BAMBOO HUB

Strategy for Developing Bamboo

RVSKVV, Gwalior, MP

11 August, 2021 (3-5PM)

"Bestow upon us a hundred Bamboo clumps"

-Rig Veda (5000BC)

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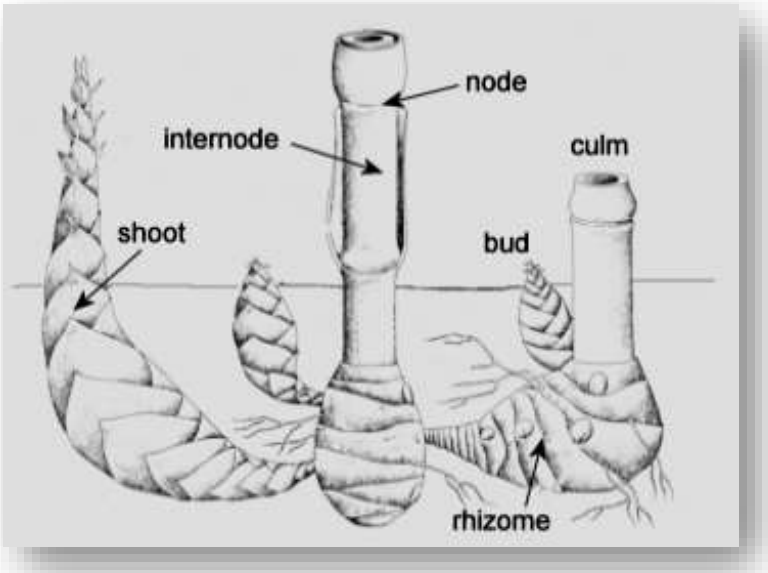
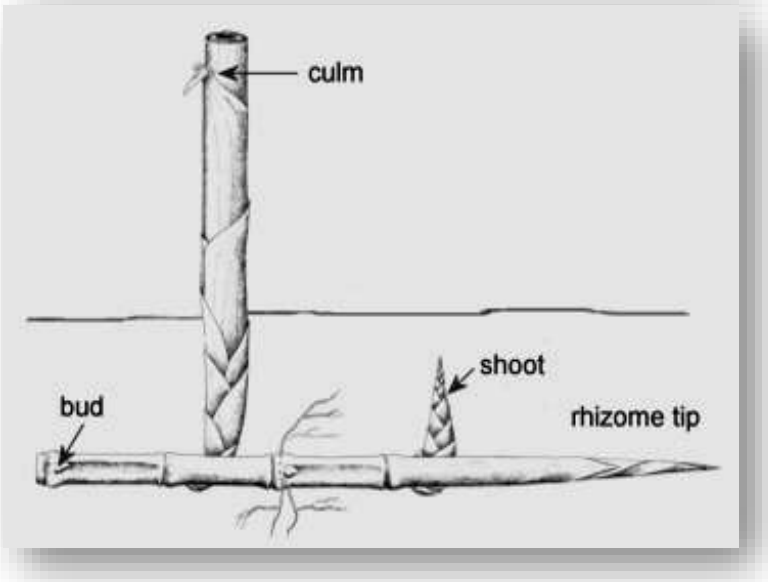
Characteristics

- Tree like, woody grass
- 136 species (36 genera in India)
- Versatile & highly renewable resource
- Short Growth cycle (commercially imp species mature in 4-5yrs)
  - Up to 30 days - shoots as food
  - B/w 6-9 months - for basketry
  - B/w 2-3 yrs -for laminates &boards
  - B/w 3-6 years - for construction
- Source of Energy
- Hardy, Light and flexible sought for nutritional and environmental value





TRIVIAL

Hiroshima , 1945: B provides first re-greening after atom bomb blasts

Limon, Costa Rica: Only B houses from the National B Project survive violent earthquake of 1992

Taiwanese comp launched first ever laptop with outer casing made from B

Edison success -fully used a carbonized B filament in his experiment with the first light bulb

A. Bell's first phonograph needle was made of B

Some species of B grow @ 1.5 m/day

Tensile Strength of Bamboo is greater than that o mild steel

Polo balls made from B rhizome
A bicycle
Artificial teeth

Mahatma Gandhi set out on his famous Dandi march armed with his conviction and B stave!

Bamboo and Sustainable Development Goals

SDG1 End **poverty** in all its forms everywhere.

SDG7 Ensure access to affordable, reliable, sustainable, and modern **energy** for all.

SDG11 Make cities and human **settlements** inclusive, safe and sustainable.

SDG12 Promote sustainable **consumption and production** patterns.

SDG13 Take action to combat **climate change** and its impacts.

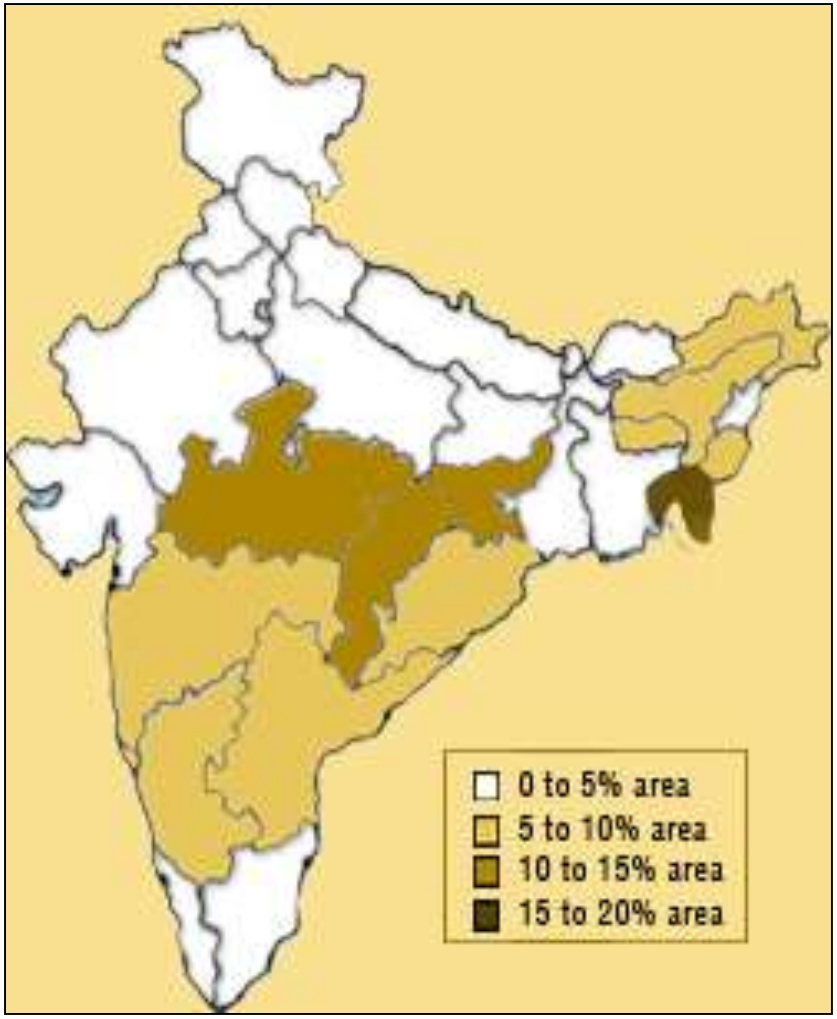
SDG15 Protect, restore, and promote sustainable use of terrestrial **ecosystems**, and halt biodiversity loss.

