FEASIBILITY STUDIES OF SETTING UP A NONWOVEN TISSUE MANUFACTURING PLANT

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Abstract

A study was made to establish a site for the tissue manufacturing plant. The plant is proposed to be located in the Northern part of Nigeria. It will be situated on a 615,204 square meters area, which is to be acquired prior to erection of building and other infrastructure. The major raw materials include obsolete/ waste paper, carton and chipboards. The types of machines to be used are pulper machines, Chester machine, tissue recycling machine, cutting machine and slicing machine. The initial capital outlay for the plant is N75 million for a start. The product will generate a total revenue over a period of three years of ₦497 million with a net fixed asset ofN54.5 million.
Thus, the project is feasible even at an annual discount of 10%.

Introduction

The nonwoven industries manufacture a diversity of products such as tissues, diapers, and tea bags which are different in end uses, sell in many markets and employ production organizations varying in size and complexity from a few workers to several thousands in a series of factories (1). These nonwoven industries rest on a common technology of bonding or interlocking of fibres or both which can be accomplished by mechanical, chemical, hermal or solvent means and combination of both (2). Presently, there are few numbers of nonwoven manufacturing plants, however, they don't start from raw materials to finishing, except one which supplies the Northern part of the country with secondary products (3). The current production figures are high which is an indication of the lucrative nature of the industry. However, there is an indication that all these industries have not met local demands. It is reasonable to say that all these non-woven manufacturing plants cannot supply more than 20% of the quantity demanded locally leaving about 80% of the market requiring to be 111 led, this is in addition to the possibility of exportation to the nearby African countries especially the community of West African States. This suggests a very generous market outlay for nonwoven products. Furthermore, the increase in population, automobile, fashion (body and foot wears) machines, agricultural products, etc. will cause an increase in the local demand of nonwoven products
(4**).**

Experimental

Materials

The major raw materials include obsolete/ waste papers, cartons or chipboards. The types of machines to be used are pulper machine, Chester machine, tissue paper recycling machines, cutting machine and slicing machine [1].

Production Technique

The waste papers, cartons or chipboards are fed into the pulper machine in the unit; they are washed clean and soaked to soften in a reservoir. The product is then fed into the Chester machine where bleaching agents are added to bleach the material if required. The product in turn is fed into the tissue-recycling machine, where production takes place with application of adhesive in the finishing section. The finishing section comprises of finishing 1, and finishing II, and lastly into the packaging section where the products are packed after being sliced by the slicing machine or cutting machine [1,4].

Results and Discussion Analysis of Results

Table 1: Description of the Activities and Their Duration

Actiyity	Description	Duration (Weeks)
A •	Feasibility report	4
B	Negotiation with technical partners/ flnancers consultant Registration	4
C	Procurement of land	2
D	Screening and recruitment of senior staff	1
E	Procurement of machines equipment and other accessories	3
F	Building design, plants and blue prints	5
G	Surveying, filling, reclaiming of land, linking up sites with electricity and water supply	3
H	Erection of building (starting with factory) structures, plumbing and other installations	5
1	Procurement of raw materials and other accessories Installation of machines and equipment	40
J	Recruitment and training of other staff	1
K	Start up and test running	9
L	Final adjustment of machines	4
M	Commissioning of plant	3
N		2
O		1
Total		87 weeks

Table II: Capital Cost

Fixed Asset	Cost Estimate (£1)
Land	3,000,000
Building equipment	10,000.000
Furnitures and fittings	1,000,000
Machines	12,000,000
Electricity and water	10,000,000
Vehicles	13,000,000
Computer and accessories	6,000,000
Medical equipment	4,000,000
Miscellaneous expenses	5,000,000
Total	55,000,000

Table III: Balance Sheet for the Three Years

Capacity Utilization	I'[1] Year (N)	2"[1r] Year (f*)	3"[1] Year (N)
Fixed asset Less depreciation	55.0. 000	55,000.000	55,000,000
Net fixed asset	500.0,	500.000	500.000
	54,500,000	54.500.000	54.500.000

