BAMBOO REGULATION IN INDIA:
THE NEED FOR REFORMS

ViewPoint 12

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Viewpoint 12: Bamboo Regulation in India : The Need for Reforms

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INTRODUCTION

Bamboo, widely grown in India, has immense potential to transform the country's rural economy and contribute to the sustainable development efforts of the country. However, because it is governed by a complex web of forestry laws and policies, there are serious restrictions on its cultivation, harvesting and transportation. These laws, coupled with the contradictory policies on ownership of forest resources and tenure security, along with a lack of institutional mechanisms that would facilitate the same, have made it difficult for India's rural citizens to unlock the value of this abundant resource. India lags far behind its neighbours—particularly China—in maximising its use of bamboo.

This memo examines the **current state of laws and policies that affect bamboo in India**, with the **goal of setting out a broad framework for reforms** that would pave the way for sustainable development of the country's bamboo sector. **The first section provides an overview of the opportunities and restrictions** on the sector's growth due to India's current forestry policy, transportation restrictions and land tenure system. **The second section explores policy considerations** which uniquely situate the bamboo industry to be an engine of development for the Indian economy. The **third section surveys bamboo regulation in China and Southeast Asia** with an eye towards highlighting comparative solutions to some of the problems currently faced by the bamboo industry in India. The **final section details the framework of reforms** envisioned in the goal statement.

THE POWER OF BAMBOO

Bamboo is one of the fastest growing and highest yielding renewable natural resource and at the same time is highly versatile–having over 1500 documented uses[1] ranging from fuel wood and light bulb to even aircraft manufacturing, while occupying 12.8% of the total area under forests in India. The reforms proposed here would have tremendous economic impact on India, especially the economically volatile and sensitive North-Eastern states[2] which contain 66% of the growing stock[3]. There is tremendous hope that freeing the bamboo sector from cumbersome regulations would help in poverty eradication and environmental protection, with the greatest effect expected to be in the neglected North-Eastern states. Bamboo's short growth cycles, low water requirement, and ameliorating environmental attributes uniquely qualify it as an appropriate vehicle for both grassroots and industrial development.

EMPLOYMENT POTENTIAL

In India, bamboo currently generates 432 million workdays annually, employing nearly 10 million people. Women constitute a majority in some craft industries, and 50% of a tribal population of 68 million depends on exploitation of non-timber forest produce like bamboo for their livelihood. With 8.96 million hectares of India's forest cover containing bamboo, there is potential to create approximately 129 million jobs or, even by more conservative estimates, at least 50 million.

ENVIRONMENTAL BENEFITS

- **Ameliorating environmental attributes of bamboo** – Bamboo sequesters carbon dioxide (CO2) much faster than other forest and plantation crops. A grove of bamboo releases 35% more oxygen than an equivalent stand of trees and absorbs four times as much carbon.[4]
- **Short growth cycles** – Bamboo is one of the fastest growing plants in the world (Farrelly, 1984)[5]. A pole of bamboo can fully regenerate to its full mass in just six months. Some commercially important species mature in 4-5 years (i.e. the time after which the plant can be harvested) after which multiple harvests are possible every second year for up to 120 years[6]. In comparison, a red oak tree takes about 50 years to reach maturity and white oak takes up to 200 years to reach maturity. This ability of bamboo to grow fast makes it an attractive crop for farmers since it provides quick cash returns to them compared to traditional cash crops and timber-yielding trees.
- **Low water requirement** – Bamboo requires much less water to grow compared to wood, making it a good substitute to wood in mitigating pressure on natural forests. The shallow roots of bamboo, compared to wood, make it less likely to deplete groundwater resources.

