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# Inventorying bamboo diversity of Kokrajhar District, BTAD, Assam, India with emphasis on its uses by the *Bodos* and allied tribes

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***Abstract***

**BACKGROUND & OBJECTIVE:** Bamboo (Poaceae), an important non-wood forest resource has been interwoven with the life style of the *Bodos* and allied tribes of this region since ages but there is as such no documentation of bamboos found in Kokrajhar district of Assam, India. Thus, here an attempted have been made to present diversity of bamboo species along with their utilization by the resident tribes. **METHODOLGY:** Field visit were conducted for collection coupled with consultation with the published literatures, experts for proper identification and extensive interviews with the local people to record the uses and vernacular names. **RESULTS:** A total of 13 species, 2 varieties and 1 forma under 5 genera were recorded from Kokrajhar district. The genera *Bambusa* was found to be the most dominating with eight species, two varieties and one forma. The myriad uses of bamboo by the local as construction material, raw material for pulp and paper industries, *agarbati* (incense sticks) industries, designing minor craft have also been presented. Of the total 9 species produces edible shoots which forms a favourite item for the tribes.

***Keywords:*** Bamboo, diversity, Kokrajhar, Assam, uses



## *1. Introduction*

Bamboos are a group of about 1575 species of perennial evergreen plants belonging to the subfamily Bambusoideae (Poaceae)[1,2]. China has the highest number of bamboos in terms of genetic variation whereas geographically India has more land under bamboo[3]. In India, there are about 136 indigenous and exotic species found to grow naturally and/or under cultivation[4]. Northeastern states like Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland and Sikkim along with the state of West Bengal (North Bengal, Himalaya) houses over 50% of the total bamboo species recorded in India[5]. Bamboo is found in almost all the parts of the country except Jammu and Kashmir[5]. The numbers of genera and species of bamboo have been estimated by different researchers round the globe over time[6-8], but however it is yet to be resolved perfectly. In Assam, 40 species, one variety and one forma of bamboos belonging to 10 genera have been reported[9].

Bamboo is closely associated with indigenous culture and knowledge not only in Asia but also in Africa and Latin America. Today bamboo has over 1500 applications and thus its status has been changed from 'Poor man's timber' to 'Green Gold of forests'[3,10,11]. Bamboo serves as a superior material for constructions, utensils, weapons, fuel, fodder, food, firewood, furniture, mats, chop sticks, tooth picks, handicrafts, musical instruments etc[12]. Apart from its extensive use in paper and pulp industries, nowadays bamboo is used in making hard boards, flooring, corrugated sheets etc[13]. The shoots are used in many exquisite culinary preparations like pickle, vegetables, soup, salads, vinegar and several other forms in different countries[14].

From ancient time bamboo has been an important ingredient of traditional Asian Medicines. Recently, many biologically active components in bamboo leaves and their potential health benefits have been widely studied[15-20]. Thus it can safely be asserted that each part of bamboo is not only a treasure but also a medicine. The use of bamboo is endless and because of this it is an indispensable resource for the rural people.

Thus keeping this in mind the present study aims at providing a comprehensive account on the diversity and uses of bamboos growing in Kokrajhar District of Assam through literature and extensive field surveys and maintenance of germplasm.

## *2. Study Area*

Assam, the gateway to northeast India is surrounded by International borders of Bhutan and Bangladesh in addition to the interstate boundaries with West Bengal, Tripura, Manipur, Mizoram, Meghalaya, Arunachal Pradesh and Nagaland.

The present inventory was conducted in the Kokrajhar District of Assam. Kokrajhar is one of the 27 districts of Assam. Kokrajhar district lies roughly between 89˚46' to 90˚38' East longitudes and between 26˚19' to 26˚54' North latitudes. The district is demographically dominated by tribal and non-tribal

