



TOGETHER
for a sustainable future

OCCASION

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From "Poor Man's Timber" to "Green Gold"

Bamboo grasses are an immensely useful and highly renewable natural resource. They have been used by people – most notably in Asia – since time immemorial, and their remarkable versatility as raw material is attested to in our day by a list of products which is as long as that of the 1,573 known bamboo species. From food, fodder, fencing and fuel to flooring and furniture, to flutes, fishing rods and even false teeth, bamboo products are used by an estimated 2.5 billion people, or almost half of the world's population.

Growing naturally on all green continents except Europe, bamboo is closely associated with the lives of countless poor people and stands out as a most promising development option. Although bamboo statistics leave a good deal to be desired, many experts have outlined in compelling terms the magnitude of this opportunity for developing countries. The resource itself is present in significant amounts in some African and Latin American countries and is abundantly available in tropical Asia with some truly impressive cases: 1.3 million ha in Viet Nam, 3.8 million ha in China (which also cultivates bamboo extensively) and some 10 million ha, or nearly one-eighth of the country's total forest cover, in India. The number of bamboo growers and artisans, most of them working to meet local needs, is said to be in excess of 2 million in India alone, and the global market for bamboo products, largely driven by a growing demand for bamboo flooring, veneer sheets, laminated panels and furniture, is currently estimated at over US\$12 billion.

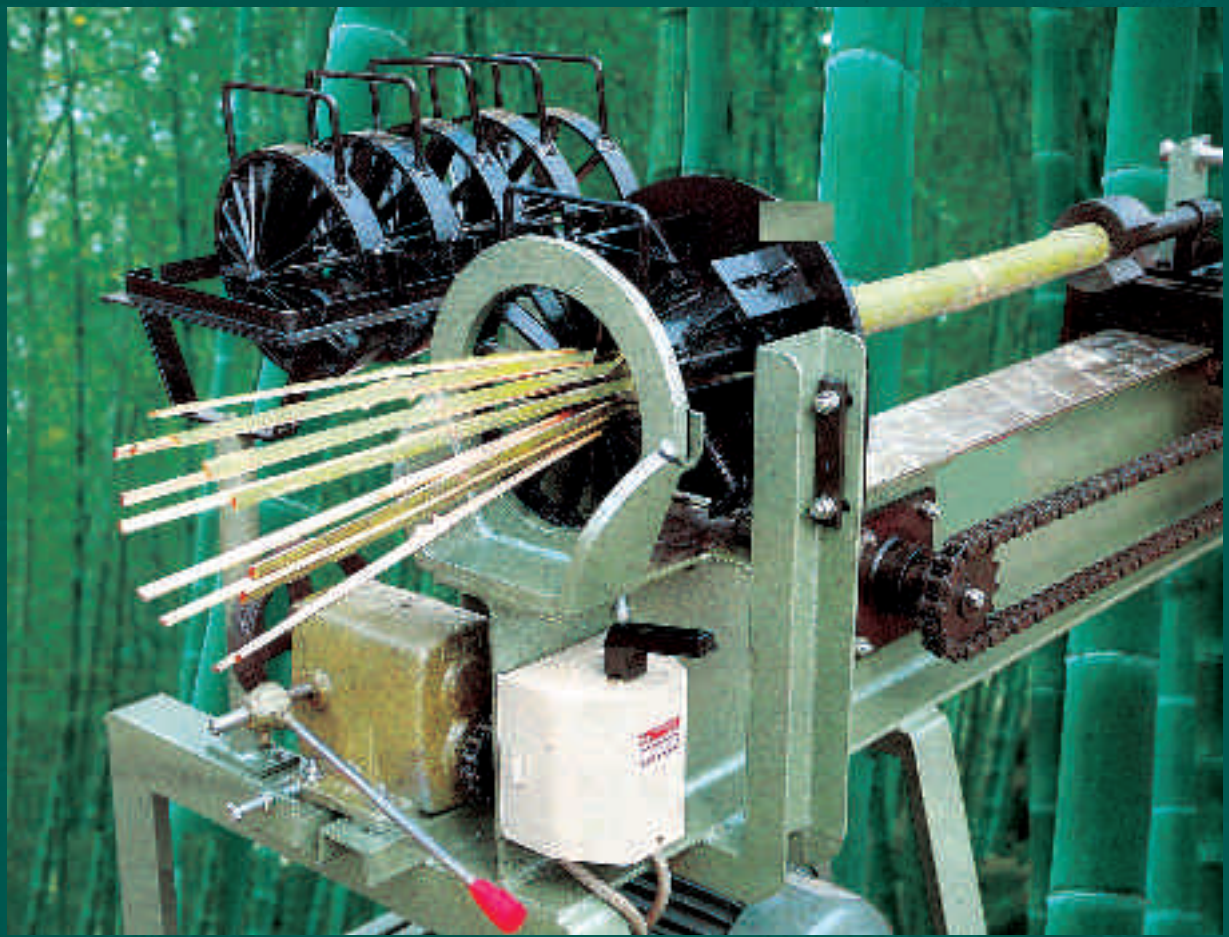
A Grass-Roots Industry The immediate development potential is greatest where the need for employment and income generation is most urgent. Bamboo growing and processing is largely a subsistence-oriented cottage industry. However, the availability of traditional low-cost processing technologies, low overhead costs and substantial markets for numerous handicraft products suggest that large numbers of poor people – an overwhelming majority of whom live in rural areas which offer very limited income-generation opportunities at best – could gain access to the cash economy. Moreover, handicraft work can be a complementary source of income for the underemployed and is ideally suited to fill the spare time of women with daily domestic duties.



