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Bamboo & Rattan Update

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

ENDING POVERTY WITH BAMBOO & RATTAN

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B R U

EDITORIAL

Welcome to the first issue of the* Bamboo and Rattan Update *for 2024, which details bamboo and rattan's contribution to ending poverty.

Enormous challenges are facing our planet, from greenhouse gases trapping heat in the atmosphere and the systemic degradation of land and water environments to the rapid loss of species.

In 2023, the *Bamboo and Rattan Update* (BRU) shined a light on these challenges, focusing on the contributions of bamboo and rattan to the three Rio conventions, global pacts agreed upon by the world's governments to fight climate change, desertification and declining biodiversity, as well as spotlighting the ways in which bamboo can strategically combat plastic pollution. Part and parcel of these international treaties, the 17 United Nations (UN) Sustainable Development Goals (SDGs) comprise a list of objectives aimed at creating a better world by 2030 through sustainable development in economic, environmental and social sectors. Bamboo and rattan can play direct roles in achieving at least seven of the SDGs, with indirect impacts on more. In 2024, the BRU will focus on the contributions of bamboo and rattan to the UN SDGs.

The first issue of BRU in 2024 highlights, rather naturally, the first goal — "SDG 1: End poverty in all its forms." Focusing on extreme poverty, which the UN measures as "surviving on less than $2.15 per person per day at 2017 purchasing power parity," the world has made significant economic progress in the last few decades, leading to massive improvements in standards of living. However, the COVID-19 pandemic decelerated and even reversed some of these gains. Costly lockdown measures, travel restrictions, an overburdened medical sector, supply chain disruptions and more hampered movement toward sustainable development. With a bevy of high-value end uses, bamboo and rattan can be important tools for rebooting efforts to keep the momentum of poverty reduction on track while building thriving green industries.

But at what scale can these resources be utilized, and where can they be leveraged for maximal impact? The author of the first article points out that bamboo value chains can address poverty alleviation at the national level, pointing to the example of Ethiopia. Representing 31.55% of Africa's total bamboo, Ethiopia is naturally equipped to generate green economic development through strengthening its bamboo value chain. The extensive distribution of bamboo means it can be utilized by a wide range of communities across the country, many of which already have related local craft traditions and value addition processes, facilitating its uptake on a broad level. It goes on to mention that one approach that could significantly bolster the value chain in Ethiopia is to reinforce efforts to manufacture bamboo products

with advanced technologies for targeting the export market since 88% of bamboo growers sell their products at local markets.

The next article switches gears, transporting readers to the lush island of Borneo, home to Indonesia's Kalimantan territory and over nine million hectares of rattan. It is here that rattan growing in the forest can help tackle poverty in a number of ways, such as by creating green jobs from its harvesting, processing and value addition, livelihood diversification, and strengthening small and medium enterprises. The author of this article suggests that rattan offers not only economic but also cultural value to the Dayak people whose livelihoods are interconnected with the rainforest. A sustainable company is working with Indigenous artisans and smallholders in the area, forging sustainable village economies through ethically made products, helping connect locals with global buyers. In this, they enhance the economic resilience of stakeholders while enshrining cultural traditions where they matter most.

The next article champions bamboo in Uganda for reducing economic hardships and mitigating deforestation and climate change. As the author mentions, one forestry and energy firm in East Africa is implementing project work in the region, with the goal of using nature-based solutions to reduce the impacts of climate change and poverty on communities in the Greater Rwenzori Sub-Landscape. High poverty rates in the area have exacerbated pressures on the natural environment, leading to reductions in forest cover. Coupled with climate change and erratic rainfall patterns, seasonal dry spells and degradation of vital wetlands, a complex interplay of factors has now created a situation in which devastating natural disasters occur regularly, including large-scale flooding and landslides. The project seeks to improve disaster management while putting cash into the pockets of locals, training hundreds of beneficiaries and planting thousands of seedlings to aid in soil stabilization.

And so, while the world continues to bounce back from COVID-19 unevenly, there are undoubtedly arenas in which bamboo and rattan can be harnessed for greater utility. Tapping into this potential will require coordination between many diverse actors, from producers and growers, processors and artisans, traders and middlemen, purchasers, regulatory agencies, standard organizations, policymaking bodies, international coalitions and more. This is no simple feat. However, the power of the UN SDGs is that they are synergistic in nature, an intricate network of linkages. Progress toward their achievements can effect transboundary benefits that are orders of magnitude greater than initial actions, delivering numerous downstream benefits. It is with this spirit of optimism that the Editors present to you BRU 5-1, "Ending Poverty with Bamboo & Rattan." We hope you enjoy it.

THE EDITORS

BAMBOO VALUE CHAINS CONTRIBUTING TO POVERTY REDUCTION IN ETHIOPIA

Bamboo baskets are household items in many places of Ethiopia.

Tapping into native bamboo resources and traditional practices for green growth.

