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Bamboo Product Business Plans

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Introduction

This document comprises of various product profiles/Business plans created under the project: Promote Bamboo MSME Clusters for sustainable development funded by the European Union Switch Asia Initiative. These business plans have been created for the purpose of facilitating credit linkage of the artisans associated/supported under the project. The document has been published jointly by Foundation for MSME Clusters (FMC), Small Industrial Development Bank of India (SIDBI), Commonwealth Educational Media Centre for Asia (CEMCA) and Copenhagen Business School (CBS).

The e-version of this is also available at: <https://fmc.org.in/publications/>

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Bamboo Water Bottle

The bamboo water bottle has immense potential as a substitute of plastics. They are eco-friendly, long-lasting and superior to plastic bottles as they can keep the water cooler for longer periods even in summers.



Production Process

Bamboo Species: Bambusa Balcooa



The bamboo is cut and treated naturally by boiling, drying and then smoking. Boiling purifies and strengthens the wall around the hollow of the culm.



The different parts of the bamboo bottle like the body, base, neck or cap are carved using lathe or turning machine. These parts are smoothed using sanding machine.



Optionally, the formed outer cup can be fitted with an inner liner. A glass filter or a stainless steel filter is placed inside the outer cup. The cap of the bottle may be made of plastic, metal or even bamboo.



Polish the bamboo body of bottle with waterproof oil polish or coating of camphor and mustard oil as needed. The cap can have round or threaded finishing.

The bamboo bottles may be combined with components made of plastic or steel for value addition. However, demand for pure bamboo bottles is also high.

Investment and Expected Returns

For an industrial set up to make bamboo bottles, the entrepreneur would need to invest around Rs. 25 Lakh including around Rs. 5 lakh working capital. The machines and components needed are treatment tank, drying chamber, lathe machine, sanding machine and portable cross cutting machine.

Capital Investment		Recurring Monthly Cost	
	INR		INR
Construction for 1000 sq feet workshed	10,00,000	Salary for 10 workers @ Rs. 10000	1,00,000
Portable Cross cutting machine 3 Nos	60,000	Raw Material	1,50,000
Lathe Machine - 2 Nos	3,00,000	Electricity	50,000
Sanding Machine - 2 Nos	1,40,000	Insurance	2,000
Fabricated Drying Chamber 4ft x 4ft	3,00,000	Office Supplies	10,000
Fabricated Aluminium/MS Treatment Tank	2,00,000	Logistics	1,00,000
	20,00,000	Loan repayment 20 lakh loans @ 14% CI per annum	65,000
		Machine maintenance	20,000
			4,97,000
Turnover Calculation		Profit Calculation	
	INR		INR
Production per month	3,000	Gross Profit	30,36,000
Selling Price	250	Depreciation on machinery @20% considering 5 Year life	2,00,000
Total Turnover per month	7,50,000	Tax @ 30% on (Gross Profit-Depreciation)	8,50,800
Total annual turnover	90,00,000	Net Profit	19,85,200

Market

Bamboo based water bottles have seen a steady rise in demand in the national as well as the international market. DB Industries in Assam currently produces around 1,500 bottles per month and have standing demand of more than 8,000 water bottles per month.

Bamboo water bottles can be sold in retail and lifestyle stores such as Home Centre, Home Town and IKEA. They are available on e-Commerce platforms such as Amazon and Flipkart. The product has good export potential to Europe, North America and Australia as the customer preference is aligned towards more sustainable and eco-friendly substitutes of plastics. Appreciation for such products is also growing in India, especially amongst the youth.

Apart from being utility products, use of such ecologically sustainable products is also seen as a style statement. This segment is driven mostly by social media - Facebook or Instagram. The sale and adoption of such products is highly dependent on references and

recommendations. Thus, the entrepreneur needs to have access to markets in lifestyle retail chains, e-commerce and export market. Needs to be good at social media sales as well.

Bamboo Barbeque Skewers

Bamboo barbeque skewers are popular with both vegetarian and non-vegetarian barbeque lovers across the world. Earlier iron skewers were used widely but is getting fast replaced by bamboo ones, creating a huge market potential in both domestic and exports markets. These are single use and affordable products having no negative impact on environment. Studies have shown that food contamination in bamboo skewers is much less than steel skewers.



Production Process



Bamboo poles are cut into pieces through a cross cutting machine to required length, which may vary from 8 to 16 inches.



Bamboo splits are made from splitting machine and then put on a slicer machine to prepare slices of required dimensions



Bamboo slices are put on a bamboo stick making machine to prepare sticks as per skewer size



Sticks are boiled in water until the water turns yellowish. Then the skewed sticks are dried in sun or using a dryer.



The sticks are sharpened on one side using machine. They are further dried and polished, and are ready for packaging and shipping.

The final product is packaged in bundles, packets, cartoons to reach buyers at different places.

Investment and Expected Returns

For an industrial set up to make bamboo skewers, the entrepreneur would need to invest 55 - 60 lakhs depending on the planned scale of the business, including 20 - 25 lakhs for working capital. The machines and components needed are bamboo cross cutting machine, splitting machine, slicer machine, stick making machine, skewer making machine and polishing machine and boiling tub. One can easily produce toothpick and chopstick by the same production line by adjusting the machines or adding a single specific machine to the production line. Prashant Bamboo Machines, Arihant Engineering and Anil Enterprises are some of the suppliers of bamboo skewer machine. One can find machine suppliers from India and abroad on e-commerce portals such as India Mart and Alibaba.

Capital Investment	INR	Recurring Monthly Cost	INR
Construction for 3000 sq feet workshed @ 800 sq ft	24,00,000	Payroll Semi Skilled	80,000
Bamboo Cross Cutter	43,000	Payroll Skilled	72,000
Bamboo Auto Splitter	1,92,000	Raw Material	13,75,000
Bamboo Slicer 2 Stroke	75,000	Electricity	30,000
Bamboo Round Stick Machine (2)	4,30,000	Insurance	2,000
Bamboo Stick Sizing Machine	48,000	Office Supplies	10,000
Bamboo Stick Polisher Machine	55,000	Logistics	2,00,000
Bamboo Skewer Making Machine (2)	3,50,000	Loan repayment - 35,93,000 lakh loans @ 14% CI/ar	1,15,300
	35,93,000	Machine maintenance	20,000
		Miscellaneous	3,000
		Depreciation @10% on workshed and machines	3,59,300
			22,66,600
Turnover Calculation	INR	Profit Calculation	INR
Production per month (kg)	20,000	Gross Profit	16,00,797
Selling Price/ Kg	120	Tax @ 30%	4,80,239
Total Turnover per month	24,00,000	Net Profit	11,20,558
Total annual turnover	2,88,00,000		
Breakeven Calculation	Months		
Breakeven	39 months		

Breakeven Point = 39 months

Market

The bamboo skewer market is growing rapidly due to its cost effectiveness in comparison to stainless steel skewers. As single use products, they are more preferred in picnics and marriage parties. The local markets include hotels, dhabas, motels and town side caterers. They can also be marketed through wholesalers and retail outlets. They are also popular on Amazon and Flipkart. One may register on B2B portals such as India Mart, Trade India and Alibaba for bulk orders across the country and globe.

Bamboo Straw

Bamboo Culms of *Melocana baccifera*, *Bambusa pallida* of 6-8mm or less diameter and 1-3 years of maturity suitable for making straw. In Jharkhand state branches of *Bambusa nutans* or *Bambusa tulda* could be alternative raw material as *M. baccifera* and *B. pallida* are unavailable. Bamboo straws are natural, eco-friendly, biodegradable, hygienic and chemical free substitute of plastic straw. They are reusable if washed and dried properly.



Production Process



The bamboo for straw should be of 1-3 years maturity and 6-8mm or less in diameter.



Bamboos are kept for drying for at least 4-5 days to reduce water content post which it is cut into pieces of desired length (6, 8 or 10 inches). Hand cutting tools are used to cut bamboo into pieces.



Sanding of the pieces are done with sand paper or sanding machine for smoothness of the straw. Both end of the straw also sanded to give surface finish of the end.



The bamboo pieces are kept in water and boiled for an hour with salt to make them dirt and bacteria free. After boiling bamboo pieces are rinsed and cleaned from inerside through a brush.



The bamboo pieces are kept for drying at room temperature for 8-10 hours during summer season and longer in other seasons. After drying it is packed for dispatch.

Investment and Expected Returns

A bamboo straw unit of 1 Lakh pieces per month would need an investment of approx. Rs. 2.8 Lakhs and working capital of Rs. 2 Lakhs for 30-day cycle. Major equipment required are grinding and sanding blade, oven and straw cleaning brush.

Capital Investment	INR	Recurring Monthly Cost	INR
Construction for 400 sq ft bamboo work shed @ Rs.500 per sq ft	2,00,000	Payroll for 12 workers average @ Rs. 8000	96,000
Hand tools & other supporting equipment	20,000	Raw Material	90,000
Sanding machine	22,500	Electricity	3,000
Boiling equipment	10,000	Insurance	2,000
Electrical fittings & rack for work shed	20,000	Office Supplies	3,000
Total Investment	2,72,500	Logistics	5,000
Turnover Calculation	INR	Loan repayment - 2.72lakh loans @ 14% CI/annum	9,588
Production per month (pcs)	1,00,000	Machine maintenance	2,000
Selling Price	2.7	Depreciation SLM (Work shed 3.17% & Machine 6.33%)	810
Total Turnover per month	2,70,000		2,11,398
Total annual turnover	32,40,000	Profit Calculation	
		Gross Profit	7,03,224
		Tax @ 30%	2,10,967
Breakeven Calculation	Months	Net Profit	4,92,257
Break even	7 months		

Breakeven Point = 7 months

Market

Bamboo straw is the alternative option of plastic and paper straws and has high potential to grab a share of the existing straw market in India. It has an advantage over plastic as it is reusable and biodegradable. Government of India is set to impose a nationwide ban from 2nd October 2019 on six single use plastic items - plastic straw is one of them and can open up high demand for bamboo straws.

