BRU

INBAR

Bamboo and Rattan Update

Volume 2 | Issue 2

Sharing the latest news and activities from the bamboo and rattan sector

OUT OF THE WOODS? THE FUTURE OF RATTAN

Bamboo and Rattan Update
Vol. 2 Issue 2
June 2021

Cover Image
Rattan furniture is a common sight across Indonesia. Credit: Bastian AS / Shutterstock.com

Editorial Team
Rene Kaam (Guest Editor)
Wu JunQi
Charlotte King
Leticia Robles (Art Editor)

Contributors
Lulu Lytle, Lorenzo Pradella, Terry Sunderland

To Submit
www.inbar.int/bru-magazine/
bru-magazine@inbar.int

About *BRU*
Bamboo and Rattan Update (BRU) is published quarterly by the International Bamboo and Rattan Organisation (INBAR). Content does not necessarily reflect the views or policies of INBAR. Articles may be reprinted without charge provided INBAR and author are credited.

About INBAR
INBAR is an intergovernmental organisation which promotes the use of bamboo and rattan for sustainable development.
www.inbar.int

INBAR Headquarters: Beijing, China
Regional Offices: Yaoundé, Cameroon; Quito, Ecuador; Addis Ababa, Ethiopia; Accra, Ghana; New Delhi, India

B R U

EDITORIAL

Welcome to the fourth issue of* Bamboo and Rattan Update*: a magazine that aims to bring together diverse voices for nature-based solutions around the world.

A question INBAR staff are often asked is: "Why rattan?"

While it is a ubiquitous sight in households across the world, rattan, the spiky climbing palm, often does not receive as much media attention as fellow non-timber forest products like bamboo.

But rattan is far from being the Cinderella of tropical plants. On the contrary, in many INBAR Member States rattan is considered a more important material than bamboo. There are more than 600 identified species of rattan around the world. Its long, flexible stems make it easy to weave into a wide range of products, and its relative proximity to rural households means it can be a lucrative "bank in the backyard." Traditional uses of rattan include baskets, canes, furniture, woven mats and ropes.

Two of the contributors to this issue of *BRU* consider the international journey of rattan. In her article, renowned founder of Soane Britain **Lulu Lytle** traces rattan's rise to prominence as a high-value, sought-after furniture material in Europe and America (page 4). She follows the plant's journey from humid tropical forests to high-society front rooms, and the development of specialised rattan workshops in the western hemisphere, some of which—such as Dryad in the United Kingdom—are still open for business.

As Lytle shows, although rattan was originally used as a material for packaging spices and silks sent from Asia to Europe, its flexibility and durability soon made it a popular choice for creating distinctive furniture designs. The photographs in her article, which are taken from her book *Rattan: A World of Elegance and Charm*, illustrate how the plant became such a household name in nineteenth- and twentieth-century Europe and America.

The popularity of rattan furniture has important implications for rattan-producing countries. International trade in rattan products is currently valued at around USD 350 million, and comes mostly from countries in Asia. In his article, Professor **Terry Sunderland** considers how African countries could contribute more to international rattan supply (page 9).

While many countries in Central and West Africa already boast thriving cottage industries for rattan, there are a number of issues hampering the sector's growth. Unclear tenure rights, and a lack of willingness by farmers to cultivate rattan, have led to poor management and dwindling supplies of the plant. But, as Sunderland explains, there are reasons to be optimistic that African rattans may soon be traded internationally.

One of those reasons could lie in a surprising area: bone transplant. In a company profile, **Lorenzo Pradella** introduces

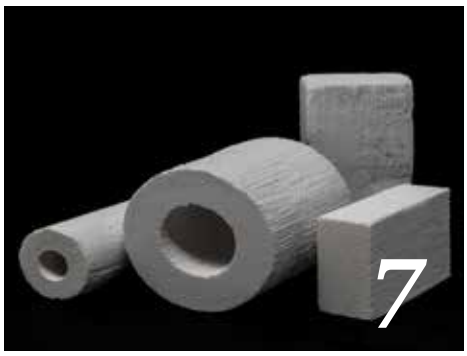
the pioneering work of his company GreenBone, which has developed a rattan material for bone transplant (page 7). As Pradella describes, there are two factors which make GreenBone unique: the use of rattan, whose internal structure closely mimics bone, and the production process, which transforms the plant while retaining its porosity and organic 'skeleton'. The result is a biomimetic material which allows full bone regeneration.

GreenBone's benefits extend outside the operating theatre. The product is set to hit the market soon, and Pradella estimates the company will need more than 50,000 rattan canes per year once the company is running at full capacity. There is a unique opportunity for rattan-producing areas to supply GreenBone, and similar companies, with sustainably sourced rattan canes.

As a climbing plant, rattan is literally inextricable from the fate of forests. Deforestation and ecosystem degradation affects the supply of rattan; in the same way, unsustainable harvesting of rattan can harm the trees on which it grows. With more attention, planned cultivation and sustainable management, rattan can be a key fibre of the future.

This issue also features a round-up of the latest bamboo and rattan news, in **Internode** (page 12); INBAR's latest activities around the world, in **INBAR Spotlight** (page 14); a review of the recent publication *Establishment of Rattan Plantations* (**In Review**, page 17); exploring why international bamboo and rattan trade reached USD 3.25 billion in 2018 (**In Numbers**, page 18); and an overview of past and upcoming events (**Events and Meetings**, page 19).

THE EDITORS



> ***Rattans could provide a real opportunity for the meaningful, and sustainable, development of rural areas and, potentially, for forest conservation and rural livelihoods.***
>
> ***- Out of Africa, Page 7+***

> ***Hopefully one day we'll have a professional player walking out into Lord's holding a bamboo cricket bat.***
>
> ***- Internode, Page 11+***

JOURNEY TO THE WEST

The author of the book* Rattan: A World of Elegance and Charm *describes the plant's long journey from tropical forests to Titanic deck chairs.

