

Zen Bamboo and Carbon credits

Bamboo is an ancient grass, a woody plant, producing 35% more oxygen than wood.

It is estimated that bamboo occupies over one percent of the tropical and subtropical forest area. Bamboo is one of the most productive and fastest growing plants on the planet.

Bamboo has several advantages over tree species in terms of sustainability and carbon fixing capacity. Available studies conclude that bamboo biomass and carbon production may be 7-30% higher compared to the fast growing wood species.

The rotation cycle of bamboo should be considered when comparing it to woody crops. Bamboo will be harvested annually (say 20% of the growing stock) and will continue producing new culms throughout its life. Every five years the carbon sequestered on one hectare will be the same and this productivity of bamboo will not be reflected in living biomass. After 30-40 years (at the age of teak or eucalyptus harvesting) the bamboo's biomass will still be as high as it was at 5-8 years old.

Besides higher biomass, bamboo has other advantages over wood as a carbon stock. Unlike woody crops, bamboo offers the possibility of annual selective harvesting and removal of about 15-20% of the total stock without damaging the environment and productivity. Over 90% of bamboo carbon can be sequestered in durable products such as boards, panels, floors, furniture, buildings, cloth, paper and activated charcoal. These products have a long life span and may retain carbon for decades. **If continuing sequestration in durable products is added to the total carbon sequestration figure, the productivity of bamboo should enable it to reach and exceed long term sequestration levels of the best tree species for carbon sequestration.**

Bamboo can play a significant role in linking climate change mitigation to sustainable economic development in the developing world. Carbon credits may trigger creation of otherwise marginal bamboo plantations for processing, jobs and wealth generation. Interest in carbon trading under the Clean Development Mechanism (CDM) of the Kyoto Protocol has blossomed since 2004. The first carbon trade forestry projects under the Kyoto Protocol are expected in 2008. Although no projects have been developed for bamboo so far, it does qualify for the forest carbon credits. Bamboo is a part of the world's forests and forest industries. Bamboo can meet current requirements for CDM forestry projects such as forest definition, socio-economic and environmental criteria for sustainability, cost benefit analysis, CO₂ models, monitoring methodology and accounting. Many different types of CDM projects could be developed using bamboo, ranging from ecological conservation to cottage and large scale industrial projects. **FAO, INBAR and other partners should take the initiative to develop such projects in the next few years**

Tropical *Bambusa bambos* has been measured at a total above ground biomass 287 t/ha with a mean annual production of around 47.8 t/ha/yr, almost twice that of the *Eucalyptus* clones. Interestingly, the total biomass of mature *Bambusa* at 6 years is in fact higher than that of teak at 40 years: 149 t C/ha versus only 126 t C/ha for teak.

Sub-tropical moso bamboo (*Phyllostachys pubescens*) reaches above ground biomass of 137.9 t/ha and is generally harvested at 5-8 years intervals. Every 5 years it would produce at least 86 t/ha biomass and sequester 43 t/ C/ha, almost twice as much as a teak plantation under the same conditions. This includes total biomass as well as products.

The data for bamboo leaf biomass is variable. Most stands appear to have leaf weights of ~ 5 tonnes per hectare although there are two observations at 10.7 and 14.8 tonnes/ha. Kleinhenz and Midmore (2001) likewise report leaf weights of between 1 and 11 t/ha with one outlier of 37 t/ha. Five of their 8 observations are 6 t/ha or less. If it were generally true that bamboo has leaf weights of approximately 5 tonnes/hectare yet high productivity that might indicate a possible quantitative difference with tree crops.

Zen Bamboo and Forest Stewardship Council:

Vision: The world's forests meet the social, ecological, and economic rights and needs of the present generation without compromising those of future generations.

Mission: The Forest Stewardship Council A.C. (FSC) shall promote environmentally appropriate, socially beneficial, and economically viable management of the world's forests.

FSC Chain of Custody certification allows companies to label their FSC products, which in turn enables consumers to identify and choose products that support responsible forest management.

Mixing of FSC certified and non-certified products must be done under controlled procedures that meet the FSC Chain of Custody requirements.

Chain of Custody certification is essential for businesses seeking to access environmentally and socially aware markets, or to demonstrate compliance with public and private procurement policies that specify environmentally responsible materials. These include the EU Ecolabel scheme for furniture, or the US Green Building Leadership in Energy and Environmental Design (LEED) rating system.

Types of Chain of Custody Certification:

The Chain of Custody Program sets standards for three types of Chain of Custody Certifications that companies can choose from depending on their scale and type of operation:

- Individual Chain of Custody Certification

- Multiple Site Chain of Custody Certification
- Project Certification

The Chain of Custody Program also provides additional standards that may be combined with the Chain of Custody Certificate according to the scope of the organization seeking certification, including:

Controlled wood standards:

The FSC Controlled Wood Standard is for companies that source non-certified material to be included in the production of FSC Mix products. The non-certified material is controlled to avoid mixing of wood from unacceptable sources with FSC certified material in FSC Mix products.

Reclaimed material:

Reclaimed forest-based materials can be used as components in FSC certified products and projects. The Chain of Custody Program sets the requirements for purchasing, verification and classification of these materials.