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BAMBOO DIVERSITY AND UTILIZATION IN MOKOKCHUNG DISTRICT, NAGALAND

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Abstract:-

Bamboo is considered as one of the most ancient and diverse group of plant belonging to the grass family. Over more than 1000 species of bamboos belonging to 90 genera has been identified and described. But the current rate of discoveries suggests that many more species are still unknown. The fascinating facts about bamboo is that it helps reverse global warming and effectively clean up the environment. It is a sustainable and green material and has immense prospect in near future. In Nagaland, with increasing demand of timber and wood, bamboo serves an alternative to forest products. Bamboo also provides food and livelihood to the people.

Keywords:- Bamboo, global warming, livelihood.

I. INTRODUCTION

Bamboo is one of the oldest building materials used by mankind since time immemorial [1]. It is a vital component of social and cultural fabric as a source of sustainable livelihood for billions [2]. Bamboo is a natural composite of which its native originates from most of the tropical countries [1]. It is a perennial, giant, woody grass belonging to the group angiosperm [3].

Wang and Shen [4] and Tamang *et al.*, [5] stated that there are about 60-70 genera and over 1200-1500 species of bamboo in the world. About half of the species are grown in Asian, most of them within Indo-Burmese region which is also considered to be their area of origin [6]. Lee *et al.*, [7] stated that smaller bamboos are found in temperate latitude and the larger ones are found in tropic and sub-tropic areas. Bamboo is a fast growing species and a high yielding renewable resources.

In India, bamboo occupies 12.8% [8] of the total forest area comprising 29 genera and 148 species of bamboo [9 and 10]. Bamboo grows naturally or cultivated in tropical and subtropical regions of India [11]. The North-East India is recognized as one of the reserves of bamboo in India. Out of 148 species of bamboo, 64 species are reported from North-East India and 43 bamboo species have been reported from Nagaland state [12].

Nath and Das [13] stated that bamboo form the important component of agro-silviculture system in North-East India and have an important influence on the carbon balance of the ecosystem through assimilating atmospheric carbon-dioxide. Bamboo forms an important component in the rural landscape of North-East India [14].

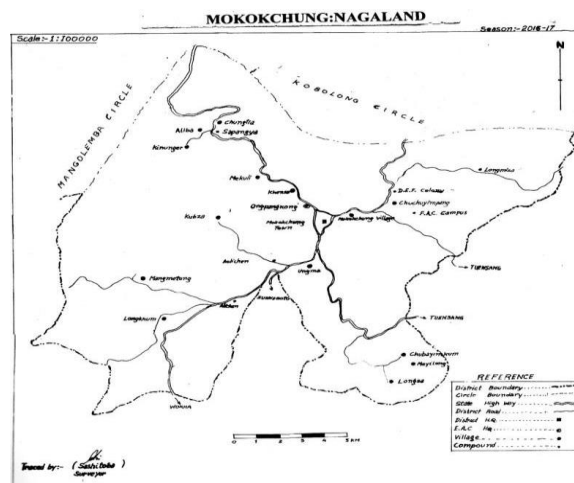
The annual economic value of total bamboo consumption has been estimated \$10 million [15]. Experiences have shown that bamboo has proof beneficial as a valuable and sustainable natural resources particularly in Asian countries [16]. It is regarded as The 'Green Gold' of the 21st century and as 'Poor Man's Timber' because it played as significant role in human society and even today contributes to the subsistence needs of over billions of people worldwide [17].

Bamboo is common for bridge, scaffolding and housing that is sufficiently cheap and plentiful to meet the extensive demand for economical housing [18]. In addition to its more common application, bamboo has other uses [19] from skyscraper scaffolding and phonograph needles to slide ruler, skin of aeroplanes and diesel fuels [20]. Ghavami [21] points to the use of bamboo to be superior than other construction material and its special uses in eco-construction and infrastructure. Bamboo shoots are an important source of food and a delicacy in Asia. Politou [22] estimated that about 4.5 billion people still use bamboo as their primary source of roofing sheet. Bamboo is unique from other plants and trees.

II. MATERIALS AND METHODS

A. Location of the study area

Mokokchung is one of the important districts in the state of Nagaland, India. Out of 16 different tribes in Nagaland, Ao Naga are considered to be the major tribe. The main inhabitants of this district belong to the Ao Naga ethnic group. The district is located at 25.56° N latitudes and between 93.53° and 94.53° E longitudes. The total area of the district is 1,615 square kms. This district is bordered by Wokha district in the west, Assam state in the north, Zunheboto district in the south and Tuensang district in the east. Agriculture is a major part of the economy of Mokokchung district.