INDUSTRIAL USE

India's current demand for bamboo is estimated at 27 million tons per year; only 50% of that demand can be met domestically[7] because of lack of facilities for value addition and transportation. The rest is imported from China and other South-East Asian countries. The world market for bamboo has been estimated at over US$ 10 billion in 2001 and is expected to grow to US$ 20 billion by 2015. Although India has 30% of the world's bamboo resources, it constitutes only 4% of the global market. This has been attributed to a nascent industry, which has seen even domestic demand fall as a result of surge in the imports of bamboo products from South-East Asian countries.

In the early 2000s, in a remarkable change of policy, the Government of India categorised bamboo as an easily manageable export item that provides high yields, having multiple uses with the potential to provide employment for millions. As a result, the Planning Commission accorded a special status to

bamboo and launched the 'National Mission on Bamboo Technology and Trade Development' with a target of capturing 27% of the world bamboo market by the year 2015. To facilitate the same, the Xth Five Year Plan envisaged the expansion of the area under bamboo cultivation by 20 lakh hectares. However, despite all these measures, the bamboo industry has not and will never reach its full potential unless certain regulatory and non-regulatory reforms are undertaken.

CHALLENGES FACED BY THE SECTOR

Regulatory Restrictions

The regulatory aspects of bamboo cultivation and development are currently covered by the legislations, policies and judgments of the apex court:

a. **Indian Forest Act 1927 (IFA)** – Classifies bamboo as a 'tree' contrary to the scientific classification of bamboo as a 'grass'. Bamboo when felled is referred to as 'timber'. Thus, this act is applicable to felled bamboo found in all forests, whether private or government owned. However, plantation grown bamboo is subject to various transport and permit-related restrictions under the IFA, only as long as it is classified as a tree.

b. **Forest Conservation Act 1980 (FCA)** – Deals with restriction on allotment of 'forest-land' for non-forest purposes and de-reservation of reserved forests. It essentially expands the scope of the IFA and enhances Government control over the forest, making it difficult to remove restrictions once they have been put in place.

c. **Forest Rights Act 2006 (FRA)** – Classifies bamboo as a non-timber minor forest produce. It vests the right of ownership and the right to collect, use and dispose of bamboo in the forest-dwelling communities, as a part of their traditional rights. The FRA restricts the development of bamboo industry by attempting to vest the right to trade in bamboo in the tribals.

d. **Panchayats (Extension to Rural Areas) Act, 1996 (PESA)** – Grants *Gram Panchayats* (local **self-government bodies) the ownership of Minor Forest** Produce (M*FP)* and defines their role in MFP management and conservation in PESA States. However, this is yet to be implemented.

e. **The Minister for Environment & Forests Mr. Jairam Ramesh** (in his letter dated 21 March 2011) to the Chief Ministers of all States, had urged the States to treat bamboo as an MFP. The MoEF in a circular dated 14 May 2013[8] has further urged State Governments to remove transit pass requirements for bamboo grown on private lands.

f. **Supreme Court Judgment(s)** – The Hon'ble Supreme Court inter alia classified bamboo as a Minor Forest Produce[9] and exempted it from the ban on felling of trees from forests in 1996. This implies that bamboo was not considered to be a tree by the Hon'ble Court, and felled bamboo was not considered to be timber. This again contradicts the Indian Forest

Act which classifies bamboo as a 'tree', and consequentially fell bamboo as 'timber'.

g. **Forest Acts/Regulations at the State level** cover government forests, private forests and private plantations alike – especially applicable when bamboo continues to be defined as a tree in the IFA. Though States are vested with the power to exempt bamboo or any other forest produce from transit regulation under Section 41 (3) of the IFA, this is not exercised.

Barring the first two and the last, the other legislations/efforts have faced stiff implementation challenges and are yet to deliver the intended benefits.

