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for a sustainable future

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Bamboo:

Sustainable Solution for Timor-Leste



United Nations
Industrial Development Organization

RDTL

Ministry of Economy and Development
Democratic Republic of Timor-Leste



CENTRU DE BAMBU



TIMOR-LESTE

This brochure has been produced under the direction of :

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Preface

When Martin Luther King delivered his famous speech "I have a dream" in 1963 he referred to the inequalities in the United States of America when he said: "I have a dream that one day this nation will rise up and live out the true meaning of its creed: We hold these truths to be self-evident, that all men are created equal."

I also have a dream that one day our country, Timor-Leste, will overcome its socio-economic inequalities, showing that this young nation can live in peace and use its capacity and capability to create its own means to a decent livelihood. There was no hesitation on my part when Prime Minister Kay Rala Xanana asked me in 2008 to take over the responsibility for the UNIDO-project of a *Bamboo Centre for Production, Demonstration and Training*. The selected personnel and management core team started with high hopes and spirits to fully exploit the industrial potential of bamboo and its socio-economic opportunities.

Today, my dream has become a reality. In partnership with UNIDO and the UNIDO Centre for South-South Industrial Cooperation, India, the *Centru Bambu de Timor-Leste* in Tibar has developed into a prototype of local integrated development. Over a period of a mere three years, we have graduated from the status of an externally-driven project, to one that is indigenously managed and promoted; we are on our way to sustainability and are producing furniture and handicrafts which are competitive with bamboo-products produced anywhere else in the world, and we are poised to diversify into yet more products such as bamboo blinds.

I believe that my cherished dream of a Timor-Leste without poverty and inequalities is taking shape. When I see the Bamboo Centre, I see concrete steps initiated in the fulfilment of these aspirations. It is a true demonstration of a successful partnership in development cooperation between the Government of Timor Leste and the United Nations Industrial Development Organization.

João Mendes Gonçalves
Minister of Economy and Development
Democratic Republic of Timor-Leste



Rare Black Bamboo in Timor Leste



Bamboo : From 'Poor Man's Timber' to 'Green Gold'

The origin of the term "bamboo" is still a puzzle. Some believe that the expression derives from the crackling sound made by the culms when burned, which is described by the Malayan word "bam-boom". Others believe that the origin of the term comes from the ancient Indian Sanskrit "mambu". The most ancient descriptions of bamboo are found in Chinese literature, describing bamboos of fabulous dimensions. From these ancient texts we learn that bamboo was not only scientifically but also socio-culturally deeply integrated in Asian society.

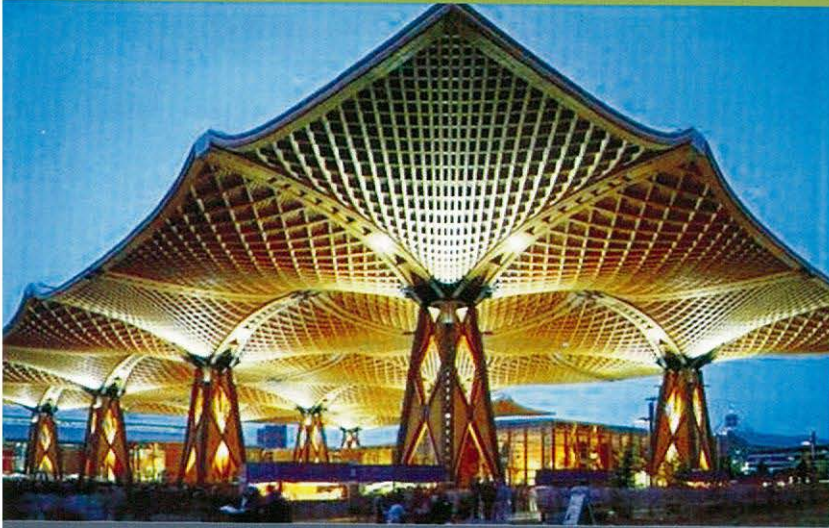
Even though bamboo is a grass and not a tree, in many countries it is still considered a tree in the legal sense, and is regulated under the rules of forestry, restricting its use for commercial and private purposes. Also in Timor-Leste, where the village communities are allowed to grow and use bamboo with legal restriction on commercial use.

For most people around the world who live around and with bamboo, the giant grass, which is the fastest-growing plant known to man, continues to be the "Poor Man's Timber".

There are known about 1,600 bamboo species, and almost 3 billion people worldwide use bamboo in some form or the other. Bamboo grows extensively, especially in Asia, occupying 2 million ha in Viet Nam, 4 million ha in China and nearly 10 million ha in India. Both, ecologically and economically, there is absolutely no doubt that bamboo is a most efficient and versatile raw material, particularly as a substitute for other raw materials like wood, fuels, construction materials and even food. Bamboo is excellent for rejuvenating degraded lands and protecting against soil erosion.



