

Contact

Mission Director, MP State Bamboo Mission, and
CEO, MP State Bamboo & Bamboo Crafts Development Board
Khel Parisar, 74 Bungalows, Bhopal (MP) 462 003

T 91-755-2555520/24

F 91-755-2555523

E mpbamboomission@mpforest.org • ajoykb@gmail.com

W www.mpforest.org

www.mpbamboomission.org

**MADHYA
PRADESH
STATE
BAMBOO
MISSION**





03 | FOREWORDS

07 | VISION

**08 | MISSION'S GOALS
AND OBJECTIVES**

10 | BACKGROUND

**12 | SECTOR-WISE
MARKET POTENTIAL
OF BAMBOO**

**16 | POTENTIAL OF
BAMBOO IN
MADHYA PRADESH**

26 | STRATEGY

**40 | NETWORKING
AND PARTNERSHIPS**

**42 | PROMISING
ONGOING EFFORTS**

45 | MPSBM ACTION PLAN

CONTENTS



The growing global public and private demand for sustainable products and lifestyles has put bamboo in the spotlight as the material for the future. This versatile material, traditionally the domain of bamboo-working artisans, has always had a plethora of uses, ranging from housing, to interior applications, food and handicraft. State-of-the-art technologies emerging all over the world have demonstrated myriad new uses for this ancient material—including bamboo textile, bamboo flavonoids, bamboo surfboards and even bamboo crash helmets.

Yet, India has not been able to tap into these markets despite being the second-largest bamboo producer in the world after China. We have not been able to capture the global bamboo market even as well as the rest of our Asian counterparts, including the Philippines, Indonesia, and Vietnam.

In a nation as large and as densely populated as ours, the domestic market alone can provide a huge opportunity for bamboo products produced in India. Maximizing the use of bamboo in the public sector, including through government infrastructure such as through furniture for schools or through social welfare schemes such as the Indira Awaas Yojna, can provide a huge impetus for the Indian bamboo sector.

This can best be achieved by a convergence between different government departments, including Tribal Welfare, Commerce and Industries, Forest, Cottage and Village Industries, Agriculture, and the MP Livelihoods Mission. Such interdepartmental efforts—targeting bamboo-based, inclusive

development—are essential. The aim must be to safeguard traditional bamboo-based livelihoods and build upon the cadre of traditional bamboo workers in MP. Simultaneously, MP must bring cutting-edge technologies from around the world to the state, through industries that dovetail with the vision of bamboo-based, inclusive development.

The Madhya Pradesh State Bamboo Mission (MPBSM) is well positioned to be the catalyst in realizing the potential that bamboo-based development offers in the state, by increasing the amount of bamboo available as a resource, and simultaneously increasing the application of this resource in a manner which facilitates inclusive development in the state.

I am sure MPSBM will be able to facilitate a convergence between the different departments that deal with bamboo, and bamboo-based schemes and activities. Alongside this, I believe MPSBM will also create a synergy, facilitating innovative public-private partnerships (PPP), based on tradition and technology, which will help the state realize its potential for sustainable bamboo-based development.

Anthony de Sa

**FROM THE DESK OF
THE CHIEF SECRETARY
MADHYA PRADESH**



Madhya Pradesh is the largest Indian state in terms of forest area, and comprises 12% of the country's growing bamboo stock. However, roughly half of MP's natural bamboo forests, which are spread over 28 forest divisions in 22 districts, are degraded. In some areas, the degradation of the forests has led to the extinction of bamboo altogether.

This rapid and serious degradation of bamboo forests endangers not only bamboo, but also the livelihoods of bamboo-dependent communities. One of these is the Basod community—the state's traditional bamboo artisans. Another group that uses bamboo is the nistar—farmers who use bamboo usufruct from the forests.

Apart from these traditional user groups, the industrial sector requires 5 lakh notional tonnes (NT) of bamboo, whereas the supply is a mere 0.5 lakh NT. Similarly, the demand of bamboo for commercial applications is around 6 lakh NT, whereas the supply is 0.55 lakh NT. These figures point to a glaring gap of nearly 90% between the demand for, and supply of, bamboo in MP.

There is, therefore, an urgent need to supplement the efforts of the forest department to increase and manage MP's bamboo stock, taking into consideration its commercial and industrial market. If the state's bamboo resource is increased, a huge market already exists which can absorb the additional supply of bamboo.

The enormous potential for the bamboo sector in MP is evident. What is equally evident, is that this potential can only be realized through adequate management of bamboo resources on both public and private lands, and proper utilization thereon.

It is my belief that MPSBM will be instrumental in bridging the supply gap of bamboo for farmers and artisans, for industrial and commercial applications, by bringing more areas under bamboo, managing the existing stock of bamboo, and promoting and facilitating value-added applications, which will lead to inclusive and sustainable livelihoods through the bamboo sector.

BP Singh

FROM THE DESK OF
THE PRINCIPAL SECRETARY
FOREST DEPARTMENT, GoMP



Bamboo offers tremendous livelihood opportunities for the forest-dwelling communities of Madhya Pradesh. The abundant natural bamboo resource and simultaneous existence of bamboo-working skills among the Basod, MP's traditional bamboo-working community, provide an ideal base which can be developed further.

A four-pronged approach—education, vocation, certification and entrepreneurship—offers the strategic way forward.

It is imperative that all stakeholders, especially members of the artisan community, be educated to orient them towards bamboo-based entrepreneurship. This education may not be formal, but in the apprenticeship mode, building on their existing experiential learning as craftspeople. The idea is to dovetail their craft with the knowledge economy, thereby realizing and leveraging the informal 'education' they have acquired as practitioners of their craft.

Identifying bamboo-based vocations is an important step in the way forward. Expert resource people and institutions working in the area of bamboo-based development and livelihood vocations need to be brought on board to develop specialized capacity building and training programmes to develop the existing workforce to dovetail with the bamboo-based vocations identified.

Certification is essential for the institutionalization and sustainability of the entire process. In the age of green washing,

every node of the value chain has become apprehensive about trusting the commodity chain. Above-board certification will help in mainstreaming bamboo-based livelihoods and establishing a benchmark within the country and abroad.

Last, but not the least, entrepreneurship will act as the vehicle to take bamboo-based livelihoods forward. The state needs a cadre of innovative entrepreneurs who will act as repositories in taking forward MPSBM's investment in a commercially viable manner. We need to build this cadre through a cross section of inputs from expert institutions and professionals.

I am convinced that adopting this four-pronged approach—involving education, vocation, certification and entrepreneurship—will set the stage for MPSBM's success, and will result in increased and secure livelihoods for the people of MP through bamboo-based initiatives.

Anil Oberoi

FROM THE DESK OF
THE PRINCIPAL
CHIEF CONSERVATOR OF FOREST
GoMP



Bamboo, a versatile and renewable grass, has taken centre stage in recent times, since it, as an ecologically, socially, economically and culturally sustainable material, offers solutions to sustainability-related issues, such as global warming, climate change, poverty, food security and job security. Bamboo is a wonder plant with a plethora of uses—from the cradle to the grave—which dovetails easily with the Blue Economy concept.

Large parts of natural bamboo forests in Madhya Pradesh have been degraded. However, given bamboo's resilience and the speed at which it grows, this situation can be rectified through plantations and high-tech nurseries. MPSBM will also work on other innovative strategic exercises, outlined in this document, to build on MP's natural bamboo resource base.

It is imperative to build this resource, as the non-availability of sufficient quantities of high-quality age-graded bamboo has been identified as one of the main constraints to bamboo-based production, whether at the level of micro-enterprises or that of large industries.

We intend to form strong alliances with collaborators who can provide technical backstopping, to determine the best bamboo livelihood enterprises, in terms of thematic area and size, for MP. We have already initiated such discussions and will soon have on board state-of-the-art inputs on the way forward, keeping in mind the state's resource base and micro, and macro-environments.

Ensuring inclusivity in MP's bamboo-based development is a key point on our agenda. We intend to provide livelihoods to the poorest of the poor through pro-poor enterprise models. We will look especially at forest-dependent communities, especially those—such as the Basod community—that have crafted bamboo into articles of daily consumption for generations.

Simultaneously, we will adopt and improvise the best practices from countries that have successfully implemented bamboo-based development. We will reach out to international and national resource persons to ensure that these technologies and models are not just transplanted into MP but 'hardened', if needed, through field pilot projects that would act as 'nurseries' for these technologies.

MPSBM intends to look at the entire bamboo eco-system—the resource, producers, marketers, buyers, business-development resource persons, and even flora and fauna deeply dependent on bamboo forests. We propose the vision document that follows, based on all these factors and mindful that they all need to co-exist in a balanced way for bamboo-based development to flourish in a sustainable and holistic manner in MP.

AK Bhattacharya

FROM THE DESK OF
THE MISSION DIRECTOR
 MADHYA PRADESH STATE BAMBOO MISSION



VISION

The vision of the Madhya Pradesh State Bamboo Mission is to promote and facilitate bamboo-based development in a holistically sustainable manner, to address multiple dimensions, including ecological, economic, social and cultural issues. The mission will achieve this by adopting a dynamic, holistic and scientific approach to the entire bamboo production-to-consumption system—from cultivation and management of bamboo in natural forests and private lands, to harvesting, design, production and marketing. This will be done in an integrated manner, through a multi-departmental and multi-dimensional approach, alongside capacity building of the stakeholders, research and development, and a massive awareness generation in Madhya Pradesh on the potentials of the bamboo sector.

**PROMOTING AND
FACILITATING
BAMBOO-BASED
HOLISTICALLY
SUSTAINABLE
DEVELOPMENT**



Leveraging bamboo as a vehicle for sustainable and inclusive development, which can contribute to restoring and rejuvenating Madhya Pradesh holistically—including its ecological, economic, social and cultural dimensions

Increasing awareness on bamboo's viability as a versatile timber-replacement material, among different stakeholder groups, including farmers, traders, artisans, industries and buyers

Provision of business-development services—including design, production streamlining and entrepreneurship development inputs—to local artisans and traditional bamboo-working communities, to help them access lucrative traditional and non-traditional markets

Building the capacity of bamboo stakeholders—including craftspeople, non-traditional producers, entrepreneurs and technical experts—so that they can constitute an expert group of bamboo resource persons and can contribute to enhancing the bamboo sector in MP

Increasing the resource base of bamboo in forest and non-forest areas, in a planned and scientific manner, through the cultivation and management of bamboo in plantations and nurseries, by the government, institutions, communities and individuals

Promotion and facilitation of bamboo-based economies and livelihoods on different scales, including micro-enterprises, SMEs and industries

Putting in place certification mechanisms to ensure the sustainable management of the bamboo resource, process, system, chain of custody and products

Consolidate the diverse factions of bamboo stakeholders through an institutional mechanism that creates a synergy and enables them to work towards the common goal of promoting and facilitating bamboo-based holistically sustainable development

Protection, conservation and promotion of the rich biodiversity associated with bamboo forests

MISSION'S GOALS AND OBJECTIVES



Bamboo is a versatile grass with the potential to positively impact sustainability in a holistic manner, covering ecological, economic, social and cultural dimensions. If this perennial is properly managed, harvesting bamboo does not lead to a complete loss of green cover, such as when trees are felled. Bamboo can yield up to twenty times more bio-mass than trees cultivated in the same area, making it the ideal carbon sink. Bamboo's underground rhizome network controls soil erosion and helps in capturing water, while its significant leaf fall forms mulch—which retains moisture and helps rehabilitate degraded lands. Bamboo uses a high amount of nitrogen, making it a good solution for wastewater treatment.