The specific issues that stand in the way of access to bamboo as a source of livelihood are summarised below:

Regulation	Description	Impact on Forest Dwellers	Impact on Commercial Planters
Indian Forest Act, 1927 (IFA)	Defines certain forests as "Restricted" to which only authorities have access; bans felling of trees; defines bamboo as a tree.	Prevents the felling of bamboo or its utilisation for personal livelihoods	Bans felling of bamboo on Government lands; state policies in addition ban bamboo felling in private forests and transportation on private lands without permits/ licenses
Forest Conservation Act, 1980 (FCA)	Restricts the scope for de-reservation of forests	Extends control by authorities of previously reserved forest lands	
Scheduled Tribes and Other Forest Dwellers (Recognition of Forest Rights) Act, 2006 (FRA)	Recognises rights over collection and disposal of MFP by tribals "vested" with rights.	Provides *Gram Sabhas* the ownership of Transit Passbooks, maps out claims to land, forests, forest produce, etc.	NA
Panchayats (Extension to Rural Areas) Act, 1996 (PESA)	Grants Gram Panchayats ownership of MFP's and defines their role in MFP Management and conservation, in PESA States	Grants local self-government bodies powers over MFP Management	NA

Lack of Single Owner

The opportunity to leverage this valuable resource is further constrained by the number of Ministries who oversee regulations relating to it. Different legislations have authorised different Ministries to make rules pertaining to the legislation. The Indian Forest Act is administered by the Ministry of Environment & Forests, the Forest Rights Act is administered by the Ministry of Tribal Affairs and the National Bamboo Mission has been set up under the aegis of the Ministry of Agriculture. (With effect from 2014-15, the National Bamboo Mission will be rolled up under the National Oilseeds and Palm Mission of the Ministry of Agriculture!)

Lack of co-ordination between these owners results in arbitrary legislation, as is evident from the multiple contradictions among the legislations along with haphazard policy implementation. The lack of a single regulatory body to oversee the growth of the bamboo industry has led to a loss in potential and this wasted potential is immediately evident when one compares the situation of bamboo with the achievements of the Tea Board and Rubber Board.

Outdated and Unimplemented Laws

The IFA promulgated in 1927 is more than 85 years old and in need of a comprehensive revision to make it address the needs of today's India and also to make it consistent with legislations passed since then. The Hon'ble Standing Committee on Science & Technology, Environment & Forests has observed the pressing need for amendments to the IFA in its report submitted in November 2012–specifically on the need to amend the colonial spirit of 'monopolising forest resources to harness maximum revenue to the detriment of forest dwellers' which underscores the IFA in its current form and to 'harmonise' it with the FRA.

Simply amending the IFA is not enough because the implementation challenges faced by FRA will continue to impede the access of forest dwelling communities to bamboo and other forest produce. Non-implementation of the FRA in its true spirit has led to various troubles with regard to the infringement of the rights of tribals, whereby they have been incarcerated for simply exercising the rights guaranteed to them by the Forest Rights Act.

Finally, the implementation of FRA will not be sufficient if transit pass requirements continue to burden this sector. Forest dwellers enjoying their right to harvest and transport bamboo is a necessary first step. However, if the upstream producers/manufacturers of bamboo-based products continue to face transit pass requirements, it will dampen the demand for the same. Therefore this has to be removed too, in line with the circular dated May 2013 from the Ministry of Environment & Forests (MoEF) to States.

Non-regulatory Issues

While regulatory problems have stifled the potential of the bamboo industry and the rural economy, non-regulatory problems have also played a huge role in not allowing even the rural populace to be able to fully exploit this resource to its optimum level. Progress is hampered not only by red-tapism and bureaucratic inefficiency, but also through the lack of information, lack of institutional credit and restrictive rules. The impediments include high transport costs associated with agro-forestry and non-uniform rules with regard to inter-state transport. Further, problems of institutional support include lack of incentivisation, lack of economic viability, lack of rationalisation/taxation, lack of awareness etc.

