



Socio-economic importance of bamboo in Assam: A brief analysis

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ABSTRACT

Bamboo, regarded as 'The Green Gold' of the 21st century and commonly known as 'poor man's timber', played a significant role in human society since time immemorial and today contributes to the subsistence needs of over a billion people worldwide. It has been traditionally used as fuel, food, for rural housing, shelter, fencing, tools, and various other purposes. Assam is one of the largest bamboo producing states of India. The main bamboo growing areas of Assam are the districts of Cachar, Karbi Anglong, Dima-Hasao, Nagaon and Lakhimpur. Bamboo forms an integral part of culture and life style of the people of Assam. Bamboo is also plentiful in the villages throughout the State. Even though Assam has been traditionally rich in bamboo, bamboo craft from Assam do not figure prominently in the handicraft market of India and Assam's share in the export trade is negligible. This paper will try to focus the socio-economic importance of bamboo in Assam.

KEY WORDS: Socio-economic, Resources, Bamboo, North-East, Assam

I. INTRODUCTION

Bamboo, regarded as 'The Green Gold' of the 21st century and commonly known as 'poor man's timber', played a significant role in human society since time immemorial and today contributes to the subsistence needs of over a billion people worldwide (Salam, 2008). Bamboo also plays an important role in carbon sequestration and biodiversity conservation (Raizada *et al.*, 2002). The multifunctional range of bamboo uses has only lately received more attention. Experiences of Asian

countries have shown that it may prove beneficial as a valuable and sustainable natural resource (Dannenmann *et al.*, 2007). It has been traditionally used as fuel, food, for rural housing, shelter, fencing, tools, and various other purposes. In modern days, it is being used as industrial raw material for pulp and paper, construction and engineering materials, panel products, etc. Present day industry uses one of the numerous species of bamboo-*Bambusa vulgaris* for more modern products, such as baskets, vases, pencil and pen holders, kitchen containers, wall plaques, table mats and lamp shades, all of which have a decorative-cum-utility value (Zoysa *et al.*, 1990).

In India, bamboos account for around 12.8 percent of the total forest cover and are one of the largest bamboo resources in the world. Bamboo forests occupy an area about 14 million hectares in India (FSI, 2011). India is second only to China in bamboo production with 3.23 million tones per year (Tewari, 1992). Bamboo is an important non-wood forest resource found in forest as well as non-forest areas in the country.

Bamboos are a group of tall, perennial arborescent grasses. Over 135 species of bamboos are found in India. They are common in the south-western and north-eastern parts of the country, occurring usually mixed with deciduous or evergreen forests or in small patches (Loushambam, *et al.* 2017). In India, bamboos are used for many purposes. Their main qualities are- strength, straightness, smoothness, height, weight, hollowness, ability to be split and locally available. Table 1, shows the percent breakup of bamboo consumption in India on the basis of its uses.



Table 1. Consumption of bamboo in India

Bamboo consumption	Percentage
Rural uses	30
Paper and pulp	17
House construction	16
Other construction	16
Packaging	07
Other uses	14
Total	100

Source: Negi, S.S. 2006.

II. REVIEW OF LITERATURE

Bamboo is one of the most important forestry species with wide distribution throughout the earth. It makes significant contribution to the rural economy (Gogoi, 2020). Bamboo is the common term applied to a broad group of large woody grasses, ranging from 10cm to 40m in height (Scurlock *et al.*, 2000). Bamboo originates from Southeast Asia, where it is a natural component of the forest ecosystem (Dannenmann *et al.*, 2007). As many as 1,500 bamboo species exist worldwide, most of which grow in Southeast Asia (Wong, 2004); the annual economic value of total bamboo consumption has been estimated to be \$10 billion (Vaiphei, 2005). India has about 13 percent of its total forested area covered with bamboo (Shanmughavel *et al.* 1996).

Assam has been blended with very rich important tropical resources including Cane and Bamboo. It may be noted that Cane and Bamboo and now considered as most important natural and renewable vegetable resources in the world. Bamboo works are recognized for sustainable development in the economy of Assam (Hazarika, 2020). Bamboo can be a potential source of employment generation in rural areas through manufacturing activity and utilization of local material in value added products. It offers considerable opportunities for local people to increase their economic independence and their self-reliance (Nadkarni,*et.al.*, 2020).

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Bamboo products such as bamboo ply, flooring, roofing sheets, props and many others have been key wood substitutes of bamboo in construction and fencing industry worldwide. Apart from this, it is also used as medicine, food, charcoal, vinegar and as natural pesticides (Hossain *et al.*, 2015). According to Sastry and Webb (1990), over-exploitation associated with growing human populations, destruction of tropical forests and new demands on the resource for industrial uses, especially by the pulp and paper industry, has resulted in wide-scale decimation of bamboo stocks, from vast forests of bamboo in South and Southeast Asia at the beginning of 20th century.

