

A Study of Resources With Reference to Distribution, Types and Potential/Prospect of Bamboo Forest in Mizoram, India

Bobby Beingachhi^{1*} and David Zothansanga²

¹*Department of Geography, Mizoram University, Pachhunga University Campus, Aizawl, Mizoram, India*

²*Department of Public Administration, Mizoram University Pachhunga University Campus, Aizawl, Mizoram, India*

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ABSTRACT

Bamboos are self renewable resources and comprises one of the most important natural resources of the world. Many species of bamboos are largely distributed especially in the tropical and sub-tropical of the world and play a prominent role in the economy of developing countries in Asia, Latin America and Africa. All over the world there are about 1200 species of bamboos. In India, N. E. India has a great diversity and culture of bamboo. Bamboo is a very important non-timber forest produce which is a quick growing and has short rotation. It has good regeneration and economic values. For centuries, bamboos have played an important role in the daily life of the people in many countries with wide range of values and uses. Mizoram has abundant natural bamboo resources, the current listings now indicate that out of 150 India's bamboo species, as many as 64 species occur in North-East India, out of which 22 species have been recorded from Mizoram. Bamboos found in Mizoram are both clump and non-clump forming, the non-clump forming are commonly found in the cooler, higher parts of the State while the clump forming are mostly distributed in the sub-tropical region.

Key words: Bamboo, Forest, Timber, Mizoram

Introduction

One of the world's most significant natural and renewable resources is bamboo. The world's tropics and subtropics are home to a wide variety of bamboo species, which are essential for the economies of developing nations in Asia, Latin America, and Africa. There are approximately 1200 species of bamboo in existence worldwide. In India, Northeast India has a rich bamboo culture and diversity. One billion of the 2.5 billion people use bamboo for housing. Trade accounts for about \$5 billion annually

(tropical timber 8 billion USD). It offers employment, ecological upkeep, food security, and environmentally friendly goods. Total acreage, or 22 million hectares, exceeds 1% of tropical and subtropical forest.

Other names for bamboo include "giant grass," "poor man's timber," "the timber of the twenty-first century," and "green gold."

According to estimates, bamboo generates roughly 4.5 billion dollars in revenue annually through commodities and jobs. Population increase destroys tropical forests quickly, which has led to an

ever-increasing need for lumber for industrial purposes. A raw material alternative to wood and other building materials is bamboo. With an increase in bamboo culm yield, the outcomes of previous research activities have already greatly enhanced bamboo farming, management, and processing techniques.

The world's richest bamboo resource, covering 10.05 million hectares or roughly 12.8% of the nation's total forest area, is found in India. Bamboo, which multiplies and has a short rotation, is a crucial non-timber forest product. Its economic values and rejuvenation are strong. Bamboos have a long history and have been used for a variety of purposes over the world, contributing significantly to people's daily lives. Food, housing, and crafting materials are the three most significant traditional applications. According to estimates, bamboo generates roughly \$5 billion in revenue annually through goods and jobs. Another US\$2.7 billion is generated annually from bamboo exports.

Environment and bamboo

In Europe and North America, bamboo's ornamental value for indoor and outdoor use is growing in popularity. Bamboo is utilised to create windbreaks and stabilise soil because of its quick growth and active rhizome development. Additionally, it is the best plant for social forestry. The fastest-growing plant on the planet is bamboo. It is an important species for the landscape since it acts as a barrier, wind-break, and source of shade. In numerous ways, bamboo promotes a better environment. In addition to storing carbon and lessening the effects of tropical rains, it reduces the light intensity and provides UV protection.

A bamboo forest may even function as a natural system for cleaning the air, converting pollutants into nutrients for plants and yielding profitable crops. According to research, bamboo-based agroforestry may be a practical method for restoring degraded jhumland and reducing pressure on the natural forest tract. Bamboo can restore soil harmed by excessive grazing, relocating agriculture, erosion, etc.