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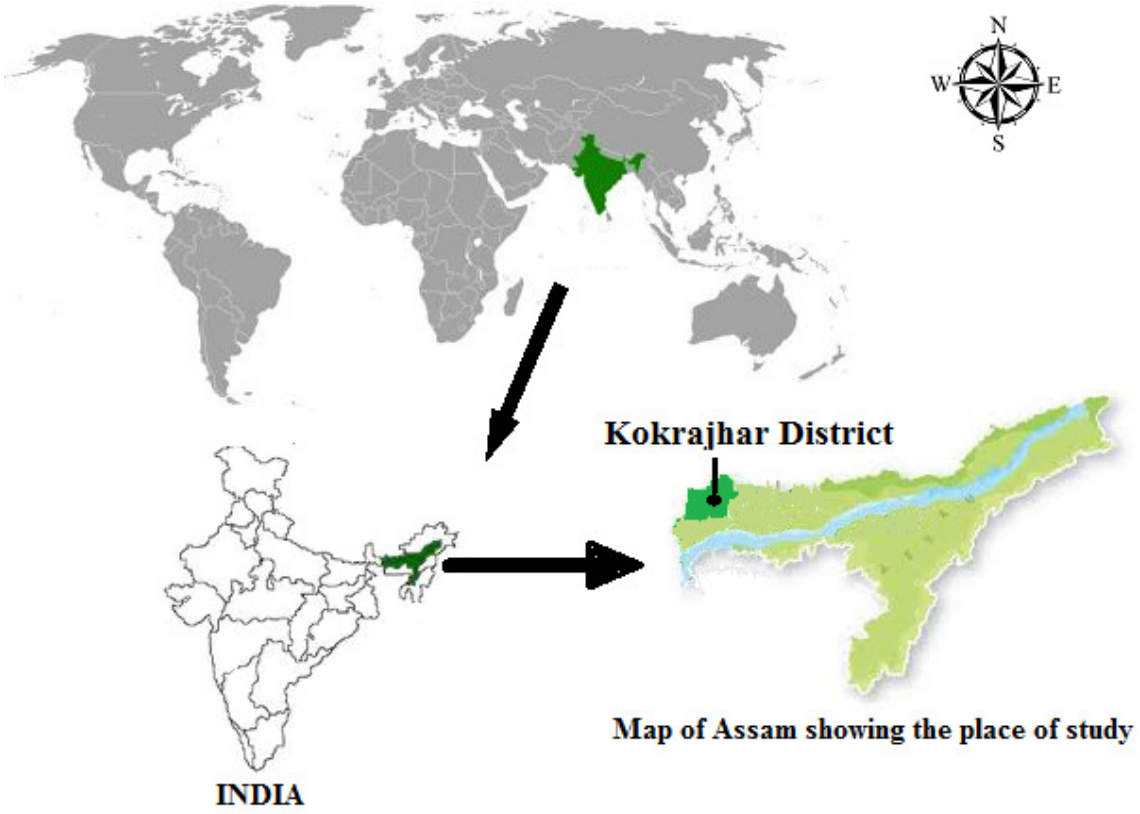


**Figure I: Map of study area**

communities namely *Bodos, Ravas, Koch Rajbangshis, Santhals, Orangs, Muslims, Nepalis, Bengalis* etc[21]. The total geographic area of the district is estimated to be 3,169 $Km^2$ of which 1,144 $Km^2$ is under forest cover[22] (figure I). The district has been divided into three Agro Ecological situations *viz.* Plain zone, Hill and Hillock zone and Foot Hill area based on physiography, hydrology, soil, climate and cropping patterns. The climate of the district is humid sub-tropical in nature characterized by warm-humid summer and cool-dry winter.

## *3. Methodology*

Field visits were conducted in several places almost covering the entire district for documenting the bamboo species. Initially random walk in the forest was opted for sampling and later regular interval was maintained to have fixed sampling intensity for the study[2]. During field trips elaborate notes were made on the habit, habitat and characters of different parts at different stages of development. The provisional identification was made using some manuals and taxonomic keys available in the public domains, like Handbook of Indian bamboos[23]; Diversity and Distribution of bamboos of Assam[9]; Bamboos of Sikkim (India) Bhutan and Nepal[24]. However final authentication was done with the help of experts. The specimens thus collected are planted in "Bambusetum" at Bamboo Technology, Department of Biotechnology, Bodoland University to maintain the germplasm. To document the vernacular name and utilization of bamboos, the local people were interviewed.