Small enterprises in rural areas are perfectly capable of manufacturing many of the products that can be gained from bamboo. Such enterprises can be established with modest capital investment and the skill requirements are relatively low. Another attractive aspect from the development perspective is that, at this level, bamboo processing is labour-intensive and consequently represents a major source of employment.

Adding Value to a Versatile Commodity Traditional primary uses in the pulp-and-paper, construction and energy sectors still hold the lead in large-scale industrial processing of bamboo; India uses some 3 million tons a year and China about 1 million tons for paper manufacturing alone. Recent research and development efforts however are beginning to chart out a very different course for this highly versatile commodity. It is becoming increasingly evident that a wide range of intermediate and finished products could add significant value to bamboo. In joinery products and furniture, bamboo can replace wood successfully in both practical and aesthetic terms with the additional appeal of a substitution that benefits the environment. Bamboo can also replace steel in road and bridge construction as stabilizing mats and structural elements. Among the more sophisticated – but nevertheless realistic options – are bamboo-reinforced plastics and the use of bioactive bamboo components in pharmaceutical and food products.

The Need for an Integrated Development Drive To seize the wide range of opportunities inherent in this plentiful natural resource denigrated for too long as "poor man's timber," to make the "bamboom," the "boom in green gold" predicted by many experts come true, all aspects of bamboo harvesting, processing and consumption have to be addressed as well as the various levels of technology that can be applied. Such integrated development policies would ensure both the sustainable use of the resource and the flexibility to choose processing options that can serve best the paramount poverty-eradication objective of employment and income generation. Economies of scale are certainly not the only solution, and there is sufficient evidence that handicraft and small "rural industry" enterprises hold greater promise. Moreover, experts point out the potential of a symbiotic relationship where the establishment of large-scale facilities that process the lower 4 to 5 metres of the bamboo culms into raw material for panels, flooring or furniture has a catalytic effect on the informal and small-scale sectors; small complementary enterprises will spring up in the area to use the upper 8 to 10 metres of the culms for handicraft or the shoots for food products.



The Case of North East India: Concerted Action by Policy Makers and Development Experts

A growing number of Asian, African and Latin American countries are well aware of the sector's potential and the need for broad-based action to promote its development. A major initiative was launched in June 1999, on World Environment Day, when the Government of India declared its commitment to carry out a comprehensive programme with management structures involving all relevant government agencies. The programme soon received support from international organizations specialized in development assistance and has since made considerable progress, particularly in the region initially singled out as its main target, the seven states of the North East.

The main channel for international assistance was established by the United Nations Development Programme (UNDP) with the "Cane and Bamboo Technology Upgrading and Networking Project" as part of its Technology Management Programme for India. The immediate objective of the UNDP project is to facilitate access to information, skills and technology for large numbers of bamboo farmers, artisans and small entrepreneurs; the project is also designed to help ensure the business viability and ecological sustainability of such economic activities by creating linkages with providers, both local and foreign, of R&D, product design, marketing and financial services. The pursuit of these goals is focused on strengthening the institutional environment and its capability to serve its constituencies.