When rattan was first shipped from modern-day Malaysia and Indonesia to Europe in the 1600s, it was not as a prized commodity, but rather as a by-product of a growing European market for spices, silk, cotton, porcelain and printed textiles: rattan was a packaging material used to cushion these precious goods imported in increasing quantities by the Dutch and the British.

While initially, this rattan was discarded upon arrival, today, it is treated as a high-quality material sought out and imported by furniture makers around the world. How did rattan become so popular, and what is its future in western markets?

Seeding a trend

While wickerwork was a common technique in medieval northern Europe, willow, which grows in abundance across the continent, was the go-to weaving material. Rattan as a material from which to make furniture only truly came to the attention of the West from the late 1600s, as its practical advantages became increasingly apparent. Not only was rattan far stronger and more malleable than willow: chair seats made of split and woven rattan were cheaper, lighter and more hygienic than upholstered seats, as bugs could not linger as they did in fabric. At this point, there was still little understanding of rattan's design potential and it was simply incorporated as a detail in chair seats and sides.

Barbour's Woman Reading *(circa 1910) shows a young woman reclining on a rattan lounger. Credit: Sterling and Francine Clark Art Institute, Willamstown, Masschusetts/ Bridgeman Images.*

It was not until the mid-1800s that rattan furniture began to be produced in East Asia specifically for European markets. Inexpensive and considered by many to be delightfully exotic in a domesticated way, rattan furniture, from chairs and tables to planters and storage pieces, grew in popularity as the century progressed. A number of decorative and fine arts trends helped boost rattan's popularity: both the Aesthetic Movement, which drew heavily on Japanese influences, and the Arts and Crafts Movement, with its emphasis on simplicity of design and honest use of materials, helped to keep rattan in vogue.

Rattan furniture making in the West

Over time, as well as being imported from Asia, rattan became popular in workshops all over Europe.

The first factory in the western world to employ rattan in mechanised wicker production was Wakefield Rattan Company. Wakefield was established in the United States of America in the early 1850s, after successful experiments with large bundles of rattan abandoned on a dock in Boston. A few decades later, at its peak, Heywood-Wakefield's production facilities occupied almost five hectares of land in Massachusetts, producing highly sought-after furniture, baskets and baby carriages.

In Britain, what was generally known as 'art cane furniture' was made in significant quantities in the late 1800s by a number of companies. Of these, one—Dryad Furniture Works—used rattan exclusively, rather than willow or bamboo, as the principal raw material. Dryad was established in 1907; before long, the company had established

The renovation of Villa Saluzzo Bombrini, a villa in Liguria, Italy, features rattan furnishings. Credit: Carla de Benedetti.

a reputation for high-quality original designs, and was commissioned in 1914 to supply rattan chairs and tables for the lounge areas on the Titanic.

Across Europe and America, private yachts and passenger liners in the early 1900s, sanatoriums, clubs, cafés and palm courts all favoured rattan furnishings. In France, the iconic rattan bistro chair—now synonymous with French café society—has been in constant production since 1885, with the foundation of Maison Drucker in Paris.

Rattan had more unconventional applications. Light, flexible and strong, rattan seating was also incorporated in early airplanes to reduce weight and absorb in-flight stresses. When Charles Lindbergh made his pioneering solo flight across the Atlantic in 1927, his seat in the Spirit of St Louis was made of rattan.

Here to stay

As synthetic materials came into widespread use in in the European and American mass market, most notably machine-woven Lloyd Loom paper, and various types of plastic, rattan's future could have been threatened in the European and American mass markets.

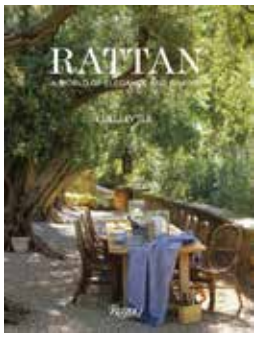
But rattan is a great survivor. Just as it began to lose ground to these new materials, it also started to receive more serious attention for its sculptural potential and cost. Rattan was seen as a democratic material on account of its affordability, unlike metals and rare timbers. Moreover, in the hands of highly skilled craftsmen, the deceptively strong and flexible rattan palm could be transformed into sculptural three-dimensional forms. The mid-century French designer, Joseph-André Motte, was one of many important creators to appreciate this, declaring "the material is in charge, then imagination."

It is this versatility, combined with its natural origins, that gives rattan furnishings an enduring appeal. Synonymous with heat, relaxation and languid summer days, rattan has been a favourite furnishing material in some of the most glamorous playgrounds of the last fifty years, whose occupants' lives were so evocatively captured by

the likes of photographers Slim Aarons and Horst P. Horst.

Far from being replaced by modern materials, well-made rattan furniture has become highly collectible. Some of the best nineteenth and twentieth century designs have achieved iconic status with their inclusion in museums' permanent collections. A resurgent appreciation for true craftsmanship, combined with an increased respect for natural materials, have created the perfect conditions for rattan's current popularity which shows no signs of waning any time soon.

LULU LYTLE
Lulu Lytle is the founder of British furniture and home decoration brand Soane Britain, and the author of *Rattan: A World of Elegance and Charm*. She is an expert in rattan furniture and traditional British crafts.