## *4. Results and Discussion*

### *4.1. Bamboo diversity*:

Kokrajhar district of Assam is laden with different species of bamboos. The inventory conducted throughout the district resulted in collection of thirteen species, two varieties and one forma under 5 genera (table 1). Of the five genera, *Bambusa* was found to be the most dominating with eight species, two varieties and one forma followed by *Dendrocalamus* with only two species, while others *viz. Melocanna*, *Gigantochloa* and *Schizostachyum* were represented by one species each.

A total of 40 species, one variety and one forma have been reported from Assam[9]. In the same study, they mentioned the occurrence of eight species and one variety belonging to 3 genera in the Kokrajhar district of Assam, India. In our study we have encountered all the species of bamboos mentioned by Barooah and Borthakur[9] except *Bambusa teres*. In addition to these we were successful in collecting 6 species, one variety and one forma namely *Bambusa garuchokua*, *B. pallida*, *B. poymorpha*, *B. vulgaris* f. waminii, *B. vulgaris* var. vulgaris, *Dendrocalamus giganteus*, *Melocanna baccifera*, *Schizostachyum pergracile* adding two new genera *Melocanna* and *Schizostachyum* to the existing three genera. This variation in the number of genera and species might be attributed to the taxonomic ambiguity[25] since the flowering in bamboo is an unusual event which can be over 100 years in some species[26] and the taxonomists have to rely upon the morphological characters for the identification of the same. However today, scientists have diverted towards molecular techniques and thus in this modern era morphological features coupled with molecular studies are implemented to resolve the long-standing problem related to identification of bamboo[1,11].

### *4.2. Uses of bamboo*:

Bamboo is well acknowledged as one of the most important plant by the rural people of North-east India in general and the *Bodos* and allied tribes residing in Kokrajhar district in particular because of its multifarious traditional uses. Bamboo

**Table I: List of bamboo species encountered in Kokrajhar district with their vernacular name and place of collection**

| Sl. No. | Scientific Name | Bodo Name | Assamese Name | Place of collection |
|---|---|---|---|---|
| 1. | *Bambusa assamica* Barooah *et* Borthakur | Owa there | Saur bijuli | Dotma, Karigaon |
| 2. | *Bambusa balcooa* Roxb. | Owa burkha | Bhaluka banh | Dimalgaon, Karigaon |
| 3. | *Bambusa bambos* Willd. | Owa suganang | Kotoha banh | Dimalgaon |
| 4. | *Bambusa garuchokua* Barooah *et* Borthakur | Owa gorai athing | Nagal banh | Dotma, Titaguri, Karigaon, Dimalgaon |
| 5. | *Bambusa multiplex* (Lour.) Raeusch. Ex Schult. | Owa barsidanda | Jupri banh | Hadanpara, Bengtol |
| 6. | *Bambusa pallida* Munro | Owa hathai | Bijuli banh | Throughout the district |
| 7. | *Bambusa polymorpha* Munro | Owa ridwing | Betwa banh | Dimalgaon |
| 8. | *Bambusa tulda* Roxb. | Owa gubwai | Jati banh | Throughout the district |
| 9. | *Bambusa vulgaris* Schrad. ex J. C. Wendl. f. Waminii (Brandis) Wen | Owa daihu | Kolochi banh | Batarmari |
| 10. | *Bambusa vulgaris* Schrad. ex J. C. Wendl. var. Vulgaris A. Riviere & C. Riviere | Owa telai | Telai banh | Dimalgaon |
| 11. | *Bambusa vulgaris* Schrad. ex J. C. Wendl. var. Vittata A. Riviere & C. Riviere | Owa gwmw | Halodhia banh | Karigaon, Batarmari, Chandarpara |
| 12. | *Dendrocalamus hamiltonii* Munro | Owa khangkhua | Kekowa banh | Dotma, Karigaon, Dimalgaon |
| 13. | *Dendrocalamus giganteus* Munro | Owa khangkhua gidir | Kako banh | Balagaon |
| 14. | *Gigantochloa albociliata* (Munro) Kurz | Owa phakra | Kalisuneti | Titaguri |
| 15. | *Melocanna baccifera* (Roxb.) Kurz | Owa thorai | Muli banh | Dotma, Debargaon, Charaikhola |
| 16. | *Schizostachyum pergracile* (Munro) R. Majumdar | Owa maidang | Medang Banh | Karigaon |