SUCCESS STORIES TO LEARN FROM

China

- **Classification Schemes**: Bamboo is classified in Chinese law as a tree, which, contrary to what happens in India, does not have a negative effect on the bamboo industry. China's forestry policy is highly region-specific, rather than species-specific. This system offers some benefits, and has allowed targeted development of ten designated "bamboo regions". China's "Classification-Based Forest Management" sorts all forests into protected vs. commercial, which offers flexibility and federal-state cooperation.
- **Lifting Price Controls:** Bamboo was among the first commodities to be removed from state marketing control and recently, local futures markets have also been piloted to encourage market-based exchange. Price control lifting, however, has not itself always led to growth in demand; rural producers need help overcoming poor information, inferior product quality and a lack of high value added products.
- **Encouraging Industry:** Policies to actively promote the bamboo industry include land coverage/intensification policies, production target setting, funding research and establishing special regions for industry cultivation.
- **Land Rights:** Strengthening of private land rights is identified as a key driver for growth. Major goals now are aimed at increasing transparency and accountability in local governments, which usually allocate rights.
- **Economic Impact:** In regions such as Anji County, bamboo industry has been a key driver in alleviating poverty, increasing average household incomes by 220% within ten years.
- **Environmental Impact:** China's dominant bamboo species is *moso*, a mono-podal species that is easier to commercially cultivate than the dominant species in India. Policy challenges in cultivating this species are combating intensive monoculture, soil erosion/degradation, and concerns about reduced biodiversity.

(See Annexure 1 for details of the experience in China with the de-regulation of this sector)

Nagaland

Closer home, the Nagaland Government's policy on Bamboo (2004)[10] is worthy of emulation. It specifically focuses on the support systems and policies needed for development of bamboo as a resource in a sustainable manner. It has defined a focused strategy to develop natural bamboo forests and bamboo plantations, done away with Transit Pass requirements, defined a plan to deal with flowering and excess bamboo etc. While this has freed up and supported the development of bamboo within the state, the constraints imposed in the rest of the country on transit pass, among other things, limits the extent of growth of this resource in the state.

Conclusion

Though India celebrated Independence from British-Raj in 1947 and though the big and large of Indian industry got freedom in 1991 from the License-Permit-Quota-Raj that replaced the British-Raj, decades later the small and marginalised in India who rely on bamboo for their livelihood, continue to bear the burden imposed on them by the Transit-Permit-Raj that weighs on this sector.

The bamboo sector holds great potential to contribute to the development of many sections of society including forest dwellers, bamboo planters, small and medium enterprises making bamboo-based products, the construction sector etc. and to significantly boost economic development in the troubled North-East and other under-developed regions of our country.

Economic development continues to be the most significant pre-cursor we have seen for social development, and economic freedom continues to be one of the largest contributors to economic development. In conclusion therefore, we make the following recommendations which will play a substantial role in helping this sector realise its potential:

1. **Recognition of property rights of forest dwellers** and therefore the effective implementation of Forest Rights Act. The experience in China has demonstrated the benefits of private ownership in ensuring the sustainable development of this sector
2. **Removal of transit pass requirements** for bamboo in line with the circular from the MoEF issued in May 2013.
3. **Consolidation of the web of forestry laws** governing bamboo in order to make them simple and consistent. The consolidation of laws needs to go hand in hand with the consolidation of Ministries that manage these laws into one authority that will be empowered to study and reform the regulations as required and to support regulations with the right incentive and institutional structure to develop this sector.

ANNEXURE 1

THE BAMBOO INDUSTRY IN CHINA: AN INSTRUCTIVE STUDY AND KEY TAKEAWAYS[i]

The Chinese bamboo industry is perhaps the only well-studied bamboo industry which has managed to develop industrial capacities in producing value-added products to cater to a vast export market (Khan et al, 2007). The sector provides employment to over 35 million people and generates annual revenues of over US$ 10 billion.[11] While China faces significant comparative advantages in the bamboo sector–it leads the world in bamboo biodiversity with close to 500 species, many of which are mono-podal and consequently higher in yields–it is undeniable that government policies promoting the growth of the industry at the grassroots level have had an enormous role to play in their success story. In China, policies designed towards encouragement of individual forest management rights and towards technical innovations (over 200 patents have been filed for machinery and other technical innovations in the utilisation of bamboo), as well as liberalisation of local markets, have led to the creation of an environment greatly conducive to a free market in bamboo and its products. Export promotion policies and encouragement of value addition have contributed further to the virtuous cycles in question.

