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## BAMBOOS: DIVERSITY, UTILIZATION AND ECONOMIC IMPORTANCE IN TIZIT AREA OF MON DISTRICT, NAGALAND, INDIA

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### ABSTRACT

Bamboos are also known to as 'green gold' and 'poor man's timber' and is one of the most important groups of plants belonging to family poaceae (Gramineae) and is used as an alternate for timber. They have wide range of uses, such as food sources, building materials, paper etc. they have wide socio-economic values. Bamboos also play a very important role in biodiversity conservation. More than 1250 bamboo species of 75 genera are recorded from around the world. In this paper we recorded 9 bamboo species under 4 genera from Tizit area in Mon district of Nagaland, India.

**Keywords:** Bamboo, Nagaland, Food, Economy

### INTRODUCTION

Bamboos are known to as green gold and poor man's timber (Nongkynrih *et al.*, 2019). It is one of the most important building materials used by humans because of its elasticity, lightness and strength. The special property of a bamboo is, fast to grow and short harvest periods (Lokho & Narasimhan, 2019) and also because of its high mechanical properties (Yu, 2007). Bamboo plays a very important role for the Asians and also for the South American as it is closely associated with their survival and culture (Wong 2004). Bamboos have high economic, ecological and social benefits (Lalhruitluanga & Prasad, 2009, Akwada & Akinlabi, 2016, Tewari *et al.*, 2019) and are also able to survive in wide range of climatic conditions (Tewari *et al.*, 2015). Bamboo also plays a very important role in carbon sequestration (Gu *et al.*, 2019) and biodiversity conservation (Raizada *et al.*, 2002, Loushambam *et al.*, 2017). People in rural areas are closely associated with bamboos as they make household items and living from it (Setiawati *et al.*, 2017).

According to (Yuming *et al.*, 2004), around 1250 bamboo species belonging to 75 genera exist throughout the world. In India there are approximately 148 species in 29 genera where Northeast India consists of 90 species with 41 genera and are endemic to that region (Sharma and Nirmala, 2015). There are about 43 species of bamboo reported from Nagaland (Naithani, 2015). Bamboos are found exclusively all over the state and are readily mixed with other forest species in all the district of Nagaland (Kithan, 2014). In district like Mokokchung of Nagaland, it showed variation of bamboo species in relation to altitude (Walling & Puro, 2018). In Northeast India, apart from its high economic values Bamboos of almost all the species are consumed by the people (Bisht *et al.*, 2012). Nagaland consumes as much as 441.52 tones of bamboo shoots annually (Bhatt *et al.*,

2004). In Northeast India bamboo shoots are used to prepare different delicacies of food (Mao and Odyuo 2007, Tamang and Tamang 2009).

According to forest survey of India 2011 data, bamboos in Nagaland are found locally abundant and widely distributed with 4902 km<sup>2</sup> of the total forest cover area. In this context, we studied the diversity, local utilization and economic significance of some commonly available Bamboo species found in Tizit area of Mon district, Nagaland.

### MATERIALS AND METHODS

Mon district covers an area of 1786 sq.km. The study was done in Tizit area which lies on the coordinates 26° 54'11" N 95°4'57" E, and is a subdivision of Mon and consists of 29 villages. The topography of Mon is divided into two regions namely, the upper region comprising of Longching, Chen, Mopong and Tobu areas and the lower region comprises of Mon, Tizit and Naganimora areas. Tizit area and Naganimora area lie on the foothill and in the plains of Assam. Tizit experience hot summer but pleasant winters and average rainfall received is 2000 mm to 3000 mm mostly during May to October. Tizit is bordered with Arunachal Pradesh on the northeast side, northwest by Sivasagar district of Assam, and on the east with Myanmar. Tizit is approximately 40 kms away from district headquarter. The identification was done with latest monographs published.