It would be in demand in restaurants, hotels, institutional canteens, corporate house staff canteens, juice bar, coastal area eateries, and eateries where consumers spend about 45 minutes to have beverages. Bamboo straws are better than paper straws as the latter cant withstand more than 5minutes when dipped in liquid. There is scope of selling few lacs of bamboo straw in a month through B2B sales.

E-commerce platforms viz. Amazon, Alibaba, Flipkart are already placing bamboo straws as part of their assortment. The product has significant export potential. In US 500 million straws are used on daily basis. US and European countries are shifting to sustainable environment friendly products and enquiring for single use plastic substitutes. The European Union plans to ban single use plastic straws by 2021.

Murha

The '**Murha**', also spelt as **muda, moodha, muddha** is a traditional handcrafted bamboo stool



Production Process

Preferred Species: Bambusa Tulda



Frame of the Murha –

- Bamboo sticks measured and cut in uniform length.
- Pairs of bamboo sticks arranged opposite in crisscross manner.
- Bamboo sticks then tied up using plastic, cane or bamboo twine.
- Bamboo sticks are added one by one to create a strap of bamboo.
- Strap is woven till desired length and rolled up in circular form.



Base of the Murha –

- Bamboo sticks measured and cut in uniform length.
- Pairs of bamboo sticks arranged opposite in crisscross manner.
- Bamboo sticks then tied up using plastic, cane or bamboo twine.
- Bamboo sticks are added one by one to create a strap of bamboo.
- Strap is woven till desired length and rolled up in circular form.



Seat of the Murha –

- Aluminium Ring used as mould to make seat uniform
- Weaving done on aluminium ring using cane, water hyacinth, water reed or plastic to make the base
- Parallel weaving followed by diagonal weaving to make crisscross pattern

Investment and Expected Returns

As a household micro enterprise, the tools required are very basic in nature. Only a machete / dao and knife is needed in order to crosscut the bamboo, split it and to make sticks out of the splits. The investment needed is

thus, less than Rs. 50,000 even considering the working capital requirement. If the objective is to start the enterprise at a large scale with hired labour, then an investment of Rs. 18 Lakh (*including working capital*) is needed. The necessary machinery can be easily procured from any of the Indian manufacturers. The financial estimates are given below:

Breakeven Point = 43 months

Capital Investment		Recurring Monthly Cost	
	INR		INR
Construction for 1000 sq feet workshed	10,00,000	Salary for 30 workers @ Rs. 5000	1,50,000
Cross Cutting Machine	50,000	Owner's salary	20,000
Splitting Machine	1,80,000	Supervisor Salary	10,000
Stick Making Machines 3 Nos	2,40,000	Raw Material	1,00,000
		Electricity	10,000
		Insurance	1,000
	14,70,000	Office Supplies	5,000
		Logistics	15,000
		Loan repayment 15 lakh loans @ 10% CI per annum	40,300
		Machine maintenance	10,000
			3,61,300
Turnover Calculation		Profit Calculation	
	INR		INR
Production per month (30 days x 2 murhas x 30 Workers)	1,800	EBDTA	4,16,400
Selling Price	220	Depreciation on machinery @15%	70,500
Total Turnover per month	3,96,000	Depreciation of Workshed @ 10%	1,00,000
Total annual turnover	47,52,000	Tax @ 30% on Net Profit	73,770
		Profit after Tax	1,72,130

Market

Murha is a versatile product with stable demand in local markets and is gaining in popularity across retail outlets and e-commerce platforms.

While the local market is indifferent to the material being used to make the murha, the retail market (both brick and mortar stores as well as e-commerce retail platforms) show preference for natural fibres like cane being used in place of plastic. Apart from cane, water hyacinth and water reed can also be used as weaving material. Modern retail has good demand for such innovative products. The murha can be combined with leather and furnished with cushions to provide more value-added options for the national markets. Such innovative products will also have export potential.

E-Commerce platforms like Pepperfry.com and Amazon.com feature murhas in their marketplace and these products are listed upward of 1500 rupees in these platforms. Similarly, European furniture websites also feature the traditional murha as one of their many offerings fetching close to 35 Euros per murha (Around Rs 2,600).

Office Utility Products (Woven)

Bamboo being a woody grass, with strong fibre is one of the best natural materials for making mats and baskets. As green substitutes, there is increasing demand for bamboo-based office utility products such as Paper bins, Files, Folders, Pen-stand etc. Suitable species are Bambusa nutans/ Bambusa tulda.



Paper Bin



Pencil Box



Paper Bin



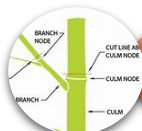
Pen Stand

Magazine Holder

Production Process



Green bamboo of 1-2 years is ideal for making the mats and baskets. Ones with large internode length (i.e. Bambusa Tulda/ Nutan) provides better results



Removal of branches from the main culm and cross cutting of the culm to desired lengths can be done manually or using crosscut machine



Splitting of bamboo-culms to make strips and slivering to desired thickness and length can be done machine or using slivering machine



Coloring of bamboo slivers and strips is done manually with hot water and dye in steel or aluminium container



Weaving of mats and baskets by different interlacing and coiling techniques is done manually by the artisans

Investment and Expected Returns

For an industrial set up to make Bamboo Office Utility Products, investment of 6.5 to 8.5 Lakhs (*including 2.5 - 3.5 lakh working capital*) is needed depending on the

scale of business. The machines could be availed vendors such as Anil Enterprises in Dewas (MP).

A		
) FIXED CAPITAL		
I. Land & Building		
1	Work-Shed (60 ft X 80 ft) Bamboo Frame & GC Sheet	1,50,000
II. Machineries and Equipment		
1	Crosscut Machine, 1 HP	25,000
2	Radial Splitter Machine 5HP	1,80,000
3	External knot removal Machine, 1 HP	30,000
4	Heavy Duty Sliver Machine, 1.5 HP	62,000
5	Thin Sliver Machine 1 HP	38,000
6	Heavy duty stitching Machine (JUKI)	20,000
7	Spare & Maintenance kit	20,000
Total		3,75,000
Total Fixed Capital Requirement:		
I.	Land & Building	1,50,000
II.	Machineries and Equipment	3,75,000
Total		5,25,000
B		
) Working Capital (Per Month):		
I.	Staff & Labour (Per Month)	32,650
II.	Raw-material (Per Month)	55,950
III	Utilities (Per Month)	4,200
IV	Other Contingent Expenses (Per Month)	8,000
IV	Total Recurring Expenses (per month)	1,00,800
Total Working Capital for 3-months		3,02,400
C		
) Total Capital Investment		
Fixed Capital		5,25,000
Working Capital for 3 - months		3,02,400
Total Capital		8,27,400
D		
) Financial Analysis:		
I.	Recurring Expenses/ Annum	13,52,060
II.	Turnover / Annum	21,65,000
III	Net-Profit /Annum	8,12,940
IV	Net Profit Ratio /Annum	37.55%
V.	Rate of Return:	98.25%
VI	Break Even Point:	14.16%

Market

Due to its environment friendly benefits, overall demand for bamboo products is increasing. Government offices, such as Forest and Environment departments are deciding to use bamboo-based office utility products. Students are also showing preferences towards such products and in general people are becoming aware and prefer green bamboo products than non-biodegradable products. This leads towards a large market potential for bamboo-based office utility products like paper bins, file, folders pen-stand, pencil box etc. and more options likely to emerge in future.

Round Bamboo Furniture

Round bamboo furniture or the traditional bamboo furniture are seen as low-cost substitute to wooden furniture. The aesthetically designed ones have found a resurgence in demand in interior decoration, use in gazebos, resorts and lawns. They can outlast wooden furniture and fetch good price in the market, making it a lucrative business.



Production Process

Solid bamboo species like *Dendrocalamus Strictus* and *Dendrocalamus stocksii* are most suitable for making furniture. *Bambusa Tulda* with *Dendrocalamus giganteus* and *Bambusa pallida* is often used in Assam. In Tripura, *T.Oliveri* is used.



The bamboo selected for making the furniture should be of at least 3 years maturity. Lesser hollow ones provide better results



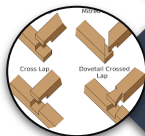
The bamboo is treated with preservatives to enhance its pest resistance and longevity. Preferred method is CCB Treatment (Boric-Borax)



The bamboo is then straightened by application of heat. Usually, LPG Blow torch is used for the purpose. For bending the bamboo, straightening wooden column is used



The components required for assembly of the bamboo furniture are made by knot removing, marking, filling end parts and groove making. The tools needed are measuring tape, saw, pencils, scraping knife, knot removal hand planer or angle grinder or knot removing machine



The joineries are made with the help of marking jig, tape, markers, saw, chisel and hammer. The components are then assembled to make the final product using Long Clamps (F Type), C-Clamps, Hammer, Adhesive / Glue, Chisel, Hand / Electrical Drill

The final product is then polished using air sprayer with compressor and packaged with cardboard, bubble wrap. The machinery can be procured from both Indian as well as Chinese manufacturers. Portable cross cutting machines are available at Bosch or Stanley.