III. OBJECTIVES OF THE STUDY

- i. To study the importance of bamboo in the rural life of North-East India.
- ii. To study the socio-economic importance of bamboo in Assam.
- iii. To give some recommendations.

IV. BAMBOO RESOURCES IN NORTH – EASTERN STATES OF INDIA

The north-eastern region of India comprises seven states: Arunachal Pradesh, Assam, Meghalaya, Manipur, Nagaland, Mizoram, and Tripura, which are collectively considered as a major 'Hotspot of Biodiversity' (Sundriyal *et al.*, 2002). North East India is endowed with abundant bamboo resources, sufficient enough to build a robust economy, besides maintaining conducive climatic conditions. Bamboo and Cane constitute an important part in the lives of the people of North-Eastern Region of the country. It has been an integral part of the cultural, social and economic



traditions of the region and is an important wealth of the region. It grows in natural forests, and is cultivated in homesteads, groves and on private plantations. It is utilized in many ways, for housing, fencing, functional articles, agricultural implements, basketry and even fuel and food.

People in the region possess traditional skills of working with the material and knowledge of the cultivation and management practices of bamboo. Bamboo is one of the most abundant, environmental-friendly and sustainable resources in North Eastern Region. Bamboo is one of the important minor forest produces that assists in

subsistence income of tribal folk to a greater extent (Sundriyal *et al.*, 2002). High diversity of bamboo resource plays a significant role in the food and nutritional security of the tribal population of North-Eastern region of the country (Solanki *et al.*, 2003). More than 50 percent of the bamboo species occur in North Eastern part of India, viz. Arunachal Pradesh, Assam, Manipur, Meghalaya, Nagaland, Mizoram, Sikkim, Tripura and in the Western Ghats (Rai and Chauhan 1998). Table-2 shows the total geographical area and the bamboo bearing areas in North Eastern states of India.

Table-2: Total geographical area and the bamboo bearing areas in North Eastern states of India.

North Eastern states	Total geographical area(Sq/Km)	Bamboo bearing area(Sq/Km)
Arunachal Pradesh	83,743	15,125
Assam	78,483	8,955
Manipur	22,327	10,687
Meghalaya	22,429	5,943
Mizoram	21,087	3,267
Nagaland	16,579	6,025
Tripura	10,477	3,617

Source: Compiled by author

Tribal communities of the region use this resource for food, shelter, furniture, handicrafts, medicines and various ethno-religious purpose. Working with bamboo is widespread in the region with a large percentage of the ethnic population involved in refined craftsmanship. The most creative expression of different tribes are reflected in their handwork and is integral part of their tradition. The items they make include things like furniture, bamboo and cane mats, decorative lamp shades, stools, hand fans, baskets, hand bags, jewelries *etc.* The North-Eastern region can very well go for global export of steamed and canned bamboo shoot to European countries. As bamboo products are

highly labour intensive in nature, these industries have the potential of becoming major employer in the North Eastern States. Further, bamboo being an important minor forest product, contributes to generate supplementary income to the tribal folk. High diversity of bamboo resource plays a significant role in the food and nutritional security of the tribal population of North-Eastern region. The maximum concentration of species is found in the deciduous and semi-evergreen regions of the North-East India. Table -3 shows the percentage of forest area and bamboo bearing area in the North Eastern region of India

Table 3: Forest Area and Bamboo bearing Area in North- East Region

North-Eastern States	Percentage of forest area to geographical area	Percentage of bamboo bearing area to total forest area
Arunachal Pradesh	61.39	31.29
Assam	34.21	26.98
Mizoram	91.47	47.94
Meghalaya	79.93	26.74
Tripura	76.71	40.35
Manipur	77.20	53.97
Nagaland	80.50	36.72
Sikkim	47.80	34.82

Source: (Loushambam, *et.al.*, 2017), Indian Journal of Hill Farming.