I able IV: Analysis of Raw Materials Cost Estimate

Raw Materials	1st Year *(N)*	2,ui Year (N)	3rd Year (K)	Total (IV)
Waste papers	10,150,000	16,100,000	20.025.000	46,275,000
Cartons	2.202,600	4.108.200	10.100.0	16,410,800
Chipboards	3,536,200	6.310.200	8,023,000	17,869,400
1 otal	15,888,800	26,518,400	38.148,000	80,555,200

Table V: Analysis of Profit and Loss Estimate

Year	Expenditure (Cost of Raw Materials + Labour) (N)	Income (Cost of Finished Products) ($f)	Gain (N)
I[s'] year at 60% production	20,000,000	35,000,000	15,000,000
2[nd] year at 80% production	32,000,000	50,000,000	18,000,000
3[,d] year at 100% production	45,000,000	65,000,000	20,000,000
Total	97,000,000	150,000,000	53,000,000

Discussion

The plant is proposed to be located in the Northern part of Nigeria. It will be situated on a 615,204 square meters area, which is to be acquired prior to erection of building and other infrastructure. Table 1 showed the various activities that are required to be implemented as well as their durations. The project is estimated to take a period of eighty-seven weeks for completion. The production of tissue will be three shifts of eight hours, each scheduled as follows:

i. Morning shift: 6.00 am- 2.00 pm.
ii. Afternoon shift: 2.00 pm -10.00 pm.
iii. Night shift: 10.00 pm- 6.00 am.

Suppose that the forecast is rated as 100 kg of product per hour, for an eight hours shift, the machine will produce:

100 x24 = 2400 kg per day
2,400 x 6 = 144,000 kg per week
144,000 x 52 = 748,000 kg per year

It is proposed that in the first year the production will be at 60% capacity and about full capacity of 100% will commence in the third year. The firm being a new one will require at least three, years for stabilization. Hence the forecast of the cost analysis is for five years but only the first three years will be considered, as the remaining two years will be as the third year at 100% production. Thus, the forecast will be cost analyzed by 60% production at the first year, 80% for the second year and 100% for the third year.

There are several categories of human labour to be employed in this firm and they include:

i. General hand.
ii. Semi skilled labourers.
iii. Skilled labourers.
iv. Technicians.
v. Supervisors.
vi. Administrative staff.
vii. Managers.

The total estimate of the labour force is put at $4571, 000 per month. Hence in a year, the estimate will be N571,000 X 12 = $46, 852,000.

Therefore,

For the first year at 60% capacity,

Labour cost = 60/100 x 6,852,000 = $44,11 1,200 For the second year at 80% capacity,

Labour cost = 80/100 x 6,852,000 = $45,481,600 For the third year at 100% capacity,

Labour cost = 100/100 x 6,852,000 = N6, 852,000.

Total labour cost (salary) for the three years:

= 4,111,200 + £45,481,600 + $46,852,000 =1416,444,800.

Therefore, totaling the cost above, the firm is to be set up with a minimum of the following: Capital cost =1455,000,000

Cost of raw materialfor the l[sl] year = 1415,888,800

Labour cost for the 1[sl] year =£44,111,200

Total = £475,000,000

For the three consecutive years under review out of the five years forecast as shown in Table V,

Total expenditure = £497,000,000 Total income =£4150,000,000 Total gain = Total income - dotal expenditure

= £41 50.000,000 - £497,000,000 = £453,00 0,000

Thus,

Percentage gain for the three years under review = Total gain x 100
Total expenditure

= 53,000,000 ---------- -
97,000,000____

= 54.6%

The fourth and fifth years are assumed to make even a higher gain or same as the third year, since the third year is a settlement year, any year from the third year upwards is expected to have a higher or equal gain.

Conclusion

The analysis showed that the firm when set up would be a profitable firm, which has a 54.6% gain in full capacity production. With a net fixed asset of £445.6 million, the company has a better chance of attracting investors and funding from other agencies. The firm can also expand as it stabilizes for the production of other nonvvoven products such as sanitary pads and tea bags, hence more profit can be made. Expected increment both in local and international market is also viable. The work provides a guide as well as the cost estimate of setting up a tissue manufacturing plant. However, this is an estimate, the real cost could be slightly higher or lower.

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