The Crucial Role of Technical Assistance Established in early 2001, the Cane and Bamboo Technology Centre (CBTC) in Guwahati, in the northeastern state of Assam, plays a key role in the project. The Centre is the main cogwheel of an intricate mechanism by which the United Nations Industrial Development Organization (UNIDO), the agency assigned to implement the project, delivers technical assistance. With its considerable experience in the management of industrial sectors and the promotion of small-scale economic activity, UNIDO is also involved in planning the development of the cane and bamboo sector in India. The Organization's main partner in the region is to be the North Eastern Council (NEC), which will act as the field implementation agency. NEC has announced that it intends to spend approximately US\$5 million over the next five years to promote bamboo processing in the region.

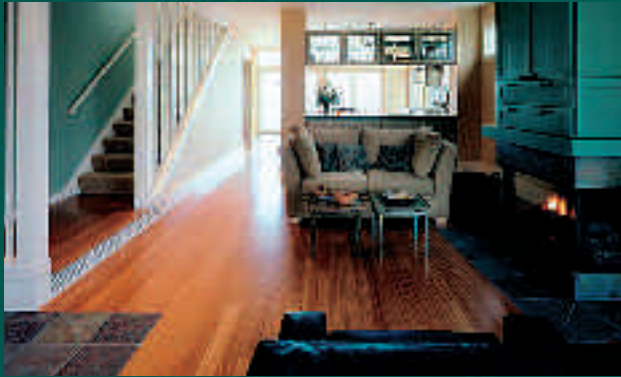


To capitalize on a remarkable opportunity for effective south-south technology transfer, UNIDO has cooperated closely with China, the undisputed regional leader in bamboo R&D and processing technology. Special attention is being given to the non-traditional processing of bamboo culms into rectangular strips and slivers that can be laminated into boards and mats for a wide range of products. The main immediate beneficiary is the local furniture industry, but certain intermediate products – such as floorboard blanks and veneer sheets to be further processed in Europe – can generate considerable export income. Another area of chief interest is the processing of bamboo shoots into food products that enjoy growing demand especially in Asian markets.

Centre Stage for Applied Technical Research On several fronts, applied research holds the key to success in developing the bamboo sector. Processing trials can accurately gauge the commercial value of local species. Available processing machinery, mostly of Chinese manufacture, may require adaptation to the specific properties of local raw material. Product design can greatly increase export potential by reflecting the prevailing aesthetic preferences of consumers in developed countries.

It is the Guwahati Centre that will ultimately carry out such trail-blazing work to help its clients – from artisan cooperatives to small industrial facilities – to gain access to lucrative markets with competitive products. To this end, the Centre is being equipped with advanced processing machines, most of which are imported from China and the Philippines, and is building up its library and documentation facility. It also receives expert advice provided by international consultants selected by UNIDO.

A Flurry of Ground-Breaking Activities Workshops held to date at the Centre and at various locations in the northeastern states have covered new techniques and technologies, product design and development, tooling requirements and finishing. Eight persons closely associated with the bamboo programme in the North East, among them three entrepreneurs, were trained at Hangzhou, China. An exhibition of laminated products entitled "Bamboo Boards and Beyond" was shown at Guwahati, Aizawl and Itanagar. In January 2002, the Centre hosted a "buyer-seller meet" for handicraft products. A long list of scheduled activities will follow these initial highlights of the project whose progress bodes well for the future of the cane and bamboo sector in North East India. Moreover, UNIDO experts and their Indian partners foresee a role-modeling function for CBTC, a development that could benefit other bamboo-rich countries in the region and elsewhere.



Going Global with Bamboo Processing

Encouraged by the response and steady strides of its clients in India, UNIDO has expanded its technical cooperation with China to build a platform of new technologies for its assistance in the development of the bamboo sector in other countries. Consultations, feasibility studies and processing trials with predominant local bamboo species precede the drawing up of custom-tailored programmes to promote small-scale industrial processing. Traditional handicraft production also receives considerable attention focused on efforts to network artisans into cooperatives and other forms of professional association for easier access to expert advice and government support.

Exotic Furniture for Cuba's Hotels Bamboo is poised to become a key feature in the expansion of the Cuban hotel industry. The rapid growth of tourism in recent years has increased the demand for accommodation facilities at an annual rate of 4,000 hotel rooms. This translates into 60,000 pieces of furniture, most of which have to be imported by a country strapped for foreign currency. A new UNIDO project financed by Italy will transfer bamboo-processing technology – mainly from China – for the manufacture of both whole-culm and laminated panel-based or board furniture. The new products will soon grace Cuban hotel rooms as a substitute for expensive wood furniture with the additional benefit of giving them an appropriate exotic ambience. A lucrative spin-off from the development of the bamboo sector in Cuba is to be expected in the rapidly growing eco-tourism industry; other countries in the region, such as Costa Rica, report that visits to bamboo plantations are top sellers in the eco-tourism market.