INSIDE THE WORKSHOP

Building a 'ripple console': At Soane Britain in the UK, rattan canes are treated and processed in-house, before being woven into furniture for sale. From left to right: (1) The plant arrives in the workshops in bales of long rattan canes of varying diameters. The canes are steamed to make them malleable. (2) After steaming, each cane is guided around a machine called a 'bender' and then bent into shape using wooden jigs and another tool, a commander. (3) The final stage of the frame-making process sees the assembly of all these elements into a robust skeleton form. (4-5) Thinner rattan strands are soaked in water baths to make them pliable before 'randing' (the weaving of strands between rattan stakes) and 'wrapping' (binding around the cane frames). Randing is similar to knitting, but without the needles, and a lot more physical. As the rattan dries, each of the strands contracts, giving the piece a tight finish. It can take a skilled weaver up to three days to make a lampshade and over a month to weave a large sofa. (6) When the weaving is complete the loose hairs on the woven rattan are singed off ahead of spray painting, staining or sealing in its natural state. Credits: Soane Britain.

FROM FOREST TO FEMUR

Inside the company at the forefront of bone grafting and bone transplants.

Bone healing is a slow process. Patients with large bone defects caused by trauma, unhealed fractures, infection or cancer can expect multiple and painful surgeries, long hospitalisation and recovery time, and continued pain. The risk of complications is also considerable: 52% of patients will experience deep infection, and 66% will suffer from non-union (when a broken bone fails to properly heal).

The issue is still an unsolved problem. Even the gold standard in bone regeneration, autograft (transplanting a replacement bone from another part of the body), has disadvantages such as pain and donor site morbidity, like bleeding and pelvis fracture, and is limited by the amount and quality of available bone.

The solution may come from a surprising material. GreenBone Ortho SpA, a start-up based in Faenza, Italy, has used rattan to develop an advanced bone-regenerating implant. The implant can be used to treat non-loaded and load-bearing large bone damage, including non-union fractures, trauma, bone loss induced by cancer and infection, and spinal fusion.

Rattan bone material's internal architecture closely resembles human bone, allowing the possibility of bone regeneration. Credit: GreenBone.

GreenBone Ortho uses rattan as the starting material for its bone regenerative implant. Engineered to reflect bone in its anatomy, morphology, physiology and composition, the GreenBone scaffold is a biomimetic material with high mechanical strength and porosity, endowed with the unique capacity to regenerate large portions of bone.

Why rattan?

The technology for making GreenBone was originally conceived and developed by a research group at the prestigious Italian Institute of Science and Technology for Ceramics, led by Anna Tampieri. A nature-inspired project to find new biocompatible materials able to sustain tissue regeneration in orthopaedics prompted a screen for plants that have a similar internal structure to bone.

The researchers identified rattan as the best candidate, as it has a comparable load-bearing capacity and an internal 3D architecture which mimics the way blood vessels run through bone. The researchers then developed a process that transforms the rattan stems to hydroxyapatite (HA) and beta-tricalcium phosphate (ß-TCP) plus ions, while—crucially— preserving its architecture.

HA and ß-TCP are well-established ceramic biomaterials and are used extensively in orthopaedics and dentistry as bone filler. They are normally available as cement obtained from powder. However, they are suitable for filling only small cracks. This is because, in order for the powder to consolidate into a stable 3D shape for bigger defects and injuries, the powder must be heated to a high temperature, which results in a complete loss of its biomimetic properties. As such, the body does not properly recognise this structure and bone very rarely regenerates.

The uniqueness of GreenBone derives from its porosity and the production process. The transformation requires no high temperature treatment, thus allowing the rattan to retain its

natural porous structure and architecture while changing its chemistry. The result is a material that reflects bone in its anatomy, morphology, physiology, and composition.

Importantly, this structure also makes it possible for GreenBone to regenerate large portions of bone. GreenBone provides a home for osteoprogenitor cells, which generate new bone material, to reside and multiply.

New functional bone formation from GreenBone has been demonstrated *in vitro* and *in vivo*. In pre-clinical studies, computed tomography scans of sheep treated with GreenBone showed that after six months, the implanted GreenBone was completely replaced by new functional bone without any side effects. All patients treated so far in trials with trauma-related injuries have demonstrated bone restoration of the affected area and are expected to reach full functional recovery with no adverse events: ossification (or, the process of laying down new bone material), mineralisation and bone remodelling were all clearly observed.

Knitting together supply and sustainability

GreenBone received regulatory approval in Europe by the end of 2019 and is currently under assessment by the US Food and Drug Administration. The material will enter the market in 2022 as a product for trauma and orthopaedic bone defects, and is being further developed for use in spinal fusion and to support facial reconstruction. It is expected to be cost effective in comparison to autograft, since it preserves the use of autologous bone harvesting and consequent cost- and time-consuming surgeries and therapies.

Supply is a key issue for GreenBone. To produce enough bone substitutes, a steady stream of rattan canes is mandatory: the company estimates it will need around 50,000 or more canes per year when operating at full capacity. While challenging, this requirement also presents a lucrative opportunity to connect with rural communities in rattan-producing countries. By establishing a sustainable rattan plantation, or creating a strong international supply chain to areas where rattan is already being harvested and sold, companies like GreenBone can contribute to sustainable job creation in rural areas, and possibly create export markets where none previously existed.

This positive side effect of developing rattan-derived bone substitute was unexpected, but important. By creating a high-value product from a well-known forest plant, GreenBone can support income generation and biobased economic growth in the countries where this plant is grown, at the same time as benefitting patients. It has a life far beyond the operating table.

LORENZO PRADELLA

Lorenzo Pradella is the co-founder and CEO of GreenBone. He has many years' experience in multinational pharmaceutical and medtech companies, and was formerly the President of Italy's HealthCare Licensing Group.

GreenBone will enter the market in 2022 as a product for trauma and orthopaedic bone defects. Credit: GreenBone.

OUT OF AFRICA

How can African countries become key players in international rattan trade?

Africa's 22 species of rattan can be found in the humid forests in the West and Central parts of the continent, where the tall forest canopy provides a frame for them to climb. Many of the species are endemic to the continent and climb with the aid of a cirrus, which resembles a barbed whip.

