



BAMBOO: A NATURAL RESOURCE FOR MANKIND - AN OVERVIEW

Abhilash Joseph E\*

Interuniversity Centre for Plant Biotechnology, Department of Botany, University of Calicut, Malappuram Dt, Kerala, India. 673635

ARTICLE INFO	ABSTRACT
Received 10 <sup>th</sup> April, 2016 Received in revised form 09 <sup>th</sup> May, 2016 Accepted 25 <sup>th</sup> June, 2016 Published online 20 <sup>th</sup> July, 2016	Bamboo: -a perennial woody grass occurs under widely varying ecological environments in the tropics and subtropics or in more temperate regions. It is a versatile, fast growing and renewable resource with over thousand non-timber and timber uses, which grow rapidly and produce very high biomass. The more than 1,250 species vary widely in structure. It is becoming more and more a farm crop in addition to being a major forest product. Bamboo has been used for a variety of purposes including environmental restoration and in the production of handicrafts, artefacts, furniture, construction of buildings, pulp and paper manufacture, cottage industries and household usage. Bamboo-ply, laminated boards, flooring, roofing sheets, props and many others have been key wood substitutes of bamboo in the construction industry world-wide. Other vital products such as medicines, food, charcoal, vinegar, beverages, natural pesticides, and toiletries, among many others have been produced from bamboo. Indeed bamboo resources if properly utilised and can provide alternative viable livelihood enterprises for large, medium and small scale entrepreneurs including the rural poor.
<b>Keywords:</b> Bamboo, Products, Utilities,	

Copyright © 2016 Abhilash Joseph E., This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Bamboos, botanically considered a specialized group in the grass family, are fascinating for different reasons. Bamboos are intricately linked to both culture and even survival of many people in China, Japan, India and Southeast Asia and South America since ancient times. Uses of bamboo ranges from handicrafts made *ad hoc* in village settings, such as personal ornaments, utensils and a most incredible variety of baskets and other containers, bird cages, poultry coops, musical instruments, water pipes, bridges, house construction and fishing contraptions (Kurz, 1876; Wong, 1995). Bamboo scaffoldings are used during construction of buildings, including high-rise structures in various parts of India, Bangladesh and China, looks set to stay as a simple, inexpensive technology even in today's world of modern innovations. From bamboo blowpipes and small animal traps familiar to the more primitive technologies, the use of this material has graduated to modern factory-based production of paper, bamboo blinds and barbeque skewers. The living bamboo provides edible shoots, fences, wind breaks, ornamentals and a means to counter erosion in some situations. Bamboo has an enormous potential for alleviating many of the social and environmental problems of the developing world today (Quintans, 1998; Hammond, 2006). There are about 1200-1500 species of bamboo in the world represent a diversity that is not well understood, with many species to be discovered

or better documented, and very incomplete agreement as to how the many forms are to be classified (Kovac, 1993).

Uses and Products

The major usable materials produced by bamboos are described below.

**Whole poles** Whole poles are widely used for construction, for scaffolding, frameworks, and other structural components of buildings (after proper preservation treatments). Pole sections are also for round-pole furniture, handicrafts, and irrigation systems. *Bambusa vulgaris* poles are widely used for temporary building structures and rafts. The most promising construction bamboos introduced into the Pacific islands include *B. oldhamii*, *D. asper*, *D. giganteus* and *D. latiflorus*, and *G. angustifolia*. *B. tuldoidea* has excellent potential for making strong, long fishing poles.

**Laths** Laths are thick strips of bamboo wood. They may either be full thickness splits of a bamboo culm, or be further processed into plane-sided laths of bamboo wood which are usually shaped by hand or machine to ensure all four sides are straight, and then pressed together with glues into laminated boards, which themselves can be shaped into panels, parquet flooring, door and window frames, and soon. These are widely produced in China, Japan, and India.

\*✉ Corresponding author: Abhilash Joseph E

**Splits** Splits are thin strips that are flexible enough to be woven. Broad, thin splits are often woven into mats, which can be pressed together into mat board. Narrower splits are frequently used in weaving handicrafts, furniture, and panels. Splits of *Schizostachyum glaucifolium* are commonly used in Fiji for weaving into mats and interior panels.

**Sticks** Sticks are produced by splitting laths, or thick splits, depending on the type of stick required. The process is often mechanized with hand- or electricity-operated machines.

**Veneer** Veneers are produced by longitudinal shaving of the culm. Veneers are used in surfboards, boats, and furniture in Hawai'i.

**Fibre and pulp** Bamboo fibres are long and paper made from bamboo is usually mixed with 20-30% softwood pulp to give extra strength. The fibres may also be utilized to make high-value clothing fabrics, using processes similar to those used to manufacture of rayon. The chemical composition of bamboo culms is holocellulose (61-71%), lignin (20-30%), silica (0.5-4%), pentosans (16-21%), and ash (1-5 (9) %).