It has more than 1,500 documented applications, ranging from medicine to nutrition and from toys to aircraft (Salam, 2008). Many nutritious and active minerals, such as vitamins, amino acids, flavine, phenolic acid, polysaccharide, trace elements, and steroids can be extracted from bamboo culm, shoot, and leaf, all having anti-oxidation, anti-aging, anti-bacterial, and anti-viral functions. These are valuable in health care and can be processed into beverage, medicines, pesticides, or other household items like toothpaste, soaps, etc. Bamboo leaf contains 2 percent to 5 percent flavine and phenolic compound that have the power to remove active oxy-free-radicals, stopping sub-nitrification and abating blood fat. Flavine beverage and beer have been widely accepted particularly in East Asian countries like China, Korea, and Japan mainly because of their value in health care. Some materials extracted from bamboo can be used in fresh flavor preservation or food storage application. Some additives obtained from bamboo are used in food, such as bamboo juice, beverage, bamboo flavored rice, etc (Ogunjinmi, et.al. 2009). Bamboo shoot is one kind of ideal vegetable in the north-east India being free in pollution, low in fat, high in edible fiber, and rich in mineral. Bamboo is one of the oldest building materials used by mankind. Its utilization is not restricted to any geographical area or culture; hence bamboo has over the years been subjected to different degree of local and scientific exploitations and quarry, both in urban and rural communities.

V. SOCIO-ECONOMIC IMPORTANCE OF BAMBOO IN ASSAM:

Assam is situated in the middle of the north – eastern part of India and is gateway to this region sharing borders with West Bengal and six northern states as well as with Bangladesh and Bhutan. Its geographical area is 78,438 Sq/km which constitutes

2.39 percent of the total area of the country. The recorded forest area in the state is 26,832 Sq/km which works out to be 34.21 percent of its geographical area (FSI, 2015). Assam is rich in sylvan resources and most of its forests are richly stocked with various species of bamboos (Gogoi, 2020). Bamboo is a raw material of great versatility and forms an integral part of the lifestyle and economy of Assam. Special mention may however be made of the forests of Dima-Hasao Hills, Karbi-Anglong, Nagaon and Lakhimpur districts. The important species of bamboos of economic value are the Muli (Melocanna bambusoides), Dalu (Teinostachyum dalloa), Khang (Dendrocalmus longispatus), Kaligoda (Oxytenanthera nigrociliata) and Pecha (Dendrocalamus Hamilton-ii).

Assam is the hub of 36 different species of bamboo which are suitable for producing different varieties of products including edible item like bamboo shoot, agricultural implements, fishing equipments, furniture, musical instruments, household items, ornaments and, decorative items (Gogoi, 2020). Studies are being conducted in some research centres in India as to the suitability of the bamboo being used as reinforcement to replace mild steel bars in light concrete structures. Bamboo is also used for umbrella handles, walking sticks, tool handles, fishing rods, tent poles, cordage, ladders, yokes, baskets, toys, hand-fans and various domestic and agricultural implements. All these articles can be produced on a cottage and small-scale basis with small machineries.

At present, there are vast untapped resources of bamboo that can open avenues for utilization of bamboo for many productive works. Such a huge surplus of bamboo is not to be found elsewhere in India. Table 4, shows the Bamboo found in Assam along with their locality and Vernacular name

Table 4: Bamboo found in Assam along with their locality and Vernacular name

Sl. No.	Scientific Name	Vernacular name	Locality
1	Bambusa auriculata	Kalia bans	Karmganj
2	Bambusa balcooa	Bhaluka	Throughout the State.
3	Bambusa bambos	Kotoha, Kotabanh	Throughout the State
4	Bambusa cacharensis	–	Lakimpur, Sultani-Cherra Village
5	Bambusa jaintiana	–	Dima Hasao
6	Bambusa mastersii	Beti Banh	Lakhimpur, Dibrugarh
7	Bambusa nutans	Deobanh, Jotia maka	Throughout the State
8	Bambusa pallid	Bijuli, Jowa, Makal	Throughout the State
9	Bambusa Polymorpha	Betua, Jama.	Cachar, Dholai, Kakicherra, Si lchar
10	Bambusa Pseudopallida	–	–
11	Bambusa Sp.	Nangal banh	Kamrup, Gohpur



