. Demand for industrial starch has increased over the years in the pharmaceuticals, textiles and other related industries. Establishment of Cassava starch factory will make it possible in converting abundant available raw material into starch in large quantities, increasing foreign resources by not importing the materials into the country, creating jobs opportunities for job seekers as well as improving standard of living of the populace in Nigeria. The project profile is as presented below:

(a) Market survey

There is growing demand for starch in the country. The total market value is about ₦ 2 billion from Trade statistics in 2000, about 65% of this account for the importation of flour. The volume of the market as at 2002 estimate is 3,000,000 tons and annual growth rate is 5% (18). The demand is currently been met by three starch factories in the country (Nigerian Starch Mill, Ihiala, Anabra state; Jesse, Sapele Delta state; and Oyo Industrial Complex, Oyo State and also through imports. Strong advertisement can further promote demand in the Pharmaceuticals, textiles and other related industries. There is large demand in urban cities such as Lagos, Enugu, Kano, Kaduna, Ibadan e t c.

(b) Raw materials

Starch can be obtained from maize; rice, potato, sorghum, wheat and cassava, 13% yield is obtained from cassava, which is easily available in the country.

(c) Technical analysis

The technology for starch production is simple and is either a batch production or semi-process flow type. The factory project does not require overseas technical collaboration. Machine can be purchased from local fabricators or Rural Agricultural Industrial Development Scheme (RAIDS) in Ibadan and

the capacity is 10 tons of processed cassava per day/ 24hrs, equivalent to 1.3 tons of starch per day per 24hrs. Yield requirement of cassava is estimated to be 13% of starch. This will require a total of eleven workers operating on an eight-hour single shift. Acquisitions of about ten acres of land for the factory site for starch production with long term objective of farming to produce the raw materials. The stages of production of starch from cassava are: sorting and weighing of cassava tubers, peeling and washing, grating and milling, sieving, sedimentation, steaming and drying, milling, and packaging. The estimates for the production capacity of the plant are based on the market and the following assumption: the efficiency level of the Plant goes from 65% to 85% in 18 months considering 250 working days per year; as from the beginning of the third year the variation of 5% increase is equally assumed (19). Total starch production capacity forecast in tons for year 1, 2, 3, 4, and 5 are 325 , 341 , 488 , 512 and 532 respectively while total raw material tonnage input capacity are 2,500, 2,623, 3,938 and 4,139 Tons. Current market price for starch according to research is ₦242, 500 per ton (19, 20). Price forecasts at 5% annual increase for 1, 2, 3, 4, and 5 are ₦242500, ₦254600, ₦267300, ₦280700 and ₦294750 respectively.

(iv) Financial Analysis and Economic Evaluation

From the critical appraisal of the market potentials of the starch project and the projected five-year profitability statement of the company's operation, the management is fully convinced that it is a good investment opportunity. The management objective is to maximize contribution on the short runs of all the factors of production by maintaining 75% capacity utilization and high liquidity ratio in all its financial operation. Bearing in mind these parameters, the average return on investment on the first year is 55.16% and the unadjusted rate of return is 47%. The average profitability margin for the first year is 24.26%. These are good indicators of the outstanding viability of the starch project. Further source of funds will be from retained earnings, which will be used for the development and expansion of the factory.

(d) Personnel Requirement Analysis

The company will be run by a Director, who highly experienced in industrial set up and will be assisted by a manager. Others are production supervisors, a foreman, four production workers, an accounts clerk, a typist and a sales clerk. Total percentage of the management (a Director, a manager and a production supervisor) is 27.27% while that of the shop floor personnel as well as auxiliary staff (a foreman, four production workers, an account clerk, a typist and a sales clerk) is 72.73%. This is an indication of an adequately staffed organisation.

(e) Financial Projection

The following is a summary of the financial estimates:

(i). product costing

(v) Estimated Capital Cost

Land	₦1, 000, 000
Building	5,000,000
Plant & Machinery	1,000,000
Vehicles	5,000,000
Furniture/Office Equipment	4,500,000
Utilities	1,000,000
Working Capital	11,000.000
Preliminary expense	7,000, 000
Contingency	9,000, 000
Total	**44,500, 000**

(vi) Financial Plan

	EQUITY	LOAN	TOTAL
Promoter	13300, 000	-	13,300,000
Investment Bank (Long term)	-	20,200,000	20,200,000
Bank Overdraft (Short term)		11,000,000	11,000,000
Total	**13,300,000**	**31,200,000**	**44,500,000**

(vii) Projected Profitability Statement

The company is assumed to enjoy tax relief for two year i.e. payment of corporate tax will commence in the third year of operation.

Loan repayment will start in the second year of operation.

Average annual cash flow

$= \frac{106,717,500}{5} = ₦21,343,500$

Total Cost of Production = ₦ 44,500,000

∴ Payback period

$= \frac{₦\ 44,500,000}{21,343,500} = 2.1$ years

Unadjusted rate of return

$= \frac{213,43500x\ 100}{44,500,000} = 47.96\%$

(f) Conclusive remark

The project is technically and economically feasible; Raw materials cannot pose serious difficulties as many alternative starch-bearing crops can be processed in the same plant. There is ready market with flexibility of supplies from local industries. The factory will yield reasonable profits under good management.