Bamboo's linear fibres make it easy to process with very simple tools; wood, on the other hand, requires more effort to process. This is why most indigenous communities—including marginalized factions such as women and tribal communities—whose natural environment includes bamboo,

use it for their daily needs. Since it is easy to process and extremely versatile, it is used for a multitude of applications, from housing to household baskets. This makes bamboo an ideal material for eco-income-generation activities and for inclusive economies.

The Government of India launched a massive programme—the National Bamboo Mission (NBM)—in order to tap the vast potential bamboo offers for sustainable and holistic development in the country. The programme's objectives include increasing the bamboo resource in terms of species and yield, promoting bamboo-based applications, providing bamboo-based employment for marginalized communities, consolidating the bamboo sector, and promoting, developing and disseminating technologies at the intersection of traditional wisdom and contemporary science.

BACKGROUND

SECTOR: BAMBOO FURNITURE

SIGNIFICANCE: Bamboo is used for furniture as it is strong and light. Bamboo furniture is made from round bamboo poles, slats and slivers, as well as from industrially processed bamboo, in the form of boards and sections.

POTENTIAL: ₹3,625 Cr

**SECTOR: BAMBOO PULP & PAPER INDUSTRY**

SIGNIFICANCE: Bamboo accounts for more than 70% of the raw material used in the paper industry. Since all the material is pulped, the waste from other industries in the bamboo sector could also be used as an input for this industry.

POTENTIAL: ₹2,088 Cr

**SECTOR: BAMBOO HOUSING**

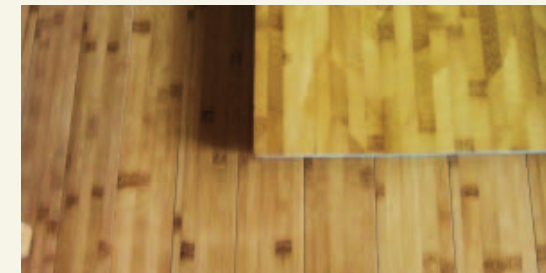
SIGNIFICANCE: Bamboo is very popular as a renewable material, including for buildings, as it is one of the fastest-growing species on the planet. It has been estimated that, worldwide, about 2.5 billion people trade in or use bamboo; of this, about 1 billion use it for housing.

POTENTIAL: ₹1,163 Cr

**SECTOR: BAMBOO FLOORING**

SIGNIFICANCE: Bamboo flooring is a premium product, made from industrially processed bamboo formed into flooring boards with easy-to-lay joinery. The material is comparable to hardwood floors and is in high demand.

POTENTIAL: ₹1,950 Cr



SECTOR-WISE MARKET POTENTIAL OF BAMBOO IN INDIA BY 2015¹

The global bamboo market is projected at ₹90,000 crore, or \$20 billion, by 2015, whereas the current market for bamboo products in India is estimated at ₹50,000 crore, or \$10 billion. The National Mission on Bamboo Technology and Trade Development, under the Planning Commission, has estimated that bamboo can replace projected timber imports to the tune of ₹30,000 crore by 2025, if its cultivation and use are properly encouraged.

**SECTOR: BAMBOO SHOOTS**

SIGNIFICANCE: Bamboo shoots are a popular ingredient in South East Asian cuisine and are also included in local diets in some parts of India. They are low in calories and high in carbohydrates, proteins and minerals. Bamboo shoots are consumed raw, canned, boiled, fermented and stir-fried, and are a popular ingredient in many restaurants as well.

POTENTIAL: ₹300 Cr

**SECTOR: BAMBOO SCAFFOLDING**

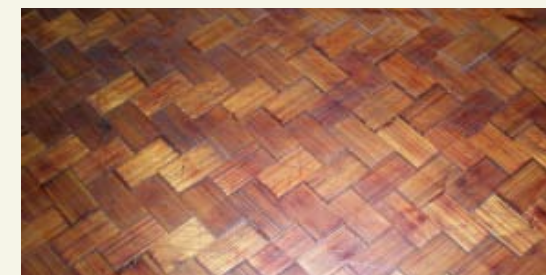
SIGNIFICANCE: Bamboo is an ideal material for scaffolds because it is light and strong. In addition to this, its low cost and reusability when lashed together makes bamboo perfectly suited to making scaffolds.

POTENTIAL: ₹861 Cr

**SECTOR: BAMBOO HANDICRAFT**

SIGNIFICANCE: Bamboo is easy to process due to its linear fibres and is therefore used to make handicraft items such as utilitarian table-top accessories, baskets, items of religious significance, fashion accessories and decorative items.

POTENTIAL: ₹600 Cr

**SECTOR: BAMBOO MAT BOARD**

SIGNIFICANCE: Bamboo mat board is a plywood-like board, made from bamboo mats laminated together. It is more flexible than regular plywood and can so be used in applications such as wall bracings and web beams—for which ply is unsuitable—alongside architectural and interior applications such as ceilings, roofs, doors and panels.

POTENTIAL: ₹3,908 Cr

SECTOR: INCENSE STICK COTTAGE INDUSTRY

SIGNIFICANCE: Bamboo incense sticks (*agarbattis*) are made from thin bamboo sticks (called *kaadis*), which are processed by rolling in a *jiggat* mixture. Bamboo *kaadis* can be a stand-alone item or can be processed into complete incense sticks. Women are mostly employed in this sector.

POTENTIAL: ₹1,000 Cr



SECTOR: BAMBOO PLY-BOARD FOR USE IN TRUCKS & RAILWAYS

SIGNIFICANCE: Being a strong, flexible, tenacious and durable material, bamboo is ideally applied in making bamboo composites, which are used to make automotive bodies as well as railway carriages.

POTENTIAL: ₹3,408 Cr



SECTOR: BAMBOO FOR ROADS

SIGNIFICANCE: Bamboo can be used as reinforcement for concrete pavements and road constructions. A bamboo grid is constructed and used as a reinforcement to control the cracking in concrete. This technology has been trialed in regions including Thailand and Cambodia.

POTENTIAL: ₹274 Cr



SECTOR: BAMBOO AS A WOOD SUBSTITUTE

SIGNIFICANCE: Bamboo is an ideal substitute for timber and wood. Bamboo boards and panels can replace wood-based composites, and often provide greater strength and flexibility than wood composites.

POTENTIAL: ₹274 Cr



SECTOR-WISE MARKET POTENTIAL OF BAMBOO BY 2015



SECTOR: BAMBOO CHARCOAL

SIGNIFICANCE: Bamboo charcoal can substitute wood charcoal or mineral coal. It serves as an absorbant, a fuel and a conductor. The calorific value of bamboo charcoal is almost half that of oil of the same weight. Moreover, the absorption capacity of bamboo charcoal is six times that of wood charcoal of the same weight.



SECTOR: BAMBOO IN ELECTRONICS

SIGNIFICANCE: Bamboo is being used increasingly to clad electronic goods such as laptops and cell phones. The market targets niche customers, who want value-added eco-friendly or green products, which are light and aesthetically appealing.



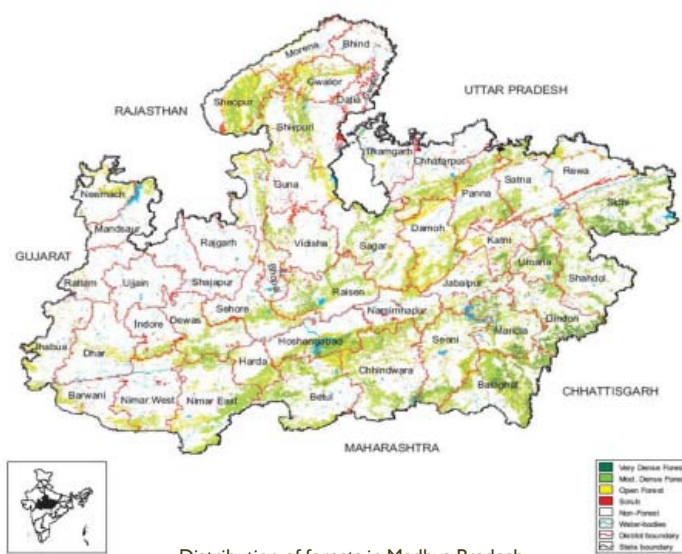
SECTOR: BAMBOO AND BIO-ENERGY

SIGNIFICANCE: Bamboo waste can be used to create bio-energy, thus making electricity production self-sustainable. Bamboo waste can also be an input material for bamboo charcoal, bamboo bio fuel, bamboo pyrolysis, bamboo firewood, bamboo gasification plant, bamboo briquettes, bamboo pellets and bio-char (a by-product, which is an excellent fertilizer).



SECTOR: BAMBOO TEXTILE INDUSTRY

SIGNIFICANCE: Most available bamboo textile is made by the viscose method where bamboo's cellulose is dissolved by a chemical process to produce a viscose cellulose pulp, which is then extruded into fine strands in a chemical bath. Manufacturers claim that bamboo fabric is antibacterial, thermal regulating, and hypoallergenic.



Distribution of forests in Madhya Pradesh

Madhya Pradesh Statistical Profile²

Geographical Area	3,08,252 sq. km	Total no. of villages	51,806
Population (Census 2011)	7.25 crore	Villages within 5km of forest boundary	21,797
Recorded forest area	94,689 sq. km	Number of Joint Forest Management Committees	15,228
Bamboo forests	6,280 sq. km	Forest Area with Joint Forest Management Committees	66,874 sq. km

Madhya Pradesh is the largest state in terms of forest area, accounting for 20.3% of India's forest area. MP's recorded forest area is 94,689 sq. km—30.72% of its geographical area. The reserved forests constitute 65.36%, protected forests, 32.84%, and unclassed forests, 1.8%.³

The predominant species of bamboo in Madhya Pradesh are

Dendrocalamus strictus—called 'desi bans' and found in nearly 80% of natural forests—and *Bambusa bambos*—called 'katang bans' and found in 80% of private bamboo clumps.⁴ Other species include *Bambusa vulgaris* var. *striata*, *Cephalostachyum pergracile*, *Gigantochloa rostrata*, *Schizostachyum pergracile*, *Bambusa tulda*, *Bambusa polymorpha*, *Bambusa nutans*, *Dendrocalamus asper*, *Bambusa balcooa* and *Melocanna baccifera*.