12	Bambusa teres	Bhaluki makal,paura	Chariduar,Darrag,Kamrup, Sibsagar
13	Bambusa tulda	Jati, Nal banh	Throughout the State
14	Bambusa vulgaris	Tansti banh, Ketura	Karmganj
15	Bambusa arundinacea	Kata banh	Lakhimpur, Dibrugarh, Upper Dihing
16	Dendrocalamus giganteus.	Worra	North Lakhimpur, Upper Dihing
17	Dendrocalamus hamiltonii	Kakoa,Kakeo banh	Dima Hasao ,Karbi-Anglong, Nagaon, Cachar etc
18	Dendrocalamus longispathus	Karail,Jati,Rupahi banh	Dima Hasao,Kamrup,Dholai
19	Dendrocalamus strictus	Karail, Jati	DeoPani river bank
20	Dinochloa Compactiflora	–	Cachar
21	Dinochloa gracilis	–	Dima Hasao
22	Dinochloa India	–	Bhuban Hills
23	Dinochloa mclellandii.	Lota	Dima Hasao, Karimganj
24	Gigantochloa	Kalisundi	Karimganj
25	Gigantochloa macrostachys	-	Hathikhali, Kamrup, Kulsi
26	Melocanna baccifera	Tarai banh, Muli Banh	Hill Districts
27	Phyllostachys assamica.	–	
28	Schizostachyum dullooa	Dalu banh	Common in hilly areas and in Upper Assam
29	Schizostachyum griffithii	Behti banh	Sibsagar and Dibrugarh
30	Schizostachyum pergracile	Madang	Dibrugarh and Dima Hasao
31	Schizostachyum polymorphum	Bajal banh, bajah banh.	Barduar, Darrang R.F. Garampani, Makum forest Narduar, Joypur etc
32	Oxytenanathera parviflora	Hill Jati	Dima Hasao, Karbi Anglong
33	Dendrocalamus longispathus	Khang	–
34	Oxytenanathera nigrociliata	Kaligoda	–

Source: Draft Assam bamboo and rattan policy-2003

Bamboo has played an important part in the lives of the people of Assam. It has been an integral part of the cultural, social and economic traditions of the State, and is an important component of the wealth of Assam. It grows in natural forests, and is cultivated in homesteads, groves and on private plantations. It is utilized in many ways, for housing, fencing, functional articles, agricultural implements, basketry, and even fuel and food. People possess traditional skills of working with the material, and knowledge of the cultivation and management of bamboo.

Bamboo can be a potential source of employment generation in rural areas through manufacturing activity and utilization of local material in value added products. It offers considerable opportunities for local people to increase their economic independence and their self-reliance. Bamboo grows abundantly and specific species required can also be grown on a small scale, preservation can be done in a factory which does not require high investment, and construction executed with relatively simple tools. In Assam, North East of India, a single knife commonly known as the 'dao' is the time tested single traditional tool for working

on bamboo (Nadkarni, *et.al.*, 2020). Bamboo is fully fibrous and possesses formidable strength, lightness, workability and easy availability especially because of its capacity for rapid regeneration. It is an ideal choice for several applications, particularly for poorer segments of society. The range of applications includes housing, grain storage barrels, agricultural implements, animal carts, furniture items, hand tools, household containers, ladders and temporary structures.

Bamboo has been an integral part of the cultural, social and economic traditions of Assam. Many people still depend on it for their livelihood, and for household and functional uses. In return communities have nurtured and protected bamboo and are repositories of vast knowledge and skills related to the propagation, processing and usage of bamboo. There is a social context too – bamboo in Assam finds a place in ritual and recreation, in culture and ceremony – needs to find a mention. Most importantly there is a traditional familiarity with the material, and a legacy of skill that can be built upon for newly emerging applications and products. Bamboo offers promise and potential for value addition and incremental income and



employment. The employment intensity of many products and processes is very high - and can lead to enhanced employment in the formal and informal sectors at different stages – cultivation, harvesting, processing, product conversion and marketing. Bamboo can be an important vehicle for sustainable and widespread development, augmenting economic opportunity, income and employment. Bamboo contributes to the soil and environment, giving back as much as it takes. It is a pivotal element in the balance of oxygen and carbon dioxide in the atmosphere; bamboo produces 30 percent of its volume in biomass. Its unique root and rhizome structures act as binders, controlling erosion and rejuvenation soil. Bamboo, in plantations or on the periphery of homesteads, acts as a windbreaker, a noise & climate buffer. As a consequence, bamboo based household plantation and agro-forestry can enhance food security, assist in soil conservation, watershed development and the reclamation of wasteland. Bamboos are effective for the control of soil erosion, stream bank protection, reinforcement of embankments and drainage channels, etc. (Tewari, et.al., 2019).

VI. CONCLUSION AND RECOMMENDATIONS

The development of bamboo applications would promote eco-friendly products and processes. It would have environmentally beneficial impact. Bamboo has many new uses too, developed through the application of science and technology. It can substitute technologically and commercially not only could, but also plastics, steel and cement and composite materials in structural and product applications through improvement in processing technologies, product innovations and the application of scientific and engineering skills. Efforts must be geared towards the protection and conservation of rich biodiversity associated with bamboo forests and utilization of bamboo resources through scientific management. Fast depletion of bamboo in the entire region is mainly due to the shifting cultivation and other anthropogenic effects resulted by population explosion. Government should initiate and also frame programmes for plantation of bamboo under farm and forest sector in this region for rural and sustainable development.

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