THEME: 2) SOCIETY, 2.1 Community and economic development: poverty reduction.

Poverty Alleviation Through Utilization of Bamboo For High End Products: Case study from Kerala state, India.

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Abstract

Bamboo, the evergreen and versatile plant is intertwined with human life and welfare since time immemorial. It is one of the fastest growing plants and as per one estimate about 11.00 million ha of the total 63.3 million ha of forests in India have been covered with bamboo. The North East India holds the largest stock and diversity of bamboos followed by the Western Ghats area including the Kerala State in South India.

Bamboo and Reed industry is one of the age-old traditional industries of Kerala State. Although, about 28 species of bamboossuch as *Bambusa bambos, Ochlandra travancorica, Dendrocalamus strictus, Dendrocalamus stocksii, etc.* are found in the State, the one with tremendous potencial viz. *O.travancorica*growing extensively beside water bodies as reeds is mainly used for weaving mats by the traditional artisans. The weaving communities in and around the Angamaly region in central part of Kerala ensure continuous supply of bamboo mats as the main raw material for Bamboo Mat Board (BMB) being manufactured by Kerala State Bamboo Corporation (KSBC). This popular IPIRTI technology for BMB wastransferred to KSBC way back in the year 1985 since when continuous production of BMB for housing and other applications is going on in Angamaly (Kerala).

From the case studies carried out by Kerala State Bamboo Mission (KSBM), it is estimated that about one lakh artisans forming Community Mat Weaving Centres (CMWC) are earning their livelihood under the umbrella of the KSBC. There are about 14 CMWCs having 85 main and sub depots where Bamboo mats are being produced regularly for manufacture of BMB. Over the years, a value chain network has been put in place among the Forest Department, reed cutters, the weavers' community and the manufacturer - KSBC. This well established network came out handy in addressing the poverty alleviation of rural folks - long associated with nature and forests for their livelihood.

The employment generation potential of bamboo mat weaving network with special reference to the Kerala State is dealt in this paper which has emerged as a successful module for Bamboo Industrialization in recent times.

Key words: Bamboo Mat Board, Weaving, Economic, Employment.

Introduction

Bamboo occupies 11.00 million ha (approx.) of forest lands in India which are mainly of sympodial clump forming variety. Sporadic clumps are also grown and available inagricultural lands, homesteads, etc., for meeting the daily requirement of various end users. Though 135 species of bamboos, including some exotics are reported as available in India, only three species constitute 78% of the growing stock viz., *Dendrocalamus strictus (45%)*. *Melocanna bamboosoides* (20%), *Bamboosa bambos* (13%). Other important species of immense commercial possibilities are *Ochlandra travancorica* of the Western Ghats, *Dendrocalamus hamiltonii*, *B. tulda*, *B. pallida* and *B.nutans* in the North Eastern parts of the country and *Oxythenanthra s*pecies in Western India. One of the major advantages of bamboo as an entry point to development is the fact that hundreds of value addition products can be made out of it and most of them can be produced by small and medium scale enterprises. It can generate important political and economic support system which can translate into true sustainable development (Rao and Shastry, 1996).

The innovations on the bamboo for various end use applications resulted to form clusters of processing centres for cross cutting, splitting, slivering and mat weaving activities. It is estimated that 8 million artisans in the country depend on bamboo craft for their livelihood. The annual turnover of the bamboo sector in India is estimated to be around Rs. 2400 crores. By and large, this totally unorganized sector has always been considered from the craft point of view and if otherwise for pulp making only. This craft has been practiced by the North Eastern States for centuries as their prime income source and, in the process; the weaving skills of the artisans had evolved to levels comparable with better placed areas of Japan, China etc.

With growing optionsfor bamboo applications including that of high end construction, it is veering into new areas as a substitute to depleting wood resources. The global markets for bamboo are booming with estimates putting the worth of industry as 24 billion US dollars. Once regarded as ‘poor man’s timber’ is now being dubbed as Green Gold for its vast economical and environmental benefits such as alleviating pressure on tropical forest thereby mitigating climate change and curbing deforestation (Ogunjinmi et al., 2009; Goyal et al., 2010). It is getting absolutely clear that it is an indispensable resource meeting the livelihood challenges of North-East and other parts of India including state of Kerala.