One country in Africa is uniquely equipped for rapid transformation of its bamboo sector. Ethiopia has the largest bamboo resources in Africa representing 31.55% of Africa's total bamboo resources. There are two native bamboo species in Ethiopia: *Oxytenanthera abyssinica*, lowland bamboo, and *Oldeania alpina*, highland bamboo. The total area of bamboo in Ethiopia is estimated to be 1,474,463 hectares. Lowland bamboo is widely distributed in the northwestern part of Ethiopia across the vast savanna woodlands and along the river valleys, spreading out over the hills, with an estimated area of 1,441,504 hectares, between 540 to 1750 meters. Highland bamboo is found in the south and central part of Ethiopia, mainly in the Oromia Region and Southern Nations, Nationalities, and Peoples' Regional State at altitudes ranging from 2200 to 4000 meters.

In addition to the two Indigenous bamboo species found in the country, 23 different bamboo species under seven genera have been introduced to Ethiopia since 2007. These include *Bambusa* (five species, two of them with two sub-varieties each), *Dendrocalamus* (six species), *Gigantochloa* (three species), *Guadua* (two species), *Phyllostachys* (five species), *Schizostachyum* (one species) and

Thyrsostachys (one species).

Bamboo resource utilization and economic contribution

Bamboo is a preferred material for various applications owing to its straightness, strength, light weight, easiness of working with it, suitable fiber for pulp production and absence of bark. Bamboo in Ethiopia is basically limited to traditional uses and sale at local markets. Some local uses of bamboo include housing, fencing, utensils, baskets, furniture, fuel/charcoal, food, fodder, musical instruments, medicine and even beehives. Many small and medium enterprises produce handcrafted products in towns and cities in the country for sale at markets. Nowadays, some medium-scale bamboo manufacturing industries have been established in the country to produce incense sticks, toothpicks, panels (flooring, ceiling), weaving products (curtains, table mats), charcoal and briquettes, and pulp and paper. Its potential for industrial use has yet to be widely popularized and accepted by both potential investors and growers. Surprisingly, in contrast to the resource base of the country, bamboo product imports exceed exports.

Ecological and cultural value of bamboo

In addition to its economic benefits, bamboo has numerous ecological and cultural functions and benefits. Because it is a fast-growing plant adaptable to degraded sites (particularly the lowland species), bamboo has the capacity to address many problems found throughout Ethiopia. It has the potential for soil and water conservation as well as improving biodiversity functioning. Bamboo forests feature an extensive rhizome system, a thick litter layer, highly elastic culms and a dense canopy. These characteristics endow bamboo forests with a high capacity for erosion control, soil and water conservation, landslide prevention and protection of riverbanks.

The extensive rhizome system of bamboos lies primarily in the top layers of soil, allowing it to play a major role in stabilizing soils on steep slopes and river banks. The aboveground part of bamboo helps to reduce erosion caused by rain via interception, and it also shelters soil from wind erosion. At the same time, bamboo litter improves soil structure and fertility.

In addition, bamboo forests play an important role in terrestrial carbon cycling. The total carbon storage of natural highland bamboo forests in southwest Ethiopia has been found to be comparable to many fast-growing timber species or tropical forest ecosystems, thereby offering an opportunity for climate change mitigation alongside the generation of an additional stream of income for rural households through carbon trading. Bamboo also provide shelter and food for many indigenous species in Ethiopia such as Bale monkeys. These monkeys feed on the young shoots and leaves of highland bamboo.

Culturally, bamboo also has many uses in Ethiopia including construction of cultural structures, musical instruments, spears and medicines. It is an integral element to Sidama's new year celebrations called Fichee-Chambalaalla. Ultimately, bamboo's myriad applications have substantial implications for its value chain.

The value chain and poverty reduction

But what comprises the bamboo value chain? The value chain for bamboo products includes the full range of activities required to bring a product from conception through different phases of production before arriving to the final customer. There are three pillars of an effective bamboo value chain: Increased system efficiency, improved quality, and development of differentiated products (product diversification). Bamboo value chains can be implemented across supply chains to boost customer satisfaction and profitability. Bamboo value chain development is crucial for Ethiopia because the country has abundant bamboo resources, and bamboo has tremendous potential for economic development at both local and international levels as well as for addressing environmental degradation.

Depending on which market is targeted, bamboo products in Ethiopia pass through intermediary stages until reaching the final customers. A diverse range of actors comprise the bamboo value chain, from producers, farmers, associations, village-level traders, brokers, agents, town and city wholesalers and distributors, small- and medium-scale bamboo processing

Bamboo can also be made into chairs, tables and other furniture.

and marketing firms, industrial processors as well as town and city consumers. Linkages remain weak between most stages of the value chain. Transboundary merchants, regional governments, bamboo research organizations, professional associations, NGOs and more are also important actors in the bamboo value chain with distinct roles to play. Analysis of the bamboo production-to-consumption value chain in Ethiopia has revealed three major channels/dimensions: 1) The vertical channel that contains the flow of raw bamboo from its production in a natural or cultivated system to the final consumer through transactions and processes; 2) the horizontal dimension where bamboo-based firms operate at a particular point in the market chain with the scale of activities and relationships among them; and 3) the intensity, which relates to the amount of labor and capital used to carry out a particular function.