Sr. No.	Species	Local name	Forest divisions
1	<i>Dendrocalamus strictus</i> ⁵	Desi bans	North Balaghat, South Balaghat, North Betul, South Betul, West Betul, Bhopal, Raisen, Obedullahganj, Sehore, Vidisha, Rajghar, Chhatarpur, Tikamgarh, North Panna, South Panna, East Chhindwara, West Chhindwara, South Chhindwara, Gwalior, Morena, Datia, Sheopur, Bhind, Hoshangabad, Harda, Indore, Dhar, Jhabua, Alirajpur, Jabalpur, Katni, West Mandla, Dindori, Khandwa, Burhanpur, Kharagon, Barwaha, Sendhwa, Barwani, Rewa, Satna, Sidhi, Singrauli, North Sagar, South Sagar, Damoh, North Seoni, South Seoni, Narsinghpur, Umaria, Anuppur, North Shahdol, South Shahdol, Shivpuri, Guna, Ashoknagar, Ujjain, Shajapur, Mandsaur, Neemuch, Dewas, Ratlam
2	<i>Bambusa bambos</i> ⁶	Katang bans	North Balaghat, South Balaghat, Bhopal, Obedullahganj, Sehore, East Chhindwara, West Chhindwara, South Chhindwara, Jhabua, Jabalpur, Katni, East Mandla, West Mandla, Dindori, North Seoni, South Seoni, Narsinghpur
3	<i>Bambusa vulgaris</i> var. <i>striata</i> ⁷		Jabalpur, Katni
4	<i>Cephalostachyum pergracile</i> ⁸		South Balaghat
5	<i>Gigantochloa rostrata</i> (Syn. <i>Oxytenanthera nigrociliata</i>) ⁹		Information not available
6	<i>Schizostachyum pergracile</i> ¹⁰		Information not available
7	<i>Bambusa tulda</i> ¹¹		Rewa, Sagar
8	<i>Bambusa polymorpha</i> ¹²	Narangi bans	Hoshangabad (Bori Sanctuary)
9	<i>Bambusa nutans</i> ¹³	Mala bans	Private plantation (Ranga), Jabalpur
10	<i>Dendrocalamus asper</i> ¹⁴		Private plantation, Jabalpur
11	<i>Bambusa balcooa</i> ¹⁵	Bema bans	Hoshangabad
12	<i>Melocanna baccifera</i> ¹⁶		Information not available

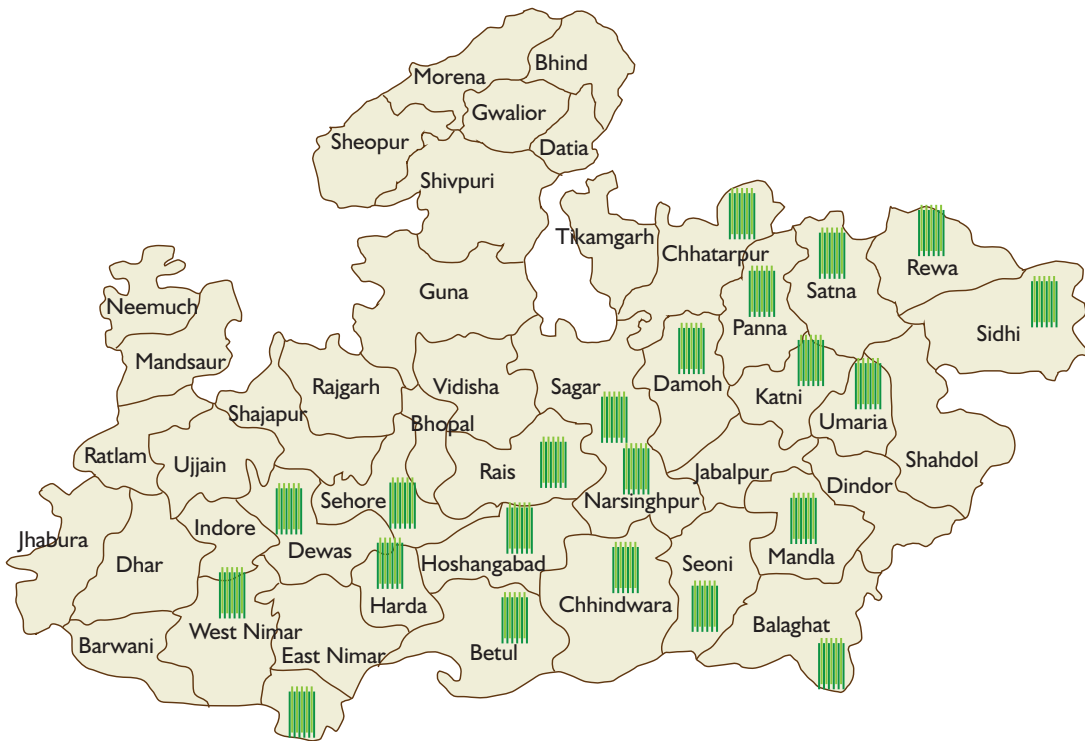
POTENTIAL OF BAMBOO IN MADHYA PRADESH

2. MP forest department annual report 2012–2013 & MP government GAD
 3. MP forest department annual report 2012–2013
 4. MP Divisional Working Plans

5. Working plans of respective forest divisions
 6. *Ibid.*
 7. *Ibid.*
 8. *Ibid.*

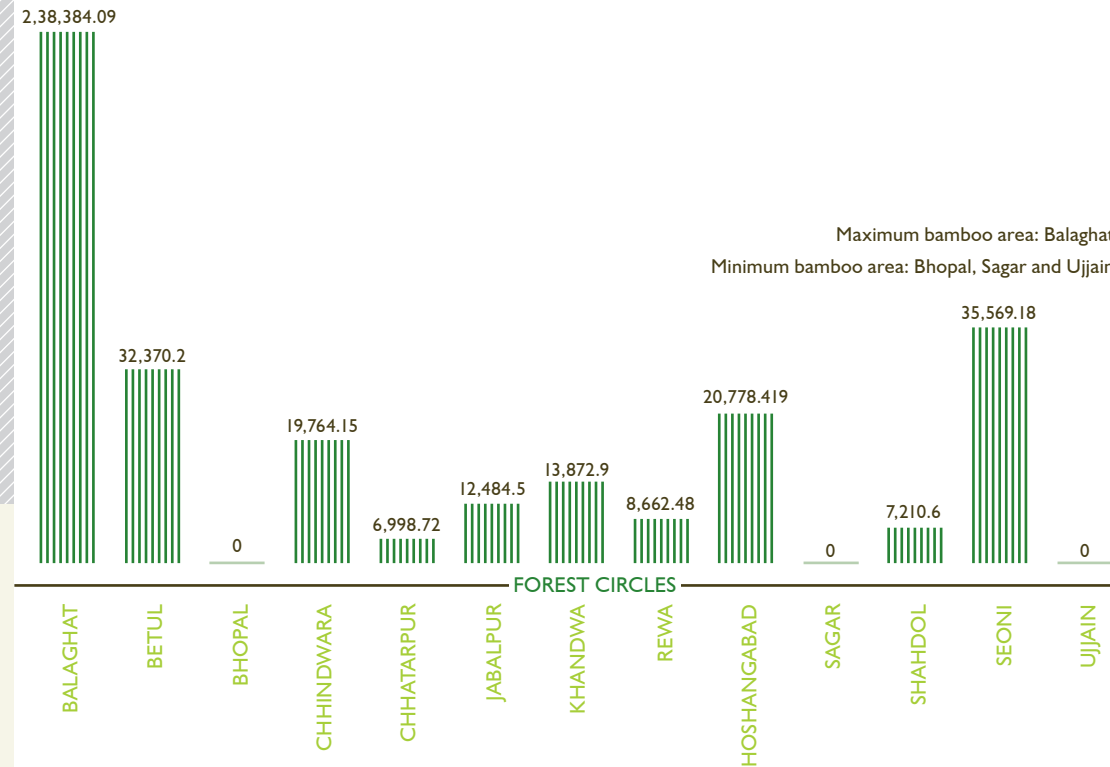
9. Nath, V., Pal, Rajat S., Banerjee, S.K.: 'Bamboo: Its distribution, production, habitat and agro-forestry potential'; TFRJ Jabalpur; accessed from 1). <http://indiaenvironmentportal.org.in/files/Bamboo%20Agroforestry.pdf> 2). <http://www.bamboocomposites.com/bamboo%20studied.htm>
 10. *Ibid.*

11. TFRJ, Jabalpur
 12. www.indianforester.co.in/index.php/indianforester/article/view/23622
 13. Forest Department, Jabalpur
 14. TFRJ, Jabalpur
 15. Report of the DFO
 16. MPFD Report



Area covered under Bamboo Plantation

Forest Circle-wise Distribution of Bamboo area in MP¹⁹ (in ha.)



Maximum bamboo area: Balaghat
Minimum bamboo area: Bhopal, Sagar and Ujjain

MP has 13 lakh ha. under bamboo,¹⁷ roughly 5.93 lakh ha.¹⁸ of which is under management. Of this, 45.13%—2.68 lakh ha.—consists of degraded bamboo forests. The area under bamboo has fallen by 44% over a period of roughly 25 years, according to a comparison of state-level working plans. The increase in the rehabilitation of degraded bamboo forest area in the same duration is 188%.

Balaghat district has the maximum area under bamboo (40%), while Bhopal, Sagar and Ujjain have the least (0%).

POTENTIAL OF BAMBOO IN MADHYA PRADESH

17. FSI 2011
18. As per the working plans of the various Divisions (data obtained from the o/o PCCF)
19. FSI 2011



It is estimated that 2.68 lakh ha. (45.13%) of bamboo forests in MP are degraded. Over the last fifteen years, the bamboo forest area has reduced to approximately half, and the degraded bamboo forest area has almost doubled. In some areas, the depletion is so acute that bamboo has been eliminated altogether.

In addition, around 55% of MP's bamboo has died due to gregarious flowering, thus further reducing bamboo stocks. Between 2004 and 2006, around 80% of bamboo clumps flowered in Seoni district and around 25% flowered in Balaghat district. These areas, and others in which flowering has taken place, need to be urgently regenerated.

Currently, 54% of the bamboo in MP's forest areas is reported to be green culms, 36% is reported to be dry culms and 10% is reported to be decayed culms.²⁰

There are two main users of bamboo in MP: 75,000 traditional bamboo artisan families who make up the Basod community (of whom 24,000 are registered) and nistar farmers, who use bamboo usufruct to repair houses and for other agro-utilitarian applications. With a total of 71,256 villages, the total domestic requirement of bamboo by the villagers has been estimated to be 1,870 lakh NT. The MP government has a policy in place to meet the current demand for bamboo, but the rapid degradation of bamboo forests indicates a huge shortage of bamboo for even MP's traditional bamboo users.

