DETAILED PROJECT REPORT ON BAMBOO STICKS PRODUCTION UNIT FOR INCENSE STICKS

ABBREVIATIONS

1. DSCR - Debt Service Coverage Ratio
2. IRR - Internal Rate of Return
3. PAT - Profit After Tax
4. SWOT - Strength Weakness Opportunities Threats
5. TL - Term Loan
6. WDV - Written-Down Value

Contents

1. Executive Summary

Agarbatti/Incence Sticks production is a well-established cottage industry and is a 5 crore worth growing market in India. Base material for incense sticks is bamboo stick which accounts for one third of its weight. Cost of bamboo is only about one percent of the final finished product but is the most essential raw material for agarbatti production. However due to shortage of gregarious flowering of the major species of bamboo used in stick production i.e. Muli bamboo, there can be shortage of raw material and decrease in supply of sticks. Further, due to decrease in import duty from 30% to 10% on bamboo sticks, 70% of bamboo needs of agarbatti industry are fulfilled by imported bamboo sticks from China and Vietnam. The imported bamboo sticks are better with respect to uniformity of dimensions and quality because of large scale mechanization.

Bamboo Mission is focusing on development of bamboo sector through encouraging bamboo plantations and introducing mechanization. Cooperative Society members were involved in stick making activity through manual process. Now, with focus of Govt. on this sector the society wants to move to mechanized stick production process as a full-fledged business activity.

2. Introduction

In India, the burning of incense in religious and social functions across all communities is being practiced since early times. Agarbatti which was once a staple feature of Indian devotional activities has now branched out as products associated with aromatherapy, meditation and yoga. Agarbatti sector of India is largest in the world. Agarbatti production is a well-established cottage industry and is a 5 crores worth growing market in India.

Though India is second in bamboo production, a large part of agarbatti industry is importing 70% of its bamboo needs Despite availability of a large number of species of bamboo, the most commonly used species for stick production are *M. Baccifera* (Muli), *Bambusa vulgaris* (Bari), *Bambusa tulda* (Mritinga), *Bambusa balcooa* (Barak) and *Dendrocalamus longispathus* (Rupai) .

As compared to manual sticks produced in India, the imported bamboo sticks on the whole are better with respect to uniformity of dimensions and quality because of large

3. Project Profile and Proposal

i) Vision

Generation of local employment by optimum utilization of local natural resources.

ii) Mission

To be one of the biggest supplier of bamboo sticks for the agarbatti industry of India.

iii) Objective:

To produce round bamboo sticks through mechanized process.

4. The Project

Stick making process in India is moving towards mechanization. However, countries like China and Vietnam are producing mechanized sticks. The present project is for establishment of round bamboo sticks production unit for agarbattis by using mechanized process. Agarbatti industry uses two kinds of bamboo sticks- square and round. By manual process only square sticks are produced. However, with rising exports, demand for round bamboo sticks has risen. The length of sticks vary from 8 to 10 inches, however majority of incense sticks (70 to 80%) is 8 inches (20.32cm). The units shall procure bamboo sticks from the collectors who collect the bamboos from the forest as well as from growers of bamboo plantations and produce round sticks of 8"to 9" by mechanized process as demanded by the Indian agarbatti sector using high processing technology. High processing technology will maximize utilization of bamboo material and produce quality output. This will help the society to compete with the sticks imported from China and Vietnam. Still wastage of bamboo (nodes, green strips, fibers etc.) is estimated to be 40%. These wastes can be used as fuel for drying unit of bamboo sticks. Selling the waste to bamboo charcoal unit shall also be explored for effective waste management.

5. Strategies:

Following strategies shall be followed for implementation of the project:

1. Proper monitoring of quality at each stage from procurement of raw material to packaging of finished product by applying proper supervision and quality checks.
2. Procurement of latest machinery for mechanizing the entire process.