Investment and Expected Returns

Investment of Rs. 10 - 25 Lakhs including Rs. 5 - 6 lakh for working capital is required. Machines needed are pressure treatment plant, LPG blow torch with accessories, straightening wooden column, angle grinder or knot removing machine and portable cross cutting machine.

Capital Investment		INR	Recurring Monthly Cost		INR
Construction for 1000 sq feet workshop		10,00,000	Hired Labour 6 Nos at Rs.10000		60,000
Vacuum Treatment Plant		7,00,000	Owner's Salary		25,000
LPG Blow torch and accessories		2,000	Supervisor's salary		15,000
Straightening wooden column		2,25,000	Raw Material		1,50,000
Angle grinder/knot removing machine		50,000	Electricity		50,000
Air sprayer with compressor		3,000	Insurance		2,000
Portable cross cutting machine		20,000	Office Supplies		10,000
		20,00,000	Logistics		1,00,000
			Loan repayment - 20 lakh loans @ 10% CI/annum		54,000
			Machine maintenance		20,000
			Miscellaneous (Cylinder, sanding paper, etc)		3,000
					4,89,000
Turnover Calculation		INR	Profit Calculation		INR
Production per month (sets)		25	EBDTA		7,32,000
Selling Price		22,000	Depreciation of machinery @ 15%		1,50,000
Total Turnover per month		5,50,000	Depreciation of Workshop @ 10%		1,00,000
Total annual turnover		66,00,000	Tax @ 30% on Net Profit		1,44,600
			Profit after Tax		3,37,400

Breakeven Point = 33 months

Market

In 2006, the furniture market of India was estimated at Rs. 35,000 crores. Considering that with the emergence of growth factors like (i) product innovations; (ii) organized retail showrooms (*IKEA, Home Town, Home Centre etc.*); (iii) advent of e-commerce like Pepper Fry, Urban Ladder, etc. and; (iv) organized furniture rental providers such as Furlenco and Rentomojo; the markets have transformed and grown bigger. Around 15 % of the market is in the organized sector, catered by companies such as Godrej & Boyce Manufacturing Co. Ltd., BP Ergo, Featherlite, Zuari, etc.

To meet emerging demand in national and exports market, the entrepreneur will need to develop knock-down or DIY versions of the products for easier storage, packaging and transportation. Those would require different designs, accessories and production systems. According investments in business may vary.

Toothpick

The **bamboo toothpick** is preferred against wood as a raw material for the product due to fast growth of bamboo and easy availability.



Production Process

Raw bamboo is crosscut into sizes for splitting using manual or electric splitter. The splits are then put into a knot removing machine to remove the interior knots in the upper green part of the bamboo. The strips are then sliced based on dimensional requirement of the final product and then boiled in hot water to enhance its durability. They are made into sticks using round stick making machine and then cut into sizes, polished and sharpened with machine. The stick may be sharpened from one or both sides depending on the requirement.

Investment and Expected Returns

To set up a full-fledged semi-automatic or fully automatic bamboo toothpick making production line, 7 basic machines are required. These can be procured from suppliers from India, Vietnam or China. Prasant Bamboo Machines and Anil Enterprises are few suppliers in India.

The likely capital investment for the production line shall be around 45-50 lakhs depending on the scale of production, excluding working capital for one month of around 20 lakhs. The same production line can be used for making products such as bamboo skewers and chopsticks by adding machines needed to make them. The estimates of the investment and expected returns are as given below:

Capital Investment		Recurring Monthly Cost	
	INR		INR
Construction for 3000 sq feet workshed	24,00,000	Payroll Semi Skilled	52,500
Bamboo Cross Cutter	43,000	Pay roll skilled	70,000
Bamboo Auto Splitter	1,92,000	Raw Material	9,75,000
Bamboo Slicer 2 Stroke	75,000	Electricity	25,000
Bamboo Round Stick Machine (2)	4,30,000	Insurance	2,000
Bamboo Stick Sizing Machine	48,000	Office Supplies	10,000
Bamboo Stick Polisher Machine	55,000	Logistics	1,50,000
Bamboo Toothpick Making Machine	1,75,000	Loan repayment - 34,18,000 lakh loans @ 14% CI/ar	1,09,684
	34,18,000	Machine maintenance	20,000
		Miscellaneous	3,000
		Depreciation @10% on workshed and machines	3,41,800
			17,58,984
Turnover Calculation		Profit Calculation	
	INR		INR
Production per month (Kilo)	8,000	Gross Profit	28,92,187
Selling Price	250	Tax @ 30%	8,67,656
Total Turnover per month	20,00,000	Net Profit	20,24,531
Total annual turnover	2,40,00,000		
Breakeven Calculation			
	Months		
Break even	21 months		

Breakeven Point = 21 months

Market

Bamboo toothpick is one of a hot selling bamboo product in domestic and international markets with a stable and increasing demand. Food points, restaurants, hotels have a regular bulk demand for the product. To reach more bulk buyers across the nation and globe the unit may be registered under different B2B online platform like India Mart, Go for Global, Trade India and Exporters India. For retailing, online platform like Flipkart, Amazon, Paytm, Nature Baskets, Grofers can be very useful. Offline sales promotion can be done to create a regular business channel in local and intra-state market. Social networking sites like Facebook and Instagram may be also used to target retail customer.

Contemporary Basket Products

Bamboo is very suitable for making Basket & Basketry items, which are in demand as they are green packaging substitute. In Dumka Bamboo Cluster of Jharkhand Bambusa nutans or Bambusa tulda are ideal to make products like storage bins, fruit / packaging baskets etc.



Storage Bin



Gift Box



Rectangular Basket



Cake Box



Flower/ Fruit Basket

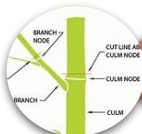


Packaging Tray

Production Process



Green bamboo of 1-2 years is ideal for making mats and baskets. Bamboo with large internode lengths (i.e. Bambusa Tulda/ Nutan) provides better results.



Removal of branches from the main culm and cross cutting of the Bamboo-culm to desired lengths, can be done manually or with a cosscut machine



Splitting of bamboo culms to form strips and slivers of desired thickness and length is done with a slivering machine in an industrial set up



Coloring of bamboo slivers and strips is done manually with hot water and dye in steel / aluminium container.



Weaving of mats and baskets by different interlacing and coiling techniques done manually by the artisans.

Investment and Expected Returns

An industrial set up to make basketry packaging items, would need investment of 6-7.5 Lakhs (including around 3-3.5 Lakhs for working capital) depending on the planned scale of his business. The machines and components required can be obtained from vendors such as Anil Enterprise in Dewas (MP).

(A) FIXED CAPITAL		
I. Land & Building		
1	Work-Shed (60 ft X 50 ft) Bamboo Frame & GC Sheet	90,000
II. Machineries and Equipments		
1	Crosscut Machine, 1 HP	25,000
2	Radial Splitter Machine 5HP	1,80,000
3	External knot removal Machine, 1 HP	38,000
4	Heavy Duty Sliver Machine, 1.5 HP	62,000
5	Thin Sliver Machine 1 HP	38,000
7	Spare & Maintenance kit	20,000
Total		3,63,000
Total Fixed Capital Requirement:		
I.	Land & Building	90,000
II.	Machineries and Equipments	3,63,000
Total		4,53,000
(B) Working Capital (Per Month):		
I. Staff & Labour (Per Month)		
		27,650
II. Raw-material (Per Month)		
		58,750
III. Utilities (Per Month)		
		3,980
IV. Other Contingent Expenses (Per Month)		
		8,000
Total Recurring Expenses (per month)		98,380
Total Working Capital for 3-months		2,95,140
(C) Total Capital Investment		
Fixed Capital		4,53,000
Working Capital for 3 months		2,95,140
Total Capital		7,48,140
(D) Financial Analysis:		
I. Recurring Expenses/ Annum		13,06,117
II. Turnover / Annum		19,15,000
III. Net-Profit /Annum		6,08,883
IV. Net Profit Ratio /Annum		31.80%
V. Rate of Return:		81.39%
VI. Break Even Point:		16.32%

Market

Using bamboo instead of plastic helps significantly reduces our carbon footprint and creates market opportunity. In terms of uses, it is already playing a leading role addressing the needs of basketry and packaging solutions and other utility items with more options likely to emerge in future.

Bamboo Shoots

Bamboo Shoots are the young, edible bamboo plants, generally 20-30 cms long, tapering at one end. They are consumed as food items after harvesting and form a traditional delicacy of many countries such as China, Japan, Thailand, Bhutan, Korea and India (particularly Eastern and North East India).

Bamboo shoots have high nutritional values - are low in cholesterol and saturated fats (total fats 0.5%), and high in carbohydrate (5.7%), protein (3.9%), minerals (1.1%) and moisture (88.8%). With 17 types of Amino acids, it contains 10 types of mineral elements – Co, Cr, Zn, Mn, Mg, Ni, Co, Cu etc.



Production Process

Receipt of freshly harvested bamboo shoots → Washing in Chlorinated Water → Removal of Culm Sheath and Peeling → Cutting to the desired size in the form of slices or dices → Blanching in boiling water (5 - 6 times) with dose of fresh water for each wash → Cooling by immersion in water at room temperature → Dewatering using sieves → Weighment in 250 gms, 500 gms and 1 kg → Filling in 3 layer HDPE bags of 80 micron thickness → Vacuum Sealing → Packing in Corrugated Boxes.