### RESULTS AND DISCUSSION

Field study for documentation of bamboo species was taken up in Tizit, Mon district, Nagaland. A total of 9 bamboo species under 4 genera were recorded as shown in the (Table 1). Among them, the genera *Bambusa* was found to be the most dominant and widely distributed species followed by *Dendrocalamus*, *Schizostachyum* and *Chimonocalamus*. The richest bamboo species diversity that

has been found commonly in this area are *Bambusa tulda*, *Bambusa vulgaris*, *Bambusa balcooa*, *Bambusa nutans*, and *Bambusa pallida*. In addition, a proper documentation of different utilization of bamboo such as for construction purposes, food sources, housing, and water storage as well as handicrafts products with their local prize range in the market have also been surveyed and mentioned in (Table 2).

### Utilization

Bamboo is considered as one of the oldest construction resources utilized by mankind (Mohmod *et al.*, 1990) and are also known to be a fast-growing and tallest species in Poaceae family (Antonio *et al.*, 2014; Wysocki *et al.*, 2015; Grosser and Liese, 1971). It has numerous applications with valuable economic importance to the people for centuries. Due to its wide range of species diversity, durability, flexibility, light weight and its rapid growth, bamboos have been used in multipurpose. Bamboo stems are used for supplying water in agricultural fields. Leaves are used as fodder for animals. It had been used extensively as an alternate for timber. Thus, bamboo plays a major role in the daily life of the people in this area.

In certain parts of Asia, bamboo shoots are harvested in spring or early summer. Young bamboo sprouts are used as vegetables mostly in Asian dishes and broths. In Nagaland, it is harvested in the month of June to October. The most commonly harvested species of bamboo found in Tizit area is *Bambusa balcooa*. They are used mainly for construction purposes especially as a pole in housing and are usually harvested in early winter. They are also used for scaffolding, bridges, handicrafts, agricultural tools such as spade handle, machete and as fishing tools. *Schizostachyum dullooa* are also used in construction purpose i.e. for making bamboo walls, woven mats, floor, cups and shoots are also consumed as a vegetable. *Dendrocalamus asper* stems are used to store water and other food stuffs as they are large and hollow; in the olden days it was also used for making spoons and plates.

Young shoots of *Bambusa tulda*, *Bambusa balcooa*, *Dendrocalamus hamiltonii*, and *Schizostachyum dullooa*

locally known as 'Ngat', 'Vahna', 'Zoanu' and 'Rah' respectively, these species have high economic value particularly fermented bamboo shoots which is usually sold in the market. It is sold in a variety of processed products such as fresh, dried or canned. Bamboo shoots are a part of traditional curry mostly cooked with Naga dal or beans. The fermented version is called 'Matham' by the Konyak tribe, and is often served with pork. These young bamboo shoots are collected, the foliage are removed and cut into various shapes for fermentation. After fermenting for about three to four months, the bamboo shoots are ready for consumption. They can be stored for years in a clean air tight container or dried in the sun for long shelf life and these dried shoots are locally called 'Makhey'.

### Economic importance

Among the total species recorded *Dendrocalamus hamiltonii*, *Bambusa tulda*, *Bambusa balcooa*, and *Schizostachyum dullooa* have the maximum market value, while *Dendrocalamus asper*, *Bambusa vulgaris*, *Bambusa nutans*, *Bambusa pallida*, and *Chimonocalamus griffithianus* are found to have lower market utility. One of the major imperative economic benefits that most local dwellers get is when they engaged in commercial transaction in their bamboo produce. Furthermore, it creates jobs and opportunities to local unemployed youths to explore their skills which add significantly to the rural agricultural economy in general and alleviates poverty from the rural poor communities.

The youths utilize bamboos in art and crafts and are much valuable in the market. Products like 'mudda' fetches around Rs. 500-1000 based on its size and product quality. Other handicraft products like bamboo cups, bamboo fishing traps also fetches good sum of money. Fermented bamboo shoots can fetch amount ranging from Rs. 100-1000 based on the size of the container. Fermented bamboo shoot juices are also sold for Rs. 30-50 per bottle. Bamboos are highly used as scaffolding and people mostly buy at price ranging from Rs. 50-100 per piece.