**Extracts** Bamboo tar-oil (also occasionally called bamboo vinegar) is used as a component of various medicines.

**Medicinal uses** Tabasheer, a siliceous concretion found in the internodes of some species, is used medicinally, as is leaf sap which is sometimes used as an eye drop. There are many other uses by indigenous peoples, but no commercialisation is known.

**Edible shoots** Bamboo shoots are usually harvested at 30-60 cm tall, and are peeled before cooking. Shoots of many of the clump forming tropical species contain high levels of cyanogens, and must be boiled well prior to consumption.

**Fodder** Bamboo leaves make excellent fodder for livestock including cows, horses, and pigs.

**Charcoal** Waste products, including branches and sawdust, can be used for the production of charcoal and charcoal briquettes. These burn hot and clean. Bamboo charcoal is also highly adsorptive and is often used in purification systems, particularly the sugar industry, and in household odour treatments.

**Scale of commercial production worldwide** The latest data indicates that international trade in bamboo products is worth US\$2.5 billion per annum, the major importers being the affluent nations, particularly the EU and the U.S. China is the major exporter. It is not known how much is imported into or exported from various Pacific islands, but the quantities are expected to be relatively small.

#### **Ecological aspects of bamboo plantations**

Bamboo makes lot of environmental impacts. They classified as follows.

**Erosion** Bamboo grows fast, and in a short time develops an extended and strong root system, supporting the soil and preventing it from being washed away by heavy rains (Singh 1995). The dense roof of branches and leaves protects the

ground from forceful tropical rains. In a bamboo plantation clear-cutting does not happen; only the adult culms are taken away, leaving the plantation intact. Bamboo is a lightweight material, without a need for heavy machinery for felling and transportation.

**Physical soil structure** The root system loosens up the soil, which was made hard and compact by exposure, machinery and cattle. The leaf roof protects the soil from further exposure.

**Ground water level** Bamboo consumes water, but this is more than compensated by the reduced evaporation created by the leaf roof, and by the layer of fallen leaves. Owing to the increased permeability of the soil, water run-off is reduced, allowing more water to penetrate the soil and to remain in the area.

**Soil fertility** This is improved by protecting the soil from exposure, and by fallen leaves providing organic material. Soil fertility can be diminished by extraction of certain nutrients; this depends on the fact whether the bamboo lives in the wilderness as a monoculture or with other plants. In a plantation many culms are harvested which is likely to cause the use of fertilizers.

Bamboo also protects drainage by the root system and the layer of fallen leaves, soil micro fauna and flora, ground water quality, micro and local climate, stabilization of humidity and temperature, feeding area and habitat for fauna. Bamboo provides an enriched environment for insects, birds and some mammals. Insects find sufficient food in the bamboos, and they in turn act as food for birds. For mammals in need of fruit, access to other types of forest is necessary, regional and global climate, fire hazard and species diversity in flora. Another important aspect of bamboo is the biomass. It depends on the species, soil quality, climate, etc.

Evidently, if one compares a bamboo plantation with a natural forest, there is no doubt that a bamboo plantation is a monoculture. The richness of a rainforest is the maximum attainable. But if the comparison is with another crop plantation (bananas, for instance) or grassland, then one can see that a bamboo plantation is much more diversified. As mentioned earlier, many herbs and flowering plants thrive in bamboo plantations, which also play host to many species of birds, insects and other living beings. This situation owes much to the fact that application of herbicides and similar chemicals does not form part of the normal management regime for an adult bamboo plantation.

#### **CONCLUSION**

Since time immemorial, bamboo has played an important role in the development of mankind. It is used for a wide range of day-to-day purposes, both as a woody material and as food. It has been the backbone of much of the world's rural life and will remain so as the population increases. Its high valued utilization not only promotes the economic development, but also saves forest resources to protect our ecological environment as a wood substitute.

---

## References

- Hammond, K. O. 2006. Cultivate bamboo for employment and income generation. Ghanaian Chronicle (Accra), 18 May 2006.
- Quintans, K. N. 1998. Ancient Grass, Future Natural Resource. The National Bamboo Project of Costa Rica: A case study of the role bamboo in international development. INBAR Working paper No. 16. 58 p.
- Kovac, D. 1993. Abundant species in Bamboo stems. German Research, Reports of the DFG 3/93: 21-24.
- Kurz, S. 1876. Bamboo and its use. Indian Forester 1: 219-269.
- Wong, K.M. 1995. The Bamboos of Peninsular Malaysia. Malayan Forest Records, No. 41. Forest Research Institute Malaysia. 200 p.

\*\*\*\*\*