Bamboo Mat Board: An Environmentally Friendly Plywood Alternative

by Lionel Lumb

Bamboo mat board is a versatile building material that can be used to make doors, interior walls, furniture, boxes, and other products

Their woven bamboo baskets, hand fans, and mats are sold by the roadside or in bazaars across India. Now, the traditional handicrafts of rural women are supporting India's construction industry, the furniture business, its giant film studios — and even helping to save the country's dwindling forests.

While bamboo baskets are used for everything from household storage to tea-pluckers' backpacks, the flat mats have inspired a rapidly growing industry. These 4-by-8 foot mats are soaked in resin, then hot-pressed together in various thicknesses to form bamboo mat board, a substitute for plywood. These boards are generally as strong as or stronger than their plywood equivalent — and are less expensive.

The direct beneficiaries of this new technology are 18,000 low-income women, mostly from tribal areas of India. These women once received 18 rupees per mat (about CA$0.65), but now earn triple that amount — just over CA$2.

New lease on life

In addition, the switch from plywood to bamboo mat offers a new lease on life for India's threatened natural forests. Hardwood trees take 40 to 80 years to reach a worthwhile logging size, but bamboo is ready to harvest in just two to five years. Using bamboo not only gives hardwood forests a chance to regenerate, it also fights soil erosion. This plant grows best in areas of heavy rainfall, which are prone to erosion after logging, and its shallow root system holds soil well.

India first tried to produce bamboo mat board back in 1963, but the hot press technology was imperfect, production costs too high, the bonding process erratic, and the appearance marred by ugly glue deposits. With financial support from the International Development Research Centre (IDRC), scientists at the Indian Plywood Industries Research and Training Institute (IPIRTI) in Bangalore persevered until they got it right.

Simple modification

"What we have now is a product that is technologically perfect. In fact, wherever you have a plywood factory, you can manufacture bamboo mat board," says Veerasettappa Sivananda, co-director of IPIRTI. All it takes to make the switch is a simple modification of existing machinery and some training, which the institute provides.

According to Dr Sivananda, BMB has already replaced about 20-25% of plywood sales. This figure could increase through better promotion and new contracts, particularly from the Indian government, which is the biggest plywood consumer — for its offices and railway carriages.

Technology transfers

Through the International Network for Bamboo and Rattan (INBAR), bamboo mat board is now being promoted beyond India's borders. At a workshop that it organized in 1994, INBAR introduced BMB to seven other Asian nations: Bangladesh, China, Lao PDR, Malaysia, Nepal, Thailand, and Viet Nam. This technology could also be transferred to Africa and Latin America.

One of the key benefits of bamboo mat board is that it can be manufactured by small factories right where the bamboo is grown, says Dr Cherla B. Sastry, INBAR's executive director. "No one needs to be displaced, or lured to a city, and there are virtually no transport costs." He notes that ten plywood factories have already started making the boards in bamboo-growing areas of India, and it is easy to make other products using bamboo and rattan.

Lionel Lumb is an associate professor in the School of Journalism and Communication at Carleton University in Ottawa. He is currently on sabbatical in South Asia.

Sidebar:

The Versatility of Bamboo Mat Board

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The Versatility of Bamboo Mat Board

A tour of the Indian Plywood Industries Research and Training Institute (IPIRTI) with one of its scientists and industry trainers, Shankarayya Shivasangayya Zoolagud, reveals the versatility of bamboo mat board (BMB). Its products include doors, interior walls, desks (in combination with rubberwood), sewing machine covers, and reusable and folding fruit boxes. The herring-bone pattern on these boxes is attractive, and the varnished finish is smooth to the touch.

Two recent BMB innovations have exciting commercial potential. One is a grain storage bin, which is both rat- and water-proof. This is important in rural India, where large amounts of food grain are lost to rodents and poor storage facilities. The other is corrugated BMB roofing, which IPIRTI hopes will replace the environmentally unfriendly asbestos roofing widely used in India. Even though BMB roofing sheets are a mere 3 mm thick, they are stronger than asbestos and should have a much longer life.

Bamboo mat board is also extremely flexible and can be bent into different shapes. (One of the largest markets is India's film industry, which buys BMB for its movie sets.) It can be combined with conventional wood, adds Dr Zoolagud. "If customers prefer a traditional look, we use bamboo mats for the interior panels, and traditional plywood veneer on the outside. That way we can save 50-70% of the natural wood."