The Chinese Government's policies towards Land Tenure arrangements are summarised in the flow diagram given on the next page.

i Chapter from The Bamboo Industry in India: Supply Chain Structure, Challenges and Recommendations, Researching Reality Internship paper by Aniket Baksy, Centre for Civil Society

1950-1955	• Removal of land from private ownership • Establishment of State-owned and collective-owned forests • Integration of tree and land ownership • Households maintained rights to fruits and non-timber trees
1965-1981	• Collectives become the dominant form of ownership • Introduction of communes of up to 4,800 households each • Deforestation, conversion of land for agricultural expansion • Policy reversals first guaranteed households ownership (1976) and then re-instated commune level collectivisation • Collectives remove forest produce for local uses, state removals for industry, timber, construction etc.
1980-2000	• "Three Fixes" Policy introduces three forms of household and shared land-holding within collective forests • Responsibilities return to households • Price systems reinstated through the 1990's
2001 onwards	• 2003: Collective reforms establish households as primary owners of land, grant security of tenure for up to 70 years. Establish 6-7 forms of household and shared land ownership. • 2008: Reforms establish households as the primary landholders, allow leasing and transfer of rights • 2009: Agricultural Tax eliminated

It is clear from the diagram that the policy flows towards the strengthening of individual rights over forested lands, incentivisation of commercial forestry and proper land management practices. In parallel to Land Tenure Reform, the Chinese Government adopted the practice of de-regulation of policies involved in procurement of bamboo and bamboo products[ii], leading to the emergence of a free market in bamboo products. The most dramatic effects of this deregulation were visible in Anji County, where the number of small scale bamboo-based enterprises rose from 19 in 1975 to 527 in 1995, with 61% of these being private enterprises. Liberation of landholdings and the freedom to adopt best practices in intensive cultivation methods, coupled with the emergence of large domestic demand, provided farmers with enormous incentives for appropriate management of bamboo holdings. As a result, Anji County saw its bamboo forests expand in area by 26% between 1975 and 1994, while the number of standing Moso Bamboo Culms rose by nearly 80%, coupled with a 50% rise in the density of bamboo forests due to

ii These steps included the abolition of centralised procurement for Bamboo and the decontrol of Bamboo prices. See Wang, 2006

adoption of intensive cultivation methods. Simultaneously, living standards have improved dramatically across the entire county, showing the potential for bamboo-based promotion of livelihoods (Wang, 2006).

In addition to the above policies the Chinese Government follows a collaborative policy for bamboo cultivation and dissemination of technical knowledge among its populace, where there is a joint effort by technical institutions, governments and communities in developing local capacities for value-addition in the bamboo sector. The Chinese Government extends:

a. Technical assistance, in the form of capital accumulation. The present industrial structure in China is said to be the result of almost 20 years of capital accumulation in the sector. At present, there are nearly 3,000 bamboo processing companies in China.

b. Education in the processing of bamboo and training for farmers, in collaboration with technical institutions and local bamboo promotion boards.

c. Financial assistance, by facilitating credit availability. In the Fujian province, recent land reforms include provision of no interest loans to farmers against the collateral of their forest tenure certificates.

Studies of China's bamboo sector (Smith and Mestre, 2007)[12] suggest the following as the primary reasons behind the immense competitiveness of the Chinese bamboo sector.

1. **Strong Domestic and Export Demand** for locally produced high value bamboo products, as a result of which small scale and micro-industrial units were able to cater to markets which already existed in bamboo products. Further, the easy availability of credit and low individual capital investment requirements allowed the growth of these small firms up to the point where they could initiate production on an industrial scale.