2. Bamboosof Kerala

Kerala State nestled in Western Ghats of South India is exceptionally suitable to develop the bamboo sector in terms of both technology and resources. Most of the commercial bamboo species come up well in the Ghat region of Kerala, due to the encouraging agro-climatic conditions. Kerala has both traditional sector such as mat weaving and basketry and modern industries like Paper pulp and Bamboo ply etc. Bamboo can contribute significantly to rural economy and create employment opportunities. The Bamboo workers in the Kerala State were mainly from the poor communities during the initial period of Bamboo Mission and they were producing only very low value products. Kerala State Bamboo Mission has made various interventions like promoting propagation, skill development programmes, awareness workshops, trade fair participation etc. These activities led to the present level developments in Bamboo Sector in the State.

In Kerala, about 28 species of bamboo are found to occur. The main species are *Bambusa bambos, Ochlandra travancorica, Dendrocalamus strictus* and *Dendrocalamus stocksii*. There are a large number of thin walled bamboos called reed bamboos (Ochlandra genera) which are used mainly for weaving by the traditional artisans. Exotic assortments like *Dendrocalamus giganteus, Dendrocalamus brandisii* and *Thyrsostachysoliveri* are also cultivated by farmers in areas like Waynad district. Reed bamboo is supplied to the artisans through the Kerala State Bamboo Corporation (KSBC). An exceptional feature of the Kerala bamboo is that 67.3 % of the extracted bamboo originates from home gardens rather than from the forests.

The municipal town of Angamaly is the nerve center of the bamboo industry. There are important factors for Angamaly emerging as the pivot around which the entire bamboo industry revolves. Along with the historical and social reasons, several geographical factors have confirmed the ideal position enjoyed by this town to become the capital among the areas dealing in bamboo. The geographical position of Angamaly town is responsible for attaining this position of importance as far as KSBC/ bamboo ply industry is concerned. (Ajith Kumar, N., 1985.)

The artisans from the weaving sector around the Angamaly region are supported by the KSBC. It is estimated that there are about one lakh people in the state dependent on bamboo for their livelihood. Data from the panchayats indicate that from the early seventies onwards there has been a great drain in the number of artisans from the sector to semi-skilled and unskilled jobs in the tertiary sectors like construction etc.

3. Community profile of bamboo dependents

Traditionally the community feature of bamboo dependents represents a homogeneous Scheduled Caste (SC) group (known as *Kavaras*, *Sambavans*, and *Parayas* from north to south of the State); whereas,of late theweavers of KSBC depict a heterogeneous community where people from all groups work. Compared to both strata, high literacy has been recorded among the KSBC weavers. High school is the maximum level of education noted in both strata depicting a stagnant economy.

Occupation wise, primary sector supremacy is noted with many taking upwage employment. Employment in the bamboo sector is periodic and highlights, 46 percent (bamboo workers in and around Kannur districts) and 46 per cent bamboo workers with the KSBC. The male:female Work Participation Rate in KSBC highlights majority of the weavers to be women. The economic structure indicates backward economy with a low income share from bamboo based activities.

4. KSBC Bamboo Trade &Role of IPIRTI in Bamboo Ply Industry

The KSBC was incorporated in the year 1971 as a State Government undertaking to promote the welfare of the traditional Bamboo workers in the state. The main objective of the KSBC is to develop and promote industries based on bamboo, reed, cane and rattan and to undertake manufacturing and trading of the above products, provide financial, technical and other assistance and guidance to the traditional workers.

The IPIRTI,as an autonomous R & D body of Govt. of India located in Bengaluru spearheaded the research efforts on Bamboo in the seventies and the technology for making Bamboo Mat Board (BMB) was standardized in early eighties. The technology to make BMB in industrial scale was transferred to KSBC in the year 1985. BMB has immense market potential for housing and furniture applications in Kerala and outside the state. It is an ISO Certified Bamboo Panel (equivalent to Marine grade plywood in strength properties) which ishaving a good market share all over and outside India. With BMB as the construction material, KSBC takes turnkey projects in tourism sectors of Kerala to build huts, eco-hubs in forests and other tourist places for aesthetics and other eco-friendly characteristics.