Lionel Lumb

Protecting Mexico's Tropical Forests: The Calakmul Model Forest Program

by Michael Boulet

Mexican women display handicrafts during a Calakmul food fair in 1995

Even Disney's animated feature film, "The Lion King," has a role to play in the protection of Mexico's tropical forests. Providing appropriate video entertainment is part of an education strategy developed by environmental educator Gloria Tavera to promote conservation and sustainable forestry practices in the Calakmul area of Mexico's Yucatan Peninsula.

"Lion King" Lessons

According to Tavera, "The Lion King" demonstrates the importance of the food chain and reinforces the idea of individuals working together to promote the needs of a community. In Calakmul communities, particularly those that lack electricity, screening films such as "The Lion King" is a way of encouraging public gatherings where environmental issues can be discussed.

The video screenings are part of the Calakmul Model Forest Program, an initiative that promotes the partnership of environmentalists, industry, and local communities to find ways to manage natural resources in a sustainable manner. Tavera's job is to demonstrate how sustainable forestry practices can benefit local communities. The Calakmul Model Forest is part of an international network of 18 model forests — that are operating or in development — located in five countries, which is coordinated by a secretariat at IDRC headquarters in Ottawa.

Sustainable Harvests

The aims of the Calakmul Model Forest Program are to ensure ongoing harvests of food, wood, and other useful products; to enhance the standard of living of the local inhabitants; to raise awareness of conservation; and to promote ecotourism. In support of these goals, Tavera gathered information and conducted demographic surveys to identify the best approaches for her educational activities. Because more than 50% of the local population is under the age of 15, ethnic diversity is high, and literacy rates are low, she realized that written material would not be particularly effective. Preliminary studies also indicated the need to target women and children.

So far, the Model Forest Program has established a wildlife station housing puma, jaguar, and wild pigs. Another initiative is the Calakmul Botanical Gardens featuring nature trails and facilities that showcase an impressive array of local flora, including edible plants and 56 species of orchids native to the region. The six-hectare parcel of land is owned by the region and provides a base for workshops, information sessions, and educational tours to the local Mayan ruins.

Food Fair

Other programs have brought local women together to exchange ideas and share information on the profitable use of forest products. In 1995, a regional food fair provided opportunities for participants to sample and compare food, arts, and crafts — and also to watch a fashion show highlighting a variety of local products. The displays demonstrated how to contribute to the local economy by adding value to forest products.

As a result of the fair, beautifully embroidered clothes incorporating traditional designs are now being sold as souvenirs to tourists visiting the Calakmul ruins. In addition, a cookbook has been published that features 127 recipes — including many exotic dishes made with Calakmul forest products. The 1996 fair, to be held this summer, will likely add more tasty recipes to the savory collection.

Environmental Workshops

As part of the educational strategy, Tavera is indirectly targeting the 2,500 primary school children in the area through environmental workshops for their teachers. The workshops cover everything from ecotourism and insect collecting to the basics of bird watching and are intended to cultivate an appreciation for the environment among children and adults alike.

Michael Boulet is a research analyst at IDRC.

For more information:

Bosque Modelo de Calakmul, Consejo Regional de X'Pujil, Domicilio Conocido, Zoh Laguna, Campeche, Mexico; Tel/Fax: (52-983) 23304

Marc Patry, Twinning Co-ordinator, Calakmul Productive Ecology Model Forest, P.O. Bag 2111, Kemptville, Ontario, K0G 1J0, Canada; Tel: (613) 258-8239; Fax: (613) 258-3920; e-mail: mpatry@emr.ca

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The Greening of Tumkur

by Deepak Thapa

Restoring forests is a key step on the road toward sustainability

Tackling deforestation and severe water shortages in southern India, a Delhi-based NGO harnesses new methods for assessing sustainability

Over the course of the 40-year period since India nationalized its forests, the traditional conservation methods that had long kept the forests intact were largely abandoned. In the last three decades, forest cover had become very sparse, hampering the capacity of soils to hold water. This degradation in turn caused increased runoff and erosion, further reducing the amount of soil moisture.

In Tumkur, a district in the southern Indian state of Karnataka, the devastating consequences of deforestation had become apparent by the mid-1980s. Surface water could only be found during the wet seasons. During the dry season, people were forced to rely on ground water that was too deep to reach in some places due to the rolling terrain. As the situation worsened, people spent more time searching for water farther from home.