Investments and Expected Returns

CAPITAL INVESTMENT	INR	WORKIN CAPITAL - ONE SEASON - 60 DAYS	INR
Construction for 700 sq. feet workshed	7,10,000	Hired Labour Skilled and unskilled	6,00,000
Stainless Steel Preparation Table	46,000	Raw Materials	72,00,000
Stainless Steel Blanching Tank with cage and LPG Stove arrangement	1,92,000	Packing Cost	9,00,000
Double Chamber Vacuum Packaging Machine	8,43,000	Electricity and Power	58,000
Cutting and Dressing Tools	2,31,000	Freight	4,50,000
Personal Protective Equipment	30,000	Selling & Distribution Ex	2,25,000
Miscellaneous Fixed Assets	82,000	Interest on loan	1,50,000
Pre-Operative Expenses	72,000	Office Supplies	60,000
	22,06,000		96,43,000
		PROFIT CALCULATIONS	
		EBDTA	38,57,000
		Depreciation on Machinery @ 15 %	1,70,000
TURNOVER CALCULATIONS		Depreciation on Workshed @ 10 %	71000
Production Per Season	90 Tons	Tax @ 30% on net Profit	10,85,000
Selling Price (in Rs. per ton)	1,50,000	Profit after Tax	25,31,000
Total Annual Turnover (in Rs.)	1,35,00,000		

Break-even point: 36 to 40% of the production capacity.

Internal Rate of Return: 18 to 22%.

- The project is conceived for single shift basis of 8 hours / day and 60 working days in one shooting season.
- Raw and freshly harvested bamboo shoot requirement is 2 tonnes per day. Bamboo Shooting Season is assumed at 60 days in a year. Price of fresh bamboo shoots is considered at Rs 60 / kg.
- Finished and packed bamboo shoots production is 3 tonnes per day, 90 tonnes of annual production and sales in 1 year.
- 8 LPG commercial gas cylinders are required in a month.
- Selling price is assumed at Rs 120 to Rs 130 per kg.
- Shelf life of the vacuum packed bamboo shoots is 90 days.

Market

Bamboo Shoots whether processed or raw have a good demand for its nutritional value but are not readily available in the metros, Tier 1 and Tier 2 cities. There are hardly any organized bamboo shoots processing facility in India to address the needs and standards of global markets.

Vacuum Packed Bamboo Shoots can be sold in the vegetable markets as well in local grocery stores and departmental stores for household use. Marketing network needs to be developed through distributors and retailers. The Chinese and Thai restaurants require good quality bamboo shoots and sourcing for these institutions is difficult during non-shooting season. These establishments can be tapped for bulk marketing of vacuum-packed bamboo shoots.

Bamboo Toothbrush

Bamboo handle-based toothbrushes can reduce plastic pollution caused by plastic toothbrushes. They are already in use in Sweden, USA and China due to natural, eco-friendly, biodegradable handle.



Production Process



The bamboo should be of 1-3 years maturity and inner wall thickness should be more than 6-7mm. B. balcooa, D. Hamiltonii could be used and sourced from forest or homestead plantation.



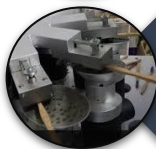
The bamboos are kept for drying at least 4-5 days to reduce moisture. After drying, bamboo is cross cut and splitted into long pieces width 20 mm using cross cutting and splitting machine.



Upper green layer and inner white layer with external and internal knot are removed using knot removing width sizing machine. Then long split is cut into 80 mm pieces for toothbrush handle.



Now the 80mm x 20mm x 7mm rectangle bamboo pieces are shaped as required and polished using sanding machine. Core is made on the shaped bamboo handle for tufting bristle. Carbonization of handles is done to prevent microbial growth and make it water resistant.



Tufting of the bristle is done. The bamboo toothbrush is now ready for laser etching. Brand name is etched on the lower flat part of the handle. The product is then packed and sold.

Investment and Expected Returns

Bamboo toothbrush handle making unit needs capital investment of 25-30L with working capital provision of 5-

7L. Machines for making bamboo handle are available in India. This industry requires mainly semi-skilled workforce. 3 phase power supply, proper work shed, wide metaled road are minimum basic facilities required to establish the unit. The estimates of the investment and expected returns are as given below:

Capital Investment for Handle Making unit	INR	Recurring Monthly Cost	INR
Construction for 1000 sq ft bamboo work shed @ Rs. 500 per sq ft	500,000	Salary for 10 workers (non-technical)	100,000.00
Bamboo Cross Cutter M/C	50,000	Salary for 2 technical persons / Machine Supervisor	50,000.00
Auto Splitter Machine SHP	225,000	Raw Material	30,000.00
Internal knot removing and slicing Machine	141,000	Electricity	10,000.00
Sliver making machine	85,000	Insurance	5,000.00
External knot remove machine	57,000	Office Supplies	7,000.00
Two-side planer machine	295,000	Logistics	20,000.00
Bamboo Sizing machine	57,000	Loan repayment - 22.37 lakh loans @ 14% CI/annum	71,786.00
Sanding machine	27,000	Machine maintenance	20,000.00
Carbonization system	500,000	Depreciation SLM (Work shed 3.17% & Machine 6.33%)	10,483.00
Electric connection and fittings	300,000	Total	574,269
Total	2,427,000	Profit Calculation	INR
Turnover Calculation	INR	Gross Profit	15,08,772
Production per month (pcs)	75,000	Tax @ 30%	4,52,632
Selling Price	6	Net Profit	10,56,140
Total Turnover per month	450,000	Break even	Months
Total annual turnover	54,00,000	Break even	26 months

Market

Bamboo toothbrushes are already in use in India, though at very low scale due to lack of awareness and price. Their uniqueness lies in the raw material itself and after its use. Plastic production from petrochemicals is polluting the environment, whereas bamboo absorbs CO₂ and releases 35% more O₂ in the environment. Plastic brushes are non-degradable (even in 100 years) and source of 2nd largest plastic waste materials worldwide, whereas bamboo toothbrushes degrade in few years.

In India 150 million plastic toothbrushes are thrown to garbage every month. In India, the current monthly demand for bamboo toothbrush handles is around 1 Lakh pieces. It indicates changing practice and increasing use of bamboo toothbrushes. Rs. 6 per bamboo toothbrush handle will reduce cost of the final product and will encourage and appeal to more people to use them.

Humble Brush, Earth's Daughter, Bmbu, Modest planet, Wowe are few existing brands selling bamboo toothbrush internationally through e-commerce platforms viz. Amazon, Alibaba, Flipkart etc. Toothbrushes are sold single piece and family pack.

Bamboo Cutlery, Glass and Cups

Bamboo Cutlery, mugs and glasses are products made from the bamboo stem.



Production Process

Bamboosa Tulda, Bamboosa Nutans, Dendrocolums Strictus, Dendrocalamus hamiltonii, Bamboosa Balcooa can be used for making such products. The various machineries that can be used for making cutlery and Glasses are listed as follows-

SI	Name of Machine	Products
1	Raw Bamboo Sawing machine 2.2 KW	Common for all products.
2	Bamboo Splitting Machine 3 KW-6	Common for all products.
3	Fixed Width Slicer 10.6 KW	Common for all products.
4	Bamboo Wool Slicer 9.6 KW	Common for all products.
5	Stick Cutting Machine 1.5 KW	Chopstick.
6	**Bamboo Spoon Shape Milling Machine	Spoon, Fork
7	**Further Shaping Forming Machine	Spoon, Fork
8	**Spoon Backside Planning Machine	Spoon, Fork
9	Medium Type Blade Sharpening Machine 0.75 KW	Common for all products.
10	Cordless Drill/Driver	Common for all products.
11	Hand Grinder 650 W 8500 Rpm	Common for all products.
12	Hand Tool Kit	Common for all products.

Certifications from agencies such as ISO, FSSAI and SGS laboratories are required.

Following is the specification of products, sub products and making process:

SI	Name of Product	Sub Products	Specification	Making process Manual/ Mechanical
1	Bamboo liquid Container	Bamboo Glasses	Height: 6-7 inches. Dia , 6-9 CM	Only cross cutting by machine rest is manual.
		Bamboo Cups	Height: 3-4 Inches. Dia: 6-9 CM	Only cross cutting by machine rest is manual.
2	Bamboo Cutlery	Bamboo Spoons	Length 5-8 Inches. Thickness 5-7 mm	All Mechanical.
		Bamboo Forks	Length 5-8 Inches. Thickness 5-7 mm	70-80% mechanical.
		Bamboo Knife	Length 5-8 Inches. Thickness 5-7 mm	All Mechanical
		Bamboo Chopsticks	4-10 Inch.	All Mechanical.

Investment and Expected Returns

Total project cost is INR 36,48,244. The Investment for machinery and fixed capital is INR 35,07,934. The working capital requirement is INR 1,40,310. Total turnover of cutlery is projected at INR 32.5 lakhs. The turnover of Glasses and cups is projected at INR 20 lakhs. (Assuming prices 110 and 70 respectively).

Parameter	Value
Production Capacity	Cutlery 6,50,000 pieces, Glasses: 15,000, Cups 5000 in a year.
Area required	2,000 Sq. feet
Plant and Machinery Cost	INR 19 Lakh Approx.
Working Capital time	Per cycle 26 days
Cost of Project	36,48,244 approx.
Current ratio	0.43
Break Even Sales value in 1 st Year	INR 9,16,985
Net Profit (In Yr. 1)	INR 2,116,836 approx.