B. Site selection

The present study was conducted in Longkhum, Khensa, Mekuli and Chungtia villages, in Mokokchung district of Nagaland, North-East India at different altitude. Bamboo forms an important component in the study area and its occurrence is observed in open forest as well as home gardens. Mokokchung district experiences moderate climate and due to this the productivity of bamboo flourishes as its productivity is determined by the nature of physical and climatic characteristic.

C. Collection of Data

Field survey was conducted in the selected villages and inventorization of bamboo forest was done. Bamboo species were documented along with photograph.

III.RESULT AND DISCUSSION

According to various literature reviewed and field observation undertaken, Mokokchung district showed variation of bamboo species in different selected villages in relation to altitude.

Field visited for documentation of bamboo species were undertaken in four villages at different altitude of Mokokchung district i.e, Longkhum (1564m), Khensa (1105m), Mekuli (1102m) and Chungtia(971m). During the present investigation 15 different species were documented. Out of 15 bamboo species recorded from these four villages, 8 species were recorded from Longkhum, 12 species were recorded from Khensa, 14 species from Mekuli and 14 species from Chungtia respectively. The dominant species in these four villages were *Bambusa tulda*, *Dendrocalamus asper* and *Bambusa jaintiana*.

Following is the list of bamboo species recorded from the four villages:

Table: I

Scientific Name	Local Name	Longkhum	Khensa	Mekuli	Chungtia	Uses
<i>Dendrocalamus asper</i>	Changpu	*	*	*	*	Construction and making thick walls
<i>Bambusa mokokchungiana</i>	Anang	-	*	*	*	Basket and handicrafts
<i>Dendrocalamus hamiltonii</i>	Watsa	*	*	*	*	Mats, basket, water vessels
<i>Chimonocalamus griffithianus</i>	Aning	*	*	*	*	Fencing
<i>Bambusa jaintiana</i>	Ana	*	*	*	*	Basket and fences
<i>Dendrocalamus latiflorus</i>	Rangnik	-	*	*	*	Construction and water pipes
<i>Bambusa tulda</i>	Longmi	*	*	*	*	Furniture, toys, scaffolding
<i>Bambusa alemsenshii</i>	Arang	*	*	*	*	Walls, basket etc
<i>Phyllostachys manvi</i>	Ashi	-	*	*	*	Fencing, walking stick, housing
<i>Bambusa mizoramiana</i>	Natang	-	*	*	*	Basket
<i>Bambusa balcooa</i>	Warok	*	*	*	*	Scaffolding, construction
<i>Cephalostachyum capitarum</i>	Dipu	*	*	*	*	Arrows, bows, splits
<i>Bambusa vulgaris</i> var. <i>vittata</i>	Teneya	-	-	*	-	Ornamental, decorative items
<i>Bambusa pallida</i>	Yimpang longmi	-	-	-	*	Basket, mats, toys
<i>Bambusa vulgaris</i>	Warok	-	-	*	*	Fencing

Absent – (-)

Present- (*)

Utilization:

During our forefather times an Ao starts his/her life on the floor of bamboo and ends on the mats of bamboo. Since then bamboo has been and still is an important resource for the Ao community starting from construction of houses with bamboo to eating bamboo shoot and pickles. Bamboo has been used as utensils, burn bamboo as fuel and used bamboo as torches.

This statement illustrates deep attention of the Ao's to this amazing bamboo plant. The most important species of bamboo found in Mokokchung is *Bambusa balcooa*, best suited for house construction, *Dendrocalamus hamiltonii* from which the best type of splints for basket weaving are extracted and *Bambusa tulda* for making floor and walls.

The main bamboo products made by the Ao tribe are varied such as baskets and allied product, musical instrument and various implements. In addition bamboo is also used for construction of building and bridges.

In Mokokchung district, the baskets are commonly known as 'Molok' (Chungli). But each village has their own respective terms of different types of baskets. 'Jangko' (Mongsen) is a type of basket used by Ao Nagas for measuring rice. Another type of basket made of bamboo is 'Chi' (Chungli), this is used for carrying paddy rice. 'Tsushi' (Chungli) is a type of bamboo basket used for carrying fire wood and fetching water. 'Ketsü' is a type of basket used for keeping cloths by old Ao ladies. 'Mosem' (Chungli) is a basket made of bamboo and it is used to store rice. 'Sera molok' is also another type of bamboo basket used for keeping cosmetics, medicines etc.

Dendrocalamus latiflorus is used for making mats which is used in walls and making fences. *Bambusa tulda* species is used for making spoons, handles for daos and knives, pistle etc.

Mats made of bamboo is used for drying rice in the sun. 'Per watsü' (Chungli) are used for separating rice and husk which is another type of bamboo product. 'Changko' another type of bamboo product which has been used for making rice beer. Auo marok (Chungli) is a type of mug used for drinking black tea, tea, rice beer, water. This tradition is been carried out even today during Moatsü and Tsüngremong festivals. 'Wapu' (Mongsen) is a plate made out of bamboo

culms sheath of the species *Bambusa balcooa*. Even today this bamboo plate is used during Ao festivals as part of Ao culture.

