



BAMBOO FIBRE **(FOR BLENDING WITH** **COTTON FIBRE)**

Introduction

Bamboo fiber is a cellulosic fiber regenerated from a bamboo plant. It is a beautiful green thread with the material of a rotting fabric, which is as strong as ordinary glass fibers. The bamboo used to prepare the fiber is usually 3-4 years old. Bamboo fiber is obtained from bamboo pulp, which is extracted from the bamboo stem through the process of hydrolysis-alkalization and multiphase bleaching. Due to the soft silky fabric and environmental benefits of bamboo fiber, bamboo clothing has become popular in some modern luxury fashions.

Market Potential and Northeast Scenario

Bamboos are of notable economic and cultural significance in South Asia, Southeast Asia and East Asia, being used for building materials, as a food source, and as a versatile raw product. The rising emphasis on eco-friendly textile production has led to an increase demand for bamboo fiber. The increasing application of bamboo fiber in the furniture and textile industry are anticipated to drive the global market of bamboo fiber in forthcoming years. Increasing awareness among the populace about environmental conservation and sustainability along with rising demand for natural fabrics is expected to boost the market demand over the forecast years. The increasing demand for eco-friendly fabrics is anticipated to further aid the growth of global market of bamboo fiber. The prominent market players operating in the market are embarking upon the launch of bamboo fiber-containing products. The bamboo fiber market is expected to grow at a compound annual growth rate of 5.0% from 2019 to 2025 to reach 98.30 billion by 2027.

There are various kinds of bamboo species cultivated in Assam, hence there is a high potential for establishing a manufacturing unit for Bamboo Fibre and also it will generate employment and revenue.

Product Uses

Bamboo fibers are used mainly in textile industry for making attires, towels, and bathrobes. It is used for making bandages, masks, nurse wears, and sanitary napkins. UV-proof, antibiotic and bacteriostatic curtains, television covers, and wallpapers and many other things are also prepared from bamboo fibers to lessen the effects of bacteria and harm of ultra violet radiations on human skin. Bamboo fibers are also used for decoration purpose.

Manufacturing Process

Regenerated bamboo fibers can be manufactured by mechanical or chemical processing. But we are considering mechanical process in the DPR since mechanical fiber is in demand.

The Mechanical Process:

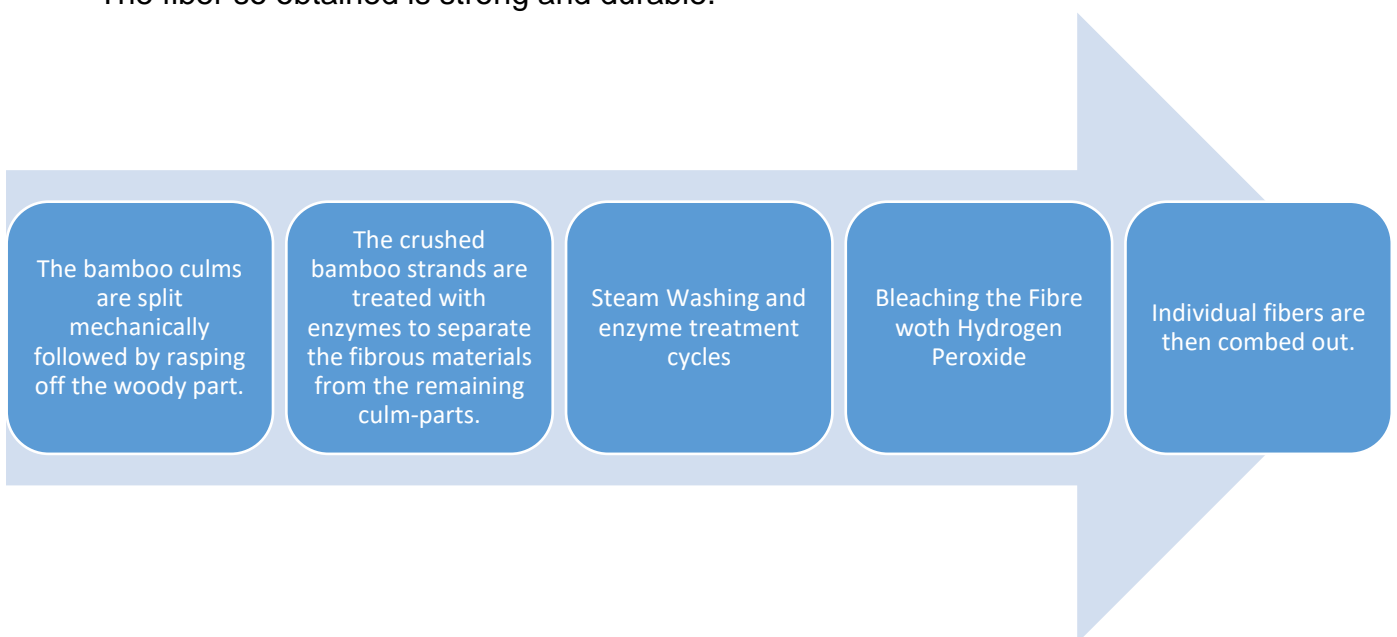
Mechanical Process includes crushing in a milling machine, brushing, carding using a steel hand-operated brush, agitation and boiling. In order to turn a bamboo into fiber, first the culm must be crushed immediately. Before crushing, the bamboo shoots are soaked into water to accelerate processing and to enhance fiber quality.