Bamboo: Post-modern construction

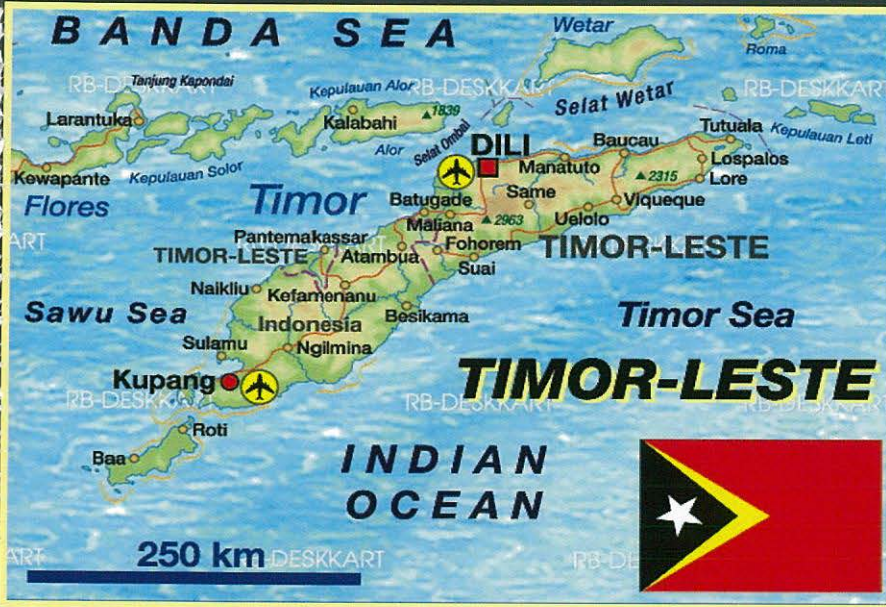


*Post-modern bamboo construction.
Photo: Joerg Stamm*

Plantation requires minimal capital investment and builds upon the inherent plant-cultivation skills of local farmers and forest-dwellers. Giant bamboos yield more cubic meters of semi finished material per ha than all plantation-grown hard woods and most soft woods. The underground rhizome of a bamboo clump produces new above ground culms annually so that there is a continuous production of new culms that enable harvesting of older mature culms. Thus, unlike a timber tree which requires fresh plantation after harvesting, bamboo can be harvested sustainably and has a much better energy balance than other construction materials.

A technology-driven transformation process starting in the last decades has elevated bamboo from the simple substitute for construction material for houses and fences to becoming one of the most versatile materials ever seen. In India alone it is estimated that more than 20 million people work directly or indirectly with bamboo, driven by the huge domestic market as well as the demanding global markets in Europe and US for flooring, laminated panels, furniture, curtains and handicrafts. China with its highly developed bamboo industry is the market leader in flooring, boards and blinds. Currently the world market Volume for bamboo products is estimated at 12 billion US\$.

Timor-Leste on the Road to Sustainable Development



Today the "Poor Man's Timber" is used in high-tech products to reinforce plastics, e.g. in the automotive industry, and extensively used as exclusive flooring and panelling, especially in European homes. There is absolutely no doubt about the extraordinary physical structure of bamboo, with tensile strength of 28,000 per square inch versus 21,000 for steel.

From low-cost housing to post-modern buildings and futuristic resorts, all these are being built from bamboo today. The paper industry long ago discovered its long and resistant fibers and even the energy industry is looking to transform bamboo into a source of renewable energy.

The notable process of technological transformation and the new global demands are boosting the prospects of the "Poor Man's Timber" into "Green Gold" and Timor-Leste is geared to gain access in a small but significant share of this transformation.



Timor-Leste on the Road to Sustainable Development

Timor Leste is one of the less developed countries in Asia, where more than 70% of the population lives on subsistence agriculture and where the average income is barely US\$ 30 a month. The issue at hand is can the country exploit natural endowment available for greater productive use and value addition along the full value chain for job and wealth creation?