Market

Recently the Airport Authority of India, fast food giants like KFC's, McDonald's have decided to cease usage of plastic disposables and opt for biodegradable cutlery. In disposable cutlery, spoons account for 55% of global market, which is around USD 881 million (Source: Future market insight). The retail sales channel of disposable cutlery primarily targets social

gatherings such as marriages, social club meetings and community get-togethers, etc. Institutional buyers include restaurants, event management companies, ice cream companies, temples and government and private canteens across the country. Online portals like India Mart, Amazon, Snap deal etc. can also be explored.

Bamboo Strip Board

Bamboo Strip Board is a decorative solid hard wood substitute for indoor use. It comes in sizes up to 8 feet length, 4 feet width and thicknesses ranging from 10mm to 18mm. It is suitable for indoor use for wall cladding, flooring, kitchenware and bath ware.



Production Process

Cross Cutting of Bamboo Poles → Splitting → Width Sizing, Inside knot removing, Outside Knot removing and slicing for making strips → Carbonization of Bamboo strips → Drying → Precise 4 Side Planning → Gluing of Bamboo Strips (Urea Formaldehyde Glue) → Pressing of Glued Bamboo Strips into Bamboo board using hot press → Thickness planning of Bamboo Board → Sanding of Bamboo Board → Edge milling, molding as per product requirement → Assembly of Bamboo Products → Plastic Shrink packing of Bamboo Products → Corrugated Box Packing → Dispatch to customers



---Sorting and grading of bamboo according to wall thickness and outer diameter is essential for good quality Bamboo Strip Board



--At the time of harvest only mature bamboos of 3 years age and above should be selected so as to ensure quality of the Bamboo Strip Board-



-Bamboo Strip Board can be sanded and moulded similar to other hardwood species such as teak. The natural grains on the surface have a unique attractive appearance.



--The Bamboo Strip Board should be protected from water and damp areas to avoid swelling and shrinkage.

Investment and Expected Returns

The Project is based on single shift basis and 300 working days in a year. Needs 58 Workers and 10 administrative staff. The financial details are as follows:

INVESTMENT DETAILS	INR	RECURRING MONTHLY COST	INR
Workshed of 21,000 Square Feet.	3,05,63,000	Hired Labour Skilled and unskilled	6,50,000
Plant & machinery	4,65,59,000	Administrative Staff Salary	4,00,000
Miscellaneous fixed assets	1,28,00,000	Raw Materials	37,50,000
Pre-liminary & pre-operative exp.	20,00,000	Packing Cost	2,50,000
Contingencies	45,86,000	Electricity and Power	3,00,000
Margin money for working capital	23,24,000	Consumables	1,50,000
	9,88,32,000	Interest on loan	4,80,000
		Loan Repayment	9,50,000
		Office Supplies	1,00,000
			70,30,000
PROFIT CALCULATIONS			
EBDTA	2,81,40,000		
Depreciation on Machinery @ 15 %	69,84,000	TURNOVER CALCULATIONS	
Depreciation on Workshed @ 10 %	30,55,000	Production Per Month of Furniture, Bath ware, Kitchen ware	1500 CBM
Tax @ 30% on net Profit	54,30,000	Total turnover Per Month	93,75,000
Profit after Tax	1,26,71,000	Annual Turnover	11,25,00,000

- Break Even Point: 52-55%.
- Internal Rate of Return: 18-20%.

Market

Strip Bamboo Board has a unique soothing appearance and it can be colored to match the design interiors.

It is learned that one of the airports in India has recently floated a large tender for bamboo board products. Below is the image of application of bamboo boards at Madrid airport in Spain.



More products such as bowls and chopping boards can also be made. These products are available at home furnishing stores, regular distributor and dealer network, e-commerce platforms and online furniture companies such as Urban Ladder and Pepperfry.

Agarbattis

Agarbattis are one of the major applications of bamboo sticks followed by use as kulfi sticks, barbeque skewers and toothpicks. Agarbattis are used by a large population of India for praying purpose and for fragrance on a daily basis in most of the households and a large number of commercial establishments.

Production Process

Cross Cutting of Bamboo Poles → Splitting → Width Sizing, inside knot removing, Outside Knot removing and slicing for making strips → Round Stick Making → Sizing of sticks → Sorting of sticks → Polishing of sticks → Packaging of sticks



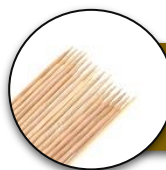
Sorting and Grading of bamboo according to wall thickness and outer diameter is essential for good quality round bamboo sticks



At the time of harvest only mature bamboos of 3 years age and above should be selected so as to ensure quality of the round bamboo sticks



The round bamboo and the finished round bamboo sticks should be stored in dry area away from dampness in order to avoid fungal infection and borar attack



The profile cutters and the round saw should be sharpened at regular intervals in order to maintain the quality of round bamboo sticks

- Bamboo waste shall be pulverized into fine dust and used as ingredient for agarbattis.
- Manpower Requirement for the project is 30 workers and 2 administrative staff.
- Power rate is assumed at Rs. 7 per KWH.

INVESTMENT DETAILS	INR	RECURRING MONTHLY COST	INR
Workshed of 5000 square feet	50,00,000	Hired Labour Skilled and unskilled	3,50,000
Plant & machinery	79,80,000	Administrative Staff Salary	1,00,000
Pre-liminary & pre-operative exp.	2,00,000	Raw Materials	6,75,000
Miscellaneous fixed assets	11,50,000	Packing Cost	2,40,000
Margin money for working capital	16,00,000	Electricity and Power	2,50,000
	1,59,30,000	Consumables	1,15,000
		Selling & Distribution Ex	50,000
TURNOVER CALCULATIONS		INR	
Production Per Month (Round Sticks)	20 Tons	Office Supplies	25,000
Production Per Month (Fine Bamboo Dust)	100 Tons		18,05,000
Selling Price Round Sticks (Per Ton)	95,000	PROFIT CALCULATIONS	
Selling Price Fine Bamboo Dust (Per Ton)	8,000	EBDTA	1,07,04,000
Total turnover Per Month	27,00,000	Depreciation on Machinery @ 15 %	13,70,000
Total Annual Turnover	3,24,00,000	Depreciation on Workshed @ 10 %	5,00,000
		Tax @ 30% on net Profit	26,00,000
		Profit after Tax	62,30,000

- Break Even Point: 52-55%
- Internal Rate of Return: 22-24%

Market Potential

The domestic production of Raw Agarbatti in India is about 1,20,000 tons per annum which requires 40,000 tons of Round Bamboo Sticks. Most of this quantity is imported from China, however the recent announcement of hike in customs duty from 10% to 30% has opened up opportunities for the domestic industry.

Further about 1,10,000 tons of raw Agarbatti is imported from Vietnam. Recently the Government has put raw Agarbatti in the restricted list which will reduce the quantum of imports and corresponding the demand for round bamboo sticks shall go up for these segments of Agarbatti.

Investment and Expected Returns

Some key assumptions for the project are as follows:

- The Project is based on a single shift basis and 300 working days in a year.
- Raw Bamboo Required is 5.34 Tonnes Per day
- Finished Round Stick Yield is 15% / Day based on average of 1.3mm, 2mm and 2.5mm diameter.



Bamboo Incense Sticks

Incense sticks (*agarbattis*) are popularly used in many Indian households and religious places. It serves religious purpose and is also used for its aromatic properties. It is widely used on auspicious occasions, festivals and social celebrations. Bamboo is an important raw material for making incense sticks and thin pieces of sliced bamboo are used for this purpose.



Production Process

Procurement of raw bamboo sticks → Blending of premix powder to prepare *masala* using powder mixing machine → Application of *masala* on sticks using automatic *Agarbatti* making machine → Drying of sticks → packing of dried sticks in desired sizes → Dispatch to customers



Procurement of raw bamboo sticks in order to minimise operational activity and economise on resources



The premix powder is blended together in order to prepare the mix (*masala*) for incense sticks



The blended powder (*masala*) is applied on bamboo sticks to produce incense sticks



The sticks are dried after *masala* application and packed in desired sizes

Investment and Expected Returns

The total project cost is Rs.26,64,425, including the cost of machinery, construction, working capital and other costs (preliminary, furniture & contingency). The working capital for one cycle is estimated to be Rs.7,66,825.

The manufacturing unit will have three type of machines- powder mixing machines (2), automatic *agarbatti* making machine (8) and dryer (2). Proposed machines can produce 450 kg (Assuming 56.5 Kg/Hr.) finished products in one day shift of 8 Hrs for which 100 Kg raw bamboo sticks (1.3 mm /8 Inch size) and 350 Kg of premix powder is required.

Capital Investment	INR	Recurring Monthly Cost	INR
A. Factory Work Shed (800 sq. ft)	9,60,000	Raw Materials	4,50,000
B1.Noiseless Agarbatti Machine - 2 HP	6,08,000	Wages	7,000
B2 Agarbatti Stick Dryer machine	56,000	Repairs & Maintenance	5,200
B3 Agarbatti masala Mixer	56,000	Power & Fuel	28,080
B4 GST 18%	1,29,600	Other Overhead Expenses	5,200
Grand Total (A+B1+B2+B3+B4)	18,09,600	Depreciation	21,280
Turnover Calculation	INR	Administrative Expenses	INR
Production per month in Kg	11,200	Interest on Bank credit	10,666
Selling Price Per KG in INR	65		
Total Turnover per month in INR	7,28,000	Profit Calculation	INR
Total annual turnover in INR	87,36,000	Gross Profit	33,35,356
Break Even Calculation	Months	Tax @ 29.12%	9,71,256
Break Even	8	Net Profit	23,64,100

Break-even point =8 Months

Market

The *agarbatti* of 1.3 mm round sticks have a large and ready market. The approx. market size is Rs.10,000 cr annually and Madhya Pradesh has become the hub of *agarbatti* production in the country and almost all the major brands have manufacturing base in Madhya Pradesh. The incense stick of 1.3 mm is the main ingredient of *agarbatti*, and has excellent market within the state. Besides, there is huge market potential market outside Madhya Pradesh as well.