3. Market surveys for production of stick as per market trend at competitive price.
4. Branding of the bamboo sticks.
5. Tie-ups with e-commerce websites and logistic partners.
6. Coordination with various Govt. agencies for Training and support.
7. Participation in trade fairs

6. Business Model Canvas of the Project:

1. Customer segments:

Organized agarbatti rolling units

2. Customer relationships:

(a) Personal Assistance
(b) Through traders

3. Value propositions:

(a) Customized sticks with respect to size as per industry specifications.
(b) High quality polished round sticks with respect to thickness and moisture content
(c) Competitive price

4. Key Activities:

(a) Establishment of production unit
(b) Creation of direct forward linkage
(c) Presence on digital platform through tie-up with the e-commerce websites

5. Key Partners:

(a) Suppliers of bamboo poles (collectors/growers)
(b) Supplier of Machineries
(c) Logistics partners
(d) Financial Institutions

6. Key Resources:

(a) Physical:-Land, machinery, raw material (bamboo poles)
(b) Human: members of the society, labour
(c) Financial: Share Capital, Loan

7. Channels:

Society shall reach the customers either directly or through e commerce websites.

8. Cost Structure:

(a) The most important cost inherent in the model is infrastructure development, machinery and labour.
(b) Most expensive key activity is producing bamboo sticks from slivers.

9. Revenue Streams:

The customers are willing to pay for the same quality of sticks imported from China and Vietnam

7. Feasibility Assessment:

(i) **Technical Analysis:** The location of the Unit near the raw material site is an advantage as the raw material is available in abundance. Secondly, well connected districts with roads will aid in transportation/ distribution of finished goods to be easy as well as cheap. Labour is easily available at a cheaper cost. The labours are involved in manual stick making as a part-time activity therefore transition to mechanized stick making won't be a difficulty as they already know the basic flow of the process.

As per the requirement of agarbatti industry the project aims to produce 8" and 9" round bamboo sticks by following a mechanized process. The process of making bamboo sticks by mechanized process involves the following steps:

Cleaning the culms (Manual)

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Cross cutting of bamboo poles to cylinders

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Splitting the cylinders into slats

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Making of slivers from slats of uniform thickness

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Making bamboo sticks from slivers

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Polishing Bamboo sticks

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Sizing of bamboo sticks into desired length

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Drying of bamboo sticks

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Sorting, grading and packaging

The machines used for the above processes are as follows:

Process	Machinery
Cross cutting of bamboo poles to cylinders	Bamboo cross cutting machine
Splitting the cylinders into slats	Bamboo manual splitter machine
Making of slivers from slats of uniform thickness	Bamboo heavy duty sliver making machine
Making bamboo sticks from slivers	Bamboo round stick machine
Polishing Bamboo sticks	Bamboo stick polishing machine
Sizing of bamboo sticks into desired length	Bamboo sticks sizing machine
Drying of bamboo sticks	Open air or Dryer machine

Latest machines with desired parameters will be imported from suppliers of China or Vietnam. List of required machines along with estimated price is given at Annexure I.

Generally, these bamboo sticks will be packed in bundles of one kg. However the packaging can be modified as per precise demand and requirement of the buyers. Heavy rainfall occurs from July to September and as the bamboos regenerate during this period therefore the production activity will only be for 9 months in a year. Capacity utilization of the unit can be 80% for the first 5 years.

(ii) **Commercial Feasibility:** Only raw material for production of bamboo sticks is bamboo pole which is available in abundance. With policy initiatives focusing on bamboo plantations, availability of raw material can be assured.

(iii) **Market Analysis:** There is a huge requirement of bamboo sticks from India agarbatti market and quality bamboo sticks sell like a hot cake. India accounts for over 70% consumption of the world incense stick market. Indian agarbatti market amounts to Rs.6000 crore out of which Rs.2000 crore is in organized market. The incense stick makers range from small fragmented units to small factories to FMCG giants. Between FY2012 and FY2016, India exported agarbattis worth $498.02 million. In addition, annual exports witnessed an 11.57% growth during the same period, from $89.64 million in FY2012 to $100.02 million in FY2016.