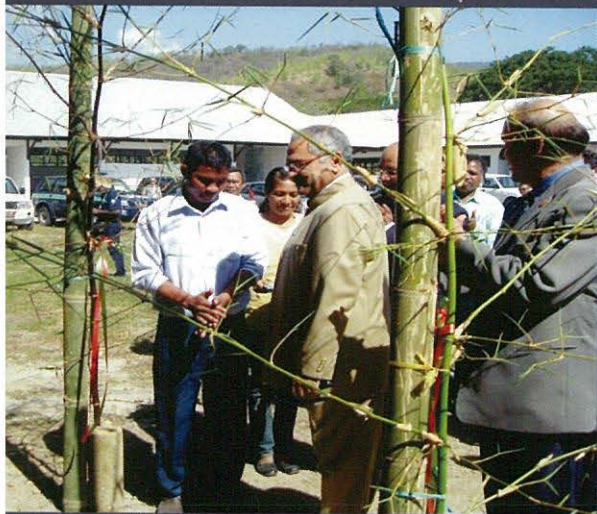
Job creation is one of the most challenging issues. An unusually high proportion of Timor-Leste's population is young, with more than half under 18 years, and a quarter between 18 and 30 years. With an average growth rate of around 3% per annum, more than 15,000 young people are entering the labour market each year. The private sector is still underdeveloped, and most employment generation is dependent on government investments. With the initiative of the Bamboo-Centre the country is able to exploit sustainable natural resources and add value along the full value chain for job and income creation.

As part of Timor Leste's development process, the bamboo sector has a dominant role to play in its growth plan. This vision is well documented in the recently launched Timor Leste Strategic Development Plan 2011 – 2030 and highlights in developing a National Bamboo Strategy undertaken in 2008 where Timor Leste's first Centre for Bamboo was established in Tibar. This initiative has the potential to reduce unemployment and establish an important value added industry for Timor Leste.

It is for this reason that the Ministry of Economy and Development has committed substantial resources to the UNIDO-assisted Centru Bambu. The Centre is envisioned not only as a provider of jobs in manufacturing, but more importantly, as a catalyst to vivify a value chain stretching from the village community that plants and harvests bamboo, right up to the carpenter and artisan who makes furniture and handicrafts, and the shopkeeper who sells these products or the trader who exports them.

The Centru Bambu is one more significant step on the long road to sustainable development in Timor-Leste.

Timor-Leste's Model of Integrated Bamboo Development



Ribbon cutting with H. E. President Ramos Horta, H. E. Minister João Mendes Gonçalves and Center-Director, Sabino Rua

The Centru de Bambu de Timor-Leste is rooted in a project initiated by UNIDO in 2003, under which some equipment was procured and installed in 2005, with the original intention of producing bamboo flooring material. But due to a variety of reasons, coupled with the internal civil disturbances, the project could not become operational.

Then in 2008, after a visit of Prime Minister Kay Rala Xanana Gusmão to UNIDO in Vienna and at the initiative of the Minister of Economy and Development, João Mendes Gonçalves, the project was revived. It was decided that UNIDO, in conjunction with the recently established India-based UNIDO Centre for South-South Industrial Cooperation (UCSSIC), would revive the project in an innovative and wider format.

The main objective of the project is to contribute in co-operation with the Timorese partners and the UCSSIC to poverty reduction by means of employment and income generation in a context of a post-crisis

situation through the establishment of a Bamboo Centre for manufacture of bamboo laminates, furniture and other industrial products, demonstration of viable technologies, and promotion of training and skill development.

Furthermore, the project aims at expanding the manufacturing capacity of the country by turning bamboo into a cash crop for wood substitution, creating value-addition to ultimately improve the economy of the country.

The first bamboo-table produced in Timor Leste in 2009

The Government of Timor-Leste undertook a thorough renovation of the buildings at Tibar, 15 kilometres from the capital of Dili, after re-settling the IDPs. A full renovation of the civil construction of the facility to house the centre including electricity and water supply was made available. The idle and disused machinery was repaired by UNIDO, additional equipment was procured, and the bamboo initiative entered its first phase of realization.

A detailed study was undertaken to map the natural bamboo resources available in a radius of 40 km around Tibar and the village communities were visited. Specific selection of bamboo species was made. A first group of 8 technicians received their initial training on bamboo industrial processing and management at the Cane & Bamboo Technology Centre (CBTC) in Guwahati, India in April 2009. UNIDO also organized a capacity building seminar in Tibar, and the first laminate boards began to roll out. Finally the first table made of bamboo laminate in Timor-Leste had been produced!



Bamboo sampling distributed to increase bamboo plantation

Transforming raw products from the rural areas through several steps of value addition is not an invention of the bamboo initiative in Timor-Leste, but the structure and manner of implementation is unique in modeling an integrated approach along the full value chain. From the beginning the focus has been to create an “integrated cycle of value”, to spread benefits upstream (to farmers and rural communities engaged in growing and harvesting bamboo) as well as downstream (to carpenters and artisans engaged in using the laminate boards manufactured at the Centre).