(viii) Projected cash flow statement

(g) Implementation Schedule

The raw material, cassava, the machinery and plant for the processing of cassava are available locally.

This minimizes the lead-time between the ordering and receipt of plant as well as continuous and efficient production of starch. However the quality of the starch to be produced must be high because of the need of pharmaceutical industries.

Time schedules for implantation comprises the following activities, shown in Table 6.

RECOMMENDED STRATEGIES

The following suggested strategies could be implemented at very minimal cost to enhance small business chances of survival in the long run:

- **Small-scale engineer -entrepreneur should:**

(i) conduct constant market research and keep abreast with price changes and government regulations that may affect your business.

(ii) minimise dependence upon any single customers or product line.

(iii) get registered with the Nigerian Society of Engineers and Council for the Regulation of Engineering in Nigeria. As a registered engineer one is qualified by law to start and operate an engineering concern without registering with the registrar of companies. However, the registrar of companies will not register a company performing engineering activities unless the relevant engineering bodies register the applicant.

(iv) incorporate his enterprise as the business expand to attract clients, customers, banks and governmental agencies which often prefer to deal with companies whose names are registered with the registrar of companies.

(v) make use of professional services. For example when preparing article of association or memorandum of association, you need the services of a legal practitioner.

(vi) engage service of a consultant to do feasibility studies on the planning and implementation of the project.

(vii) efficiently organise his business by keeping employee and machines constantly busy doing right thing at the right time and the right place.

(viii) provide high quality products and services that satisfy customer's need at least cost and create an image of uniqueness in the minds of the public in order to reduce effectiveness of competition.

(ix) avoid sales for credit, ensure adequate cash flow, avoid heavy borrowing, and keep abreast with price change and government regulations.

- **Engineering schools should:**

(i) overhaul engineering curricula to reflect the real needs of the society which will ensure development of basic skills and train graduates for self employment;

(ii) initiate a programme that will see engineering students work for at least six weeks with small-scale artisans. Such as plant mechanics, electricians, welders, painters, auto mechanics, panel beaters, plumbers, etc in order to acquire experience and to set up their own small-scale businesses with small capital as soon as they left school;

(iii) incorporate into their programme entrepreneurship development so that they prepare and encourage some of their graduates to plan to set up their own small-scale

(iv) engage in research and development activities that can immediately be profitably exploited by industry and encourage group and joint final year projects cutting across disciplines and direct students' projects to solve industry problems and give students real life problems to solve;

- **Professional engineering bodies should:**

(i) create awareness and develop a programme for creation of entrepreneur among graduate engineers

(ii) create Entrepreneurship and Engineering Innovation Division.

(iii) encourage genuine research and development of local materials and local conditions to solve professional problems confronting the society at large; and put in place a system which shall facilitate the commercialisation (patent) of applicable research findings by the engineers;

(iv) liaise with the financial institutions to provide adequate support to products or services resulting from the research findings;

- **Government should:**

(i) support by setting up a National Commission on Entrepreneurship and overhaul the National Directorate of Employment;

(ii) adopt economic policies that favour producers rather than importer of finished foreign goods.

(iii) help in giving loans to the small-scale outfit through establishment of special banks like Nigeria Industrial Development Bank (NIDB) and overhaul various financial institutions as well as the commercial bank to ensure that serious-minded entrepreneurs receive needed funds at the right time.

(iv) through the Raw Materials Research Centres, sponsor mineral processing centres to process our abundant minerals to provide raw materials for small-scale enterprises to alleviate lack of raw materials;

(v) revive and expand the existing Machine Tool Company, and her relevant foundries, so that spare parts and machines for the country industrial growth can be manufactured locally;

(vi) encourage the machine companies to go into hire purchase programme with the small-scale firms with little funds.

CONCLUSIONS

Establishment of small-scale enterprises will open up new employment opportunities for graduate engineers and promote the development and advancement of the engineering profession. This paper discusses procedural approach through which engineer-entrepreneur can establish a new business and the type of business he may invest in. It also discussed engineering management methods to be adopted in any venture. Engineers have a great role to play in the establishment of small-scale partnership business by virtue of their technical training. The government, professional engineering bodies and Universities should play their part to encourage graduates to become small-scale entrepreneur through financial assistance, career counselling, well-designed engineering curricula.

This paper could be useful to young graduate engineers, graduates in other professions, professional engineers, Engineering institutions, Professional Engineering bodies, Government institutions and Federal Ministry of Industry.