Supply Side

- Area: 8.96 m ha (12.8% of forest area)
- 28% of area and 66% of growing stock of bamboo in NE region
- 20% of area and 12% of growing stock in MP & Chattisgarh
- Grows in all parts of India except Kashmir valley
- Second Richest country after China in Bamboo resources

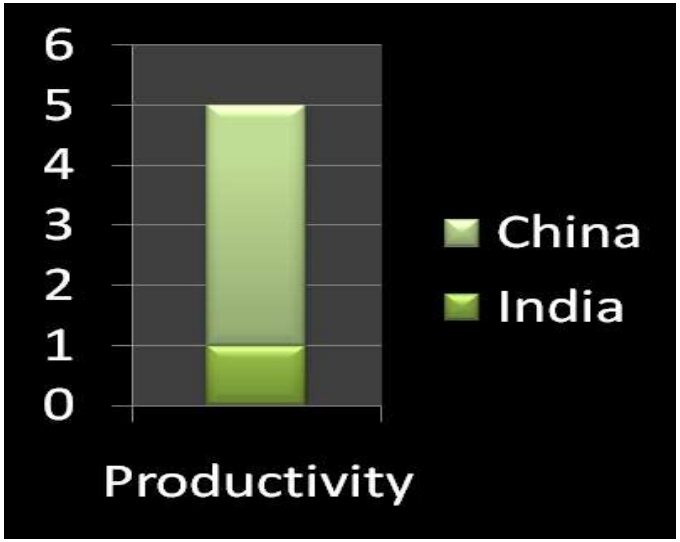
Availability of Bamboo

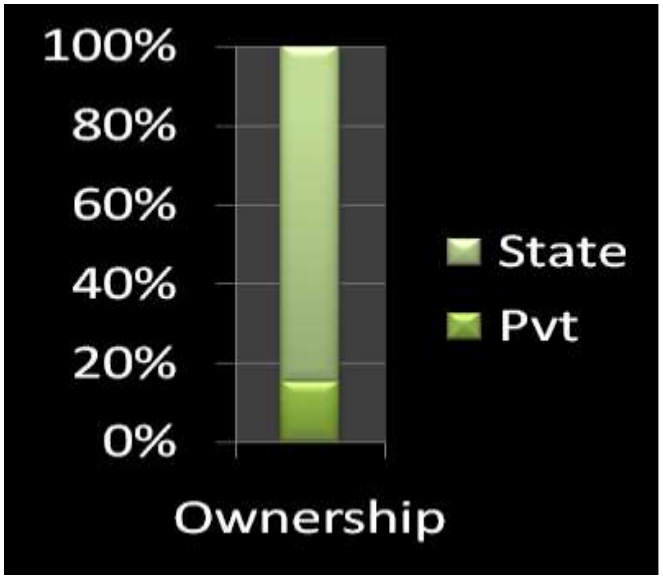
- Growing Stock: 80.43 m MT,
- Annual Harvest: 13.5 m MT (demand: 27 m MT)



Supply Issues

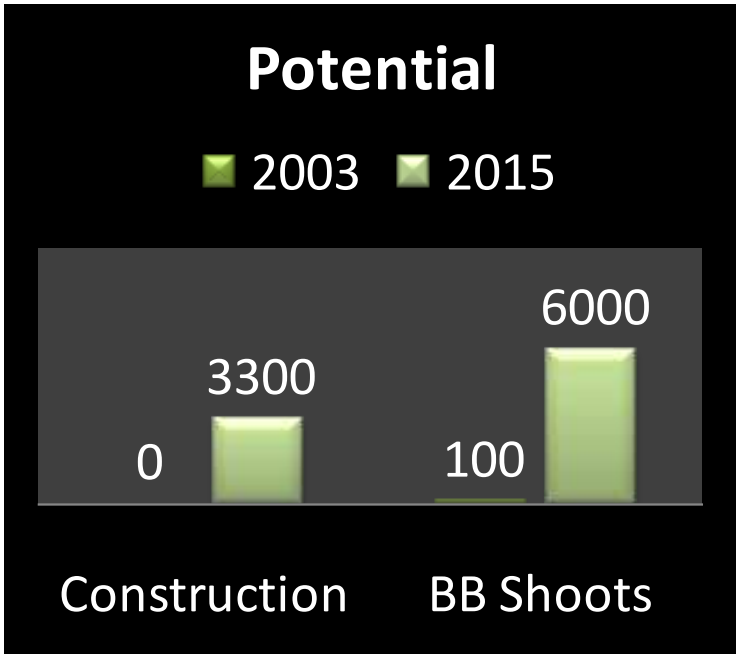
- Poor management and low productivity (forest areas: 1tonne/ha of avg. production
- Large bamboo forests under protected areas with no harvesting
- Ban on felling and restriction on use in many districts
- Lack of intensive management
- Overexploitation, fires, grazing
- Flowering patterns