**Table 1:** Enumeration of bamboo species and its utilization in Tizit area.

Sl No.	Scientific Name	Local Name	Utilization
1	<i>Dendrocalamus asper</i>	Taü	It is used as water storage. It is also used as plate and spoons, broom, stools etc.
2	<i>Bambusa tulda</i>	Ngat	As fencing and housing, water supply/pipes, young shoots are edible.
3	<i>Bambusa vulgaris</i>	Vahnan	Decorative arts & Crafts.
4	<i>Bambusa balcooa</i>	Vahna	As pole in housing, scaffolding, bridges, crafts, as handle for fishing, agricultural tools, Young shoots are edible.
5	<i>Bambusa nutans</i>	Veinu	As fence and housing.
6	<i>Bambusa pallida</i>	Veisa	Used in housing construction.
7	<i>Dendrocalamus hamiltonii</i>	Zoanu	As binding rope, bamboo crafts, young shoots are edible.
8	<i>Schizostachyum dullooa</i>	Rah	Used in housing, floor, mat and bamboo walls. Used as disposable cups. Young shoots are edible.
9	<i>Chimonocalamus griffithianus</i>	Vahcheang	Used in housing.

**Table 2:** Bamboo products and its values in market of Tizit area.

Sl. no.	Species name	Product	Local name of the product	Market price (Rs)
1.	<i>Schizostachyum dullooa</i>	Bamboo wall for housing	Kaa	200-500
2.	<i>Bambusa tulda</i>	Bamboo pole for housing	Thong	50-100
3.	<i>Bambusa tulda</i>	Bamboo cup	Pae	150-200
4.	<i>Bambusa balcooa</i>	Bamboo pole for housing	Thong	200
5.	<i>Dendrocalamus hamiltonii</i>	Bamboo shoot	Maey	150-200
6.	<i>Dendrocalamus hamiltonii</i>	Bamboo shoot juice	Maey tee	50-100
7.	<i>Dendrocalamus hamiltonii</i>	Carrying basket	Tsong	300
8.	<i>Dendrocalamus hamiltonii</i>	Winnowing tray	Dola	300
9.	<i>Dendrocalamus hamiltonii</i>	Mini basket	Sokso	200-400
10.	<i>Bambusa tulda</i>	Fish trap	Seem	100-500
11.	<i>Dendrocalamus hamiltonii</i>	Binding rope	Lung	20-30
12.	<i>Bambusa tulda</i>	Stool	Mudda	500-1000
13.	<i>Dendrocalamus hamiltonii</i>	Eating plate	Tzap	200-300
14.	<i>Dendrocalamus hamiltonii</i>	Mat	Dahmn	500-700
15.	<i>Dendrocalamus hamiltonii</i>	Rice drying tray	Tsah phot	200-700

### CONCLUSION

During this study we identified 9 species of bamboo belonging to 4 genera in Tizit area. Bamboo plays a very pivotal role in the lives of Tizit by fetching them food, money and even shelter. Therefore, the use of bamboos should be judicious and also there is in need of cultivation as we can see its market value. People of Tizit should utilize the fertile land for its cultivation and also make proper effort for its management, conservation and exportation.