DENSITY CATEGORIES OF BAMBOO CULMS IN INDIA AND MP²¹

Density categories	MP	India
Pure bamboo	0.08%	0.17%
Dense bamboo	2.89%	7.01%
Scattered bamboo	5.56%	8.17%
Bamboo present but clumps completely hacked	2.41%	1.28%
Bamboo regeneration	2.85%	2.18%
No bamboo	86.2%	81.19%

SOUNDNESS OF BAMBOO CULMS IN INDIA AND MP²²

Soundness of culms	MP	India
Green culms	54%	79%
Dry culms	36%	16%
Decayed culms	10%	5%

POTENTIAL OF BAMBOO IN MADHYA PRADESH



The production of bamboo from natural forests in MP is estimated at about 75,000 NT. One NT is equal to 2,400 metres and the ratio of industrial to commercial (long) bamboos is roughly 65% to 35%. There is limited data available for bamboo production on private land. However, according to a rough estimate, about 20,000 NT of commercial bamboo is being harvested from farmlands.

The total revenue from 1.04 lakh NT of commercial and industrial bamboo produced by MP in 2012–13, was pegged at ₹35.92 crores. In 2007–2008, the total revenue from 0.98 lakh NT of commercial and industrial bamboo produced by MP was pegged at ₹36.76 crore. The reason that the revenue for each lakh NT of bamboo increased only by around ₹3.38 over a five-year period may be that the supply of bamboo in commercial applications fell by approximately 50%, while the supply of bamboo in industrial applications increased modestly.

The current demand for bamboo for industrial applications in MP is 5 lakh NT, whereas the supply is a mere 0.5 lakh NT. Similarly, the demand for bamboo for commercial applications is 6 lakh NT, whereas the supply is 0.55 lakh NT. These figures indicate a huge gap of nearly 90% between the demand for, and supply of, bamboo in MP.

This highlights the bamboo sector's enormous potential in MP, which can only be fulfilled through a long-term vision, and strategy for scientific management of bamboo resources on both public and private land.

Currently, less than 30% of natural bamboo forest areas are being managed scientifically and/or harvested in a technical manner. Of 1.6 crore clumps in the natural forest, less than 40 lakh clumps are being managed systematically. This is mainly because dense bamboo forests are located in hilly terrains

PRODUCTION AND REVENUE OF BAMBOO IN MP²³

Year	Production in lakh NT*		Revenue	
	Commercial bamboo	Industrial bamboo	Total	₹ in crore
2007–08	0.33	0.65	0.98	36.76
2008–09	0.41	0.60	1.01	28.24
2009–10	0.29	0.49	0.78	36.81
2010–11	0.22	0.42	0.64	25.86
2011–12	0.24	0.52	0.76	26.72
2012–13	0.28	0.77	1.05	38.92

*NT: One notional tonne is equivalent to 2,400 running metres.

that are difficult to access, and because the low commercial harvesting rates are not commensurate with the intensive labour required for scientific harvesting. It is estimated that bamboo output can be doubled by correct management. It is also estimated that there is a potential yield of about 20 crore culms annually from private farms in MP's 22 bamboo districts. Managing these bamboo clumps on private land through an extensive and intensive 'Bamboo Extension Outreach Programme' (BEOP) could help meet MP's demand for bamboo.

Also important is utilizing MP's bamboo resource for applications that facilitate livelihood generation and inclusive development. There are a total of 52,117 villages in MP, of which 21,797 are within 5km of the forest boundary. The processing of bamboo into value-added products by communities living in these villages could lead to inclusive and sustainable livelihoods through the bamboo sector.

ISSUES TO BE ADDRESSED

HIGH RATE OF BAMBOO DEPLETION

- 80% culms already depleted
- 55% dead due to gregarious flowering

LACK OF SCIENTIFIC MANAGEMENT

- Potential of production of nearly 200 million culms annually on private land

LACK OF APPROPRIATE POLICY

- Policy intervention in transit rules and taxes

POTENTIAL OF BAMBOO IN MADHYA PRADESH

SWOT ANALYSIS FOR BAMBOO IN MP

STRENGTH	WEAKNESS	OPPORTUNITY	THREAT
Several new species have already been introduced	The production-to-consumption chains for these new species are not in place	New product development to leverage the new species along with market development	Generic products that are made from the same species from outside MP
Existing cadre of traditional bamboo artisans from Madhya Pradesh	Shrinking markets for traditional product range being produced by artisans	Leveraging existing skill base to manufacture new products and tap new markets	Bamboo products from outside MP
Largest state in terms of forest area in India	Difficulty in managing vast tracts of internal forests that are difficult to navigate	Managing forests in a participatory manner by linking in forest communities	Attracting new forest dwellers to the forest, thus creating an ecosystem imbalance
Traditional bamboo craft and indigenous resource in MP	Inadequate documentation on traditional bamboo craft and resource of MP	Documentation of MP's bamboo tradition through print, video, museum, etc.	Competing need from MP's other traditional crafts
MP is a developing state with several cities which can be tapped as lucrative markets	Connections lacking between MP's bamboo producers and buyers	Facilitating bamboo-based markets in MP	Markets for other produce in MP
Facilitative policy environment	Changing political environment may hinder a sustained positive policy environment	Institutionalizing MP's bamboo activities	Premature change and/or instability in policy environment
Ecotourism opportunities in MP	These opportunities have not been leveraged	Use of bamboo for creating tourist facilities including hotels, restaurants, ecotourism tracks, etc.	Tourism strategies from other Indian states
Initial activities in MP have generated a lot of interest for bamboo in the state	Most of the interest comes from factions outside of MP	Building a cadre of local bamboo experts and professionals from MP who retain MP's investment	Migration of bamboo experts outside MP
Elite technical institutions which can help develop the bamboo sector	Most of these institutions are broad based, and not dedicated to bamboo	Introducing bamboo as a topic of specialization in mainstream courses	Focus on other materials in mainstream technical education
Expert resource persons who are poised to help MP in consolidating its bamboo sector	Difficulty in penetrating the government and public sector through standard processes such as issuing of tenders, which do not recognize the complexities associated with the bamboo sector	Creating alternate systems to engage expert professionals in the bamboo sector	Difficulty in changing established practices and mechanisms



A

A multi-pronged approach will be taken up in Mission mode to realize the huge potential for bamboo-based development in MP.

STRENGTHENING THE BAMBOO RESOURCE BASE

Madhya Pradesh requires a large amount of bamboo as an input resource in planned activities for bamboo-based development and entrepreneurship. The key activities to conserve, manage and supplement the existing resource base are outlined below:

- **Bamboo-resource species and age-wise assessment** will be conducted, including inventory, utility and bio-regional analysis. Bamboo stock in the forests will be determined by species-wise GIS mapping, and bamboo stock in non-forest areas will be determined by participatory inventory. The best potential utility of the existing bamboo stock will be determined. The bio-regional analysis of bamboo growing in different agro-climatic zones of MP will be done, vis-à-vis carbon content, soil content, etc. Relevant expert institutes such as Forest Survey of India (FSI); Indian Institute of Forest Management (IIFM); institutes of Indian Council of Forestry Research & Education (ICFRE), Dehradun; Institute of Wood Sciences & Technology, Bangalore; Indian Plywood Industries Research Institute (IPIRI), Bangalore, and the Indian Institute of Technology (IIT) will be involved.

- **MP's bamboo species and ecotypes will be identified and preserved** in situ by intensive rehabilitation of bamboo forests covering more than 30,000 ha. It is estimated that nearly 1,50,000 ha. of bamboo area will be restored in five years.

- **Bamboo species and ecotypes with commercially superior and desirable attributes for large-scale cultivation will be introduced** to augment the existing bamboo species in MP.

- **Bamboo forests and plantations will be managed** by first defining correct management practices, and then transferring these to the field. A bilingual manual on best practices will be developed and used to build the capacity of a cross section of resource persons—including from the forest department, self-help groups, community-based organizations, artisans and farmers. A reputed institute, such as the Tropical Forest Research Institute (TFRI), located in Jabalpur, will assess the impact of proper management on the regeneration of the forests.

- **A bamboosetum will be established** for ex situ preservation of bamboo germplasm from different agro-climatic zones.



- **Hi-tech tissue culture labs will be established** in collaboration with reputed institutions such as Growmore Biotech Ltd from Hosur, Tamil Nadu, and the Ramakrishna Mission, Kolkata, to increase planting materials. The tissue-culture seedlings will be hardened in 12 nurseries established in districts with common facility centres (CFCs). Finally, the shoots will be planted in more than 60,000 ha. of forest area, by stakeholders including cooperatives, self-help groups (SHGs) and community-based organizations (CBOs).

- **Promotion of bamboo cultivation by individuals and communities on private and community lands** will be initiated by a study on the assessment of bamboo on private land in MP by high-tech nurseries. Plantations will be promoted on private land through PPPs and by offering lucrative schemes, streamlining of finance, and credit facilities for promoting bamboo plantation. The BEOP, proposed for bamboo clumps on private land, will include developing

databases, capacity building, scientific management, primary processing, value addition and marketing.

- **Flowering of bamboo in the state will be managed** by encouraging the fullest possible utilization of bamboo before flowering through policy interventions. A programme will be put in place to facilitate regeneration of flowered bamboo clumps. In addition, future flowering will be predicted by collating records from around the world on flowering patterns of species prevalent and introduced in MP.

- **Bamboo will be commercialized at the farmers' level by establishing a bamboo-producers' company**, with appropriate forward linkages. The pilot will be set up in Jabalpur district, in collaboration with the Small Farmers' Agri-business Consortium. On successful implementation, it will be repeated in other selected districts.

STRATEGY

B

CAPACITY BUILDING AND HUMAN RESOURCE DEVELOPMENT

Capacity building of existing bamboo stakeholders, including traditional and non-traditional producers and entrepreneurs, will be done in order to build a cadre of bamboo professionals who will consolidate MP's bamboo sector and take it forward. Some of the activities towards this are outlined below:

• **Both traditional and non-traditional bamboo producers will be trained** by expert institutions, such as the National Institute of Design (NID), School of Planning and Architecture (SPA), Indian Plywood Industries Research & Training Institute (IPIRTI), etc., to build their skill in working with different bamboo applications and technologies. The envisaged result is a cadre of highly skilled bamboo producers, who will optimally utilize MP's bamboo resources.

• **A cadre of potential bamboo entrepreneurs will be built** by providing them with entrepreneurship training through institutes such as the Bamboo Entrepreneurship Development Institute (BEDI). The entrepreneurs will be



supported with financial services such as soft loans, micro finance, etc., through development banks, such as NABARD, to facilitate their incubation towards fully productive enterprises.

• **Formal academic modular courses in bamboo technology will be provided** to traditional bamboo artisans in collaboration with institutions such as Dayalbagh Educational Institute (DEI), Agra, which is a deemed university. The aim is to build a cadre of artisans formally educated in bamboo technology.