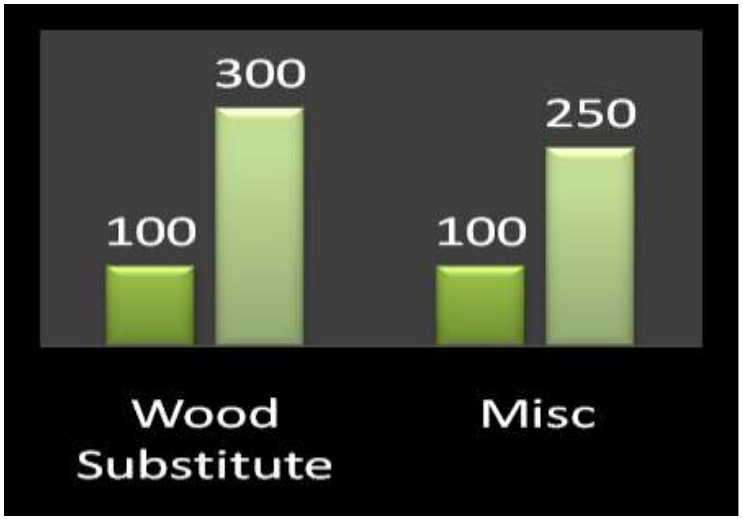




Demand Side

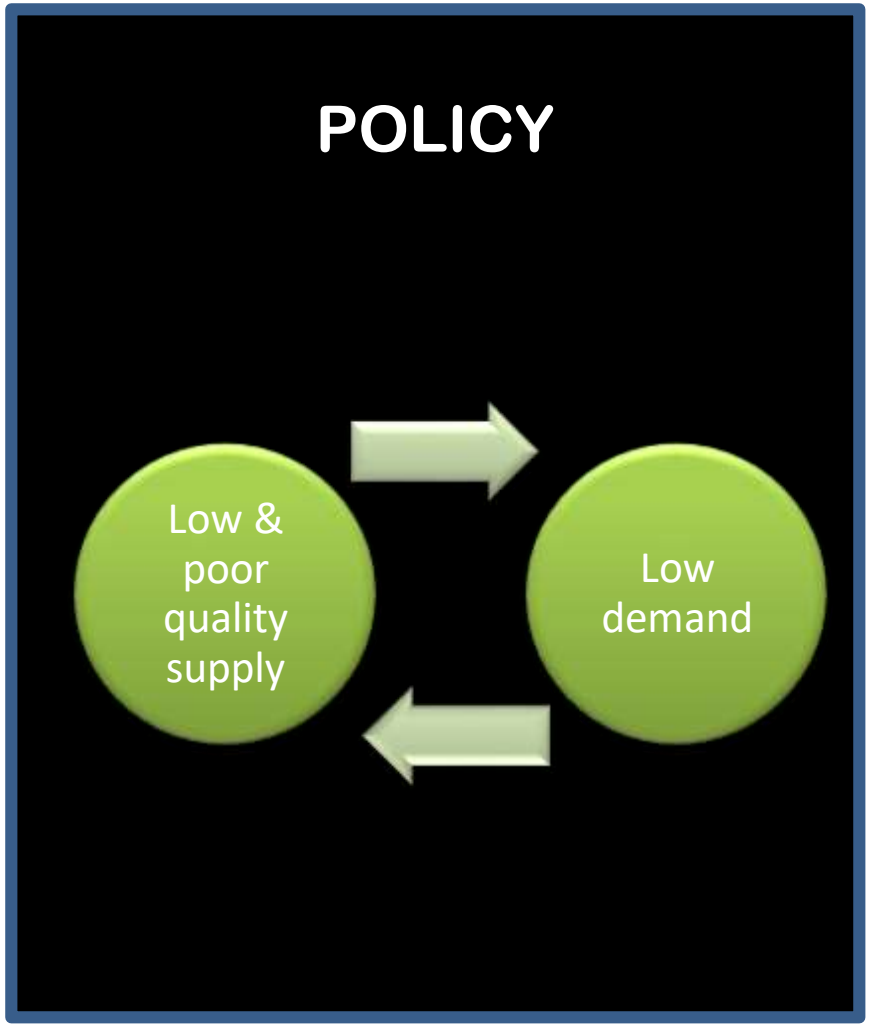
- 1500 documented uses
- Wood Substitutes & Composites/ Industrial Use & Products/ Food products/ Construction & Structural Applications
- India's Share in current for B : Rs. 2043/ 50, 000 cr*
- Bamboo industry can grow to Rs. 16,000 cr by 2012 and Rs. 26,000 cr by 2015
- The industry is expected to earn about USD 5.7 bn in revenues by 2015
- India looking at capturing 27% of this market





Demand & Supply

- Shortfall in supply even for current demand
- Location of industry away from growing areas
- Unscientific and Inefficient use
- Shortage of quality bamboo or sustained supply
- Paper & Pulp ind. Importing wood pulp worth Rs. 3500 cr
- Illegal Smuggling to Bangladesh and others – Rs.255cr
- **Bio -refinery will consume annually 300,000 Tonnes of cellulosic biomasses in NRL**



SWOT OF BAMBOO

STRENGTHS	WEAKNESSES
❖ Available government **policy and strategies**. ❖ **Awareness** among policy makers, producer and consumer. ❖ Appropriate **techniques / equipment** and basic skills available. ❖ Public investment in development and dissemination of new technology. ❖ Large **volumes** and wide species base. ❖ Multiple uses. ❖ Vast formal and informal **market** and increased awareness of climate change and emerging markets. ❖ Substitution for wood-based products and other.	❖ Unsustainable **management** (wild grow-no use, farmers unwilling-no commercial value, many different species). ❖ Lack of **quality** in processing and products. ❖ Lagging or use of inappropriate machinery and equipment. ❖ No or poor **linkages** of supply source with processing centers and limited manufacturing industries to use the large volume ❖ Domination of low value product **manufacture**. ❖ Inadequate access to **finance**. ❖ Low **benefit** for raw material producer. ❖ Limited or no access and sharing of **information**.