100 kg of bamboo will give 60 kg of bamboo fiber.

The crushed bamboo strands are then treated with designed enzymes to separate the fibrous material from the glue-line lignin within the plant.

100 kilograms bamboo crush will require 5 kilograms of cellulose enzyme to break down.

This includes a series of precisely timed alternate steam washing and enzyme treatment cycles which also act on the vertical and horizontally aligned lignin of the resulting fiber bundles. The final step is to bleach the fibers with hydrogen peroxide. The fiber so obtained is strong and durable.



The Chemical Process:

The chemical process is of two kinds:

The viscose process used to produce rayon where the fiber is broken down with harsh chemicals and extruded through mechanical spinnerets.

The closed solvent spinning loop which is essentially the same process used to produce Lyocell fibers.

- ❖ The model DPR for Bamboo Fibre Manufacturing unit was prepared in the year, 2020. The project cost, input cost and selling price have been reviewed in December, 2022 based on the current prevailing market price. The Model DPR has been prepared with the following assumptions that may vary with capacity, location, raw material availability etc. An entrepreneur can use this model DPR and modify as per requirement and suitability.

Cost of Project

Particulars	Amount (Rs. In Lakhs)
Owned Land	-
Civil works and Buildings	57.00
Plant and machinery	21.17
Miscellaneous Fixed Assets	1.25
D G Set	4.50
Escalation & Contingencies (5%)	4.20
Preliminary & Preoperative Expenses	19.14
Sub-total (A)	107.25
Working Capital Margin @ 25% total working capital requirement	4.50
Total Project Cost	111.75
Total Working Capital Required (B)	18.00
MEANS OF FINANCE	
Total Funds Required(A+B)	125.25
<u>Loan Component-</u>	-
TERM LOAN	74.50
WORKING CAPITAL	13.50
Total	88.00
Equity	37.25
Total	125.25

Detailed Cost Element

Sl. No.	Particulars	Quantity	Rate	Amount (Rs. in Lakhs)
1	Milling Machine (for cutting and crushing)	3	460000	13.80
2	Steel Hand-operated Brush	10	151	0.02
3	Enzyme Treatment Plants	2	210000	4.20
4	Bleaching Tanks	2	157500	3.15
	TOTAL			21.17

Contingencies and Escalations

It has been assumed at approximately 5% at cost.

Preliminary Expenses

Particulars	Amount (Rs. in Lakhs)
Incorporation Expenses	0.15
Project Report Preparation and Consultation	0.35
Feasibility and Engineer's/Architect's Report and Plans	1.43
Legal Charges - Drafting for agreements, contracts, stamp paper, notary and affidavit cost	0.05
Security Guard and others	14.81
Interest Cost for period before commercial operations	2.36
Total	19.14

Salary

Designation	Manpower	Amount (Rs. In lakhs)
Supervisor	1	2.14
Factory Workers	10	12.60
Accountant	1	1.89
Watchman	1	1.26
Quality Control Manager	1	1.575
Production Manager	1	1.575

Profitability Statement

Particulars	Amount (Rs. In Lakhs)				
	Year- 1	Year- 2	Year- 3	Year- 4	Year- 5
A. INCOME					
Production Capacity (kg/ annum)	30000	30000	30000	30000	30000
Capacity Utilization	50%	55%	60%	65%	70%
Production during the year	15000	16500	18000	19500	21000
Annual turnover	72.00	80.78	89.89	99.33	109.11
Total income during the year	72.00	80.78	89.89	99.33	109.11
B. OPERATING EXPENSES					
Raw Material	4.75	5.22	5.69	6.17	6.64
Salary	21.04	22.09	23.20	24.36	25.58
Repair & Maintenance	1.68	1.76	1.85	1.94	2.04
Power & utilities	1.02	1.04	1.06	1.08	1.10
Depreciation and Amortization	7.87	7.87	7.87	7.69	7.69
Total Operating Expenses	36.35	37.99	39.67	41.25	43.06
Operating Profit (A-B)	35.65	42.80	50.22	58.08	66.05
C. FINANCIAL EXPENSES					
Interest on term loan	6.43	5.01	3.60	2.18	0.65
Interest on working capital	1.42	1.59	1.77	1.96	2.15
D. Other Expenses					
Administrative and general Expenses	1.44	1.51	1.59	1.67	1.75
Total Expenses	9.29	8.12	6.96	5.80	4.55
Profit Before Tax	26.36	34.68	43.26	52.28	61.50
Provision for Tax	6.59	8.67	10.82	13.07	15.38
Profit after Tax (PAT)	19.77	26.01	32.45	39.21	46.13
Dividend Declared	0	0	0	0	0
Retained Profit	19.77	26.01	32.45	39.21	46.13

