

Giant bamboo: a grass becomes a multipurpose tree

BY CHIN ONG



Picture: Kimunya Mugo

Growth of giant bamboo, *Dendrocalamus giganteus*, in Thika, Kenya.

Bamboo is regarded as a multipurpose in Asia, where it has a thousand uses ranging from food to house construction, mainly to replace many of the timber products traditionally derived from trees. (insert photo 2). Recently, there is a huge increase in the global trade in modern bamboo products, estimated at 20 billion US dollars annually. Bamboo is used in several parts of the world for cleaning sewage. The plant is known to absorb heavy metals and pollutants faster than most other plant species. This is a potential solution to the heavily polluted lakes in Africa, notably Lake Victoria. The pollution occurs especially around the Winam gulf, an entry point into the lake. Planting bamboo trees on landscapes and riverbanks is just one way of achieving the above objectives. Bamboo rhizomes are very effective at holding topsoil on both steep slopes and riverbanks, hence the importance of planting them on the highlands to prevent soil erosion and the riverbanks.

No other woody plant rivals the bamboo's wide use in environmental conservation and commerce. It is the world's strongest and fastest growing woody plant, offering ecological and economic benefits to smallholders. In Europe and North America, bamboo floorboard sells for between \$80 and \$100 per m², it is a viable replacement for both softwoods and hardwoods. Bamboo 'culms' (poles) are also known to make the strongest, lightest, natural material available to man.

Dr Chin Ong of RELMA in ICRAF posh next to a giant bamboo hump, *Dendrocalamus giganteus*, in Thika, Kenya

According to the New Collins dictionary a tree is defined as 'any perennial plant with a distinct trunk giving rise to branches'. Therefore, can a bamboo with a trunk of 20-40 m be called a tree? Recently, ICRAF scientists in East Africa became interested in using bamboo for ecological restoration and income

generation. Despite its numerous uses, the bamboo remains an unexploited resource in Africa. But the World Agroforestry Centre (ICRAF) is working on reversing this through its work on giant bamboo (*Dendrocalamus giganteus*) with a private entrepreneur, Liam Omera, and the Jomo Kenyatta Agricultural University in Thika (insert photo 1).

The bamboo grows three times faster than eucalyptus. According to Chin Ong, an agroforestry advisor attached with ICRAF, "commercially important bamboo species usually mature in only three years, after which multiple harvests are possible every second year for up to 120 years."

Why is bamboo unexploited in Africa? In East Africa, native bamboos are usually much smaller in size than their Asian relatives and are often found in protected water catchments and river banks therefore it is considered 'illegal' to harvest. For example, bamboo forests of *Arundinaria alpina*, the species native to Kenya, are found in Mt. Kenya, Aberdares and Mt. Elgon, may yield as many as twenty thousand 15-20 m high culms per hectare annually. These are occasionally used for fencing and making baskets. Another reason is the general lack of awareness of its huge income generation and employment potential.

In contrast, bamboo is widely used for reinforcing

concrete, and as scaffolding on skyscrapers in South and East Asia. India alone reportedly has some 20 million acres of commercial bamboo that account for 60 per cent of the country's paper requirements and much of the country's economic timber requirements. In China, the commercial trade in bamboo is even greater.

Kenya has very few privately owned large commercial timber plantations. Most of the timber is produced by the Forest Department; unfortunately government forests have been over-exploited and very few have been replanted.

Kenya's Raiply has reportedly begun importing timber from the Congo and Tanzania to manufacture hardboard and soft board, while Panpaper Mills in Webuye, which manufactures much of the country's paper, uses plantation softwoods to fuel its boilers and make paper pulp. ICRAF believes that bamboo can solve both problems owing to its fast maturing nature and biomass.



Native bamboo forest, Arundinaria alpina, in Kijabe, Kenya 1927

The bamboo is a valuable source of firewood and/or charcoal; it produces more than 7,000 kilocalories per kilogram, half the value obtained from raw petroleum. Its high biomass production makes it effective as a fuel source.

Studies in South East Asia have shown that natural bamboo forests have a neutral effect on soil. The bamboo leaves, sheaves and old culms that die fall to the ground, decompose and create a thick humus layer and enrich the nutrient content of the soil.

"Kenya was once covered in bamboo, e.g. Kericho and Kijabe, however these forests were cleared and bamboo forests are hard to come by," according to Chin Ong.

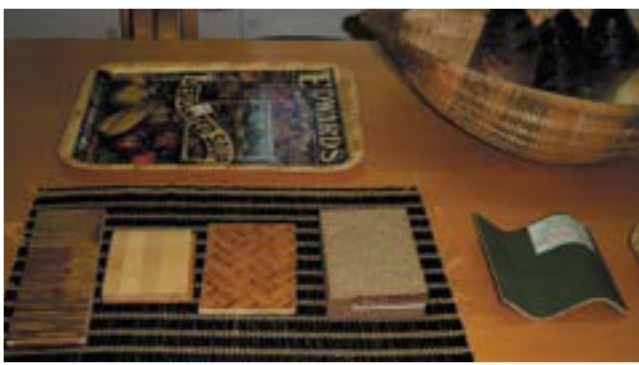
Bamboo is a critical element in the balance of oxygen and carbon dioxide in the atmosphere. It is effective in reducing the carbon gases blamed for global warming. Some species are known to sequester up to 12 tons of carbon dioxide from the air per hectare.

The world, mostly Asia, consumes over 2 million tonnes of edible bamboo shoots every year. The shoots are high in vitamins and low in carbohydrates, fat and protein. The Kenya Forestry Research Institute (KEFRI) grows several high quality edible shoots. Bamboo shoots can be eaten raw or cooked and are usually described as mild and very crunchy.

Bamboo can be propagated from seeds, however most species flower only once in 15 – 120 years. Other options are tissue culture, rhizome cuttings and vegetative cuttings.

ICRAF is set to popularise this plant in Africa through a pilot work in Kenya and other riparian countries of Lake Victoria Basin. Our aims are to create awareness on the effectiveness of giant bamboos for sewage treatment from large towns along the Lake Victoria Basin, its income and employment generating potential and protection of fragile ecosystems such as wetlands and steep slopes, which are contributing to the sedimentation of the lake ecosystems.

Picture: Chin Ong



Bamboo can be used for a wide range of products such as edible shoots, mats, roof and floor tiles