SWOT OF BAMBOO

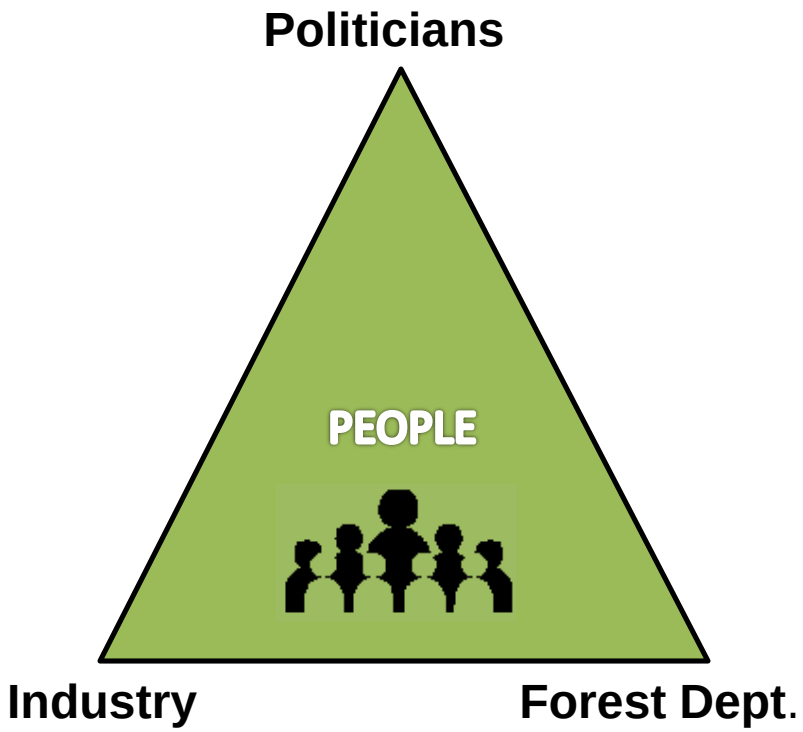
OPPORTUNITIES	TRUST
❖ Potential for high and efficient **production and processing**. ❖ Domestic stand alone SMEs. ❖ Benefits of improved **product quality and certification**. ❖ Vast untapped export and domestic **markets for high value bamboo products** to boost rural economy. ❖ Substitution of wood and non-renewable raw materials. ❖ High potential for **public-private partnerships**. ❖ Emergence of **alternative finance mechanisms**. ❖ Capturing value of environmental protection and rehabilitation. ❖ Cooperation potential related to **key drivers of global change and SDGs**, particularly climate change. ❖ Competitive advantage in rehabilitation of degraded land.	❖ No guarantee for **supply** / production. ❖ Lack of **motivation**. ❖ **Quality** requirement often not met. ❖ **Reliability** of business partner. ❖ **Price of product** too high. ❖ No organized demand. ❖ **Communication** problem/gap. ❖ **Political will**.

Policy Features

Objective	Formulation	Execution
• Laws promulgated to extend state control • extraction of forest produce esp. timber • 1988 FP marked change	• Definitional anomalies- of Bamboo & Forests • Lack of harmonization of laws	• Extensive regulation • Tedious procedures • Red Tapism • Inefficiency • Rent seeking behavior

Central Laws	Court Judgments
Indian Forest Act (1927) – Amended 2017 Definition of tree includes Bamboo by Forest Department…… till now Forest Produce : (a) Timber regardless of where it originates (b) Plants not being trees which originate from forest Act 2006 classifies BB as NTFP (minor) Now trend : **National Transit Pass System https://ntps.nic.in/Index.aspx**	High Court: Bamboo is not grass thus felled Bamboo is timber in MP, …… …… …

Implications



Why MoEF could oppose lifting of restrictions:

1. Could encourage illegal felling & extraction from govt. forests
2. Loss of royalty

National Transit Pass System : Bamboo

The system provides seamless issuance of transit pass. This system helps in monitoring and keeping records of transit permits for inter-state and intra-state transportation of timber and **bamboo from private lands/Government/private depot and other minor forest produce.**

Key features of National Transit Pass System

- It is a role based and work flow based application available as desktop based web portal as well as mobile application.
- Online registration and submission of the applications for Transit Permit (TP) or No Objection Certificate (NOC) through web-portal and mobile app
- Online application for Species grown on private land which are exempted from transit pass regime and Online application submission for Species grown on private land which are not exempted from transit pass regime.
- Online generation of Transit Permit or NOC on the basis of category of species.
- E-payment system: Payment can be made online through mobile app/web portal before downloading T.P.

Advisory Issued by GoI (Before Indian Forest (Amendment) Ordinance, 2017 [**In the Indian Forest Act, 1927, in section 2, in clause (7), the word "bamboos" shall be omitted]** issued on 23rd November, 2017.

- Expert Committee Report-Strategy for increasing green cover outside forests[PDF](7.15 MB)
- Advisory dated 23.01.2018 to consider adopt Pan India Transit Permit for commonly grown agroforestry tree species
- Advisory dated 22.12.2017 removing regulatory barriers in production, felling, transit, processing & marketing of bamboo
- Advisory dated 9.10.2017 on Pan India Transit Permit for Bamboo
- Advisory dated 06.10.2017 to consider exempting ten commonly grown agroforestry spp
- Advisory dated 17.7.2017 on Pan India Transit for bamboo
- Advisory dated 5.6.2017on PAN India Transit Permit for bamboo
- Advisory dated 19.5.2017 to consider exempting bamboo units from licensing
- Advisory dated 18.05.2017 to consider exempting bamboo grown on non forest from transit and felling regime
- Advisory dated 17.03.2016 regarding relaxing regulatory regime on Jiggit
- Advisory dated 14.05.2013 to consider exempting bamboo grown on non forest land from transit and felling regime
- Guidelines for Felling and Transit Regulations for Tree Species Grown on Non-Forest/Private lands

EASE OF DOING BUSINESS ? ? ? ? ?

Particulars	Farmers / Traders				Industries purchase from anywhere		
	Royalty - Forest	GST	TP	FTL	GST	Royalty - Forest	Total
Bamboo culm /pole sale (Private Land)	0%	5%	Yes	Yes	5%	0%	5%
Bamboo culm /pole sale (Private Land, but not properly land documents)	8%	5%	Yes	Yes	8%	5%	**13%**
Bamboo culm /pole sale (Forest Land)	8%	5%	Yes	Yes	5%	8%	**13%**

NB : Different States as per State Government – Forest Royalty for Bamboo and same States Exempted.