(iv) **Industry Analysis:**

SWOT Analysis of bamboo stick industry of India is as follows:

STRENGTHS	**WEAKNESSES**
a. Availability of abundant raw material b. Availability of local skill for making bamboo sticks c. Trade relations already with end user industry d. Low labour cost e. No substitute for bamboo sticks likely to be available for end user industry.	a. Industry in the clutches of a few traders b. Bargaining power of bamboo stick maker is low. c. Lack of entrepreneurial talent to drive a local industry
OPPORTUNITIES	**THREATS**
a. Ever growing domestic market b. Introduction to mechanization for improving the productivity. c. Initiatives of the Govt. for development of the sector through infrastructure development, increasing bamboo plantations and capacity building under its scheme of Bamboo Mission.	a. High Competition from China and Vietnam b. Change in Govt. policies c. Shortage of raw material due to gregarious flowering of Bamboos

(v) **Management Aspects:** The management of the unit will be handled by the members themselves. The society has an elected board of members. Even though by traditional methods, the members are experienced in the process of stick making. They are involved in the process through generations. Moreover, they have been trained under the Govt. scheme for mechanized stick production. Society shall hire personnel for production management, for upkeep/ maintenance of machines and book keeping.

(vi) **Financial Analysis:** The project has been found to be financially viable with favourable DSCR of 2.30 and IRR of 39%.

I. Financials:

A] Project Cost

(i) Capital Expenditure:

Particulars	Amount (Rupees in Lakh)
Site preparation	.50
Sheds	.50
Office	1
Godowns	2
Machinery-Imported	10.04
Water Supply	.50
Electrification	1
Furniture and fixtures	.50
Total	16.04

(ii) Working Capital:

Requirement of working capital per month for production of 7500 kg sticks per month. Approximately 50% of bamboo gets wasted in stick production process. It is assumed that the machine runs for 26 days and every day 250 poles of bamboo can be cut into cylinders by cross cutting machine. Time taken for final conversion of these bamboo cylinders to round sticks is assumed to be 2 days. The unit shall run only for 9 months i.e. excluding 3 months of rainy season from July-September. Requirement of working capital at 80% capacity utilization is as follows:

S.No.	Particulars	Details	Amount (Rs. Lakh)
1	Raw Material- Bamboo poles (approximate weight- 6 kg)	Cost of 2500 bamboo poles per month @ Rs. 100/-	2.5
2	Packaging and Transportation of sticks	@ Re. 5 per kg	.38

4	Wages for 15 labours	Minimum wages i.e. Rs.5290/-per month	.79
		Total	**3.67**
4	Power for unit and general lighting		.24
5	Salary of 3 employees		.30
7	Other expenses		.20
		Total	**0.74**
Grand Total Working capital for one month			**4.41**

As the unit runs for only 9 months therefore, recurring cost per annum shall be= (4.41*9)+(0.74*3)=Rs.41.91 Lakh

B] Total Initial Investment:

Particulars	Amount (Rs. Lakh)
Capital Cost	16.04
Working capital for two months	8.82
Total	24.86

C] Source of Finance:

Particulars	Amount (Rs. Lakh)
Contribution by the society (25%)	6.22
Term Loan (75%)	18.64
Total	24.86

D] Cost of production per annum (Amount in Rs. Lakh):

Year	I	II	III	IV	V
Recurring cost per annum	41.91	41.91	41.91	41.91	41.91
Depreciation*	2.47	2.01	1.63	1.34	1.09
Annual interest on term loan @ 12%	2.24	1.71	1.34	0.89	0.45
Total	46.62	45.63	44.88	44.14	43.45

* Detailed calculation of Depreciation is given at Annexure I (D)

E] Annual Sales realization (Amount in Rs. Lakh):

Year	I	II	III	IV	V
Quantity of sticks produced (kg)	67,500	67,500	67,500	67,500	67,500
Annual Sales realization	54.00	54.00	54.00	54.00	54.00

(@Rs.80/ per kg)					
Profit before Tax	7.38	8.38	9.12	9.86	10.55
Provision for tax	0.37	0.42	0.46	0.49	0.53
Profit after tax	7.01	7.96	8.66	9.37	10.02

F] DSCR and IRR:

Year	I	II	III	IV	V
Cash accrual (PAT+ Depreciation+ Interest on TL)	11.72	11.67	11.63	11.6	11.56
Interest on TL + Installment of TL	5.97	5.44	5.07	4.62	4.17
DSCR	1.96	2.14	2.29	2.51	2.77
Average DSCR	2.30				