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### REFERENCES

- Akwada, D.R. AND Akinlabi, E.T. (2016). Economic, social and environmental assessment of bamboo for infrastructure development *ICIDA-2016* conference.
- Bhatt, B.P.; Singha, L.B.; Sachan, M.S. and Singh, K. (2004). Commercial edible bamboo species of the North-Eastern Himalayan region, India. Part I; Young shoot sales. *J. Bamboo Rattan*, 3: 337-364.
- Bisht, M.S.; Nirmala, C. and Vyas, P. (2012). Bamboo shoot a neglected natural resource: a source of food and prosperity for North-East India. Proceedings of National Seminar: Recent Advances in Natural Product Research. *Mizoram University, Aizawl*, p-18-22.
- Emamverdian, A.; Ding, Y.; Ranaei, F. and Ahmad, Z. (2020). Application of Bamboo Plants in Nine aspects. *Hindawi, The Scientific World Journal*.
- Grosser, D. and Lies, W. (1971). On the anatomy of Asian bamboos, with special reference to their vascular bundles. *Wood Science and Technology*. 5: 290-312.
- Gu, L.; Zhou, Y.; Mei, T., Zhou, G. and Xu, L. (2019). Carbon footprint analysis of bamboo scrimbe flooring- Implications for carbon sequestration of bamboo forests and its products. *Forests* 10: 51.
- Kithan L.N. (2014). Socio-economic importance of bamboo among the Nagas of Nagaland, *Journal of Human Ecology*, 48(3): 393-397.
- Lalhrualtuanga, H. and Prasad. M.N.V. (2006). Traditional Uses, Economic Importance and Ecological Services of *Melocana baccifera* Roxb. in Mizora, India. *The Asian and Australasian journal of plant science and biotechnology*, 3(1): 1-6.
- Lokho, K. and Narasimhan, D. (2019) Bamboo- The timber of Mao-Naga community, *Ethnobotany Research & Applications*, 18(27): 1-10.
- Loushambam, R.S.; Singh, N.R.; Taloh, A. and Mayanglambam, S. (2017). Bamboo in North East India *Indian Journal of Hill Farming*, 30(2): 181-185.
- Mao, A.A. and Odyuo, N. (2006). Traditional fermented foods of the Naga tribes of Northeastern, India, *Indian Journal of Traditional Knowledge*, 6(1): 37-41.
- Mohmod, A.L.; Ariffin, W.T.W. and Ahmad, F. (1990). Anatomical features and mechanical properties of three Malaysian bamboos. *Journal of tropical Forest science*, 2(3): 227-234.
- Naithani, H.B. (2015) Bamboos of Nagaland. NEPED, NBDA. pp- 23-24.
- Raizada, A.C. and Singh, G. (2002). Production, nutrient dynamics and breakdown of leaf litter in six forest plantations raised on gravelly flood plain in the lower western Himalayas, *Journal of Tropical forest Science*, 14 (4): 499-512.
- Setiawati, T.; Mutaqin, A.Z.; Irawan, B.; Amillah, A. and Iskandar, J. (2017). Species diversity and utilization of bamboo to support life's the community of Karangwangi Village, Cidaun Sub-District of Cianjur, Indonesia, *Biodiversitas*, 18(1): 58-64.
- Sharma, M.L. and Nirmala, C. (2015). Bamboo Diversity of India: An update *10th World Bamboo Congress*, Korea.
- Tamang, B. and Tamang, J.P. (2009). Traditional knowledge of biopreservation of perishable vegetables and bamboo shoots in Northeast India as food resources. *Indian Journal of Traditional Knowledge*, 8(1): 89-95.
- Tewari, S.; Banik, R.L.; Kaushal, R.; Bhardwaj, D.; Chaturvedi, O. and Gupta, A. (2015). Bamboo based agroforestry systems. ENVIS centre on forestry. National Forest Library and Information Centre forest Research Institute, ICFRE, Dehradun, p-24.
- Tewari, S.; Negi, H. and Kaushal, R. (2019). Status of Bamboo in India, *International Journal of Economic Plants*, 6(1): 030-039.
- Walling, M. and Puro, N. (2018). Bamboo Diversity and Utilization in Mokokchung District, Nagaland, *EPH- International journal of Agriculture and Environmental Research*, 4(9): 14-25.

- Wong, K.M. (2004). Bamboo: The Amazing Grass, A Guide to the diversity and study of bamboos in southeast Asia, International Plant Genetic Resources Institute (IPGRI).
- Wysocki, W.P.; Clark, L.G.; Attigala, L.; Ruiz-Sanchez, E. and Duvall, M.R. (2015). Evolution of the bamboos (bamusoideae; poaceae): a gull plastome phylogenomic analysis, *BMC Evolutionary Biology*. 15: 50.
- Yu, X. (2007) Bamboo: Structure and Culture, utilizing bamboo in the industrial context with reference to its structural and cultural dimensions. Ph.D. Thesis, University of Disburg-Essen.
- Yuming, Y.; Kanglin, W.; Shengji, P. and Jiming, H. (2004). Bamboo diversity and traditional uses in Yunnan China, *Mountain resources and develop*, 24(2): 157-165.