GST - HSN: 1401

One Nation – One Market

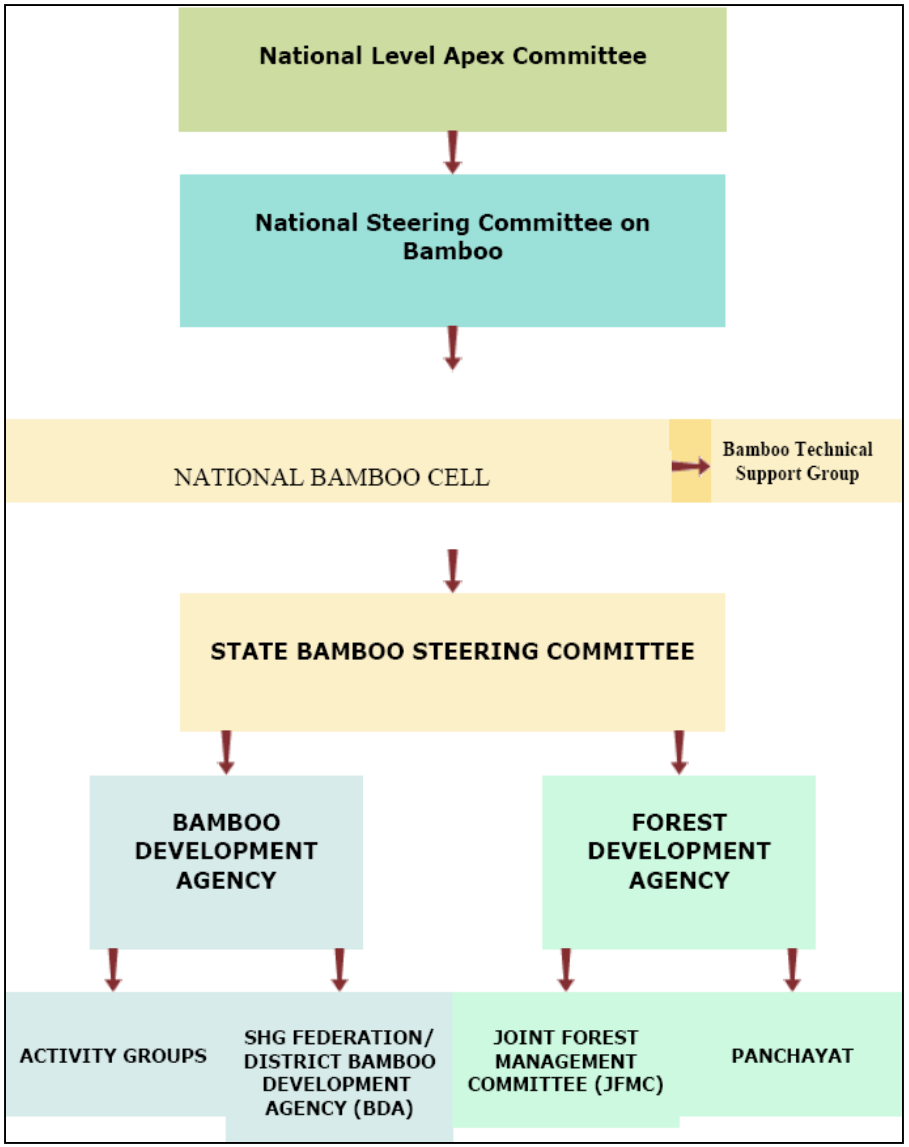
Vocal for Global / Doubling Income Farmers'

Cause	Existing	Proposed
Policies or regulation related challenges faced by bamboo farmers or traders in transporting or selling Bamboo in India?	**Rule 12 of the Principal Rules: 12A. Transport of Bamboos – G.P./T.P** **Now National Transit Permit System.**	Free movement or remove restrictions on **National Transit Permit System.** Benefit for farmer and increased supply raw material available to Industries.
Formation of Bamboo Farmers' Producer Organization (BFPO) in Block level covering 500-1,000 farmers?	**Bamboo** FPO / FPC / SHG no available in India.	NABARD or NBM or create of **National Bamboo Board** for more increasing plantation sector on Bamboo – **National Agency**
Skill Training (Short / ITI) – NSQF under Ministry of Skill Development & Entrepreneurship, Govt. of India?	Bamboo Work Trade under Ministry of Skill Development & Entrepreneurship, Govt. of India.	More come out for **New Age or Industry 4.0 : Bamboo business**

One Nation – One Market or eNam market portal as standards quality raw material. Price rate devise by Bamboo farmer / FPO / SHG / JFMC. Create of **National Bamboo Board** and notify of price list on Bamboos. (like **Rubber Board / Tea Board / Spice Board/** Others Board)

Forwarded NBM's

- Earlier BB was considered a minor forest product compared to wood and therefore did not receive the kind of support from government as other forest res
- Mission Approach adopted- National Bamboo Mission
- Micro Missions under different Ministries. Important among them-
- M.M on Technology Development/ Policy/ Marketing/ Trade& Development
- Requires a mammoth coordination effort
- Overlapping Jurisdictions
- 25 different institutions including 5 ministries have been roped in
- Underlying Forest management system also needs to change



Livelihood

Current Status

- Bamboo Sector generates 432 Mn workdays annually
- Bamboo based handicrafts employs 10 million people
- Women constitute a majority of the map weaving and Bamboo crafts work
- Bamboo mat production in India generates 3 mn workdays annually
- Out of 68 million tribal population, 50% depend on NTFPs for their livelihood requirement
- Traditional uses- support agriculture, horticulture, animal husbandry, sericulture and in small industries

Targets and Issues

- Unavailability of raw materials for artisans & NTFP for forest dependent communities
- Cross Subsidization of poor
- Traditional communities moving away from B Crafts
- Can generate employment or unskilled, semi skilled and skilled workers
- Target was 8.6 mn jobs (new) and uplifting 5.01 mn BPL families
- New Bamboo Plantations (forest and non forest areas)
- In the long run establishment of new industries can generate employment to 50 mn people

Environment

Uses

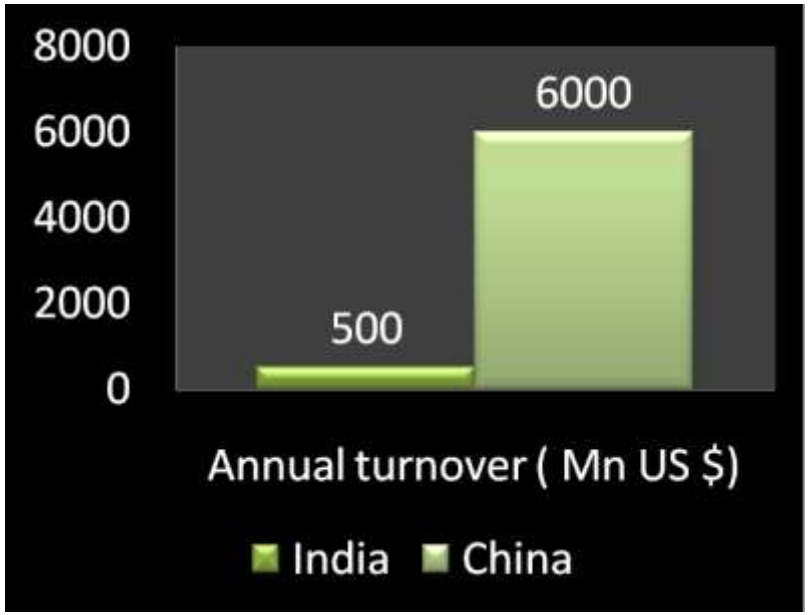
- Reduces Carbon Dioxide levels in the atmosphere*
- Lowers light intensity, protects against UV rays- acts as atmospheric and soil purifier
- Versatile high yield renewable natural resource
- Substitute for wood- grows faster, less water req.
- Prevents soil erosion
- Food source, has anti tioxidant medicinal value
- Source of energy- foremost in Biomass prodn. (burnt directly) or gasification of Bamboo