The product will mostly be sold locally to wholesalers/distributors and perfumers in Bhopal where 80-100 such units are functional and remaining could be sold to incense stick wholesalers/distributors in Sehore and Vidisha in Madhya Pradesh. The entrepreneur has in principally agreed to tie up with Mahakaal Traders, in Bhopal to sell of 10-20% of finished products. Besides, the product could also be sold under Khadi Grammodyog Vindhyaachal yojna where retail outlets are established by department. The requirement of wholesalers and distributors will be explored and enlisted as the business and production will be streamlined.

Bamboo Briquettes

Bamboo briquette is made from bamboo residue, such as, bamboo dust, saw powder etc. This is done by compressing the residue into sticks of a certain shape and carbonizing the sticks. Bamboo briquettes are slow burning materials and are more efficient. Traditionally people have been using bamboo briquettes as cooking fuel, producing less air pollution than other charcoal. Since briquette compressed from biomass materials including bamboo produce less ash and reduce greenhouse gas emissions there is a growing inclination toward the use of clean and renewable resources such as these. Charcoal is increasingly being used as a fuel in many industries such as brick kilns, food processing units, chemical plants etc.

Production Process



Grinding/crushing of bamboo/saw dust and other agro-waste



Drying of the crushed bamboo/saw dust and other agro-waste



Formation of briquettes using the briquette making machines which uses a with high pressure mechanical punch



Cooling of the briquettes and then sorting and packing in desired lot sizes

Investment and Expected Returns

The total project cost is Rs.30,84,750, out of which Rs.28,85,000 is the capital cost and Rs.1,99,750 is the working capital cost. A total of five machines would be used in the production process which include- Briquette Machine, Flash Dryer Single Pass, Vibrator machine, Saw dust Machine and Pallet Making Machine.

There is a requirement of 2.8 MT dry Bamboo/saw dust/residual (moisture varies from 8-10%) per day and around 49 MT per month for 25days production in a month assuming 70% utilization. Initial production will be around 25-30 MT of 8/40 mm finished briquettes/pallets per month for first 2-3 months and then based on the skill of the laborer, machine performance, payment cycle, market reach and its demand the production will go up to 35 ton per month in the first year.

The nearby place has set of more than 100 of acre of land under bamboo cultivation. Apart from this there are many stick-based industries, furniture units existing in the place hence the procurement of Bamboo dust/Saw dust and residual can be done easily.

Capital Investment	INR	Recurring Monthly Cost	INR
Factory Shed (1100 sqft) & approach road	15,00,000	Raw Materials	1,08,780
Briquette Machine	5,05,000	Wages	50,000
Flash Dryer Single Pass	2,95,000	Repairs & Maintenance	3,675
Vibrator machine	75,000	Power & Fuel	18,375
Saw dust Machine	1,00,000	Other Overhead Expenses	3,675
Pallet Making Machine	1,00,000	Depreciation	25,000
GST	1,93,500	Administrative Expenses	38,846
Installation and commissioning	81,500	Interest on Bank credit	12,719
Grand Total	28,85,000		
Turnover Calculation	INR		
Production per month in Kg	49,000		
Selling Price Per KG in INR	8		
Total Turnover per month in INR	3,67,500	Profit Calculation	INR
Total annual turnover in INR	44,10,000	Gross Profit	7,08,377
Break Even Calculation	Months	Tax	70,838
Break Even	27	Net Profit	6,37,539

Break-Even point- 27 Months

Market

Bamboo briquettes has a good demand in industrial and domestic market. There are demands for briquettes in boiler for industrial and commercial units and for residential heating as well, as it is ecofriendly material. The proprietor has already contacted industries and commercial ventures in nearby 150 Km area to supply produced briquette/pallets

Sl	Types of Industries	No. of Units
1	Brick Kilns	10
2	Food Processing Units	13
3	Chemical Plants	32
4	Residential heating	2
5	Hotels and Hospitality	8
6	FMCG/Food processing and Beverages industry	3

The product will mostly be sold locally mostly to various industries and units having broilers. There are 4 industrial area in Barwani named Semlya, Segaon, Anjad, Palsund. These industries are agro-based, chemical, leather, wood based and food packaging Industries. In Borlay and Indore there are almost 50-100 units where briquette of 40 MM can be used. The connectivity from Metro Cities like Mumbai and Ahmedabad also provides huge opportunity in form of supply to potential market.

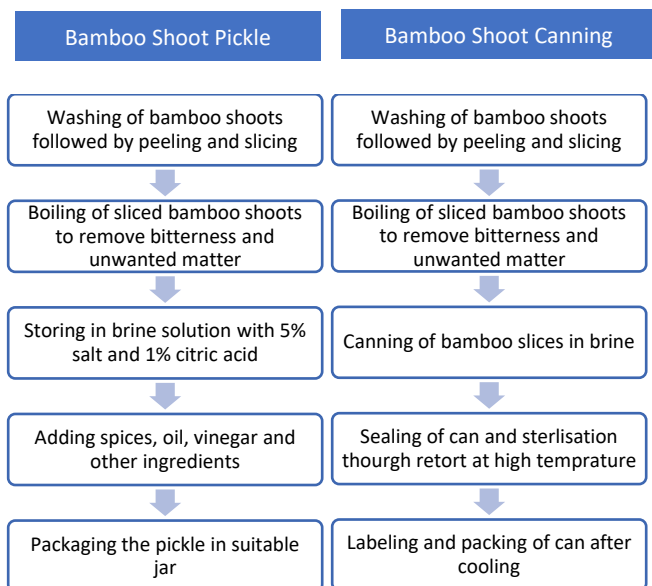
Bamboo Shoot products

Bamboo shoots are the young, edible bamboo plants that have just emerged from the ground. Bamboo shoots are low in fat and calories but rich in fibre with about 90% water. Fresh shoots have a crisp and sweet flavour with limited shelf life and have to be sold immediately. The peak availability period is June to October. The shoots are usually harvested when they attain the height of 15-16 cm.



In north-east India, bamboo shoot is consumed either raw or processed because of its exotic taste and flavour. Many nutritious and active materials-such as vitamins, amino acids and anti-oxidants such as flavones, phenols and steroids are present in the bamboo shoots. They are valuable in pharmaceutical and food processing industries and can be processed into beverages, medicines, additives or health foods. The key products proposed under the project are Bamboo shoot pickle and canned bamboo shoot.

Production Process



Investment and Expected Returns

The Capital cost of the project has been estimated on the basis of installed capacity assuming 300 working days per annum. The total cost of the project including margin for working capital has been estimated at Rs. 20,46,650.

The plant, machinery and equipment required for the unit are washing tanks, slicing machines, boiler, mixer grinder, bottle filling machine and cap sealing machine etc. The major consumables under the proposed unit are raw bamboo shoot, ingredients like salt, mustard seeds, oil, spices, vinegar etc. and packaging materials.

The installed capacity of bamboo shoot pickle is 100 tons and the capacity of canned bamboo shoot is 150 tons.

Capital Investment	INR	Recurring Monthly Cost (@100% capacity)	INR
Building and civil works	9,00,000	Raw Materials	7,56,667
Plant & Machinery	6,72,000	Repairs & Maintenance	3,452
Misc. Fixed Assets	1,11,000	Power & Fuel	24,881
Grand Total	16,83,000	Other Overhead Expenses	10,476
Turnover Calculation	INR	Depreciation	8,250
Bamboo shoot pickle		Administrative Expenses	97,500
Production per month in Kg	8,333	Interest on Bank credit	15,417
Selling Price Per KG in INR	62	Total	9,16,643
Total Turnover per month in INR	5,16,667	Profit Calculation	INR
Canned Bamboo Shoot		Net Profit	6,24,000
Production per month in Kg	12,500		
Selling Price Per KG in INR	42		
Total Turnover per month in INR	5,25,000	Break Even Calculation	Months
Total annual turnover in INR	1,25,00,000	Break Even	30

Break-even point- 30 Months

Market

Bamboo shoots are gaining popularity among the people all over the world. Despite huge scope of value addition, the preparation of various bamboo shoot based products is traditional, local and unorganized.

Bamboo shoots either processed or raw have a high demand in the markets. There is a ready market as there are very few processing units whereas demand is increasing. Apart from individual households, processed bamboo shoots have very good demand from restaurants, caterers, other caterers etc. Product can be sold through provisional stores and super markets in consumer packs and to bulk buyers in large packing.

The NE region being the largest producer of bamboos in India has a bright prospect for bamboo shoot industry but

presently bamboo shoot production is predominantly for fulfilling the local needs only, leaving a huge scope for expansion

Bamboo sticks for Agarbatti

The burning of incense in religious and social functions has been practiced in India since early times. *Dhup* an aromatic powder or paste is burnt in Indian homes as a fragrant fumigant and is reputed to possess insecticide and antiseptic properties. There is a high demand for incense sticks throughout the entire country and one of the most important raw material for incense sticks is the bamboo stick. The project proposed to make these sticks which will be further used to make incense sticks.