With the growing demand of BMB from the Angamaly plant, KSBC has emerged the main agency in the state to supply reed to traditional sector (organized), including small scale units. The number of reed poles collected and supplied to depots and SSI units by KSBC are given in **Table 1**. From which, it may be noted that the number of bamboo poles collected during 1990-91 to 2004-05 ranges between 16.28 million and 8.04 million, indicating a significant variation. About 60 per cent of the poles are supplied to traditional sector and the remaining to small scale industrial (SSI) units.

Table 1.

Quantity of reed collected and supplied by Kerala State Bamboo Corporation during 1990-91 to 2004-05

Year	Quantity collected (No. of poles on million)	Quantity sold to SSI units (No. of poles in million)	Quantity sold in depots (No. of poles in million)	Price/ pole
1990-91	14.53	5.9	8.63	1.06
1991-92	16.21	7.0	9.21	
1992-93	14.58	6.1	8.48	
1993-94	16.27	6.4	9.87	
1994-95	15.84	5.9	9.94	
1995-96	15.93	5.2	10.73	1.51
1996-97	14.83	5.2	9.63	
1997-98	16.28	6.0	10.28	
1998-99	15.89	5.9	9.99	
1999-00	13.14	3.8	9.34	
2000-01	13.86	4.3	7.01	
2001-02	11.59	3.6	5.76	
2002-03	9.50	3.7	5.61	
2003-04	8.04	2.4	5.38	2.27
2004-05	8.10	2.5	5.39	

Source: KSBC

5. Community Mat Weaving Centres-Kerala

The Community Mat Weaving Centres (CMWC) are running under the umbrella of Kerala State Bamboo Corporation Ltd (KSBC). At present there are about 10000 families of registered weavers working under this activity and all of them are women in particular. They are constituted into 14 CMWCshaving 85 main and sub depots for producing bamboo mats for the KSBC. The primary processing machines of cross cutting and sliver making are available only in the CMWC and not in the other depots.

Forest Department of Government of Kerala has permitted to supply the reed bamboo (Ochlandra spp)free of cost to KSBC since inception of the Corporation. KSBC inturn providesthe reed bamboo (Ochlandra spp) to these CMWCs and its depots as collected from places like Adimaly, Pooyamkutty, Edamalaiyar and Thalumkandam by the registered reed cutters who are about 1500 in number. The average cutting cost for each reed bamboo is Rs.11/reed and in addition to this Government of Kerala has recently introduced the 17.5% annual incentives based on the total number of reeds cut by the registered cutter in the year. The incentives are to be paid before the famous Onam festival of Kerala. Reed cutters earned up to Rs.2,70,000/- per headannuallyin the present day context. The dominant income source of this tribal group from Pooyamkutty is reed cutting (Anitha. V, 2012).

The reeds are supplied to the registered weavers on credit basis and the rate starts from Rs.3.60/reed- Rs.4.86/reedbased on the grade and quality of the material. KSBC is buying the mats at average rate of Rs. 105/mat (8.25' x 4.25'). In the present system the Bamboo Mat Weaver is being paid Rs. 500/day as contract amount for making 5 mats in the size of 8.25' x 4.25' which will be produced by the weavers in a day. Considering the mandays of 220 days in a year with rate of Rs.500/day, the income generation will be about Rs.1,10,000/- per weaver annually.