In addition to storing carbon and lessening the effects of tropical rains, bamboo contributes to a healthier ecosystem in a variety of other ways. A bamboo forest may even function as a natural system for cleaning the air, converting pollutants into nutrients for plants and yielding profitable crops.

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Bamboo stands release 35% more oxygen than comparable tree stands, making them the fastest-growing canopy for regreening degraded soils. Some bamboo varieties can trap up to 12 tonnes of carbon dioxide per hectare. Additionally, bamboo can reduce light intensity and block UV radiation. According to research, bamboo-based agroforestry may be a practical method for restoring degraded jhum lands and relieving pressure on the natural forest tract.

It is primarily found in temperate to tropical forests in warm and chilly climates. It thrives in wet regions near streams and valleys. Warm weather, slightly acidic to neutral soil, and sandy loam texture are preferred. In jhum fallows, expand as secondary forest.

Types of Bamboo

There are three different types of bamboo based on their development habits.

1. Monopodial: Individual culms of non-clump-forming bamboo often grow.
For example, *Melocannabaccifera*.
2. Sympodial bamboo: Bamboo that forms clumps and grows in groups, such as *Hamiltonii*
3. Climbing bamboo: The main culm climbs like canes and requires help to grow. Includes *Dinochloamalayana*

Bamboo Species in Mizoram

Mizoram has a wealth of natural resources for bamboo; the first mention of the nine different kinds of bamboo in Mizoram is found in Fishcer's "The Flora of the Lushai Hills" (1938). Later, 18 species were listed by the Department of Environment & Forest and 18 species were noted by Naithani (1994) in his report on the preliminary survey of bamboo species in Mizoram. According to the most recent listings, 64 of the 150 bamboo species found in India-out of which 22 species have been identified from Mizoram-occur in North-East India. There are clump-forming bamboos in Mizoram, including *Bambusa*, *Dendrocalamus*, etc. The clump-forming bamboo can only grow on steep inclines and are generally difficult to reach; they are mainly found in subtropical areas.

Except for *Melocannabaccifera*, a significant portion of secondary flora on previously jhummed lands

in tropical places, the non-clump-forming bamboo species are often found in the cooler, higher parts of the State. *Melocana baccifera* (Mautak), *Dendrocalamus hamiltonii* (Phulrua), *Dendrocalamus longipathus* (Rawnal), *Bambusatulda* (Rawthing), and *Schizostachyumdulloa* (Rawtla) are the five most dominant species in Mizoram, according to a survey conducted by the State Forest Department. *Melocana baccifera* contributes nearly.

Distribution of Bamboo Forest in Mizoram

Natural bamboo resources abound in Mizoram, with the five northern districts having the greatest concentration. Most bamboo species native to the State is located between 40 and 1500 metres, with a considerably smaller distribution over 1550 metres. Additionally, bamboos are found as understory plants in tropical moist deciduous and evergreen forests, in pure stands along riverbanks, in and near settlements, and as the primary and secondary vegetation on jhum lands that have been abandoned. When primary forests are cleared, bamboo, notably *Melocanna baccifera*, which dominates the species composition, is established.

Both clump-forming and non-clump-forming bamboo may be found in Mizoram, with the former being more frequently distributed in the subtropical area and the latter in the cooler, higher areas of the State. According to a survey by the State Forest Department, the five most dominant species are *Melocanna baccifera*, *Dendrocalamushamiltonii*, *Dendrocalamus longispatus*, *Oxythenantara parreifolia*, and *Neohouzeua dulloa*. *Melocanna baccifera* contributes nearly 98% of the total growing stock, while clump-forming species only share a meagre 2%. The area of bamboo woods is approximately 6,118 sq km or 29.01% of the State's total area. The growing stock is expected to be around 25.25 million metric tonnes, and the yearly availability from the ever-increasing stock is estimated to be 5.828 million metric tonnes, according to the State Forest Department's survey. Mizoram uses bamboo extensively in building, furniture, fencing, weaving, pulping, and other products. Four of the 22 species are edible and frequently consumed as a significant food source. Additionally processed and accessible all year round in tins are bamboo shoots.