Production Process

Cross Cutting of Bamboo Poles → Splitting → Width Sizing, inside knot removing, Outside Knot removing and slicing for making strips → Round Stick Making → Sizing of sticks → Sorting of sticks → Polishing of sticks → Packaging of sticks



Sorting and Grading of bamboo according to wall thickness and outer diameter is essential for good quality round bamboo sticks



Cross cutting of bamboo poles, splitting, and knot removing



Slicing the bamboo for making strips and sizing and sorting of sticks



Polishing of sticks and final packaging

Investment and Expected Returns

The capital cost of the project has been estimated at ₹ 25.00 lakhs. The project cost is expected to be financed through Grant in Aid of ₹ 15.00 lakhs, a

term loan of ₹ 7.50 lakhs, and the promoter's own capital contribution of ₹ 2.50 lakhs. The project will involve setting up of four key machines- Bamboo splitting machine, slicing machine, sticks making machine and polishing machine, which will be purchased and installed at a cost of Rs.16 lakh. Apart from this Rs.5 lakh will be used for shed construction and electrification. The total working capital requirement will be of Rs.4 lakh.

Capital Investment	INR	Recurring Monthly Cost (@100% capacity)	INR
Shed	4,00,000	Raw Materials	3,75,000
Bamboo splitting machine		Repairs & Maintenance	11,905
Bamboo slicing machine		Power & Fuel	23,810
Bamboo stick making machine		Other Overhead Expenses	11,905
Bamboo polishing machine	16,00,000	Wages	1,78,571
Electrification	1,00,000	Depreciation	22,083
Grand Total	21,00,000	Administrative Expenses	16,667
Turnover Calculation	INR	Interest on Bank credit	6,833
Production per month in Kg	6,000	Total	6,46,774
Selling Price Per KG in INR	120	Profit Calculation (1st Year)	INR
Total Turnover per month in INR	7,20,000	Net Profit	1,25,000
Total annual turnover in INR	86,40,000	Break Even Calculation	Months
		Break Even	11

Break-even- 11 Months

Market Potential

The market for incense sticks in the entire north eastern region is growing rapidly as it is in the rest of the country. The strength of the product is that it is used daily by large sections of people throughout the country. Considering the above scenario which is a practical assessment, it can be reasonably assumed that there is enough demand for the proposed incense stick processing unit. There are many incense stick units which require raw bamboo sticks as a raw material. The unit will explore partnerships with these units and due to ready availability and proximity to bamboo growing area, it has the cost advantage in procurement and manufacturing these bamboo sticks.

Further, India imports raw incense sticks Vietnam and recently the Government has put raw incense sticks in the restricted list which will reduce the quantum of imports. This can significantly contribute to increasing

the demand for locally manufactured raw bamboo sticks which will greatly help the industry.

Bamboo Jewellery

Handicrafts are unique expressions and represent a culture, tradition and heritage of a country. Among the

crafts/trades under Handicrafts Industry, cane and bamboo craft is the most wide-spread in the north eastern states. Nangkyrsoi group is a common group from Kynrud whose aim is to engage in a common activity i.e. making of bamboo Jewelry, to improve the livelihood and income of fellow members through jewelry making.



Production Process

Cutting of bamboo with Hacksaw → slicing of bamboo using sickle → dyeing of the bamboo strips/pieces in desired colors → drying of bamboo strips/pieces → spiraling of bamboo strips/shaping of bamboo pieces → sanding of edges → inserting beads and stones → finishing and packaging of jewelry



Treatment & seasoning of bamboo, which is the most important factor for product development activity



Undertake primary processing of bamboo like cross cut, splitting, knot removing,



Cutting of bamboo into desired sizes as per the final jewellery design using appropriate tools such as basic pliers, forceps etc and Drill machine.



Processing the bamboo and giving finishing touches to make jewellery

Investment and Expected Returns

The total capital cost of the proposed project is Rs. 15,00,000, out of which Rs.11,65,660 is the fixed capital cost and the remaining 3,34,340 is the working capital cost. The proposed machinery for the project include

bamboo cross cutter machine, bamboo slicer, splitter, thin slicer and tool kits for jewelry manufacturing. The cost of land and building is Rs.6,50,000 and the cost of machinery and equipment is Rs.5,15,660. At annual profit of approx. 6,73,356 the unit is expected to provide a return of 45% and break-even of 54.53%.

Capital Investment	INR	Turnover Calculation	INR
Land (leased)	50,000	Earrings & clips	
Building	6,00,000	Production per month in Kg	1,500
Bamboo Cross Cutter Machine	42,500	Selling Price Per KG in INR	25
Bamboo slicer with inside knot removing machine	1,20,000	Total Turnover per month in INR	37,500
Bamboo Parallel splitter machine	85,000	Bangles	
Bamboo Thin Slicer/Silver Machine	45,000	Production per month in Kg	500
Bamboo power tool kit	70,000	Selling Price Per KG in INR	30
Bamboo Hand Tool Kit for Jewellery Making	17,500	Total Turnover per month in INR	15,000
Packaging, forwarding, Freight & Insurance Charges and taxes	1,35,660	Necklace	
Grand Total	11,65,660	Production per month in Kg	500
Recurring Monthly Cost (@100% capacity)	INR	Selling Price Per KG in INR	200
Raw Materials	1,90,000	Total Turnover per month in INR	1,00,000
Salary & Wages	1,00,000	Necklace (Premium)	
Other expense	44,340	Production per month in Kg	250
Depreciation	6,797	Selling Price Per KG in INR	1,000
Interest on Bank credit	5,250	Total Turnover per month in INR	2,50,000
Total	3,46,387	Total Turnover per annum in INR	48,30,000
Profit Calculation	INR	Break Even Calculation	%
Net Profit	6,73,356	Break Even	54.5

Market

Bamboo jewelry is fast gaining popularity as a mainstream fashion product with many people buying these types of jewelry. One of the major reasons for the increasing market is the eco-friendly nature of the product and the demand for more sustainable products by the consumers. The unit plans to tap this market and take advantage of the traditional skills of the local artisans and help to market these products in the local as well as national market.

Bamboo Crafts

Bamboo is used for making variety of decorative items. The eco-friendly products of bamboo are light in weight and have their own style and elegance. These products have a high life with minimum maintenance equivalent to wooden products. Strips of bamboo and various types of canes are extensively used to manufacture different utility and decorative items. Mats, lamp shades, trays, baskets are weaved and knitted by the skilled hands of the artisans. The unit is aimed to produce different furniture like mooras of different size, Flower Vase and other decorative items by using bamboo & cane materials



Production Process



The cane and bamboo required for making the product will be selected and cut in the required size as per the product requirement



The bamboos are then dried in the sun to reduce the moisture content and reduce the chances of insect damage



The bamboo is cut into pieces reqd. by the workers & then the different sizes of bamboos are joined or bind together by the means of nails or some adhesive.



After the product is completed the surface is decorated which gives a attractive look to the product.

Investment and Expected Returns

This project profile is for setting up of Bamboo Handicraft and Furniture making unit, based on 300 working days per annum and 8 working hours per day. The capital cost of the project including Pre-Operative Expenses has been calculated at around Rs. 15 lakhs of which Rs. 11.85 lakh is the cost of machinery, Rs.1.36 lakh is the cost of Miscellaneous fixed assets, Rs. 0.73 lakhs are the pre-operative and contingency expense and Rs.1.06 is the working capital requirement.

Capital Investment	INR	Turnover Calculation	INR
Machinery	11,85,000	Cane Muras (Big)	
Miscellaneous Fixed Assets	1,36,000	Production per month in Kg	83
Grand Total	13,21,000	Selling Price Per KG in INR	1,500
Recurring Monthly Cost (@100% capacity)	INR	Turnover per month in INR	1,25,000
Raw Materials	1,82,083	Cane Muras (Med)	
Wages	65,000	Production per month in Kg	67
Other expense	12,083	Selling Price Per KG in INR	500
Administrative expenses	5,208	Turnover per month in INR	33,333
Depreciation	28,125	Cane Muras(small) & cane basket	
Interest	8,542	Production per month in Kg	150
Total	2,92,500	Selling Price Per KG in INR	400
Profit Calculation	INR	Turnover per month in INR	60,000
Net Profit	5,07,500	Cane tray, gift items, traditional craft	
Break Even Calculation	%	Production per month in Kg	250
Break Even	49.3	Selling Price Per KG in INR	350
		Turnover per month in INR	87,500
		Flower vase & Bamboo Craft	
		Production per month in Kg	125
		Selling Price Per KG in INR	300
		Turnover per month in INR	37,500
		Total Turnover per month in INR	3,43,333
		Total Turnover per annum in INR	41,20,000

Break-even- 49.3%

Market

Bamboo have a wide variety of products ranging from baskets, musical instruments to utility items like pen stand, mugs, hair clips, vases, containers. Household furniture like chairs, sofa sets, mooras (small stools) are also made out of cane and bamboo. The whole plant part of bamboos can be utilized in many ways thus becoming the highest economically potential plant of the region.

There is tremendous demand of the products in domestic as well as in international market. Furniture and utility items of various designs are exported to the foreign countries as well. There is also good demand of the product in our domestic market.

Different artistic work of cane products made by Indian artists and craftsman are sold both in domestic and International market with high appreciation

Primary Bamboo Processing

Bamboo industry is one of the most important and fast growing industries in the country. Bamboo can be used as a raw material in the production of a variety of products, including agarbatti, construction, fibre, paper, biofuel, lifestyle products, handicrafts like toys and dolls etc.

Most of the Bamboo products require shearing of bamboo on their nodes, splitting bamboo and then making slivers and sticks for further usage in traditional products. These operations are undertaken at cottage scale using hand-tools and primary equipment in households or neighbourhood in small groups of primary processors. The submitted proposal envisages use of technology in the primary processing activity and connect with different nodes of the value chain of Bamboo.