Action-oriented programs

Today, however, change has begun in the Tumkur district. Starting in mid-1994, a field centre of the Delhi-based NGO Development Alternatives (DA) initiated efforts to build local capacity and encourage action-oriented programs for wasteland development, sustainable agriculture, and community management systems by self help groups. The program builds upon a joint IDRC/IUCN (World Conservation Union) project to develop, test, and refine ways of assessing sustainability in Asia, Africa and Latin America.

In a setting such as Tumkur, people's need to draw on natural resources for their livelihoods is quite urgent. The paradox is that sustaining these resources is a long-term proposition. "The difficulty with sustainability is that one has to try to think two or three generations down the road. But that is hard to do when you are dealing with an immediate crisis," says Fred Carden, an IDRC program officer. The idea behind the project is to find ways to assess progress toward sustainability and show communities how they can monitor this on an ongoing basis.

"... one has to try to think two or three generations down the road ..."

Development Alternatives began working in Tumkur in 1994, with the goal of helping to reclaim degraded lands. Around the same time, it began preparing a District Resource Atlas with the support of IDRC. The Government of India then chose DA to coordinate its Integrated Mission for Sustainable Development (IMSD) in the Chiknayakanhalli *taluk*, an area of approximately 100,000 hectares in Tumkur. Chiknayakanhalli is divided into 28 smaller administrative areas, of which five were chosen as a starting point for research. The selection was based on a simple criterion: the willingness of the villagers to help themselves.

Community-level mapping

A key step in the assessment was community-level mapping one of several tools developed by the IUCN/IDRC project. Since maps can be easily updated, they are useful for monitoring and evaluating change. Residents helped draft simple village maps to illustrate the terrain, position of houses and where water was being drawn from the ground. Community discussions followed to make everyone aware of the issues involved. Through this process it became evident that water had become the de facto property of the rich [who have money to dig wells] and that the poor had no access to it, says Ashok Kumar of Development Alternatives.

These same maps are now being used to find ways to fairly distribute the water. Using strategic negotiation methods developed by DA in the IUCN/IDRC project, residents eventually decided to charge money for excessive use of water, a revolutionary idea for people who traditionally had access to unlimited free water.

Water shortages

However, the problem of water shortages remained. Wells had to be dug deeper and deeper as the water table sank lower and lower. The solution, which was reached by a consensus of community members, was to restore the forests, regenerate water storage ponds and revive, in some form, traditional systems of conservation that had long proven their effectiveness.

Development Alternatives initiated community tree planting programs, alongside its afforestation program. Soil and moisture conservation programs were also carried out. Between 1995 and 1996, half a million trees were planted on 370 hectares of wasteland. The planting program also introduced tropical legumes such as *Stylosanthus hamata* as part of the ground cover. This type of legume will provide fodder for livestock in the years to come. Barrages and check dams have replenished the ground water and now provide water for a small part of the dry season, especially when rainfall is good. Vegetable farming has taken root and the produce is being used to generate income. These tangible results seen in less than two years have encouraged people to plant more trees. As with the water, all produce from these forests will be shared equitably.

Communities taking control

Meanwhile, other areas not originally included in the program are now eager to start their own projects. Even more encouraging is the fact that two of the pilot areas are refusing grants. To ensure that control remains in their hands, the residents prefer loans that are to be paid back over 10 years.

"The best part is that the people identified the problems and found the solutions themselves," says Kumar. "And very little money was put into the project before people began to realize that they don't necessarily need money not charity money, at least."

Deepak Thapa is a writer based in Kathmandu, Nepal.

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The "Value" of Trees

by Jennifer Pepall

Pregnant palm tree (left) in Zimbabwe

In a Zimbabwe village stands a 200-year-old palm tree with a bulge in its trunk. It is one of the few trees in the area that has not been felled because villagers believe its spirits help to sustain their community.

This tree is precious, yet no land-use or economic planning decision to date reflects its social value. And disregarding the varied contributions that trees make to rural households can doom resource policies and programs to failure. Now, with support from IDRC, researchers from the University of Alberta's Department of Rural Economy and the University of Zimbabwe's Institute of Environmental Studies are developing ways to measure the true value of the goods and services provided by trees by taking into account their many roles and functions, and their value as seen by local communities. This information may then be used to design more effective woodland management policies in Zimbabwe.

The Value of Trees project is a five year initiative that includes faculty exchanges and studies by graduate

students and faculty members of both universities. The studies range from the importance of woodland wildlife to rural households to the influence of gender on tree planting activities.

Role of Woodlands

Natural woodlands cover 60% of Zimbabwe, supplying rural people with food, fuel, construction materials and medicines. Woodlands help maintain soil fertility and prevent soil erosion. They also have a spiritual dimension: certain tree species are considered vital to good health, while others are key to rainmaking ceremonies or serve as resting places of ancestors.