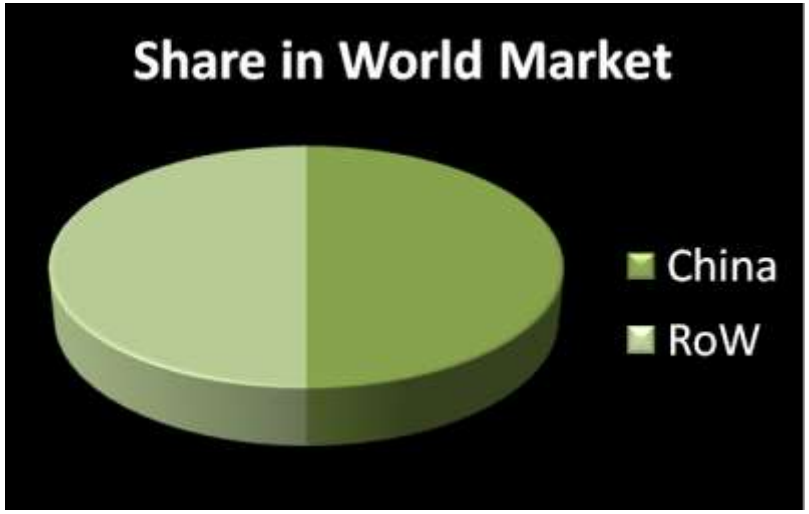
Benefits

- Offset climate change factors*
- Rehabilitation of degraded land, controlling landslides, floods, protection of sea banks, riverbanks, damsites etc.
- Can be used for Watershed development
- As a substitute for wood- will mitigate pressure on natural forests
- New innovative bamboo products can replace products made from non biodegradable material
- Ensure nutritional security for rural people
- Clean renewable source of energy

CASE STUDY: China

- Recognized as Kingdom of Bamboo
- 5 mn ha of Bamboo resources
- Total Bamboo production value over US $ 6 billion (export value- US $ 600 mn)*
- First mover Advantage
- Result of 4 decades of efforts
- Post 1985 old system of state procurement abolished
- Mkt for Bamboo opened completely prices determined by SS & DD
- Export & pvt enterprise culture
- Facilitate formation of Dragon head enterprises
- Bamboo industry zones





Development Sequence

Later 1970s- Early 1980s

- Rural System Reform
- Collective Responsibility-> Household Responsibility Scheme
- Bamboo product marketing system: State Monopoly -> Free Market

Middle 1990s: 3 Pronged Stabilization

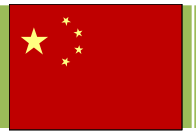
- Stabilization of
  - Mt. & Forest Property
  - Self Processes Mt. Property
  - HRS
- Incentivized investment by farmers

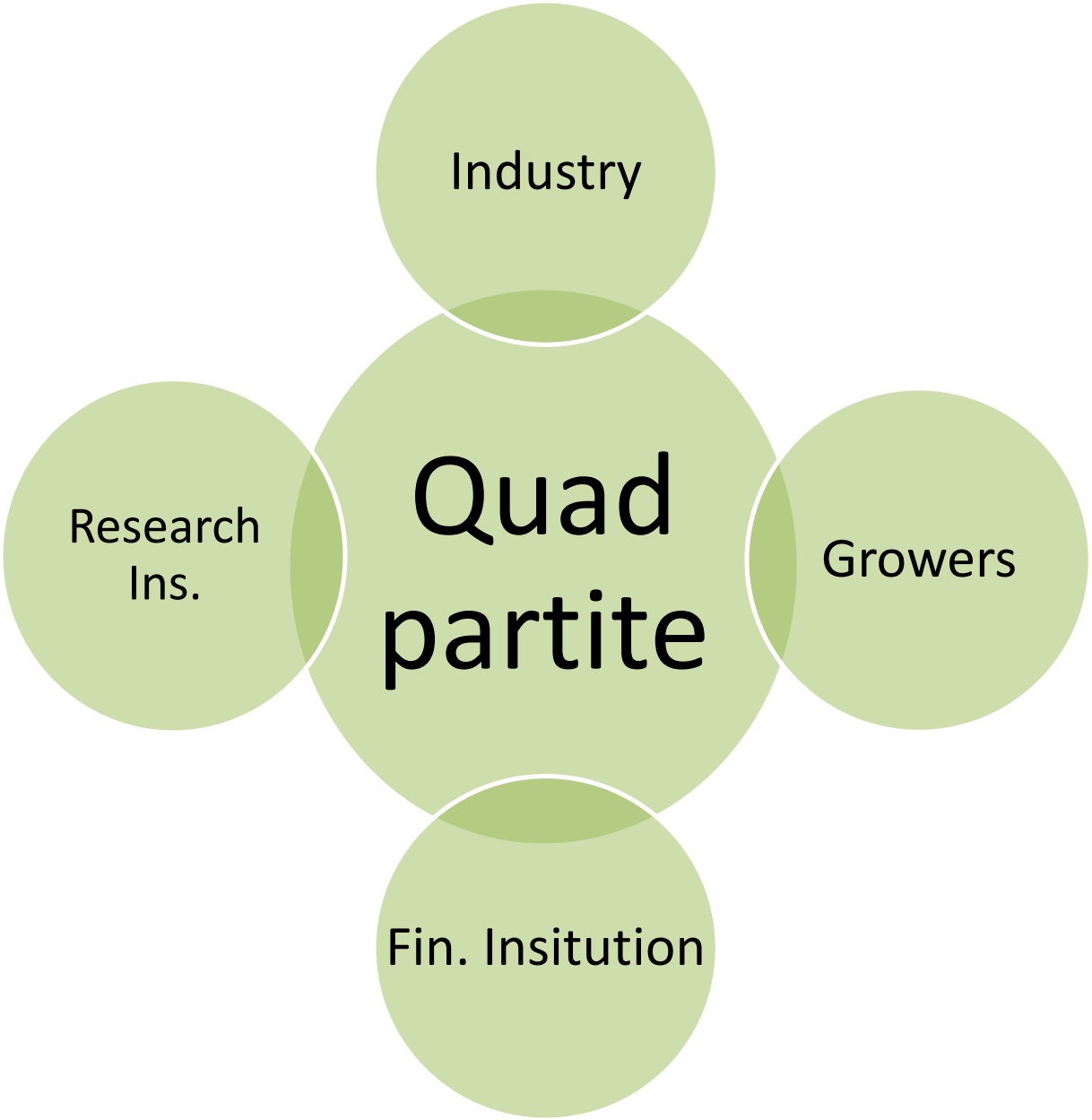
2006 onwards

- Forestry System Reforms incl. Bamboo
- Right to ownership which allows farmers to transfer, transact or circulate as property
- Sundry taxes & fees exempted In 2001*
- Subsidized funds and fertilizers