The strategy was to emphasize the importance of bamboo as a commercial raw material in rural communities and its importance for the local environment. An expert forester from India was deputed to conduct practical seminars for the target population, and train them in the scientific management and culm-harvesting of existing bamboo plantations, thus raising productivity and improving the quality of the harvested bamboo. With expert guidance, nurseries have been providing saplings to rural folk to enhance the bamboo availability, and to reduce reliance on naturally growing bamboo.

Since 2011 the bamboo initiative in Timor-Leste has started to plant bamboo in a bigger scale in those communities which have established a close relationship with the Centre. A special unit in the Bamboo Centre is taking care of training local leaders in bamboo plantation, nursery management, Monitoring of saplings and commercialization.



H.E. Minister João Mendes Gonçalves witnesses the first organized bamboo plantation in Timor-Leste

The Joint Timor Leste - UNIDO Programme Signed

With the introduction of the splitting-process at the plantation site the Centre is transferring a value addition process to the rural communities. With this value addition the farmers' additional income is expected to increase by around 30%.

The project entered its final phase in 2011. This phase is seen as a culmination of the pilot phase and aims at demonstrating technologies for product diversification, and skill enhancement for staff, craftspeople and small-and medium-scale entrepreneurs in the bamboo and wood sector of Timor-Leste. Sustainability of the project is at the core of the activities by ensuring market access, outreach and efficiency.

The industrial production of bamboo blinds, much in demand locally and in the export market, is the main aspect of product diversification in the final phase, as is the focus on waste-utilisation through production of artefacts and handicrafts from bamboo wastes.

The Bamboo Centre itself has developed as an industrial unit for the production of bamboo laminates and products. It has simultaneously grown into a Centre for the demonstration of viable bamboo industrial technologies and for training and skill development of apprentices from all over Timor-Leste.

Capacity is being built in existing institutions in Timor-Leste through networking and by linking them with specialized institutions. Marketing Efforts are being improved and new products developed towards the sustainability of the Centre.



Signing ceremony with H.E. Minister João Mendes Gonçalves and UNIDO Country Representative for Indonesia and Timor-Leste, Imran Farooque



Bamboo Culms and Bamboo Nursery



Nursery at the Bamboo Center

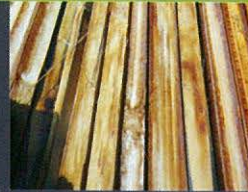


Quality selection of stems



Bamboo cuts at the community

From Raw-Bamboo to Bamboo-Board



Split-preservation

Cross-cutting

Two-side-planing

Splitting

Raw splits



From Raw-Bamboo to Bamboo-Board



Raw- board grinding



Board-press



Board-press

From Raw-Bamboo to Bamboo-Board



Raw-board

Split-assembling



Glueing



A Model for future Sustainable Development



The production of bamboo furniture started in 2009 when the first table was produced. From that time on the focus of the Bamboo Centre was the production of quality furniture as a core business. There are two lines: The Standard Line comprises tables, chairs, computer tables, shelves, beds etc. which are sturdy in use, sleek in appearance and affordable in cost. The Designer Line comprises furniture of modern design, comparable to the best in the world, at rates that are considerably lower. For the first time in Timor-Leste, furniture is being produced which has the characteristics of straight and clear forms, can be used in a flexible way as folding tables and folding chairs or are easy to transport like the shelves, tables or even beds which the customer can assemble by himself.

The industrial use of bamboo has become a model of integrated development in Timor-Leste. The humble plant, given little commercial value in the rural areas, has become an industrial raw material, which has turned into an intermediate wood-substitute in order to create furniture, blinds and other items, never before experienced in Timor-Leste!

This model of integrated development today is a prototype of best practice for mutual project implementation between national and international cooperation-partners leading to a successful outcome with a clear identification of a future plan to further strengthen the Bamboo Centre operations based on the principles of market operations. The foundation of the Bamboo centre, its demonstrated success and lessons learned and given the commitment of the Government of Timor Leste will ensure significant contribution in the development of the Bamboo sector in line with the national development policies and strategies.

Furniture - Standard Line



*Ensemble with
traditional seat-pillows*



Table line Bauhaus



Colly & bedside case

Furniture - Standard Line



Folding chairs and folding table



CKD - tables and shelves

Furniture - Standard Line



Office-desk and computer table

Bar- hocker



School-table with chair



Furniture - Designer Line



Anatomic resting couch

*Arm-chair
with traditional textile*



High-back chairs



Wash-stand ensemble



Furniture - Designer Line



Ensemble in black



Shelf Futura



Futuristic arm-chair

Transforming bamboo waste to household products



Pots and utilities



Fruit baskets



Serving Tray



Barbeque stick and tooth picks

Bamboo Blinds and Handcrafts



Cutting Boards



Picture Frames



Bamboo blind curtains



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