2. **Complexity of Supply Chains for Bamboo Products** allows firms to define vertical boundaries in the value chain more strictly. In China, individual producers supply bamboo to intermediary firms specialising in bamboo processing, as a result of which bamboo product manufacturers can purchase processed bamboo and need not invest in primary processing technologies. This specialisation allows industrial outlets to produce quality products to cater to domestic and export markets with acceptable rates of return on investment.

3. **Development of Technical Capacities** and relentless improvement in levels of technology through innovation and methods of production has led to the creation of low cost capital technologies which can be adopted by local firms in China.

4. **Extreme Levels of Productive Efficiency** are achieved through the effective use of technology. China has developed expertise in utilising nearly every portion of the bamboo plant, to the extent where raw material conversion rates are as high as 95% of the plant. Individual industries are able to purchase only the portions of the plant they require for the purposes of their own industrial production, contributing to remarkably low marginal costs of production. Competition for raw material forces industries to innovate and continuously optimise on their production processes.

5. **The Presence of Economies of Scope and Scale** due to the above factors has lowered production costs further, coupled with the availability of a large pool of semi-skilled low cost labour. These economies have led to a decrease in costs of output as the scale of production has risen to the present industrial level. A major impact of these economies has been to decrease marginal costs of products to levels below those of competing industries in Asian nations, despite the higher cost of raw materials. As a result, Chinese bamboo products have proven extremely difficult to compete against.

The policy recommendations provided in the next section will be geared to developing a similar industrial structure in India, while recognising the limited success that replication of the said model in East-Asian nations has achieved (ibid).

The conclusions from the Chinese experience in the bamboo industry–particularly in Anji County, widely cited as among regions with the most intensive production methods and value chains (Maogong et al, 1998)–are as follows:

1. Land Tenure Reform must be directed towards liberalisation of landholdings from collective ownership and must provide secure, long-term ownership to individual economic units (households). This generates individual incentives towards proper management and yield optimisation through adoption of best practices in farming and agriculture.

2. Education and technical support must be subsequent to existence of a secure land rights system. In the absence of security of tenure, farmers lack interest and initiative in adopting technologically intensive growing of bamboo. Conversely, in the absence of technical knowledge, production and cultivation of bamboo will not move beyond the subsistence production level.

3. There must exist an adequate market mechanism which decides bamboo prices daily based on demand and supply. This mechanism must

incorporate into its fold dissemination of information to farmers, who must be aware of the price of bamboo regularly.

4. A large demand for bamboo products must exist in the local markets. If not, such demand must be created through aggressive promotion and government interventions in the short run. The demand must allow for remunerative pricing to manufacturers in the bamboo sector. This demand is essential to allow small manufacturers to move beyond the informal subsistence level of production towards the production of higher value products further along the value chain, and to provide for capital investment by the same.
5. The emergence of small industrial units specialising in processing of bamboo must be promoted, with the view to distribute activities along the value chain amidst small stakeholders with the aim of specialisation and consequently increased efficiency.
6. The linkages between small processing houses and relatively larger industrial production houses must be strong enough to ensure that firms are able to get their orders delivered on schedule as per their orders. This also requires contract enforcement through stringent rule of law.

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1. Bamboo: Poor Man's Gold – A case for developing the bamboo sector in India; Researching Reality Internship paper (2009) by Malavika Vyavahare from Lady Shri Ram College, New Delhi
2. Research Report on Bamboo Development in India (2012)– from the Harvard Law & International Development Society (LIDS) and facilitated by Orrick, Herrington & Sutcliffe LLP
3. Review of the Regulations Governing the Bamboo Industry in India (2013)– by Ajey Karthik from NALSAR, Hyderabad
4. The Bamboo Industry in India: Supply Chain Structure, Challenges and Recommendations – Researching Reality Internship paper (2013) by Aniket Baksy from St Stephen's College, New Delhi

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