"People have underestimated the value of trees, regardless of whether these values are ecological, economic or sociological," says Eloise Murray, Professor Emeritus at the University of Alberta. One of the project's studies found that in a particular village, the value of selected woodland products was US$75 — around 38% of a local household's average annual cash income. These products included fuel, wild fruits and construction poles, but did not take into account the many non-market values that villagers identified, such as water retention, rainmaking, inheritance values and sacredness.

Unsuccessful Forestry Strategies

Despite their many uses, woodlands have often been considered unproductive by economic planners and hence have been misused or cleared. Government forestry strategies of the 1980s, for example, led to the conversion of some natural woodlands into fuelwood plantations. The research team found, however, that the annual growth rates of planted and natural woodlots are often roughly the same. A recent paper written for Zimbabwe's National Biomass Energy Strategy concluded that "after a decade or more and the injection of many millions of dollars in the woodfuel and social-forestry subsector, the interventions inspired by decision makers have mostly failed. ...There is no evidence to suggest that planted woodlots have a major role to play in fuelwood provision."

Toward Improved Resource Policies

According to Dr. Murray, the team's results should help to improve decisions on resource policy. "Policy has to be based on reliable data, not just perceptions," she says. It must also acknowledge local realities. Although currently prohibited from entering protected state forests, villagers nevertheless collect fuel, food and building materials from these areas. In fact, the research team has found that such incursions are not necessarily detrimental. For example, women who gather thatching grass are removing material that could otherwise fuel forest fires. Dr. Murray suggests that joint management — the sharing of responsibility between the state and local communities — may be one way to balance local needs against woodland conservation.

The methodologies used in these studies include conventional economic analyses, environmental impact assessments, interviews and focus groups with villagers. "The big trick is making these methodologies culturally appropriate," says Martin Luckert, an economist at the University of Alberta. "It's not even a simple thing to estimate the value of a pole in an indigenous economy."

In the absence of a formal market for agricultural products, the research team has had to grapple with such problems as placing a dollar value on the trade of two loads of fuelwood for a bag of maize.

Comparing Land Uses

By converting the value of goods and services provided by trees into a common currency used by local communities, the team hopes to compare the value of different land uses. "We think that the value of alternate uses by local people should be included in centrally planned government decisions," says Dr. Luckert. Moreover, a better understanding of local social, environmental and economic value systems could help development agencies assess the potential impact of aid projects. For example, if people value the present more than the future, an initiative to plant slow-growing trees might prove fruitless.

Jennifer Pepall is a writer based in Ottawa.

Sidebar

The Social Forest in Resettlement

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TREATY TO ESTABLISH FIRST INTERNATIONAL RESEARCH ORGANIZATION IN CHINA

OTTAWA, CANADA, 31 OCTOBER 1997 --- A treaty establishing the first international development and research organization in China will be signed by Canada and a host of other countries November 6, 1997.

The organization, the International Network for Bamboo and Rattan (INBAR), will be based in Beijing. Governments signing the treaty include Bangladesh, Canada, China, Indonesia, Myanmar, Nepal, Pakistan, Peru, Tanzania, Thailand, and Vietnam. India and Malaysia are also expected to join.

The INBAR treaty is the result of more than 15 years of research funding by Canada's International Development Research Centre (IDRC) among others. The Government of China will contribute more than $5.4 million CAN (USD 4 million), in funds and through provision of facilities such as headquarters and support staff. Both IDRC and the UN's International Fund for Agricultural Development (IFAD) have pledged support totalling approximately $4 million CAN (USD 3 million) to the organization. The government of The Netherlands is expected to contribute an initial $2 million CAN (USD 1.4 million).

Bamboo is the most universally useful plant known to mankind and approximately 2.5 billion people, especially the poor in developing countries, depend on it for a wide range of uses and livelihoods. Together bamboo and rattan are a US $14 billion global industry.

INBAR is a network for development-led research dedicated to revitalizing the potential of two multi-use plant species, bamboo and rattan for the 21st Century. Through research, INBAR seeks to address the concerns of food, livelihood and the environment in developing countries.

The International Development Research Centre (IDRC) is a public corporation created by the Parliament of Canada in 1970 to help developing-country scientists and communities find solutions to social, economic and environmental problems through research. By bringing together people, institutions and ideas, IDRC tries to ensure that the benefits of this research will be shared equitably among all its partners in the North and the South.

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