Production process



Grading of bamboo is done to select the right quality and size of bamboo



The bamboos are then dried in the sun to after which boiling and treatment of bamboo is done to increase the shelf life



Cross cutting of bamboo and node separation followed by splitting of bamboo



The split bamboo is dried in the sun

Investment and Expected Returns

The total capital cost for the proposed project is Rs.27,12,253 which comprises of machine cost of Rs.13,28,090, construction cost of 8,00,000, working capital cost of Rs.5,12,863 and some other costs.

The team will be composed of one supervisor, and 5 full time and 2 part time laborers. The supervisor would look after the operation and production. Laborer will be semi-skilled or less skilled from nearby villages.

Capital Investment	INR	Recurring Monthly Cost (@100% capacity)	INR
Cost of machinery	13,28,090	Raw Materials	2,21,625
Cost of construction	8,00,000	Wages	27,000
Grand Total	21,28,090	Power & Fuel	7,920
Turnover Calculation	INR	Other Overhead Expenses	1,980
Raw Bamboo		Repair and Maintenance	1,188
Production per month in units	21,000	Depreciation	23,268
Selling Price Per KG in units	6	Administrative Expenses	16,247
Turnover per month in INR	1,26,000	Interest on Bank credit	9,041
Treated bamboo		Total	3,08,268
Production per month in units	3,000	Profit Calculation (1st Year)	INR
Selling Price Per KG in units	90	Net Profit	4,56,411
Turnover per month in INR	2,70,000		
Total Turnover per month in INR	3,96,000	Break Even Calculation	Months
Total annual turnover in INR	47,52,000	Break Even	25

Breakeven- 25 Months

Market

Semi-finished dry split bamboo for Agarbatti and Kulfi: The product will mostly be sold locally to round bamboo stick manufactures in Borlay, Badwani and Indore where a cluster of units are already functional with production varies in capacity of 2-10 MT/Month. Some of the units where entrepreneurs has had a discussion are:

Sl	Types of Industries	Requirement- Kg/day	Location
1	Patidar Industries	2000	Borlay, Badwani
2	Mysore deep Perfumery House	1100	Indore
3	Agarbatti Complex	5 to 8000	Indore
4	Anoop Agarbatti Works	1200	Indore
5	Vijaya Agrabtti	1500	Indore

Treated Bamboo can be sold to nearby farmers who are into cultivation/Orchard option. The 6-6.5 feet Bamboo poles have high demand for creeper vegetables and orchards. The price varies from 90-100 per pole with paint applied on surface.

Bamboo Handicraft

Bamboo craft occupies an important place in the economy of the state of Assam, next only to agriculture. The products of bamboo are mostly of two types namely i) articles required for day to day use which are of average quality and are more suited to local requirements; and ii) articles of finer quality, both decorative and functional, to meet the requirements of more urbane/ premium markets.



Production Process



Removal of branches from the main culm and cross cutting of the culm to desired lengths can be done manually or using crosscut machin



splitting and slivering of bamboo to achieve desired length and thickness as per the product requirements



Coloring and finishing of bamboo strips as per the final product requirement



Weaving, arranging and assembling of bamboo slivers and pieces to create the desired product

Investment and Expected Returns

In order to set up the bamboo handicraft unit, an investment of Rs. 15,00,000 is required with the implementation period of 24 months. Out of the total investment the cost of machinery is Rs. 3.61 lakh and the cost of setting up work shed is Rs. 6.66 lakhs. The total working capital requirement for the project is approx.. Rs.3.5 lakh.

The unit will produce moorahs, cane furniture, bamboo furniture set, basket and the production capacity of the unit is expected to be around 10,000 units annually. The details of the unit wise monthly production has

been given in the table below. The sale of these products will generate an annual revenue of approx. Rs. 47.76 lakhs per annum. The break even for the project is expected to be achieved in about 8 Months.

Capital Investment	INR	Turnover Calculation	INR
Workshed	6,66,625	Moorah	
Machinery	3,61,150	Production per month in units	667
Furniture & Fixtures	55,000	Selling Price Per KG in units	500
Prelim cost	25,000	Turnover per month in INR	3,33,333
Contingency	34,775	Basket	
Grand Total	11,42,550	Production per month in units	150
Recurring Monthly Cost (@100% capacity)	INR	Selling Price Per KG in units	200
Raw Materials	22,750	Turnover per month in INR	30,000
Wages	2,800	Cane furniture set	
Power & Fuel	544	Production per month in units (20 p.a.)	1.7
Other Overhead Expenses	389	Selling Price Per KG in units	12,000
Repair and Maintenance	1,188	Turnover per month in INR	20,000
Depreciation	8,565	Bamboo furniture set	
Administrative Expenses	1,50,245	Production per month in units (22 p.a.)	1.8
Interest on Bank credit	4,875	Selling Price Per KG in units	8,000
Total	1,91,356	Turnover per month in INR	14,667
Profit Calculation (1st Year)	INR	Total Turnover per month in INR	3,98,000
Net Profit	11,40,633	Total annual turnover in INR	47,76,000
Break Even Calculation	Months		
Break Even	8		

Break-even- 8 Months

Market

Traditionally, Bamboo products like baskets, mats and stools are made by local artisans which are sold at the local market. There is also huge demand for such products in Assam and Khasi Hills. Consequently, the local artisans are supplying large quantity of the bamboo products to buyers from Assam and Khasi Hills who frequented the village for such products. With the setting up of the bamboo handicraft unit and manufacturing of more value added products the market will expand and the value of sales will also increase.

The demand for bamboo products is increasing and there is a preference for sustainable and environment friendly products, like bamboo furniture, baskets and moorahs. The growing awareness regarding global warming and the environment is surging the demand of the bamboo furniture market globally, in addition to the aesthetic appeal which it offers to the furniture. Bamboo has been gaining a major market share because of its acceptance as being a substitute for wood.

Bamboo Charcoal Making

Bamboo Charcoal made from bamboo plants has good properties, similar to wood and other lingo-cellulosic material in terms of high carbon content and calorific value. Bamboo charcoal can be used for purifying water, absorbing chemical waste, producing cosmetics, food and medicine as it contains more than 400 beneficial chemical compounds. It not only provides a new way to utilize bamboo, but also benefits environmental protection by reducing pollutant residue.



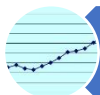
Production Process



Szing and Removal of branches from the main culm and cross cutting of the culm according to inner height of the kiln



Igniting: Charing and igniting the firewood lying behind the kiln gate and then close the top two intakes when fire wood is burned



Heating: This is drying and pre carbonization stages. This is process of raising the temperature inside the kiln by dimounting the arc feed intake on the gate and feeding firewood to keep burning



Carbonization: At 260 degree, the bamboo decompose rapidly, it gives out lot of offspring and reaction heat. At 450 degree bamboo pyrolysis enters into refining/ calcining stage.



Cooling and cleaning: The kiln gate is sealed and bamboo charcoal is allowed to cool naturally, extracted cleaned, packed/ sold.

Investment and Expected Returns

In order to set up the bamboo charcoal unit of hourly feeding capacity of 800 kg, an investment of Rs. 15 lakh is required. Out of the total investment the cost of machinery is Rs. 3.45 lakh and the cost of setting up fixed asset is Rs. 3.00 lakhs. Total pre-operative expenses is 0.40 lakh and total working capital requirement for the project is Rs.8.14 lakh.

The unit will produce Charcoal, Briquette and Pallets at a production capacity of 576000 kg annually. The sale of these products will generate an annual revenue of approx. Rs. 57.60 lakhs per annum at 100% annual capacity. The average break even as percentage of sales is 52.54% and would be able to reach the break even in first year itself.

Capital Investment	INR	Turnover Calculation	INR
Machinery	3,45,000	Charcoal	
Misc. Fixed Assets	3,00,000	Production per month in Kg	38,400
Pre-operative expenses	40,000	Selling Price Per KG	10
Grand Total	6,85,000	Turnover per month in INR	3,84,000
Recurring Monthly Cost (@100% capacity)	INR	Briquette	
Raw Materials	2,87,917	Production per month in Kg	4,800
Wages	46,667	Selling Price Per KG	8
Power & Fuel	13,667	Turnover per month in INR	38,400
Other Overhead Expenses	389	Pellets	
Depreciation	5,417	Production per month in Kg	4,800.0
Administrative Expenses	2,083	Selling Price Per KG	12
Interest on Bank credit	4,875	Turnover per month in INR	57,600
Total	3,61,014	Total Turnover per month in INR	4,80,000
Profit Calculation (1st Year)	INR	Total annual turnover in INR	57,60,000
Net Profit	2,48,000	Break Even Calculation	Months
		Break Even	8

Market

The bamboo charcoal market is broadly categorized into three major segments based on the application type such as food industry, textile industry and cosmetics industry. Cosmetics industry segment is growing rapidly in the bamboo charcoal market with substantial revenue generation in the last few years. Growing popularity of bamboo charcoal in cosmetics industry segment is attributed to the increasing product penetration in newer market and increasing use in household applications.

The global bamboo charcoal market is expected to display higher growth rate over the next five years. Rapid surge in bamboo charcoal market is credited to the increasing industrial application and its exclusive features such as excellent absorption properties. Bamboo charcoal also exhibits superior characteristics such as healing and detoxification. The bamboo charcoal powder is gaining popularity due to its environmentally-friendly nature. Globally, bamboo charcoal market is predicted to generate massive revenue over the next seven years, providing numerous opportunities for industry participants to invest in research and development of bamboo charcoal.



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