Rescue for Ghana's Rainforests Excessive logging and clearing for cultivation have reduced Ghana's tropical forest cover to 25% of its original size. Prompted into action by serious environmental concerns, the Government has focused on bamboo grasses, the fastest growing canopy for degraded forest areas. Concomitantly, four native bamboo species have been singled out by UNIDO for their potential to yield value-added board products as a profitable substitute for timber exports. Board manufacturing technology will also be the chief development vehicle in the next stages – in Thailand, Laos, Tanzania – of the global campaign carried out by UNIDO to promote bamboo processing as an effective means of income and employment generation.



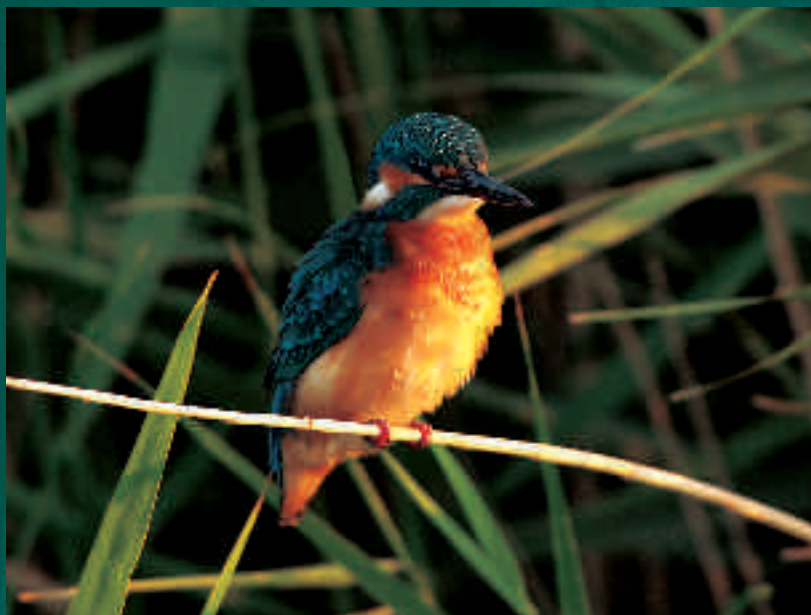
Bamboo Conservation: A Clump of Environmental Issues

The abundant occurrence of native bamboo stands in many tropical areas of the world explains to a great extent why the management of this useful natural resource has been lacking almost completely. Gradual depletion due to excessive felling in some areas of the Asia-Pacific region is causing considerable concern. Development experts point out that the viability of recent initiatives to expand the economic benefits gained from bamboo depends largely on ecologically sustainable exploitation. The weight of this imperative is made obvious by the fact that in most developing countries, particularly in Asia, up to over 90% of the bamboo processed is extracted from forests, with plantations still bringing only a marginal contribution.

In addition to their immediate economic value and the significant role they play in the culture of many peoples, bamboo grasses deserve protection through conservation efforts for a number of other important reasons. With their extensive rhizome and root system, they are a very effective means of soil-erosion control and can help stabilize road and railroad embankments. Bamboo can quickly provide vital green cover to deforested areas – and its incidental occurrence in timber forests is a telltale sign of previous abuse by humans.

Bamboo and Biodiversity Bamboo forests host a wide range of flora and fauna species whose subsistence is dependent to various degrees on bamboo ecosystems. The critically endangered giant panda as well as a close relative, the red panda, are totally dependent on bamboo, and the existence of many species of bats (some of which roost inside bamboo culms) and rodents is generally confined to bamboo forests. Elephants, wild cattle, deer, porcupines and squirrels are among the countless incidental bamboo feeders in Southeast Asia, and in Borneo and Sumatra, young bamboo culms are prized as a delicacy by orangutans. Hundreds of bird species frequent bamboo forests and over twenty species – partridges, woodpeckers, warblers, finches and fly-catchers among them – are highly dependent on bamboo.

Another aspect of biological diversity, perhaps the one of the greatest consequence, is the variation in and within bamboo species, their genetic diversity with its paramount evolutionary significance. Considerable erosion of the genetic pool caused by excessive extraction makes it urgently necessary to expand research in the immensely complex taxonomy of bamboo grasses and to carry out conservation programmes. Only sound stewardship of genetic resources can lead to sustainability and ensure that the widely envisaged development impact of bamboo becomes a lasting reality.



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