Fast-growing and flexible, rattan stems are used locally in the fabrication of baskets, furniture and other artisanal products and form the basis of a thriving cottage industry that contributes to the livelihoods of countless harvesters and artisans. The range of indigenous uses of rattan canes is vast: from bridges to baskets and from fish traps to furniture. The urban demand for rattan products has led to a significant, and vigorous, domestic trade in many African rattan-producing countries such as Cameroon, the Democratic Republic of the Congo, Gabon, Nigeria, and the Republic of the Congo, among others.

However, despite some exports, the rattans of Africa are not currently traded on a commercial basis internationally. Although in 2018, the international trade value for rattan products was USD 350 million, the main exporters were all from Asian countries: no African countries feature at all among the main exporters or importers, and African rattans constitute just USD 1 million, or 0.3% of total exports.

Climbing upwards

This could be changing. In particular, international trade bans by some of the world's larger rattan producers could offer a window for African countries to develop their sector, providing a source of raw materials for furniture and woven products.

The value of the international rattan trade is such that a number of producing countries, notably Indonesia, Malaysia, the Philippines and Thailand, banned the export of raw cane, allowing international trade in finished products only. These bans were imposed to stimulate the development of rattan-based industries in each country, and—in theory—to protect the wild resource from over-exploitation.

These restrictions in the trade of raw cane have encouraged some rattan suppliers to investigate non-traditional sources of rattans, predominantly Indo-China, Papua New Guinea and, more recently, Africa. Because the African species used for commercial purposes possess similar growth rates as well as anatomical and mechanical qualities to traded Asian taxa, this potential geographical shift in supply would ensure the overall rattan quality of the global industry would be maintained.

Increased cultivation of rattan in Africa would be both ecologically feasible and socially beneficial through the sheer value of the resource. However, there are a number of challenges to scaling up the sector.

Incentivising rattan farming

One main challenge of developing Africa's rattan sector is its management. Throughout its range, rattan is primarily managed as an 'open access' resource: it is basically common property and anyone is able to harvest anywhere it occurs. The lack of adequate land and resource tenure precludes many attempts at long-term management and sustainable harvesting.

A related problem is the lack of rattan cultivation African countries. Currently, the vast majority of African rattan is harvested exclusively from wild populations. This is dissimilar to other rattan-growing areas, such as South-East Asia, where rattan is traditionally grown as part of mixed gardens, comprising fruit or rubber trees on which rattan can climb.

By contrast, no known similar cultivation practices exist in West and Central Africa. In fact, despite numerous attempts to introduce rattan cultivation in a number of producer countries, farmer adoption of rattan cultivation has remained very low in Africa. Reasons for this low uptake range from practical (rattan's long germination times and high mortality of rattan seeds are a major disincentive to farmers), to economic

(the market uncertainty involved in growing an unfamiliar plant), to conceptual: rattan is perceived as a readily available plant, so there is no need to cultivate it. When questioned, a common response by farmers is: "If it's in the bush, why do I need to grow it?"

However, in the rare instances where resource tenure is more clearly defined, younger stems are left to regenerate and provide future sources of cane, usually on a two- to three-year rotation. In Laos' Bolikhamxay province, a combination of formal legislation—to protect 11,000 hectares of rattan forest—and training in management techniques has led to an increase in rattan supply and locals' incomes. It is a model which can be replicated elsewhere.

In this regard, there is considerable reason for optimism. Across many parts of Africa, there is a significant paradigm shift underway: from the management of forest resources being controlled by the state, to community-based management. Through the empowerment of forest communities in Africa there is significant potential to ensure the long-term sustainable, and equitable, exploitation of a wide range of forest resources, not only rattan.

A number of initiatives are underway to improve management practices and incentivise rattan cultivation across West and Central Africa.

Rattan weaving is a traditional craft in many parts of Central and West Africa. Credit: Terry Sunderland.

The former African Rattan Research Programme, an initiative of the Royal Botanic Gardens, Kew and University College London, together with a number of African institutions and non-governmental organisations, introduced curing and handling technologies from South-East Asia, facilitated new knowledge on propagation and cultivation techniques and provided a detailed assessment of the value chain for the rattan resource.

More recently, INBAR's Task Force on Rattan Uses and Development, which is made up of experts from around the world, was established to raise awareness about rattan management and best practices. In 2020, the Task Force published a technical report, Establishment of Rattan Plantations, which provides guidance on how to set up and manage a plantation. INBAR also has Regional Offices in Cameroon and Ghana, both important rattan-producing countries.

Climbing high

As essential biological, ecological and socio-economic information on the African rattan resource becomes increasingly available, and suitable strategies to ensure sustainability are implemented, there is significant potential for the rattans of Africa to contribute not only to the regional development of the resource, but also to the thriving global market.

Through the development of community-based management supported by appropriate legislation, African rattans could provide a real opportunity for the meaningful, and sustainable, development of rural areas and, potentially, for forest conservation and rural livelihoods. In this way, rattan can become a more profitable 'bank in the backyard' for rural households across Central and Western Africa.

TERRY SUNDERLAND

Terry Sunderland is a Professor of Tropical Forestry and Food Security in the Department of Forest and Conservation Sciences, the University of British Columbia and a Senior Associate with the Centre for International Forestry Research (CIFOR). In 2019, Dr. Sunderland was awarded the IUFRO Scientific Achievement Award for his research.

INTERNODE

Collating the latest international news and activities around bamboo and rattan sector development.

Darshil Shah, the co-author of a paper looking into replacing willow with bamboo as a material for making cricket bats, studying a bamboo bat. Credit: AFP.

Bamboo bats: the future of cricket?

Researchers at the University of Cambridge are promoting bamboo cricket bats as an alternative to the traditional willow.