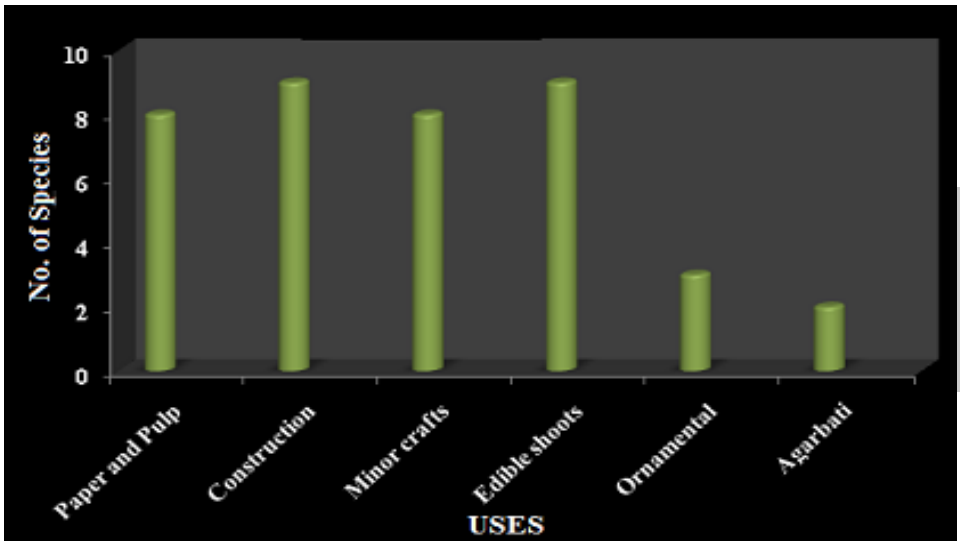


**Figure II: Utility pattern of different bamboo species by the *Bodos* and allied tribes of Kokrajhar district.**

can rightly be called the backbone of the rural culture in this part of the India. Of the thirteen species, two varieties and one forma, nine suits construction purposes like scaffolding, housing, rafters, posts etc., nine species produces edible shoots which can be pickled or used in various culinary preparations by the tribal's (Fig 2). Eight species are used for pulp and paper production while eight species find their application in designing minor crafts such as fishing gears (like *Kokha, Sen, Zekhai, Kobai*), Sieves (*Songrai, Sandanga, Sandri*), hats, hand fans (*Gisib*), head gear (*Kopri*), baskets, wall hangers, Spinner (*Danganata*) etc which is an important part of their daily life (Fig 3). Only two species, *Bambusa balcooa* and *B. polymorpha* are used for making '*agarbati*' sticks. One species *Gigantochloa albociliata*, one forma *Bambusa vulgaris* f. Waminii and one variety *Bambusa vulgaris* var. vittata are planted as ornamental plants because of their beautiful culms.


**Figure III: Some minor crafts made of bamboos used by the *Bodos* and allied tribes. (a) Fishing gears (*Kokha, Sen, Zekhai, Kobai*); (b) Sieves (*Songrai*, *Sandanga*, *Sandri*); (c) Head gear (*Kopri*); (d & e) Hand fans (*Gisib*); (f); Spinner (*Danganata*) (g) Stool (*Mora*) (*Photo courtesy*: *Authors*)**

*Bambusa tulda*, *B. balcooa*, *Dendrocalamus giganteus*, *Melocanna baccifera* are most commonly used due to their versatility.

### *Conclusion*

Inventorying bamboo resources of Kokrajhar district shows moderate species diversity. However extensive investigation is required to know emphatically about the bamboo diversity of the district, their distribution pattern, population in wild and homestead plantations, growth behaviour and management for their commercial exploitation and conservation.

Uses of bamboo traditionally in a variety of purposes have become an important part of the cultural diversity of the *Bodos* and the allied groups of Kokrajhar. Now it's the perfect time to take value addition efforts for bamboo to make the bamboo sector an important contributor to the economy of Assam in general and the Kokrajhar Distict in particular. Thus, the bamboo forests should be protected by implementing management strategy on priority basis.

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### *Conflict of interest*

The author's declares none.

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