The next is weaving, Ao ladies weaves clothes such as ‘süpeti’ (Chungli) and shawls out of yarn. This weaving require certain tools such as ‘imlong,’ ‘süksüing’ etc which are made of bamboo. All the Ao’s feel artistic pleasure in one or the other way. Men express their artistic style in the art of wood carving, painting, basketry and other decorative and the women folk express in weaving, embroidery and pottery. In all these cases bamboo plays and important role either as implements or materials.

Bamboo plays an important role in the field of warfare in the life of Ao’s. Spears, spikes, protective shell etc was made of bamboo. Till this date, these weapons are used in folk dance during Ao festivals.

During the past decades of the Ao’s, bamboo culture had a great role in the romantic life of the youngsters. The presentation of handicrafts by the boys is a significance of love and affection towards their girlfriend. The boy use to make bamboo smoking pipes which is made from the first shoot of bamboo during the year. Usually it coincides with Moatsü festival celebration. During folk dance of Moatsü celebration, if a girl dances with the newly made bamboo pipes, her friends admire her. This indicates that she has a boyfriend. Further, the boy use to make small hand basket out of bamboo for her to use it during weaving clothes and to store spinning material.

Bamboo is a raw material that has the potential for sustainable tourism. This can be done by collaborating with eco-resort projecst in Mokokchung district, wherein bamboo can be used as a sustainable material for construction of cottages. This may initiate innovation and creativity as well as generate income to the local people. Bamboo shoots are edible in most varieties and provide a nice aroma and taste in stir fries and other local recipes. In Ao community, bamboo shoots are harvested as vegetable and it is a important ingredient in most of the curries. Among all the bamboo species, the shoot of *Dendrocalamus hamiltonii* is widely consumed. Bamboo shoots are available in the market in the form of dried, paste and juice.

IV.CONCLUSION

During the present study, as many as 15 species of bamboos belonging to 5 genera were identified from the study site. The photograph of all bamboo species and bamboo crafts are portrayed. Mokokchung district offer lucrative abode of diversified bamboo species. However, the survey of literature reveal that so far not much effort has been made to assess the rich bamboo germplasm resources of this district. Hence, the present investigation was taken up to study the bamboo diversity and its utilization of Mokokchung district.

The utilization of bamboo in Mokokchung district continue to be traditional. Efforts should be made to accelerate bamboo sectors which is an important contributor to the State’s economy and conserving the rich culture of the Ao Naga. The rich diversity of bamboo resources should be conserved in their natural habitat for sustainable utilization of bamboo resources.

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BAMBOO SPECIES FOUND IN MOKOKCHUNG DISTRICT



Local Name : Changpu.
Scientific Name : *Dendrocalamus asper*.
Uses : Making thick walls & building material.



Local Name : Anang.
Scientific Name : *Bambusa mokokchungensis*.
Uses : Basketing & handicrafts.



Local Name : Watsa.
Scientific Name : *Dendrocalamus hamiltonii*.
Uses : Mats, Basket making, Water vessels.



Local Name : Rangnik.
Scientific Name : *Dendrocalamus latiflorus*.
Uses : Water piper , house construction etc.



Local Name : Ana.
Scientific Name : *Bambusa javanica*.
Uses : Basket making , fences.



Local Name : Aning.
Scientific Name : *Chimonocalamus griffithianus*.
Uses : Fencing & Tying the thatch.



Local Name : Longmi.
Scientific Name : *Bambusa tulda*.
Uses : Furniture, scaffolding, toys, wall hangers etc.



Local Name : Arang.
Scientific Name : *Bambusa aleutica*.
Uses : Walls, making basket etc.



Local Name : Ahi.
Scientific Name : *Phyllostachys massali*.
Uses : Fencing, utility for walking stick, home construction.



Local Name : Nalang.
Scientific Name : *Bambusa nana*.
Uses : Making basket.



Local Name : Tenya.
Scientific Name : *Bambusa vulgaris*.
Uses : Use as ornamental planting, construction, house.



Local Name : Wari.
Scientific Name : *Bambusa balcooa*.
Uses : Scaffolding, building.



Local Name : Wari.
Scientific Name : *Bambusa vulgaris*.
Uses : Fencing.



Local Name : Yinyang Longmi.
Scientific Name : *Bambusa pulloa*.
Uses : Basket, Mat, Vessel, Toys etc.
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Local Name : Dips.
Scientific Name : *Cephalostichomyia cepharum*.
Uses : Making bowl & screen, splint.

BAMBOO CRAFTS



BAMBOO SHOOTS FOR CONSUMPTION



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