Dr. Darshil Shah and Ben Tinkler-Davies, who unveiled their prototype bat in an article for the *Journal of Sports Engineering and Technology*, claim that bamboo bats are more sustainable and have a bigger sweet spot. They also say the bats are stiffer, harder and stronger than those made of willow, although more brittle.

One key feature of bamboo bats is the sustainability of the material. According to Dr. Shah in an interview for Sky Sports, "There's so little wastage, compared to a willow cricket bat.... With bamboo, there are very few, if any, sections which need to get thrown away. So it's great for sustainability and it's a really cheap material to use.

"The other thing you've got to consider: although willow is grown in the UK, a lot of cricket bats are manufactured in India... We've got bamboo growing in India and China, right next to where it's being manufactured, so we'd cut out 50% of the emissions just through the transport of the cricket bats.

"We believe it's going to be much more eco-friendly as a material and also as a manufacturing process."

The prototype bat blade is made from strips of bamboo shoots stuck together with a resin adhesive and formed into layers. Computer simulations have also shown the bat's 'sweet spot' to be wider and longer than for traditional willow bats.

One disadvantage of the bamboo bat is its weight. The prototype bat is 40% heavier than willow. According to Tinkler-Davies, "The next stage of our project is to take the better material properties and make a thinner bat."

The study has provoked much discussion online. The renowned Marylebone Cricket Club in the UK has ruled out the use of bamboo, because it is a grass and not a tree: as such, it is "illegal" under current club laws. However, the body also said in a statement that it welcomes the exploration of alternatives to the willow blade.

Tinkler-Davies and the team are optimistic

about the future of their prototype, and say they have received very positive feedback from the cricketing community. "Hopefully one day we'll have a professional player walking out into Lord's holding a bamboo cricket bat."

Source: SkySports, *12 May.*

Californian bamboo start-up wins national affordable building prize

Bamboo housing company BamCore has won an award from the Ivory Prize for Housing Affordability.

Now in its third year, the Ivory Prize recognises ambitious, feasible, and scalable solutions to housing affordability in America. California-based start-up BamCore won the construction and design award for its bamboo-based panelised wall systems.

Described as a "studless framing solution", BamCore panels have a lower carbon footprint than traditional housing materials, and can be framed quickly and at less cost. BamCore describes its work as innovative for "reducing the need for skilled labour and speeding up the build time by more than 50%, while producing a much more energy-efficient home."

Source: Ivory Innovations*, 18 May.*

New oil heat treatment technology for bamboo

Researchers in the Philippines have developed a new method of bamboo preservation, which reuses old cooking oil. The method is expected to reduce costs for treating bamboo among businesses in the Philippines.

While oil treatment for bamboo, or thermal modification technology, is already popular as a non-chemically intensive way to treat bamboo, the cost of the equipment and fresh oil can be prohibitive for smaller businesses. Researchers at the Forest Products Research and Development Institute of the Department of Science and Technology have developed 'hot oil bath' technology which reuses waste cooking oil instead of fresh vegetable oil. It can be used to treat bamboo poles up to eight feet long.

According to a department representative, the new technology costs PHP 500,000 [around USD 10,500] to build, or less than half the price of imported technologies, making it more affordable for small- and medium-sized bamboo processing companies.

Source: Manila Bulletin*, 9 May.*

New bamboo factories in Guatemala, Jamaica, Rwanda

Jamaica's first dedicated bamboo pulp mill, Bamboo Bioproducts Ltd., will start operations in 2021.

According to company representatives interviewed for *Forbes*, the mill and bamboo plantation will be built on more than 10,000 hectares of old sugar cane land in Frome, Westmoreland, and are expected to harvest one million tons of bamboo poles annually.

Similarly, in Rwanda, Minister of Environment Jeanne d'Arc Mujawamariya announced that a bamboo processing factory will be established in August 2021. The factory is expected to produce a number of articles, including plywood, toilet paper, toothbrushes and furniture, for domestic use and export.

So far, over 200 hectares of bamboo have been planted to supply the factory. This is expected to increase to more than 5000 hectares in the future.

A new bamboo plant is also scheduled to open shortly in Guatemala. The plant, which is located in Villa Nueva, is expected to treat and process 50,000 bamboo poles a year, for sale to Mexico, El Salvador and Honduras.

Source: Forbes*, 31 March;* The New Times (Kigali), *31 May;* Central America Data, *31 May.*

Promoting bamboo construction in India

The Bamboo Society of India (BSI) and Council of Architecture (COA) have recently signed a Memorandum of Understanding to promote bamboo use in India's construction sector.

Although bamboo is widely distributed across India, bamboo buildings remain informal and unregulated. The Memorandum aims to conduct and share research about bamboo construction, and promote greater awareness about bamboo

housing at undergraduate and postgraduate levels.

As part of the Memorandum, COA will include content on bamboo construction in its architecture curriculum. BSI and COA will also establish and manage several Centres for Bamboo Technology and Design Development. Each Centre will feature classrooms, workshop buildings and treatment and processing facilities, to support people to learn about bamboo construction.

Source: The Hitavada, *25 May.*

New species of bamboo named

A new species of bamboo, found in India, has been named 'Madhav Gadgil', after the country's famous ecologist.

This new species, *Pseudoxytenanthera madhavii*, was named by a team of researchers in Pune district. While the species has long been known to local residents as 'Mes', and used as a construction material, it was not known botanically, and was treated under the same name as a similar species.

According to the Forest Survey of India, the total bamboo bearing area of India is estimated to be 15.7 million hectares. Established in 2018, the National Bamboo Mission aims to increase the area under bamboo cultivation, and promote a more formal bamboo economy in areas such as Pune.

Source: Hindustan Times*, 26 May.*

Promoting bamboo in Thailand

A new initiative aims to promote bamboo as an economic crop for sustainable development in southern Thailand.