Average DSCR= 2.30

IRR= 39%

G] Repayment schedule:

The repayment schedule of the project will be as follows (Amount in Rs. Lakh):

Year	Outstanding Principal	Annual repayment of principal	Annual interest @ 12%	Total repayment
I	18.64	3.73	2.24	5.97
II	14.91	3.73	1.71	5.44
III	11.18	3.73	1.34	5.07
IV	7.45	3.73	0.89	4.62
V	3.72	3.72	0.45	4.17

H] Project Implementation schedule:

(i) Project implementation will take a period of 6 months and production process shall start soon
(ii) Sanction of Financial support: 2 to 3 months
(iii) Site Development and construction of building and sheds: 2 months
(iv) Installation of machinery and power connection: 2-3 months after grant of financial support

(v) Water and sanitation-1 month
(vi) Procurement of raw material and trial run- 1 month

I] Assumptions:

Following assumptions have been taken for calculation of the Project cost.

(i) The unit will work for 9 months in a year excluding 3 months of heavy rainfall from July to Sep during which the procurement of bamboo becomes difficult as bamboos regenerate during rainy season.
(ii) Cost of machines is based on average prices of machine manufacturers
(iii) Cost of different species of bamboos available is different. A uniform cost price of say Rs.100 per bamboo pole can be assumed.
(iv) Sale price of bamboo sticks has been taken as an average price of Rs.80/kg of stick.
(v) One bamboo weighing 6 kg produces bamboo sticks of 3 kg.
(vi) The rate of interest of the bank can be considered as 12% per annum which may vary from time to time.
(vii) The salary of staff and wages of labours can be taken at the present rate.

II. Financial Statements:

A] Profit and Loss Account

Projected Profit and Loss Account of this Unit is as follows (Amount in Rs. Lakh):

Year	I	II	III	IV	V
Sales	54.00	54.00	54.00	54.00	54.00
Cost	33.03	33.03	33.03	33.03	33.03
Gross Profit (A)	20.97	20.97	20.97	20.97	20.97
Operating Expenses					
Salary	3.60	3.60	3.60	3.60	3.60
Utilities	2.88	2.88	2.88	2.88	2.88
Interest	2.24	1.71	1.34	0.89	0.45
Depreciation	2.47	2.01	1.63	1.34	1.09
Other expense (telephone, advertising etc.)	2.40	2.40	2.40	2.40	2.40
Total Expenses (B)	13.59	12.60	11.85	11.11	10.42
Net Profit Before Taxes (A-B)	7.38	8.38	9.12	9.86	10.55
Tax	0.37	0.42	0.46	0.49	0.53
PAT	7.01	7.96	8.66	9.37	10.02

B] BALANCE SHEET

Projected Balance sheet of this Unit is as follows (Amount in Rs. Lakh):

Year	as on 31st March				
	I	II	III	IV	V
ASSETS					
Fixed Assets					
Machinery & equipment	10.04	10.04	10.04	10.04	10.04
Furniture & fixtures	0.5	0.5	0.5	0.5	0.5
Land	20	20	20	20	20
Building	3.5	3.5	3.5	3.5	3.5
(LESS accumulated depreciation on all fixed assets)	-2.47	-4.48	-6.11	-7.45	-8.54
Total Fixed Assets	**31.57**	**29.56**	**27.93**	**26.59**	**25.5**
Current Assets					
Cash in bank	7.151	6.06	4.25	2.16	1.27
Accounts receivable	2.5	2.5	2.5	2.5	2.5
Deposits	7	7	7	7	7
Inventory	5	5	5	5	5
Total Current Assets	**21.651**	**20.56**	**18.75**	**16.66**	**15.77**
Others (pre-operative)	**2**	**2**	**2**	**2**	**2**
TOTAL ASSETS	**55.22**	**52.12**	**48.68**	**45.25**	**43.27**
LIABILITIES					
Owners' Equity					
Invested capital	26.22	26.22	26.22	26.22	26.22
Net Profit	7.011	7.96	8.66	9.37	10.02
Total Owners' Equity	**33.23**	**34.18**	**34.88**	**35.59**	**36.24**
Long Term Liabilities					
Bank loans payable	14.91	11.18	7.45	3.72	
Total Long-term Liabilities	**14.91**	**11.18**	**7.45**	**3.72**	**0**
Current Liabilities					
Accounts payable	5	5	5	5	6.5
Interest payable	1.71	1.34	0.89	0.45	
Taxes payable	0.37	0.42	0.46	0.49	0.53
Total Current Liabilities	**7.08**	**6.76**	**6.35**	**5.94**	**7.03**
TOTAL OWNER'S EQUITY AND LIABILITIES	**55.22**	**52.12**	**48.68**	**45.25**	**43.27**