Comparative Study

China 	 India
Ownership & Management Rights with individuals	O & M rights not clearly defined. Differ from state to state
BB related Institutional Arrangements cover all aspects	Till recently the institutions focused on dist of BB to local and industrial units. NBM, NMBA, BCDI, CBTC etc launched
Organizational Arrangements for Bamboo Management- Multi layer and Multi regional (Forestry Bureau also follows the same form	Administrative structure U form- Independent forest depts exist only at the state level
Local level govts have little bargaining power but greater autonomy. Ability to design dynamic institutions	Institutions designed at the state level. Institutional inertia, attitudinal inertia and non-accountability
Mkt Research and Product diversification- pvt enterprises put great emphasis on mkt research. Responds to world demand. Consumer items+ new industrial items	Till recently even basic data abt BB was absent. Traditional products, Industrial use limited to Pulp

China 	 India
In BB – dominant areas BB has played a critical role in poverty eradication	B mainly used for benefit for ind. Org.s (pulp mills) & subsistence at village levels
Diverse ownership and management arrangements, all units compete for BB (raw material) in an open competitive mkt. State has no role to play in supply to these units	In some states industrial units still dependent on state for supply of raw materials so are rural artisans. Classic case of cross subsidization of rich by poor
Institutional Arrangements are: Complete Decentralized Diverse Flexible Responsive to local needs Responsive to other subsectors Aimed at equity consistent economic efficiency	Institutional Arrangements are: Partial Centralized Narrow Full of rigidities Non responsive to local needs Non responsive to other sub sectors Aimed at profit maximization of ind. Units and subsistence of poor


Industry
Research Ins.
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CASE STUDY: (APIL, NAMSAI)

Features

- Converted from Plywood factory to BB board manufacturing unit
- 1996 (Ban on timber by SC)
- FIPPI agreed to convert it into a bamboo board industry
- Faced numerous procedural handicaps
- Factory closed 18 times during conversion process due to different interpretations of the SC order by different forest officers
- Functioned regularly from 2006 intervention by PC
- Ancillary units in remote villages with a buyback arrangement

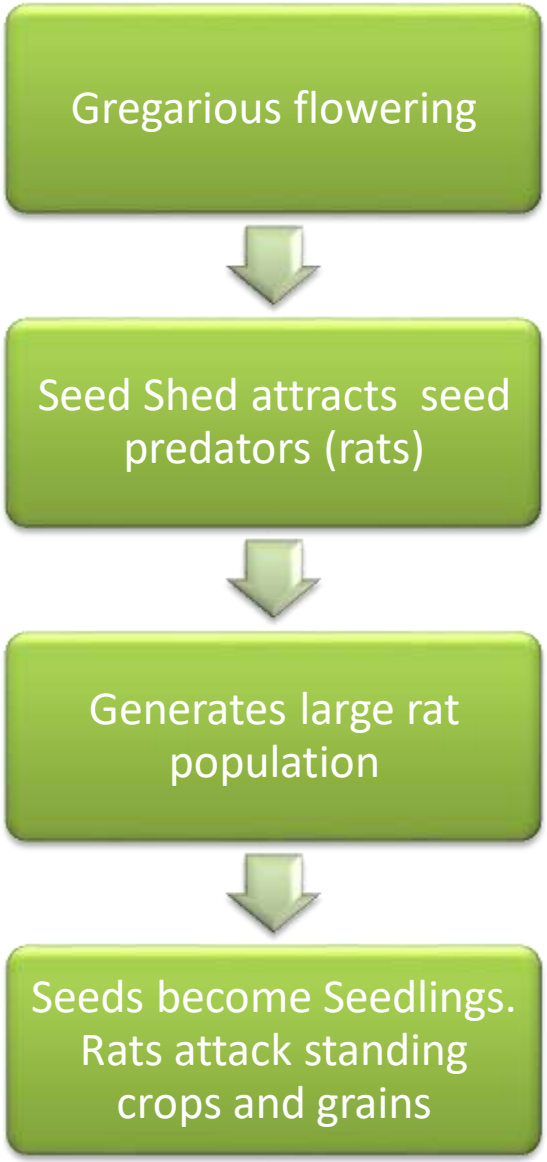
Lessons

- Procedural impediments must go
- Systematic not piecemeal approach to be adopted
- Takes care of demand supply problem
- local entrepreneurship and sustainable livelihood opportunities for local populace
- E.g. Agreement to procure mats from 38 villages in Nagaland (earlier supplying 700->10,000 units/month
- Req. of 1 lakh mats can generate employment to 33,000 persons (90% of mat makers are women)
- More than 100% value addition in Splint manufacturing units

The North-East

Bamboo Flowering

- Flowering of Melocanna bacciefera , Bambusa tulda & Dendrocalamus longispathus in North East with its epicentre in Mizoram
- Cycle of 48 years. The B dies after flowering. Regeneration is a problem
- Last occurred in 1959 lead to famine
- Expected to reoccur btw 2004-07
- 26 MT (of which 10 MT accessible) will be available if harvested before flowering
- failure of the then Assam Govt. to adequately respond to the demands of famine relief requirements which resulted in insurgency in Mizoram



REPORT: Bio-refinery (2G)

Criteria	Sub Criteria	Max Points	Total Points	A.P	A	MH	MP	N
Feedstock	Price	10	30	10	6	6	7	8
	Availability	15		12	10	10	12	12
	Bamboo Flowering	5		5	5	5	5	5
Infrastructure	Road	5	20	3	4	4	2	3
	Rail	5		1	5	1	2	1
	Power	5		3	3	2	1	1
	Waterway / Airport	5		3	3	1	1	0