STRATEGY

C

INNOVATIVE DESIGN

It is essential to utilize the available bamboo, through value-added applications, in a manner conducive to holistic sustainability and development. Design inputs are essential to help MP's traditional and non-traditional bamboo producers to connect with viable markets through focused value-added applications. Design is a very important stage, as it orchestrates the entire production-to-consumption system (PCS), and thereby determines the sustainability of MP's bamboo products and systems. Regular design inputs will be given to producer groups at different levels, from micro-enterprises to industries, by expert design consultants and reputed design institutes. Some key activities in this regard are illustrated below:

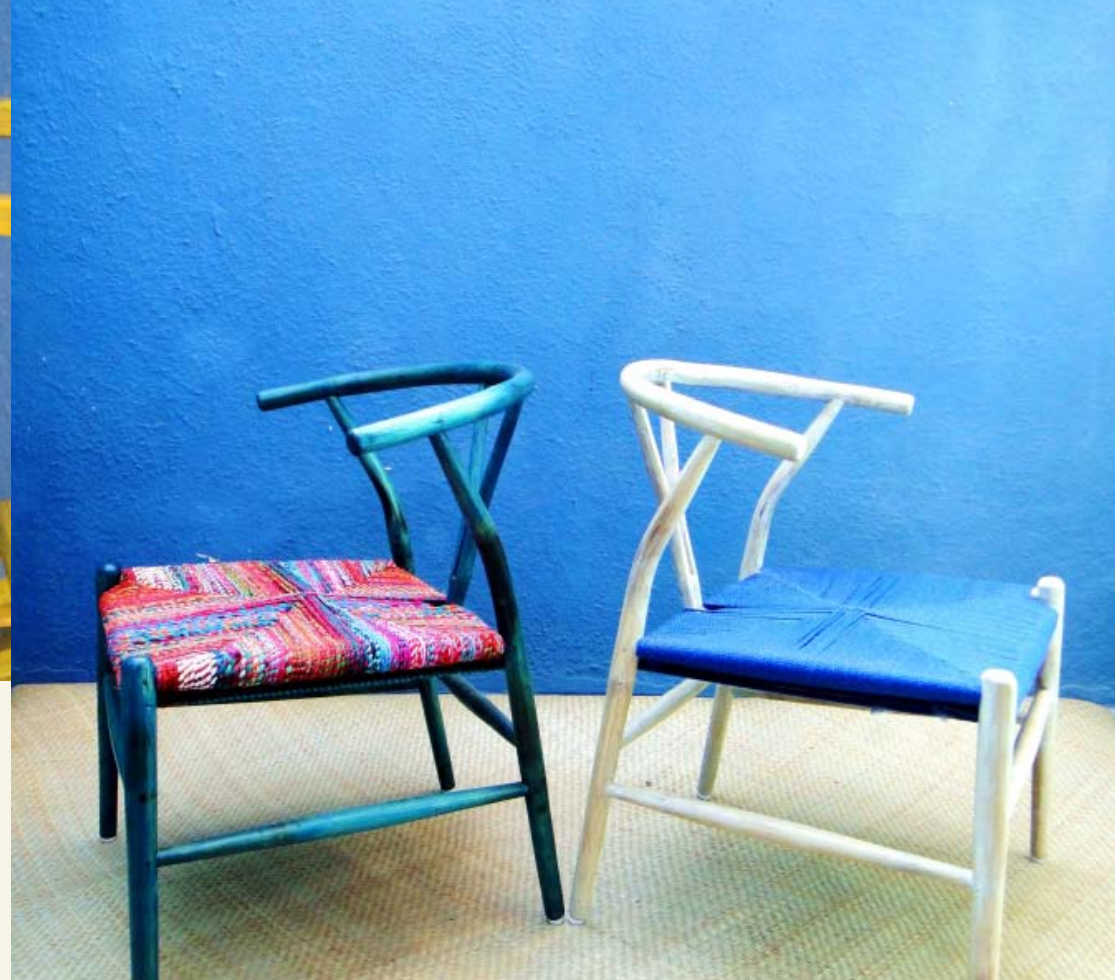
- **MP's traditional bamboo craft will be used as a starting point for design and products development** to facilitate cultural sustainability, and also develop a specific USP for MP's bamboo products. Towards this end, MP's traditional bamboo crafts will be documented holistically as reference-study materials, in the form of a publication that will include critical overviews, including on the craftspeople, crafts,



product ranges, tools and machineries, resources and previous efforts made by the state for bamboo-based development and entrepreneurship. A physical repository of MP's traditional bamboo crafts—including the resources, tools, technology, product ranges and information on artisan groups—will be created, in the form of a museum. These background materials will be used to develop innovative products, which draw on MP's traditional craft, and simultaneously dovetail with existing market requirements.

- **Another starting point for design and development will be the potential utilization and applications of the bamboo species available in MP.**

- **Wherever sufficient bamboo resource exists, or is going to be built up, bamboo-based industrial applications will be explored.** These explorations will be



based on a study on potential industrial applications of MP's bamboo species. In line with this, a bamboo-based particle board manufacturing plant is in the pipeline, as is a tripartite agreement between Artison Investments Ltd, JFMC and the MP government to promote bamboo productivity. Design and development in this area will be accompanied by setting up manufacturing units to produce these industrial bamboo composites in a productive manner.

- **Innovative designs using bamboo will be encouraged through design competitions** for professionals and students. One such example is the national-level architecture and design contest for bamboo-themed construction and bamboo artefacts in India, conducted in collaboration with SPA.

STRATEGY

D

PRODUCTION STREAMLINING

Optimal productivity, production quality and production efficiency will be facilitated through inputs given to producer groups at different levels, from micro-enterprises to industries, by expert consultants and reputed institutions. Some of the activities for the same are listed below:

- **District-level CFCs will be set up** in all the bamboo-prevalent districts of MP to provide bamboo producers with physical infrastructure and machinery for dissemination of bamboo-production technologies and mechanization of bamboo production.
- **Production streamlining and productivity inputs** will be given to producer groups at different levels, from micro-enterprises to industries.
- **Bamboo products will be certified** through ISO certification, including for the sustainable management of the resource, process, system, chain of custody. High-quality treated bamboo will be used for production, which will be available from treatment plants in MP's 12 CFCs.



- **Cleaner production and technology will be facilitated** by cleaning up existing production chains. Towards this, process chains of different bamboo technologies will be studied and changes will be introduced to clean them up, based on inputs from sustainability and technology experts.



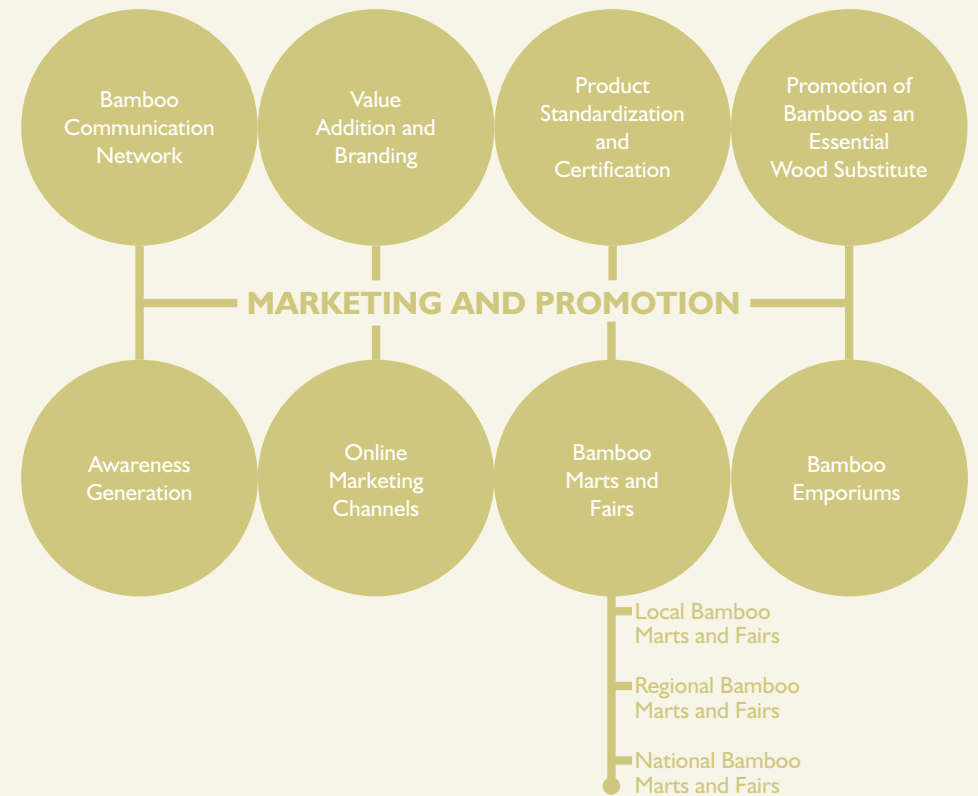
STRATEGY

E

BUILDING MARKETING LINKAGES AND PLATFORMS

Marketing will be aggressively facilitated to provide forward linkages to MP's bamboo production outputs. Some of the activities for the same are outlined below:

- An aggressive marketing policy will be put in place, to create massive and consistent awareness about bamboo as an eco-friendly timber-replacement material. Necessary mechanisms to actualize this, including seminars, workshops, training programmes will be planned and operationalized.
- Artisans will be provided with marketing platforms and skills both at the level of urban centres and districts. Bamboo marts (haats) will be organized in six districts of MP every year to provide artisans and entrepreneurs a platform for showcasing and marketing their products and interacting with experts. A project proposal in this regard has been submitted to the development commissioner of handicrafts. Bamboo haats will also be organized regularly in urban centres such as Bhopal, Indore and New Delhi.
- A branding programme for bamboo products from MP will be put in place. This will include a holistic sustainability labelling scheme and communication through a specific MP bamboo brand, in line with existing sustainability branding schemes such as UNIDO's holistic sustainability label.