ix. Risk Assessment and Management:

Risks identified in this project are as follows:

(i) Operational Risk:

Though the members know the process of stick making and have been trained for mechanized stick production, however moving to mechanized process can cause hindrances in usage due to lack of technical know-how. This is a mechanized unit and there is a risk of breakdown of machines. Further, inexperience of members in handling a business activity and maintenance of accounts can become a hurdle.

Thought the unit is mechanized, the production process is labour intensive and non-availability of labour can be a risk for the unit.

(ii) Systemic risk:

Only raw material for bamboo stick is a bamboo and the population of most commonly used bamboo for stick making i.e. Muli bamboo (M. baccifera) is decreasing due to its gregarious flowering.

(iii) Market risk:

Though there is a huge market for bamboo sticks, the market is highly competitive. The unit shall strive to revamp its marketing strategies considering the pricing and market linkages. Also to reduce the risk of producing a single product to the market, diverse market opportunities in various stick products shall be explored.

(iv) Change in Govt. policy-

Any change on import policy for bamboo sticks may impact the local stick industry and the industry has to bear this risk.

(v) Liquidity Risk:

Agarbatti industry is a highly unorganized market and involves many small players and timely receipt of payment for sticks can be a problem.

Annexure I

A. List of Machinery to be installed:

S. No.	Name	No.	Estimated price (Rs.)
1	Bamboo cross cutting machine	1 @ Rs.22000/-	22,000/-
2	Manual splitter machine	4 @ Rs.6500/-	26,000/-
3	Sliver making machine	2 @ Rs.60000/-	1,20,000/-
4	Bamboo round stick machine	3 @ Rs. 1,90,000/-	5,70,000/-
5	Bamboo Stick dryer machine	1 @ Rs.40,000/-	40,000/-
6	Bamboo stick polish machine	2 @ Rs.72,000/-	1,44,000/-
7	Bamboo stick sizing machine	2 @ Rs.36,000/-	72,000/-
8	Weighing Machine	2 @ Rs.5,000/-	10,000/-
Total		17 (approximately 20 HP)	10,04,000/-

B. Utilities:

(i) Power:

Power Load for machinieries-20 HP: 14.8KWH

Power for general lighting: 5 KWH

19.8 KWH

Tariff for industrial consumers (above 20 HP) = Rs.7.24 per KWH

Daily power requirement (80% efficiency for 8 working hours) = 19.8*.8*8= 126.72 KWH

Therefore, monthly requirement of power= 126.72*26= 3295KWH

Therefore monthly cost of power= Rs. 23856. Rounded to Rs.24000/-

(ii) Fuel:

Bamboo waste produced from the unit shall be used as fuel for the stick dryer machine.

C. Wage and Salaries:

S.No.	Category	No.	Rs. per month
Salaried employees			
1	Production Manager cum Accountant	1	12,000/-
2	Technical person for upkeep/maintenance of machines	1	12,000/-
3	Office Boy	1	6,000/-
	Total		30,000/-
Daily workers			
4	Labours for operating machines, sorting and packaging	15 @ Rs.5290/- per month (Minimum wages w.e.f. 01.04.2018 for Tripura)	79,350/-

D. Depreciation:

Depreciation is calculated as follows by using WDV method (Amount in Rs. Lakh):

Year	I	II	III	IV	V
Depreciation on building @ 10%	0.35	0.32	0.28	0.26	0.23
Depreciation on machinery and furniture/fixtures @ 20%	2.12	1.69	1.35	1.08	0.86
Total	2.47	2.01	1.63	1.34	1.09