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Table 1: Product Costing

Variable Cost	Cost per Year ₦'00,000	Total ₦'00,000
Raw material		
Cassava	373	
Packaging	20	
Others	5	4000
Salaries		
Management	31.8	
Factory/office staff	18.5	51.0
Administrative Cost	1.5	
Bank Charge & Commission	2.0	
Insurance Charge	10.0	
Medical & Staff Welfare	5.0	
Vehicle allowance	5.0	
Entertainment allowance	10.0	
Utilities	5.0	
Stationeries/Printing & Telephone charge	1.0	40
Others		
Vehicle/Transport		50
Office furniture/Equipment		5
Total Variable Cost		**546**

(ii) Total fixed costs

Table 2: Total fixed cost

Fixed cost	Total	Total Cost ₦'00,000	Total Cost Per Year ₦'00,000	Total ₦'00,000
Depreciation				
Buildings	5%	90	4.5	
Plant & Machinery	5%	10	0.5	
Vehicles	25%	50	12.5	
Furniture/office	10%	5	0.5	18
Interest on loan				
13%	202	202	26.5	
13.5%	202	110	15.0	41.5
Loan Repayment				
Total fixed costs		62.4	62.4	62.4
Total				**122**

Loan repayment will start in the second year of operation.

(iii) Total Production Cost

Table 3: Total Production Costs

Year	Total Production Cost				
	1	2	3	4	5
Tonnage output capacity	30500	34100	48800	51200	5380
Net Sales Value	78800	89700	114900	121200	12540
Production costs					
Raw materials	40000	410900	58800	61600	6460
Salaries/wages	5100	5600.0	6200.0	6800	7500
Fixed costs					
Depreciation	1800	1800	180	1800	1800
Interest on Loan	4100.5	1400.5	1450	1450	1450
Loan Repayment	-	6240	6240	6240	62400
Administrative cost	4000	4400	4850	5350	59000
Total production cost	55100	64100	8210	8600	90200
Gross Profit	23700	25600	3280	3520	35200
Corporation Tax 24%	-	-	1480	1580	15800
Net Profit	23700	25600	1800	1940	19400
%Profit	43%	40%	21.9%	22.6%	21.5%

Table 4: Projected profitability Statement

ITEM	1st year ₦'000	2nd year ₦'000	3rd year ₦'000	4th year ₦'000	5th year ₦'000
Sales Revenue	78800	89700000	1149000	1212000	125400
Exercise Duty	--	--	--	--	--
Net Sales Revenue	78800	89700	114900	121200	125400
Cost of Sales	40000	41900	58800	61600	64600
Raw material)					
Packaging & Other)	5100	5600	6200	6800	7500
Personnel(Salary & Wages)					
General Service & Admin.)	4000	4400	4850	5300	5900
Utilities)					
Maintenance)	1800	1800	1800	1800	1800
Depreciation					
Earning Before Interest & Taxes	27900	36000	43250	45650	45600
	1500	1500	1500	1500	1500
INTEREST EXPENSES	2650	2650	2650	2650	2650
Short Term Loan					
Long Term Loan					
Earning Before Taxes	23750	31850	39100	41500	41450
Taxes (45%)	-	-	17595	18675	18652.5
Net Profit (Loss)	23750	31850	21505	22,825	22,797.5
Profit Margin (%)	30.10	35.5	35.50	18.83	18.17
Return on Equity (%)	178.50	239.47	239.49	171.62	171.41
Return on Total Investment	53.40	71.57	71.57	51.29	51.23
(%)	5.70	7.67	7.67	5.5	5.49
Time Interest Earned					

Table 5: Projected Cash Flow Statement

ITEM	CONTRIBUTION PERIOD ₦'000	1ST Year ₦'000	2nd Year ₦'000	3rd Year ₦'000	4th Year ₦'000	5th Year ₦'000
A: SOURCE OF FUND						
INTERNAL						
Earning before	-	27,900	36,000	43,250	45,650	45,600
Interest	-	1,800	1,800	1,800	1,800	1,800
& Taxes Depreciation						
EXTERNAL	13,300	-	-	-	-	-
Equity	31,200	-	-	-	-	-
Loan						
TOTAL 'A'	**44,500**	**29,700**	**37,800**	**45,000**	**47,450**	**47,400**
B: APPLICATION						
Capital Expenses	44,500	-	-	-	-	-
Loan Repayment	-	-	6,240	6,240	6,240	6,200
Interest payment	-	4,150	4,400	4,150	4,150	4,150
Taxes	-	-	-	17.595	18,675	18,625.5
TOTAL 'B'	44,500	4,150	10,390	27,985	29,065	29,042.5
Cash Surplus (A-B)	-	25,550	27,410	17,015	18,385	18,357.5
Cumulative cash Surplus	-	25,550	52,960	69,975	88,360	106,717.5

Table 6: Activity list for starch factory

Activity code	Description	Expected Duration	Preceding Activities
A	Company formation and pre-implementation activities	6	-
B	Land development, civil engineering and construction activities	24	A
C	Order and Procurement of production machinery	12	A
D	Equipment delivery and installation	5	C
E	Selection of supplies, ordering and receipt of raw materials (purchase of raw materials)	4	B
F	Recruitment of personnel	2	D
G	Test run	2	F
H	Trial Marketing	5	G
I	Commencement of regular production		H