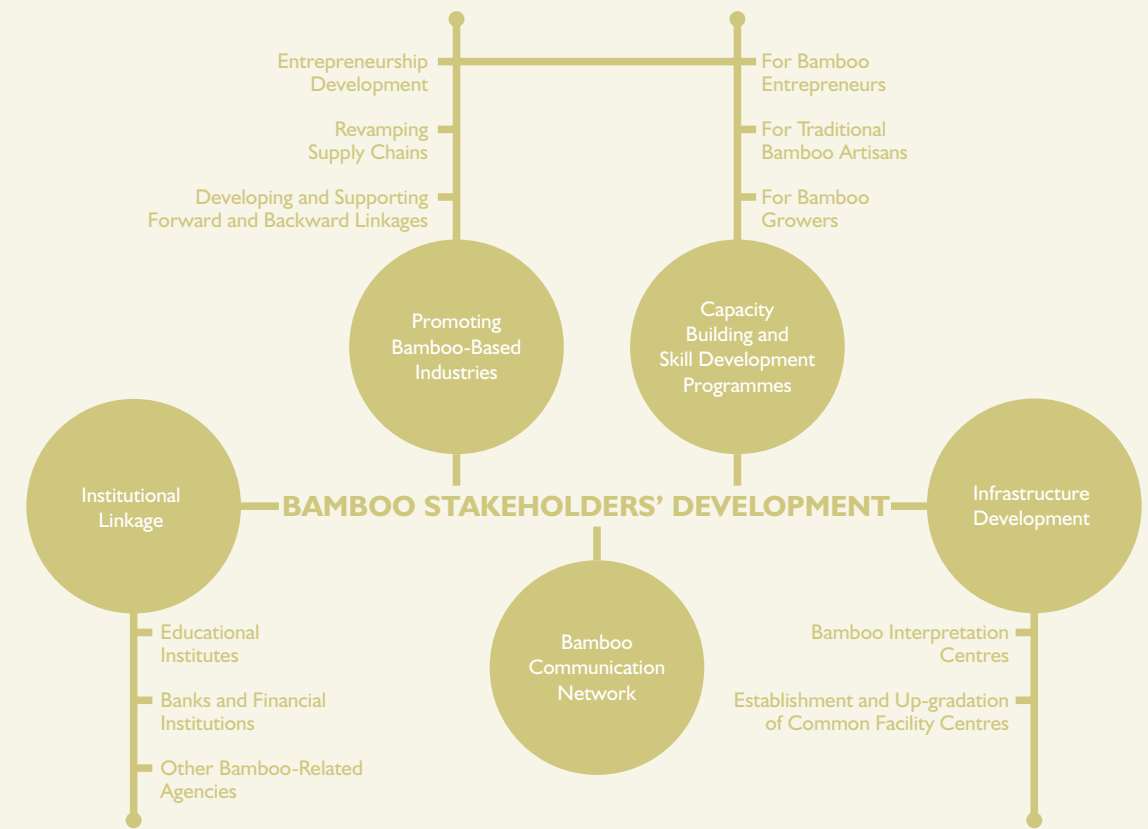
STRATEGY

F

CREATING INFORMATION REPOSITORIES AND DISSEMINATION MECHANISMS

Information repositories will be created and mechanisms to facilitate dissemination of this information will be put in place. Some activities towards the same are outlined below:

- **A state-level district-wise directory of stakeholders**, including registered bamboo artisans and entrepreneurs will be prepared. Registration for this will be done locally, through the forest department, and also online, through websites of MPSBM and the forest department.
- **An extensive, multipurpose, user-friendly bamboo Web portal will be developed as an online platform to facilitate dialogue between different bamboo stakeholders.** The Web portal will cater to the needs of a cross section of stakeholders, including rural artisans. This portal will help in registering artisans and entrepreneurs, inviting innovative ideas, establishing interactive linkages with stakeholders, and efficient marketing linkages.



STRATEGY

G

STRENGTHENING POLICY AND INSTITUTIONAL LINKAGES

Appropriate policies will be put in place to facilitate bamboo-based sustainable and inclusive development in MP. Some activities for the same are outlined below:

- **A state bamboo development policy will be created**, which will include a framework of incentives and subsidies, to encourage the setting up of bamboo industries and enterprises.
- **A state-level steering committee will be established** for bamboo-based development in the state, under the chairmanship of the Chief Secretary.
- **An interdepartmental committee will be established** for negotiations with international organizations for bamboo project proposals.
- **Stronger linkages will be established with state-level departments**, including Panchayat & Rural, Commerce & Industries, Cottage & Village Industries, Tribal, etc., for effective convergence of technical and financial contributions.

- **Collaborations will be facilitated with national organizations** and institutes such as The Energy Resource Institute (TERI), IPIRTI, Institute of Wood Science and Technology (IWST), TFRRI, NID, SPA, IIT (Delhi), Regional Research Lab (RRL) and DEL.

- **MPSBM will be promoted as the nodal agency for all bamboo-related schemes, projects, and matters in the state.**

- **An institutionalized mechanism will be put in place through proper government order/s to maximize the use of bamboo in government infrastructure**, such as furniture for schools, buildings for schools, Indira Awaas Yojna, etc.

- **Hassle-free production and transportation of bamboo and its products will be facilitated** by streamlining obstacles such as transit passes, mandi tax, etc.

- **A technical support group (TSG) should be constituted** under the chairmanship of PCCF (HOFF), MP. This TSG should include heads of national-level institutes relevant to bamboo. TSG is to provide technical inputs, and endorse MPBSM's projects and activities.

H

PILOT PROJECTS

Large-scale pilot projects will be put in place to showcase the potential of bamboo-based sustainable and inclusive development in MP. Some activities for the same are outlined below:

- **Bamboo will be showcased as an integrated lifestyle solution through a state-of-the-art bamboo township**, proposed to be developed near the state capital over an area of around 2,000 acres, based on availability. The township will include different zones for housing, markets, galleries, restaurants, furniture marts and entertainment zones, which use bamboo as the primary material.
- **Awareness on the potentials of bamboo, including technology and products, will be facilitated by developing a state-level institute—the Centre of Excellence for Bamboo—in Bhopal**, which will have advanced training centres for all stakeholders, a common facility centre for the artisans, a bamboo research centre, a demonstration plot (with all possible varieties of bamboo species), an exhibition for bamboo products, a high-end commercial bamboo depot (with treatment plants) and a high-tech bamboo nursery. A bamboo research institute will also be set up on the same premises, to meet research and development

requirements of bamboo, both for regeneration, and industrial processing and value addition. The institute will facilitate effective lab to land transfer.



STRATEGY

Formal and organic collaborations will be developed between MPSBM and relevant institutions and individuals towards developing the bamboo sector in MP. This would include technical bodies, funding agencies, NGOs, expert consultants and resource persons, and government and intergovernmental institutions. Some of the collaborations already put in place are listed below:

TERI

Bamboo-based gasification plants will be installed at Madhya Pradesh Forest Department's CFCs under ongoing schemes of the Energy Research Institute, New Delhi. Three CFCs (Balaghat, Sidhi, and Harda) have been identified to begin with. The work has been initiated, and the TERI team has visited the centres, and started working on it.

IPIRTI

Indian Plywood Industries Research & Training Institute, Bangalore—under the Central Government's Ministry of Environment and Forests—has agreed to collaborate with MPSBM to strengthen the CFCs for bamboo composite woods. IPIRTI has submitted a

proposal, which MPSBM has forwarded to the National Bamboo Mission, New Delhi, for funding.

TFRI

MPSBM is collaborating with the Tropical Forest Research Institute, Jabalpur, to develop a bamboo-management manual, scientifically manage bamboo clumps on private farmland, and assess the sustainable functioning of CFCs. TFRI has already started working; its proposal has been approved by the MPSBM EC. To begin with, three Divisions—Jabalpur, Mandla (West) and Mandla (East)—have been selected.

NID

The National Institute of Design has started working on building capacity of

bamboo artisans in MP through value addition to existing designs and new designs. NID's Bangalore unit has started working for capacity building of artisans for product designing and value addition of bamboo products at three CFCs (Balaghat, Sidhi and Harda). NID has also proposed to collaborate with MPSBM on one of its ongoing international projects on bamboo-based entrepreneurship.

IWST

Institute of Wood Sciences and Technology, Bangalore, has principally agreed to establish an IWST unit to work on the areas of their specialization in bamboo, especially the treatment methods of bamboo and

quality control unit. The Institute has developed a state-of-the-art quality-control unit for bamboo (physical, physiological and mechanical). MPSBM has initiated to replicate such a unit for central India in collaboration with IWST.

SPA

School of Planning and Architecture, Bhopal, is starting a centre for traditional applied technology, which will have a bamboo centre. SPA has proposed to collaborate with MPSBM on this. In this connection, a meeting has already been held with Principal Chief Conservator of Forest and the SPA's director. A memorandum of understanding (MoU) has been developed for

the modality for long-term collaboration. SPA, which is already associated with all of MPSBM's architecture- and design-related initiatives, has also organized a national competition for the MPSBM logo, as well as a bamboo design competition at the Indore Bamboo Mart.

IIT

The Civil Engineering (CE) wing of IIT, Delhi, has a bamboo centre, which is working on using bamboo as a low-cost reinforcing material. This unit has been approached to help MPSBM develop a prototype for the Indira Awaas Yojna cottages. The CE unit of IIT, Delhi, has agreed to collaborate and help to establish a bamboo civil engineering workshop at Bhopal. IIT, Delhi, is one of the

expert members of MPSBM's Technical Support Group.

RRL, GoI

Regional Research Lab, Bhopal, has been engaged in research on the properties of bamboo, and increasing the strengths of bamboo and bamboo products. RRL has agreed to support MPSBM on research fronts, especially to compare the properties of different species of bamboo in MP and also in other states.

DEI

MPSBM is collaborating with Agra's Dayalbagh Educational Institute and the Centre For Green Building Material and Technology CGBMT to institutionalize the process of skill development of bamboo artisans. DEI's global network

will be used to impart education on bamboo-based entrepreneurship development, especially for the rural youth of the State. An MoU has been signed with DEI and CGBMT in this regard.

FOREST-PLUS

Collaboration has been initiated with Forest-PLUS for the resource mapping and carbon assessment of MP's bamboo forests, capacity building of farmers for bamboo harvesting, chain of custody study for bamboo products, certification of bamboo forests, development of a PPP model for the private sector involved with MPSBM, and coordinating with other organizations relevant to MPSBM.

NETWORKING AND PARTNERSHIPS

KOLUDEEH BAMBOO CENTRE, SIDHI

This effort aimed at reducing destruction of forests by local tribal women, promoting women's empowerment by providing them with sustainable livelihood, utilization and value addition of available forest bamboo, and cementing the trust gap between the forest division and local communities.

The activity began by organizing local tribal women into SHGs and training them to make bamboo-based *agarbattis* in conjunction with local NGOs such as the SAFE Foundation, Shiva Graminikas Sansthan (Satna) and Sun Rise Welfare Society (Satna). Initially, the women were trained in manufacturing bamboo *agarbatti kaadis* (bamboo sticks on which *agarbattis* are formed) manually, using simple tools. Next, the groups received training in manufacturing *agarbattis*. Now, these women have graduated to using automated machinery. Thirty of the trained women were made into master trainers. These master trainers replicated this model in nearby villages.

The Koludeeh Bamboo Centre at Sidhi has produced and sold *agarbatti* sticks and finished packaged *agarbattis*, to the tune of ₹66 lakh between March 2011 and November 2013. The centre provides part-time livelihoods to around 2,800 local women from 248 SHGs, each of whom earns around ₹3,000 per month.

GANDHIGRAM BAMBOO CENTRE, SIDHI

The success of the Koludeeh initiative prompted the forest division to replicate the activity at the Gandhigram CFC of Sidhi.

The activity began with women and girls from 40 Baiga families in the village of Gandhigram, who were trained to operate simple equipment to manufacture *agarbatti kaadis*. This allowed them to earn ₹75–125 per day, almost double the amount they previously earned, by selling firewood. Gradually, more women from villages surrounding Gandhigram were involved, while the core group became trainers.