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Uses of Bamboo

Bamboo is used for a limited number of purposes at the moment. In total, 28,315 metric tonnes of bamboo are consumed annually for construction, handicrafts, and looms, as well as royalties from the felling of bamboo for paper mills. Despite making up almost 30% of the forest's income, bamboo resources are not adequately managed. The mahal system is the primary method of selling bamboo; under this system, contractors are granted the annual right to harvest bamboo from the forest in exchange for a fee. Since bamboo is typically used for non-market purposes, it isn't easy to estimate its financial value.

The primary applications for bamboo include weaving, food production, and house construction. Additionally, there is no data on the economics of trading such things, the earnings of specific weavers, or their expenses and returns. A bamboo policy

has been developed for Mizoram to make the best use of the considerable untapped bamboo resources for boosting the rural economy and industrial growth.

I. As food: After boiling, bamboo shoots can be consumed fresh. Some species' shoots can be consumed uncooked as well. But because bamboo shoots are a seasonal item, preservation is required for storage. Both small-scale cottage industries and massive industrial configurations can be preserved using various techniques. The majority of bamboo species have edible shoots that are eaten locally without the need for any preserving methods. The three most prevalent species are tulda (rawnal), baciferra (mautak), and longispathus (rawthing).

II. Due to its unique strength, bamboo has traditionally been utilised as a building material in numerous locations, including for roofs, walls, floors, and other structural components. Bamboo is widely used for scaffolding and supports in constructing permanent structures worldwide because of its excellent strength.

With technological advancements, bamboo may be utilised to build homes with more robust structures at a lower cost than other materials because of its structural system, joints, and other features. Construction made of bamboo in Costa Rica resisted earthquakes better than other materials. The Bangalore-based Indian Plywood Industries Research and Training Institute has created bamboo mat roofing materials. The Bamboo Development Agency - Mizoram is also developing bamboo concrete technology for construction. Thus, bamboo is a material that will be used in construction in the future.

3. As a substitute for wood: Wood is becoming rarer and rarer as global forest stocks are being depleted and environmental concerns are rising as it takes a long time for even soft wood to mature. Therefore, if that is impossible, the replacement must be identified or an alternative found. For this, bamboo is the best option.

Split bamboo can be processed with machinery and glue to create a bamboo board, which can be utilised for practically any application where wood is currently used. Bamboo mat board, which is stronger and lasts longer than plywood, is made from sliced, weaved, and hot-pressed bamboo. Heat-pressing bamboo mats and slivers make bamboo ply board. Because bamboo plyboard can be made water resistant and is highly sturdy, it can be used for construction boards and other purposes.

Round bamboo is flattened either via special methods or by applying heat and is hot pressed with adhesive. Floors of truck bodies, railroad cars, and containers are made of bamboo strip planks. Bamboo strip boards can be used to create continuous widths that are greater than the available timber. The bamboo corrugated mat roofing sheet was created by IPIRTI in Bangalore, India, and can be used for roofs. Also made are bamboo particle boards, which combine bamboo with other cementing components.

Applications for bamboo charcoal include the protection of the environment, the food industry, the pharmaceutical business, the chemical industry, the metallurgical industry, and high-tech as a novel material. To produce activated charcoal, regular bamboo charcoal is processed in an Activation burner using steam at temperatures above 800 °C. Bamboo The by-product of making bamboo charcoal is vinegar. Bamboo vinegar is made by condensing the steam that is released during the manufacturing of bamboo charcoal. For organic fertiliser, preservation medium, and paint relief, among other things, bamboo vinegar oil is employed.

Mizoram has a wealth of medicinal plants among its forest resources, yet research into these species is given little attention, and until 1990, there was no effort to survey these plants. From 1990 to 1995, work was done on botanical collecting and study. Till date, more than 400 medicinal plants have been identified, 62 of which have been documented as novel medicinal plants and 64 of which have been classified as vulnerable species. One of the opportunities and research fields in Mizoram is the in-depth study and thorough inventorization of medicinal plants in biodiverse areas.

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