6. Economic potential of bamboo based productive activities

The Seraphicsociety provides employment security to all its women workers. **Table2** represents the average benefit earned and the foregone benefit during the peak periodof sales in the different stages of production for both the trained artisans and theMarginalised Bamboo Dependent(MBD)s. The production stages involve collection, processing, production andmarketing. In the first stage i.e., collection, here the raw material is procured throughthe KSBC and the earned benefit of the institution is 71poles per day, requiring two labourers. The real wages in the nearby areas is Rs.150 perday thus, the foregone benefit is calculated as Rs 300/-. Similarly, in the processingstage, they process approximately 284 pieces or 20,448 slivers, covering 42 labourdays and thus the corresponding foregone benefit is Rs.6300/-. The averageproduction of mats is 613 with 17 labourers involved and the corresponding foregonebenefit works out to Rs.2550/-. The aggregate predetermined benefit or theopportunity cost is Rs. 9150/- while average earned benefit with respect to the price inthe market is only Rs.10065/-.The opportunity cost which is the cost of foregonealternative is less than the earned benefit. Thus, through value addition the Seraphic society ensures reasonable wages and employment security in the rural areas. (Source: KFRI Research Report No.291).

A Kavara bamboo worker requires 2 to 3 poles per month for which theyspend 5.5 days labour for collecting the required poles. The daily wage here is Rs.150per day thus the foregone benefit is Rs.825 with respect to the raw material collection.In the processing stage they process 390-396 slivers which require 12 labour daysand the corresponding foregone

benefit is Rs. 1800. In the production stage by usingthe processed slivers they can produce 24 big baskets or 40 small baskets or 12 *vatti*or 36 *cherumuram* or 20 *Kundumuram* and average labour time required is 4 days andthe corresponding foregone benefit is 600. Even though there is no secured marketfor the product, assuming that there is normal demand they can sell their product within one dayof marketing thus the corresponding foregone benefit is Rs. 150. The aggregateforegone benefit of all the production stages is Rs.3375 while the correspondingearned benefit is Rs.2250. Thus, the opportunity cost is greater than the earned benefitfrom which it is very obvious that the community is under-paid even during the peak periodof sales.

Table 2. Economic potential of bamboo based productive activity

Production stages	**Earned benefit**		**Required labour days**		**Foregone benefit (in Rs.)**	
	TAs	**MBDs**	**TAs**	**MBDs**	**TAs**	**MBDs**
Collection	71 poles	2-3 poles (30-35 slices)	02	5.5	300	825
Processing	20,448 slivers	390-396 slivers	42	12	6300	1800
Production	613 mats	40 small baskets	17	04	2550	600
Marketing	613 mats	40 small baskets	0	01	0	150
Total	Rs.10065	Rs.2250	61	22.5	9150	3375

Primary data estimates
TAs- Trained Artisans; MBDs- Marginalized Bamboo Dependent

Though bamboo has a great potential to generate income and employment, the remuneration of the marginalized weavers in Kerala is very small. Their relative income is very less and opportunity cost is high. Incidentally, though the KSBC was set up to protect the interest of traditional weavers, it is getting more and more prudent to concentrate mainly on the production of Bambooply, bamboo tile and bamboo flattened boards with advanced technologies which are viable options.

7. Conclusion:

Country like India infested with long time rural poverty and depleting forest resources, offers a sustainable option with bamboo processing having considerable potential. However,Kerala is exceptionally suitable to develop the bamboo sector consideringboth technology and resources. In the Western Ghats region of Kerala, most of thecommercial bamboo species are grown due to the favourable agro-climaticconditions.Kerala has both traditional sector such as matweaving and basketry and modern industries like Bamboo ply and tiles.Bamboo can contribute significantly to rural economy and create employmentopportunities. As observed from previous studies an average reed cutter earns about Rs.2.70 Lakhs (US$ 4500) annually. Besides the weavers earn about Rs.1.10 Lakh (US$ 1830) annually. The

flow of remunerative regular income to the reed cutters and weavers in the backward section of the society ensures sustainable growth of Bamboo Industry,especially in the Scheduled Tribe and Scheduled Caste populated areas of rural Kerala. These activities led to thepresent level developments in Bamboo Sector in the state. Prominence should be given on promoting cultivation of bamboo, creation of novel designs for innovative products along with apt skill development, promotion of bamboo based modern industries supported bytechnological upgradation.This will ensure larger business opportunities, especially among women and improving theliving standards of the rural people there by contributing to the overall growth of the sector.Kerala model of community mat weaving is a time tested, all weather and longstanding module for rural upliftment with the help of Bamboo Value Addition Technology. This needs to be emulated in other states of India including other parts of the globe.

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