The Gandhigram Bamboo Centre at Sidhi has produced and sold *agarbatti kaadis* and finished, packaged *agarbattis*, to the tune of ₹13 lakh between April 2012 and November 2013. The centre provides part-time livelihoods to around 2,300 local women from 185 SHGs, each of whom earns around ₹3,000 per month. The activity was recently institutionalized as a company called Holy Agarbatti Manufacturing and Marketing services (HAMM).



GARRA BAMBOO CFC, BALAGHAT

The Garra Bamboo CFC in Balaghat produces and sells bamboo products, primarily furniture. The centre has produced and sold products worth ₹17.20 lakh between 2010 and 2013, of which the cost of production was around ₹12.5 lakh and the cost of bamboo was approximately ₹9.22 lakh. The centre provides employment to around 70 local youth from five SHGs. Each youth earns an average monthly income of ₹5,000. The CFC produces only to order.

RANGA PLANTATION, JABALPUR

The Ranga Plantation successfully demonstrates how *Bambusa nutans*—locally known as 'mala bans'—can be planted successfully. The plantation began on 50 acres of land in 1992, with mother stock from the TFR1 nursery, at a cost of ₹5 per rhizome. These were multiplied in the Ranga Plantation's nursery. Today, clumps are planted at a spacing of 3m x 3m, and the total productivity of the plantation is 25,776 clumps. On average, up to 6 lakh culms are harvested from the Ranga Plantation every year. The 1,000-acre plantation earns around ₹25–30 lakh per annum from bamboo and has earned Mr Narsingh Ranga the title of 'Bamboo Man of Jabalpur'.

PROMISING ONGOING EFFORTS



MPSBM ACTION PLAN

RESOURCE AUGMENTATION

CAPACITY BUILDING

DESIGN AND PRODUCT
DEVELOPMENT

PRODUCTION
STREAMLINING

MARKETING

INFORMATION
REPOSITORIES AND
DISSEMINATION

STRENGTHENING POLICY
AND INSTITUTIONAL
LINKAGES

PILOT PROJECTS



MPSBM ACTION PLAN RESOURCE AUGMENTATION

STRATEGY	ACTIVITY	ACTION POINT	AGENCY	TARGET (FINANCIAL YEAR)	
				5 YEARS	ANNUAL
BAMBOO SPECIES AND AGE-WISE RESOURCE ASSESSMENT	Inventory of bamboo stock in forest areas	Species-wise GIS mapping of bamboo	FSI and forest department	Annual updates	Complete inventory
	Inventory of bamboo stock in non-forest areas	Participatory inventory of private bamboo stock with community/ individual owner	Forestry institutions (IIFM, TFRI, FRI, SFRI), IIT and NGOs	Annual updates	Complete inventory
	Assessment of utility of available bamboo	Utility of available bamboo to be determined based on species and age-wise resource assessment	Expert consultant individual/ institution on bamboo utilization	Annual updates	Complete inventory
	Bio-regional analysis of available species	Bio-regional study on different agro-climatic zones of MP vis-à-vis bamboo resource including carbon content and soil content	Forestry institutions, IIT/ NGOs/TERI	Annual updates	Complete inventory
PRESERVATION OF INDIGENOUS BAMBOO SPECIES AND ECOTYPES (IN SITU)	Intensive rehabilitation of degraded bamboo forests	Rehabilitation of degraded bamboo forests	Forest department	2,50,000 ha.	50,000 ha.
STRENGTHENING EXISTING BAMBOO RESOURCE AND INFRASTRUCTURE	Strengthening existing bamboo nurseries	Existing nurseries will be strengthened through infrastructure, new inputs and innovations	Forest department	75 nurseries	15 nurseries
INTRODUCTION OF NEW BAMBOO SPECIES AND ECOTYPES	Introduction of bamboo varieties with commercially superior and desirable attributes for large-scale cultivation to augment existing varieties of bamboo in the state	Study of commercially desirable bamboo species to be introduced to MP	Forestry institutions/expert consultants	Annual updates if needed	Complete study
		Establishing nurseries of new bamboo species	Forest department, JFMC, panchayat, individuals and NGOs	1 nursery in each division	6 nurseries
MANAGEMENT OF BAMBOO FORESTS AND PLANTATIONS	Defining correct management practices for MP's bamboo forests	Research and documentation on scientific management practices in the bamboo sector with focus on MP's situation and species	Expert consultant on bamboo management practices	Updated if necessary	Complete study
	Transferring correct management practices to the field	Developing a bilingual manual on best bamboo management practices for MP	MPSBM, forestry institutions and expert consultants	Updated if necessary	Complete study
		Capacity building of resource people from forest department, groups such as cooperatives, SHGs, CBOs and individuals, including artisans and farmers, on proper management techniques	Forest department with the help of expert forestry institutions	310 training programmes	62 (one training programme in each division) for approximately 50 persons
	Monitoring and evaluating the management of bamboo forests and plantations	Sample study on assessment of the impact of harvesting practices on the regeneration of bamboo forests in MP	TFRI	Updated if necessary	One completed sample study
		Monitoring and evaluating the management of bamboo forests and plantations through remote sensing	TFRI/Forest department IT wing	5 times	Once annually



**MPSBM
ACTION
PLAN
RESOURCE
AUGMENTATION**

STRATEGY	ACTIVITY	ACTION POINT	AGENCY	TARGET (FINANCIAL YEAR)	
				5 YEARS	ANNUAL
PRESERVATION AND BUILDING UP STOCK OF BAMBOO GERMPASM	Establishing a bamboosetum for different agro-climatic zones for ex situ preservation of bamboo germplasm	Sourcing of different bamboo species for the bamboosetum and establishing the infrastructure and nursery for the same	Forestry institutions	1 completed bamboosetum	Started in Year One (2014–15), completed in Year Three
INCREASING BAMBOO RESOURCE BASE IN FOREST AREA	Creation of planting stock	Setting up a hi-tech tissue culture lab	Expert organizations such as Growmore Biotech Ltd, Hosur, Tamil Nadu, and Ramakrishna Mission, Kolkata	2	1
	Hardening of planting stock	Establishment of high-tech nurseries in selected districts where CFCs are located	Forest department in consultation with expert organization	28	7 (1 in each bamboo division)
	Bamboo plantation	Plantation of bamboo in forest area	Forest department	1,25,000 ha.	25,000 ha.
PROMOTION OF BAMBOO CULTIVATION BY INDIVIDUALS AND COMMUNITIES ON PRIVATE AND COMMUNITY LANDS	Exploring the potential of bamboo of private lands	Assessment of bamboo on private lands of MP	Forestry institutions	Cover all districts in 5 years	Begin assessment in all districts in Year One (2014–15)
	Nurseries	Effective PPPs to raise nurseries on private land	Forest department, plantation/bamboo-based/private industries, NGOs, CBOs, SHGs, etc.	28 nurseries (1 in each division)	9 nurseries (2014–15)
	Plantations	Effective PPPs to raise high-tech plantations on private land	Forest department, plantation/bamboo based/private industries, NGOs, CBOs, SHGs, etc.	28 plantations (1 in each bamboo prevalent division)	9 plantations (2015–16)
	Incentivizing bamboo plantations and nurseries	Promoting bamboo plantations through awards and inclusion/promotion of bamboo in existing government schemes	Forest department, CSR	5 awards	1 cash award
	Institutionalizing bamboo extensions for non-forest land	Bamboo Extension Outreach Programme (BEOP) for the extensive bamboo clumps on private lands	Forest department, NGOS, SHGs, CBOs	51 districts	Ongoing from Year One in all districts
MANAGEMENT OF BAMBOO FLOWERING	Predicting bamboo flowering	Collating records from around the world on flowering patterns of species prevalent and introduced in MP in order to predict future flowering	Forest department and forestry institutions	Ongoing, updating from Year Three	Begun in 2014–15 and completed in two years
	Minimizing unutilized dead bamboo stock after gregarious flowering	Fullest possible utilization of bamboo after flowering shall be encouraged and promoted	Forest department	As and when required as per working plan	As and when required
	Regeneration of flowered bamboo clumps	Putting in place a programme to aid regeneration of flowered regeneration of flowered bamboos in forests and plantations	Forest department	As and when required as per working plan	As and when required
COMMERCIALIZE BAMBOO AT FARMERS' LEVEL	Establishing a Bamboo Producers' Company with appropriate affiliations with bamboo-based industries, viz. paper, handicrafts and its proper linkages with the local, national and global market	A pilot project for the Bamboo Producers' Company will be established. On successful implementation, it will be repeated in other selected districts.	Professional managers from development institutes	5	1 (2014–15)



**MPSBM
ACTION
PLAN
CAPACITY
BUILDING**

STRATEGY	ACTIVITY	ACTION POINT	AGENCY	TARGET (FINANCIAL YEAR)	
				5 YEARS	ANNUAL
BUILDING A CADRE OF HIGHLY SKILLED BAMBOO ARTISANS AND WORKERS	Skill building of traditional and non-traditional bamboo artisans and workers	Basic training programmes will be carried out, to build capacities of traditional and non-traditional bamboo producers and workers	Technical design institutions (such as NID, SPA, IPIRTI, CGBMT), various NGOs, government departments including forest department, rural development, tribal)	1,25,000 trained artisans/work force in a two-month training session	25,000 trained artisans/work force in a two-month training session
		Advanced training programmes will be carried out to build capacities of traditional and non-traditional bamboo producers and workers	Technical design institutions (such as NID, SPA, IPIRTI, CGBMT), various NGOs, government line departments including forest department, rural development, tribal)	25,000 trained artisans/work force in a six-month training session	5,000 trained artisans/work force in a six-month training session
BUILDING A CADRE OF POTENTIAL BAMBOO ENTREPRENEURS	Entrepreneurship training for potential bamboo entrepreneurs	Linking up potential entrepreneurs with entrepreneurship development schemes	Entrepreneurship development institutes and NGOs having expertise in bamboo sector	550 entrepreneurs trained in a programme covering approximately 15 days	110 (5 entrepreneurs promoted per bamboo district (5x22) in sessions covering approximately 15 days
	Nurturing entrepreneurship through financial support services	Producers and entrepreneurs will be supported in availing finance in the form of soft loans, micro-finance, etc., to enable them to function at full productivity	Forest department to facilitate with NABARD and other micro-finance, development banks and government schemes	550 entrepreneurs linked to financial services	110 producers/entrepreneurs linked to financial services
BUILDING A CADRE OF ARTISANS THAT HAVE BEEN FORMALLY EDUCATED IN BAMBOO TECHNOLOGY	Education in bamboo technology	Provision of modular courses in bamboo technology for traditional bamboo artisans	Educational institutions specializing in bamboo technology education	7,000 trained bamboo professionals	1,400 trained bamboo professionals (50 from each bamboo division)
ENHANCING EXISTING GOVERNMENT CAPACITY IN THE AREA OF BAMBOO	Building capacity of field functionaries of forest and other line departments	Field functionaries will be capacity built by on field training (quarterly training programmes of one week each)	Concerned forest officials from different specializations and experts	2,500 field functionaries trained	500 field functionaries trained
ENHANCING EXISTING SOCIAL SECTOR CAPACITY IN THE AREA OF BAMBOO	Building capacity of NGOs and other social institutions in the bamboo sector	NGOs and other social institutions in the bamboo sector will be capacity built by exposure visits and training programmes to help them perform a better role in facilitating bamboo-based development process	Forest department through expert consultants	305 NGOs capacity built	61 NGOs capacity built (1 in each forest division)
ENHANCING EXISTING TECHNICAL SECTOR CAPACITY IN THE AREA OF BAMBOO	Building capacity of technical institutions in the bamboo sector	Technical institutions positioned to facilitate the bamboo sector will be capacity built by exposure visits	Forest department through expert consultants	25	5