The Southern Border Provinces Administrative Center (SBPAC) plans to establish bamboo plantations on 48,500 hectares of land and create a centre for bamboo processing. In a press release, the government noted bamboo's uses "to slow down soil and coastal erosion", particularly through the building of bamboo fences on the coastline, and as a way to "generate more income and employment for local residents in the south."

Currently, the SBPAC is working with Prince of Songkla University and farmer councils on a pilot project to plant bamboo on 800 hectares of farmland in Yala province.

Source: The Government Public Relations Department, *18 May.*

Bamboo planting in Burundi

Resilient Food Systems, a programme under the Global Environment Facility, is using bamboo as part of its mission to enhance food security in sub-Saharan Africa.

The programme team is working with local residents to plant bamboo in Mwaro, Muramvya and Gitega provinces of Burundi. The bamboo is being planted along rivers, as a way to combat soil erosion and prevent landslides. So far, seedlings have been planted along 15,000 hectares of land. Through Farmer Field Schools, communities in Burundi are also learning about propagating bamboo, and growing bamboo in nurseries.

The bamboo resources are generating income for women in Gitega province, who are using the new stocks to create artisanal products for sale.

Source: Resilient Food Systems, *16 April.*

4500-year-old bamboo-mud cabin found in China

Archaeologists in southwest China's Sichuan province have discovered six pieces of carbonised bamboo chips that are believed to be part of a bamboo-mud cabin dating back 4500 years.

In ancient China, the bamboo-mud style of building was an established form of construction in some areas, but it has never been confirmed as existing on the Chengdu Plain at such an early date.

The oldest known bamboo construction in the world is 9500 years old, and was found near the coastline in modern-day Ecuador.

Source: Xinhua News*, 7 June.*

Want more nature-based solutions in your inbox?
For regular updates on bamboo- and rattan-based news, sign up here:
www.inbar.int/newsletter

INBAR commissions research, conducts project work and raises awareness about bamboo and rattan across its 47 Member States.

Bamboo planting in Ghana, as part of the recent Africa study tour. Credit: INBAR.

New international standard on bamboo structures

In June 2021, the International Organization on Standardization (ISO) published a new standard on structural design with bamboo poles. The standard, which is a significant step forward for bamboo construction around the world, was developed with support from INBAR staff and members of INBAR's Bamboo Construction Task Force.

Although bamboo is a common housing material in many parts of the world, until recently there were no international standards to regulate its use and designs. ISO 22156:2021 builds on previous standards published in 2004, providing more comprehensive guidelines for designers and architects about how to build with round bamboo. Specifically, the standard applies to the design of bamboo structures up to 7 metres high, "whose primary load bearing structure is made of round bamboo or shear panel systems in which the framing members are made from round bamboo", and specifies their "requirements for mechanical resistance, serviceability and durability".

ISO 22156 is the first bamboo standard that is written by a team of bamboo and construction experts from across the world. This includes critical support from several members of INBAR's Bamboo Construction Task Force.

As a 'liaison A' organisation to ISO, INBAR will help to disseminate the standard across its Member States, encouraging national standards authorities to adopt the guidelines, and sharing them with universities and architecture firms.

Kickstarting the UN Decade on Ecosystem Restoration

World Environment Day (5 June) marked the start of the UN Decade on Ecosystem Restoration, of which INBAR is a partner.

The Decade on Ecosystem Restoration is a ten-year "rallying call" to protect and restore ecosystems. From 2021 to 2030, the initiative will build political momentum for ecosystem conservation and restoration, and oversee thousands of initiatives on the ground. The Decade is led by the UN Environment Programme and the Food and Agricultural Organization of the UN.

As a partner of the UN Decade, INBAR will continue its work to promote bamboo and rattan for land restoration, forest conservation and biodiversity protection.

To mark the start of the Decade, on 3 June INBAR hosted a webinar, 'Integration of bamboo into forest restoration'. Invited speakers summarised the ecosystem services provided by bamboo forests and plantations, described how to integrate bamboo into landscape restoration, and considered results and lessons learned from a case study in Chishui, China.

Sharing Ghanaian bamboo expertise

Delegates from many of INBAR's African Member States took part in a three-day study tour in Ghana, as part of efforts to promote networking and establish partnerships for investment in the bamboo sector.

The trainees (pictured) visited Greater Accra, Eastern and Ashanti regions, and learned about best practices and achievements from successful Ghanaian bamboo businesses. Trainees came from 18 countries and a broad range of backgrounds, including policy makers, bamboo artisans, entrepreneurs and smallholder farmers.

The tour included a visit to several Ghana-based bamboo companies, including Booomers Bamboo Bikes, charcoal briquette producer Global Bamboo Products, and Pamplo Ghana, which manufactures bamboo dowels, skewers and sticks.

The study tour was organised as part of the ongoing Inter- Africa Smallholder Farmers Livelihood Development Programme, an initiative funded by the International Fund for Agricultural Development which seeks to upscale and diversify bamboo value chains and promote industrialisation of bamboo products in Cameroon, Ethiopia, Ghana and Madagascar.

A video summary of the study tour is on Youtube:

https://tinyurl.com/BRUV2I2

INBAR at UNFF 16

On 29 April, INBAR hosted a side event at the 16th Session of the UN Forum on Forests (UNFF 16). Speakers at the event, which was themed 'From policy to action: forest and economic revival with bamboo', discussed bamboo's potential for forest and landscape restoration, and as a tool for livelihoods and poverty reduction.

In a keynote video message at the event, INBAR Deputy Director Professor Lu Wenming described how bamboo could contribute to two thematic priorities of UNFF 16: enhancing the economic, social and environmental benefits from forests, and reversing the loss of forest cover.