A.P= Arunachal Pradesh, A=Assam, MH=Meghalaya, MP=Manipur, N=Nagaland

Cont……. Bio-refinery (2G)

Criteria	Sub Criteria	Max Points	Total Points	A.P	A	MH	MP	N
Political Stability	Less local community issues	5	10	2	3	2	1	1
	Less Bands, Strikes and Unrests	5		2	2	2	1	1
Government Support	Policies	5	10	4	2	3	3	4
	Transit Permits	5		2	2	2	2	2
Products Market Proximity	Ethanol	10	20	5	9	7	5	5
	Co-products	10		5	9	7	5	5

A.P= Arunachal Pradesh, A=Assam, MH=Meghalaya, MP=Manipur, N=Nagaland

Cont……. Bio-refinery (2G)

Criteria	Sub Criteria	Max Points	Total Points	A.P	A	MH	MP	N
Others	Land Availability	5	10	4	2	4	4	4
	Labor Availability	5		3	3	3	2	3
Total		**100**	**100**	**64**	**68**	**59**	**53**	**55**

Source: PwC Analysis

Based on the weighted scores developed using the above criteria, Assam received the highest points and comes out to be the best location for setting up of bio-refinery. Arunachal Pradesh is the second highest ranked state with 64 points. The remaining states are closely ranked with points of 59, 55 and 53 for the Meghalaya, Nagaland and Manipur respectively.

A.P= Arunachal Pradesh, A=Assam, MH=Meghalaya, MP=Manipur, N=Nagaland

Market Assessment :Ethanol

Ethanol can be produced from agricultural crops such as sugarcane, corn, wheat etc. which have high starch contents. Internationally, sugarcane, sweet sorghum and sugar beet are used for the production of ethanol as sugar containing feedstock. Corn, wheat and other cereals contain starch that can relatively easily be converted to sugar.

There are three main uses of ethanol in India – potable liquor manufacturing (45%), industrial alcohol in alcohol-based chemical manufacturing (41%), fuel grade ethanol for blending with petrol and other purposes such as use of ethanol as a feedstock to make ethers (14%).

The demand for ethanol is estimated and projected for the following grades of ethanol viz. fuel grade ethanol, industrial grade ethanol and ethanol going into potable sector. As fuel grade ethanol demand is derived from gasoline demand, the first step in estimating fuel grade ethanol is to estimate and project gasoline (Motor Spirit) demand till year 2030.

As per our analysis, fuel grade ethanol demand is derived from gasoline demand, the first step in estimating fuel grade ethanol is to estimate and project gasoline (Motor Spirit) demand till year 2030.

Policies

- BAFFACOS, a five-year programme
  - Early Harvesting of BB
  - Rodent Control
  - Agricultural Diversification
- The Govt of Mizoram declared the Mautam as a disaster in 2007
- lifting of ban on export of muli bamboo & removal of harvesting and Felling restrictions on Forest and Non forest areas in NE
- The Achievement Report on BAFFACOS at variance with Action Aid Study
- Accusations of Corruption and Misreporting. Sporadic protests

Status & Potential

Bamboo resources

	In the Country	In the NER
Number of genera	22	16
Number of species	136	89
Total estimated stock	90 million tonnes	
Total area under bamboo	8.96 million hectares	3.10 million hectares

- Reviving Closed Paper & Plywood Factories
- Bamboo Shoot industry great export potential
- Mostly non-clump forming Bamboo
- Smuggled BB can fetch 2.6 times the value of raw BB
- Special BB zone : Boost to local handicrafts (tribals) & new age items

“QUOTE UNQUOTE”

“Bamboo Sector has to be ‘liberalised’ and it should be treated as a plantation and Horticulture crop without any restriction on its movement and felling for commercial purposes”

***

“Bamboo is often called the ‘Orphan’ crop as in the Government no Department or Agency has taken up its potential in a holistic manner”

***

Planning Commission, 2003

Way Ahead…

Allow forces of demand and supply to operate
Undertake market complementary interventions
- Incentivise prod
- Remove informational asymmetries
- Facilitate expansion of markets (incl promoting exports)

Result: EFFICIENT OUTCOME

Indicator: Productivity and opportunities not lost (DD-SS gaps)

Improve on outcome by incorporating livelihood and env. concerns
- Contract Farming: provide people friendly legal framework
- Tribal Artisan communities/ Forest dependent:
- R&D activities to allow them to access markets
- & develop new products, introduce best practices

Result: EFFICIENT & EQUITABLE OUTCOME
Indicator: Employment levels, Poverty alleviation, Resource situation ,(relevant sections)

Recommendations

SUPPLY (govt. land)	DEMAND	POLICY & LEG.	LIVELIHOOD &ENV.
• Resource Inventorization and Monitoring • Sustainable Harvesting & Best Collection/Non Destructive Practices • Training of JSS members • Scientific Regeneration • Handling the phenomena of gregarious flowering effectively	• Promoting the use of bamboo and bamboo products in government infrastructure development and housing programs • Product Specific R&D/ Designing/ Range through design institutes • Marketing Strategy: Branding, Certification and Standard codes	• Amended 1927 Act • MoEF should declare B a grass • Bamboo to be clearly classified as NTFP and regulations in cutting, transport and use of bamboo should be relaxed • Orientation of People on Tribal Right Act in relation to NTFP harvesting and tenure rights • Creation of a Bamboo Board	Integrating BB based livelihood options into poverty alleviation programs that target SC/ST popn. like NREGA Rehabilitation of Plywood factories using Bamboo as raw material Expansion of Handicrafts and Cottage & tiny industry- bamboo shoot production, agarbattis etc

Recommendations

SUPPLY (pvt. Land)	DEMAND	POLICY & LEG.	LIVELIHOOD &ENV.
• Managed Plantations should be encouraged • Suitable agroforestry models developed • Investment in infrastructure to attract pvt. Investment • Establish National Bamboo Institute	• Promotional Campaign • Market Information System • Relaxation of Taxation policies • Import Duty to be levied on imported pulp in the short run • Credit made easily available for SMEs	•Govt to declare it a horticulture crop •Farm grown Bamboo trade & transit rules need to be abolished • Include BB as a Plantation crop wherever separate laws exist •Remove land ceiling restrictions •North East converted into Special Bamboo Zone	BB to be included under JFM program and planted in degraded areas Explore BB as a source of energy for rural Households Policy Make BB eligible for Carbon Credits Scientific Harvest Policy to apply to pvt producers as well

You must be the change you wish to see in the world:

Mahatma Gandhi

MEET AGAIN / NAMASTE