**MPSBM
ACTION
PLAN**
DESIGN AND
PRODUCT
DEVELOPMENT

STRATEGY	ACTIVITY	ACTION POINT	AGENCY	TARGET (FINANCIAL YEAR)	
				5 YEARS	ANNUAL
UTILIZING MP'S TRADITIONAL BAMBOO CRAFT AS AN INPUT INTO DESIGN AND PRODUCT DEVELOPMENT	Study of MP's traditional bamboo craft	MP's traditional bamboo craft will be documented as a reference-study material, in the form of a publication that will include critical overviews, including on the craftspeople, craft, product range, tools and machinery, resources and previous efforts made by the state for bamboo-based development/entrepreneurship.	Expert bamboo design consultants and/or reputed design institutes	NA	1
	Creating a physical repository of MP's traditional bamboo craft through a permanent exhibit/museum	A museum to exhibit MP's traditional bamboo craft, including resource, tools, technology, product range and information on artisan group will be created	Expert design consultants and/or reputed design institutes	NA	1
	Design of innovative products that are based on MP's traditional bamboo craft	Traditional product range will be used as a starting point for innovative bamboo products that dovetail with existing market requirements	Expert bamboo design consultants and/or reputed design institutes	15	3 collections, each comprising minimum 5 products
UTILIZING MP'S BAMBOO SPECIES AS AN INPUT INTO DESIGN AND PRODUCT DEVELOPMENT	Design and development of new products based on existing bamboo species	Innovative bamboo products will be designed based on the potential applications of MP's bamboo species	Expert bamboo design consultants and/or reputed design institutes	15	3 collections, each comprising minimum 5 products
INTRODUCING INDUSTRIAL VALUE-ADDED PRODUCTS	Exploring potential industrial applications of bamboo for species prevalent in MP	Study on potential industrial applications of bamboo species available in MP	Expert bamboo design consultants and/or reputed design institutes	15	3 collections, each comprising minimum 5 products
		Setting up manufacturing units to produce industrial material	Expert bamboo design and technology consultants and/or reputed design and technology institutes	8 (one unit between two circles)	2 (2015–16)
ENCOURAGING INNOVATIVE DESIGNS USING BAMBOO	Design competitions at professional and student level	Conduct national/international level competitions for bamboo design	Reputed design and technology institutes	10 design competitions	2 design competitions



**MPSBM
ACTION
PLAN
PRODUCTION
STREAMLINING**

STRATEGY	ACTIVITY	ACTION POINT	AGENCY	TARGET (FINANCIAL YEAR)	
				5 YEARS	ANNUAL
PROVIDING BAMBOO PRODUCERS WITH PHYSICAL INFRASTRUCTURE FOR MECHANIZED PRODUCTION	Strengthening existing Common Facility Centres (CFCs) and supplementing this so that at the end of five years, each bamboo division has a CFC	Division-level CFCs to provide bamboo producers with physical infrastructure for mechanized production set-up	Forest department	28 CFCs functioning	3 CFCs strengthened, 1 CFC established
MAKING PRODUCTION QUANTITY AND QUALITY EFFICIENT AND PRODUCTIVE	Training on production streamlining and productivity	Production streamlining and productivity inputs will be given to producer groups at different levels, from micro-enterprises to industries	Expert bamboo production consultants and line balancing expert institutions	28 training programmes in CFCs	4 training programmes in CFCs
ENSURING PRODUCTION QUALITY	Certification for bamboo products and PCSs	Undertaking certification for the sustainable management of the resource, process, system, chain of custody, and products	Authorized international certification agency	Certification will take place on ongoing basis	Certification system for entire PCS put in place (2015-16)
	Utilization of high quality, treated bamboo	Setting up of a treatment plant along with recruitment of development managers for maintenance, monitoring and follow up	Forest department	28 treatment plants	8 treatment plants
CLEANER PRODUCTION AND TECHNOLOGY	Cleaning up existing bamboo production chains	Studying process chains of different technologies and introducing changes to clean them up	TERI, Expert bamboo sustainability and technology consultants and/or reputed design institutes	28 CFCs are using clean technologies	7 in 2015



**MPSBM
ACTION
PLAN
MARKETING**

STRATEGY	ACTIVITY	ACTION POINT	AGENCY	TARGET (FINANCIAL YEAR)	
				5 YEARS	ANNUAL
POSITIONING BAMBOO AS A SUSTAINABLE MATERIAL	Marketing campaign to create massive awareness on bamboo as a sustainable material	Aggressive marketing policy to create massive and consistent awareness about bamboo as an eco-friendly timber-replacement material will be put in place through including seminars and workshops	Forest department, and also in conjunction with /through relevant institutions	10	2 seminars and workshops
		Bamboo pavilions will be established in major cities of MP	Forest department with expert consultants	4	1
PROVIDING A MARKETING PLATFORM FOR ARTISANS AND ENTREPRENEURS	Organizing bamboo marts (haats)	Bamboo marts (haats) will be organized	Forest department	30	6 (one in each regional centre)
	Establishing permanent bamboo outlets	Establishing bamboo emporia	Forest department	5	1
CREATING A SUSTAINABLE BRAND FOR BAMBOO PRODUCTS FROM MP	Putting in place a branding and labelling scheme for MP's sustainable bamboo products	A branding programme for bamboo products from MP will be put in place, which will include a holistic sustainability labelling scheme and communication through a specific MP bamboo brand, in line with existing sustainability branding schemes	Expert sustainability branding consultants and/or reputed institutes	1 in first year	1



MPSBM ACTION PLAN INFORMATION REPOSITORIES AND DISSEMINATION

STRATEGY	ACTIVITY	ACTION POINT	AGENCY	TARGET (FINANCIAL YEAR)	
				5 YEARS	ANNUAL
COLLATING INFORMATION ON BAMBOO STAKEHOLDERS	Database of bamboo stakeholders, including artisans and entrepreneurs	Creation of an online, state-level district-wise directory of stakeholders, including registered bamboo artisans and entrepreneurs	MP Online	Updated annually	1 directory updated annually
ONLINE PLATFORM TO FACILITATE DIALOGUE BETWEEN DIFFERENT BAMBOO STAKEHOLDERS	Development of an extensive, multipurpose, user-friendly bamboo Web portal	Development of an extensive, multipurpose, user-friendly bamboo Web portal, which will cater to the needs of all stakeholders, including rural artisans	MP Online	Updated annually	1 directory updated annually
INFORMATION REPOSITORY ON BAMBOO	Creation of a scientific knowledge bank on all information available on bamboo, including species, availability, usage, products, market, etc.	Create a bamboo archive	Forest department	1 archive updated annually	1 archive updated annually



MPSBM ACTION PLAN STRENGTHENING POLICY AND INSTITUTIONAL LINKAGES

STRATEGY	ACTIVITY	ACTION POINT	AGENCY	TARGET (FINANCIAL YEAR)	
				5 YEARS	ANNUAL
FACILITATE BAMBOO-BASED DEVELOPMENT IN MP	Formulation of state bamboo development policy	Formulation of a state bamboo development policy, which will include a framework of incentives and subsidies, to encourage the establishment of bamboo industries and enterprises	Expert consultant	1 manual made in Year One	1
	Constitution of a state-level steering committee	Constitution of a state-level steering committee for bamboo-based development, under the chairmanship of the Chief Secretary	State government	1 committee constituted in Year One	1
	Constitution of an interdepartmental committee	Establishment of an interdepartmental committee for negotiations with international organizations for bamboo project proposals	State government	1 committee constituted in Year One	1
	Collaborations with state-level departments	Collaborations will be pursued with state departments of panchayat and rural development; commerce, industries and employment; cottage and village industries; agriculture; tribal; etc.	State department	Ongoing	Ongoing
	Collaborations with national institutions	Collaborations will be pursued with national institutions relevant to the bamboo sector	Forest department	Ongoing	Ongoing
POLICY TO MAXIMIZE BAMBOO USE IN GOVERNMENT INFRASTRUCTURE	Facilitating government directive for maximizing use of bamboo in government infrastructure	Government directive for maximizing the use of bamboo in Government infrastructure, like furniture for schools, RHs, IHs; buildings for schools, Indira Awaas Yojana, etc.	State government	1 in first year	1
POLICY TO FACILITATE TRANSPORTATION OF BAMBOO AND BAMBOO PRODUCTS	Facilitating government directive for transportation of bamboo products	Government directive for transportation of bamboo and products including ploughing mandi tax on bamboo to MPSBM, ease transit pass process	State government	Ongoing	Ongoing
POLICY TO FACILITATE BAMBOO PRODUCTION ON PRIVATE LANDS	Facilitating government directive for production of bamboo on private lands	Government directive for promoting bamboo production on private lands	State government	Ongoing	Ongoing
POLICY TO FACILITATE BAMBOO LANDSCAPING IN COMMERCIAL AND GOVERNMENT PROJECTS	Facilitating government directive for use of bamboo in landscaping in urban areas	Government directive for use of bamboo in landscaping in commercial and government projects	State government	Ongoing	Ongoing



**MPSBM
ACTION
PLAN
PILOT
PROJECTS**

STRATEGY	ACTIVITY	ACTION POINT	AGENCY	TARGET (FINANCIAL YEAR)	
				5 YEARS	ANNUAL
SHOWCASING BAMBOO AS AN INTEGRATED LIFESTYLE SOLUTION	Establishing a state-of-the-art bamboo township	Establishment of a state-of-the-art bamboo township, which will include different zones for housing, markets, galleries, restaurants, furniture marts and entertainment zones using bamboo as the primary material	Forest department in consultation with expert organizations and consultants	I initiated in 2015	I (2015)
CREATING A PHYSICAL CENTRE TO ACT AS A REPOSITORY AND TO CREATE AWARENESS ON POTENTIALS OF BAMBOO INCLUDING TECHNOLOGY AND PRODUCTS	Establishing a Bamboo Centre of Excellence, which would include a Bamboo Resource Centre in Bhopal	Developing a state-level Centre of Excellence for Bamboo in Bhopal, which will have advanced training centre for all stakeholders, common facility centre for artisans, a bamboo research centre, a demonstration plot (with all possible varieties of bamboo species), an exhibition hub for bamboo products, a high-end commercial bamboo depot (with treatment plants) and a high-tech bamboo nursery.	Forest department in consultation with expert organizations and consultants	I initiated in 2015	I (2015)