As Professor Lu explained, INBAR is actively promoting bamboo as an important part of land restoration programmes: "In the next few years, INBAR will conduct some 450 training courses which will benefit more than 29,500 farmers across Africa, Asia, Latin America and the Caribbean, and support the establishment of around 20,000 hectares of new bamboo plantations."

Following this keynote speech, experts described specific examples from Africa, Asia and Latin America, where bamboo is being used to protect and restore forests or as a sustainable alternative to timber.

INBAR Honour Day at the Yangzhou Expo

On 8 April, INBAR celebrated its Honour Day on the opening of the International Horticultural Exposition 2021 (Yangzhou Expo).

The Yangzhou Expo opened on 8 April in Yangzhou, Jiangsu province, China. Over the next six months, the event will welcome visitors from across the country to visit its 230-hectare area, which includes gardens from a wide range of organisations, under the theme 'Green City, Healthy Life'.

INBAR has a garden at the Yangzhou Expo, which showcases the potential of bamboo and rattan as low-carbon, biobased materials for construction and green lifestyles. On 8 April, INBAR marked its 'Honour Day', with an event which celebrated the organisation's growth and achievements over the last 24 years. More than 200 guests, including local government representatives, international organisation staff and diplomats from a number of INBAR Member States, were invited to take part in the event, which took place in the bamboo-filled INBAR Garden.

At the start of the event, attendees watched a cultural performance of songs and music about bamboo and rattan, from different countries across Africa, the Asia-Pacific and the Americas.

Following the performance, a number of leading representatives made speeches, and the INBAR Garden was officially 'opened' to the public.

INBAR will host a range of events, workshops and performances about bamboo and rattan until 8 October, when the Yangzhou Expo closes.

Ethiopia adopts seven bamboo standards

In late March, the Ethiopian Standards Agency adopted seven national standards on bamboo construction and treatment. The seven ratified national standards focus on the design of bamboo structures and the preservation of bamboo for construction and non-construction purposes. Once taken up, they should improve the quality and market potential of bamboo products and structures.

Ethiopia's standardisation work is supported by INBAR, through its ongoing Dutch-Sino East Africa Bamboo Development Programme, and as part of its work with ISO to develop and promote standards.

Improving bamboo management in Viet Nam

An ongoing INBAR-led project to improve bamboo management in Viet Nam is already reaping rewards, according to data published by the Regional Community Forestry Training Center for Asia and the Pacific (RECOFTC).

For generations, people in Viet Nam's Nghe An province have relied on a species of bamboo known locally as 'Lung' (*Bambusa longissima* sp. nov) to make household items and artisan products for sale.

However, by the mid-2010s, over-harvesting was devastating the resource. INBAR is working with RECOFTC on a project to improve Lung bamboo management and sustainable income generation in this area, as part of a wider landscape restoration initiative funded by the German government.

According to RECOFTC, the four-year project has so far trained hundreds of villagers on bamboo propagation, management, harvesting and processing techniques, and helped smallholders secure tenure rights and negotiate agreements to supply larger bamboo products companies in the region.

Locals are already seeing results: in one community, average incomes from selling Lung bamboo have doubled to VND 15 million to 17 million [USD 650-740] per year after training. There is less waste in the production chain, and people have learned to propagate bamboo successfully: Lung bamboo transplants have a 90% chance of survival.

The project will run until 2022.

Building up bamboo artisans in East Africa

INBAR has been undertaking capacity-building initiatives to enhance bamboo-based economic activities across Ethiopia, Kenya and Uganda, as part of the Dutch-Sino-East Africa Programme. The Programme, which is funded by the Ministry of Foreign Affairs of the Netherlands, aims to support bamboo sector development in East Africa, using case studies and best practices from China and the Netherlands.

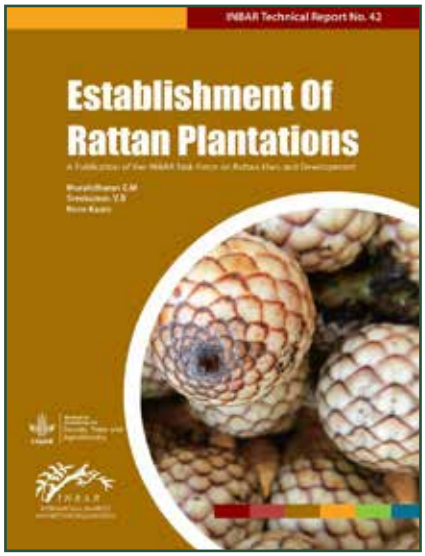
In late March, INBAR managed a workshop on bamboo treatment and furniture making for 30 carpenters in Uganda. In May, another training session introduced the basics of home-based bamboo charcoal production.

Throughout the last few months, a range of training sessions were conducted in Kenya and Ethiopia. More than 150 participants from a wide range of backgrounds, including government, youth groups and the private sector, took part in workshops on bamboo processing and product making (15 to 19 March), bamboo management and restoration (25 and 26 March), and bamboo charcoal and briquette making (25 to 26 March).

Moreover, through the support of INBAR, Ethiopia has recently adopted seven national bamboo standards, that have been ratified by the Ethiopian Standards Agency. (See article above).

The Programme is currently supporting the adoption of additional national standards for Ethiopia, Kenya, and Uganda on bamboo and bamboo-based products.

IN REVIEW



Establishment of Rattan Plantations (2020)

Rattans have been collected as an important non-timber forest product for thousands of years, and the extent of harvesting was—until recently—sustainable, since adequate natural regeneration occurred.

However, in recent years, it has become increasingly clear that unsustainable harvesting practices and deforestation are threatening most of the world's rattan resources, leading to a loss of germplasm and even the threat of extinction of some species. Part of the problem is a lack of knowledge about sustainable harvesting practices, and how to cultivate rattan.