Breakeven Point

Amount (Rs. In Lakhs)						
SL	Particulars	Year - 1	Year - 2	Year - 3	Year - 4	Year - 5
A.	Net Sales	72.00	80.78	89.89	99.33	109.11
B.	Variable Cost					
	Raw Material	4.75	5.22	5.69	6.17	6.64
	Power and Utility	1.02	1.04	1.06	1.08	1.10
	Total Variable Cost	5.77	6.26	6.76	7.25	7.75
C.	Contribution (A-B)	66.23	74.52	83.14	92.08	101.36
D.	Fixed Cost					
	Salary	21.04	22.09	23.20	24.36	25.58
	Interest on term loan	6.43	5.01	3.60	2.18	0.65
	Interest on working capital	1.42	1.59	1.77	1.96	2.15
	Repair & Maintenance	1.68	1.76	1.85	1.94	2.04
	Depreciation and Amortization	7.87	7.87	7.87	7.69	7.69
	Total Fixed Cost	38.44	38.33	38.29	38.13	38.11
E.	Breakeven Point	58%	51%	46%	41%	38%
F.	Cash BEP	46%	41%	37%	33%	30%

Debt-Service Coverage Ratio

Amount (Rs. In Lakhs)						
SL.	Particulars	Year - 1	Year - 2	Year - 3	Year - 4	Year - 5
i	Profit	19.77	26.01	32.45	39.21	46.13
ii	Depreciation	7.87	7.87	7.87	7.69	7.69
iii	Interest on term loan	6.43	5.01	3.60	2.18	0.65
A	Total (i + ii + iii)	34.07	38.89	43.91	49.08	54.47
i	Interest on term loan	6.43	5.01	3.60	2.18	0.65
ii	Principal repayment	14.90	14.90	14.90	14.90	14.90
B	Total (i + ii)	21.33	19.91	18.50	17.08	15.55
	DSCR (A / B)	1.60	1.95	2.37	2.87	3.50

Interest on Term Loan and Principal Repayment

Refer Annexure I for Loan Repayment Schedule.

We have assumed the repayment tenure of term loan for a period of 7 years, rate of interest being @ 9.50% with the moratorium period being 5 months.

Address of Vendors

Name of Vendor	Address and Contact Number
Anukamna International	Noida Ph. No.: 093115 94410
Nikson Enterprise	Coimbatore Ph. No.: 080 4892 4543

ANNEXURE- I

Year	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Annually
I													
Principal													
Opening	74.50	73.26	72.02	70.78	69.53	68.29	67.05	65.81	64.57	63.33	62.08	60.84	
Repaid	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	14.90
Closing	73.26	72.02	70.78	69.53	68.29	67.05	65.81	64.57	63.33	62.08	60.84	59.60	
Interest	0.59	0.58	0.57	0.56	0.55	0.54	0.53	0.52	0.51	0.50	0.49	0.48	6.43
II													
Principal													
Opening	59.60	58.36	57.12	55.88	54.63	53.39	52.15	50.91	49.67	48.43	47.18	45.94	
Repaid	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	14.90
Closing	58.36	57.12	55.88	54.63	53.39	52.15	50.91	49.67	48.43	47.18	45.94	44.70	
Interest	0.47	0.46	0.45	0.44	0.43	0.42	0.41	0.40	0.39	0.38	0.37	0.36	5.01
III													
Principal													
Opening	44.70	43.46	42.22	40.98	39.73	38.49	37.25	36.01	34.77	33.53	32.28	31.04	
Repaid	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	14.90
Closing	43.46	42.22	40.98	39.73	38.49	37.25	36.01	34.77	33.53	32.28	31.04	29.80	
Interest	0.35	0.34	0.33	0.32	0.31	0.30	0.29	0.29	0.28	0.27	0.26	0.25	3.60
IV													
Principal													
Opening	29.80	28.56	27.32	26.08	24.83	23.59	22.35	21.11	19.87	18.63	17.38	16.14	
Repaid	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	14.90
Closing	28.56	27.32	26.08	24.83	23.59	22.35	21.11	19.87	18.63	17.38	16.14	14.90	
Interest	0.24	0.23	0.22	0.21	0.20	0.19	0.18	0.17	0.16	0.15	0.14	0.13	2.18
V													
Principal													
Opening	14.90	13.66	12.42	11.18	9.93	8.69	7.45	6.21	4.97	3.73	2.48	1.24	
Repaid	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	14.90
Closing	13.66	12.42	11.18	9.93	8.69	7.45	6.21	4.97	3.73	2.48	1.24	0.00	
Interest	0.11	0.10	0.09	0.08	0.07	0.06	0.05	0.04	0.03	0.02	0.01	0.00	0.65