Given growing demand for rattan products, and the fact that rattans contribute substantially to the livelihoods of an estimated 700 million people, it is important to establish rattan plantations to ensure sustainable availability and sufficient economic returns. That is what the new INBAR report, *Establishment of Rattan Plantations*, sets out to do.

Written by several members of INBAR's Task Force on Rattan Uses and Development, the report aims to establish "a scientific basis for plantations", including all the activities involved in their management, cost-benefit analyses, and policy considerations. The report gathers information from various studies about rattan systematics, propagation techniques and plantations.

The establishment of high-quality plantations, and the continuous supply of high-quality rattan poles, not only benefits the socio-economic status of the communities engaged in rattan production, processing and trade: it also protects forests, since rattans require support trees for their growth and development.

The first sections of the report identify commonly used commercial species of rattan across different countries, and provide guidelines on how to select the appropriate species for certain products, land types, and climates. Examples are given from different countries across Africa and Asia which have set up rattan plantations, as a useful reference for would-be planters.

Similarly, the final sections of the report consider practical information about rattan propagation, planting and harvesting, and some considerations about how local policies, land tenure and gender issues will influence how rattan resources are managed and utilised.

But the report is more than a 'how to' manual; it also offers a rationale for establishing rattan plantations. In chapter 5, for example, the authors summarise some of the climate change and ecological benefits accruing from rattan plantations. As a commercial activity, the authors write, "rattan plantations offer advantages that few other plantation activities can claim", since growing rattan involves no great interference to the natural trees, and harvesting may be carried out with minimal disturbance to vegetation and soil. In fact, retaining mature trees in the forest is a "prerequisite for the successful cultivation of most rattan species in natural forests or plantations", making it a natural accompaniment to climate policies that protect carbon-rich, old-growth forests.

Part instruction manual, part justification for rattan plantations, *Establishment of Rattan Plantations* provides a comprehensive overview of recent literature about how, and why, to establish a more sustainable supply of rattan.

E.M. Muralidharan; V.B. Sreekumar; R. Kaam. (2020) *Establishment of Rattan Plantations*. INBAR Technical Report No. 42. Beijing, China: INBAR.

USD 3.25 billion

… The total value of international trade in bamboo and rattan products in 2018, according to UN Comtrade data analysed by INBAR. Of this, the international trade value of bamboo products was USD 2.9 billion; the international trade value for rattan products was USD 350 million.

USD 3.25 billion is much higher than previous estimates of international bamboo and rattan trade. (In its 2017 report, INBAR estimated the overall value of international bamboo and rattan trade at USD 1.7 billion.) The apparent 'bump' is due to the newly expanded range of Harmonized System (HS) codes for bamboo and rattan products, introduced in 2018. HS codes provide a way for countries to classify imports and exports, but bamboo and rattan products have historically often been mis-classified as 'timber', due to a lack of more accurate codes. The 2018 HS codes, which include options for new types of woven products, building materials and more, allow countries to report more accurately on bamboo and rattan trade. It is likely that in future years, the figures for bamboo and rattan trade will grow further.

International trade remains very small compared to domestic bamboo and rattan trade, as the case of China shows. According to Chinese Customs data, the country's bamboo sector was worth an estimated USD 38 billion in 2018, of which just 5 per cent (USD 2 billion) is international trade.

The 2018 international trade report, *Trade Overview 2018: Bamboo and Rattan Commodities in the International Market,* is available on the INBAR Resources Centre: www.inbar.int/resources/.

The main exporters and importers of bamboo products in 2018

The main exporters and importers of rattan products in 2018

EVENTS AND MEETINGS

INBAR EVENTS

6 April

International Forest City Conference 2021

Nanjing, China

8 April

INBAR Honour Day at the International Horticultural Exposition 2021, Yangzhou, China

Jiangsu, China

13 April

Webinar: Bamboo Textiles Industry Development

Virtual INBAR event

29 April

16th Session of the UN Forum on Forests

Virtual UN event

3 June

Integration of bamboo in landscape restoration

Virtual INBAR event

5 June

World Environment Day

International day

18 June

Chengdu 24th Bamboo Culture Festival

Chengdu, China

22-24 June

FTA-Kunming Scientific Conference

Kunming, China and virtual event

28 June

'Bamboo's Integration in Science, Art, Life'

Shanghai, China, and virtual event

Find out about relevant upcoming events at www.inbar.int/event/

Open for submissions

THE INBAR INTERNATIONAL PHOTO COMPETITION

www.inbar.int/event/photocompetition2021

INBAR is looking for striking photographs which tell a story about how bamboo and rattan contribute to some of the most pressing global challenges: as a tool for job creation, a part of biodiverse forests, and a biobased, low-carbon material for durable products and construction.

Winners will receive up to USD 300 for their submission, and have the chance to see their image featured on key INBAR communications materials in the future.

Find out more about photo requirements and how to submit at the link above, and visit the INBAR website to view last year's competition winners.

Credit: Bastian AS / Shutterstock.com

Women in Indonesia bind together rattan furniture. Indonesia is the world's largest rattan exporter: in 2018, the country exported USD 122 million-worth of rattan products. Although traditional rattan crafts are dwindling in a number of neighbouring countries, including Singapore and Malaysia, in Indonesia government controls have kept the sector afloat. In particular, a ban on exporting raw rattan cane has protected locals from losing market share to other countries: instead, Indonesians can make rattan into value-added products such as furniture, baskets, mats or canes, rattan products, for more money. Protectionist policies, and a growing global demand for wicker and rattan products, are helping an ancient industry to thrive.

INBAR
INTERNATIONAL BAMBOO AND RATTAN ORGANISATION

CHINA | CAMEROON | ECUADOR | ETHIOPIA | GHANA | INDIA
www.inbar.int | @INBAROfficial