The bamboo value chain in Ethiopia does not target the export market. Most bamboo products are produced traditionally and manually for use in the domestic market. Nearly 88% of bamboo growers sell their bamboo products, including bamboo culms, at local and roadside markets, with only 5% selling at regional markets and 7% using bamboo for domestic consumption. There have been recent efforts to produce several bamboo products using advanced technologies in order to target the export market. One example of bamboo manufacturing firms shifting gears to produce higher-quality products for sale to higher-income consumers is the Adal Industrial PLC. Established in 2006, Adal Bamboo Industry creates employment opportunity for roughly 120 employees. It is organized to process bamboo flooring, curtain, incense sticks, table mats, furniture, charcoal, toothpicks, and pulp and paper. The company supplies its products both locally and internationally to retailers, wholesalers and individuals. The Ethiopian Tourist Trading Enterprise is also one of the government institutions that produces bamboo furniture with its own specification for sale to both national consumption and foreign visitors.

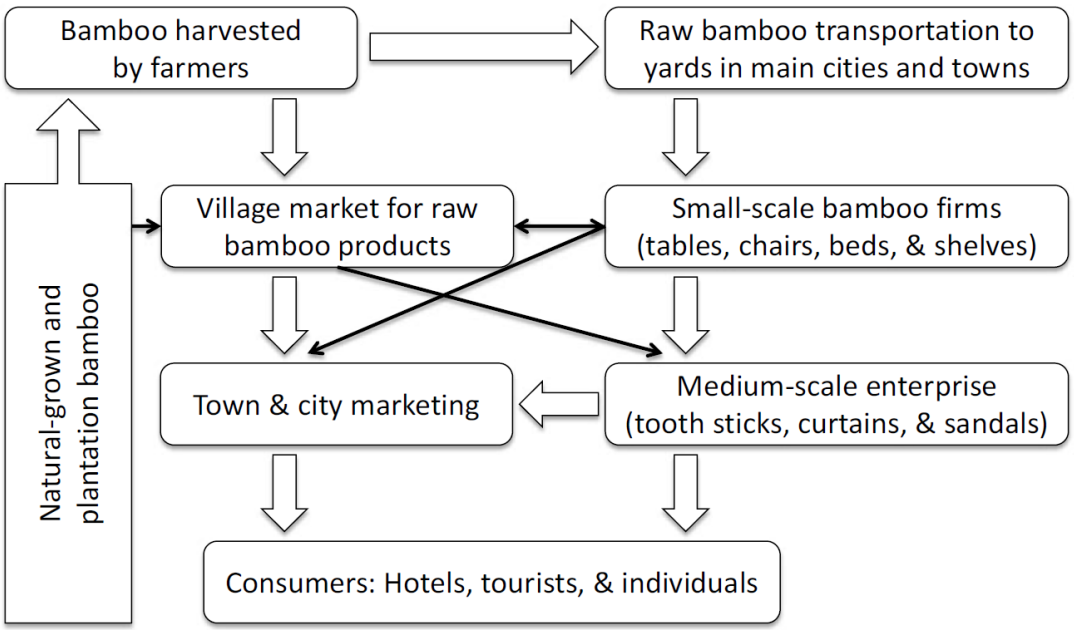
Product quality, production and transport costs,

consumer characteristics, distance from resource base and value addition are the major factors that determine the price of bamboo products in the market. The overall value chain assessment has shown that bamboo products in Ethiopia feature weak vertical and horizontal integration and lack the application of more advanced technologies, excluding some small-scale bamboo-based firms and medium-scale enterprises that have started upgrading around major cities. Currently, a number of challenges and constraints face the bamboo production and marketing system, including a shortage of raw materials, low quality of products, limited availability of processing equipment, lack of storage space and working capital, lack of direct access to raw materials, lack of promotional activities and skills, long distances to important markets and incomplete market information, lack of training, and fluctuating demand. Promoting the establishment of farmers' associations, provision of appropriate technologies and trainings for preprocessing, facilitating capacity development with technology transfer and upgrading skills in bamboo processing, as well as creating a network and partnerships with other associations, stakeholders and partners represent just some of the actions that can help develop the bamboo value chain in Ethiopia.

Contribution to poverty reduction

Rural households in Ethiopia consider the diversification of income streams one approach to boost their resilience to failures in agricultural production and natural disasters. Local farmers rely on bamboo as an alternative livelihood option. Bamboo is one of the renewable natural resources in Ethiopia with enormous potential to reduce poverty, safeguard the environment, and contribute to the achievement of the United Nations Sustainable Development Goals (SDG), particularly SDG 1: No poverty. This is because in addition to their multi-dimensional ecological importance, bamboo contributes to sustainable rural livelihoods, poverty reduction and income diversification, among others. Bamboo supports the livelihoods of millions of local people in small cottage industries across Ethiopia.

Bamboo provides various subsistence benefits to rural households by way of furniture, farming tools, construction material, fuelwood, wood and fodder. Studies indicate the average annual relative contribution of bamboo to the cash income of households in bamboo-growing areas ranges between 4–38%. For example, in Banja and Hula Districts, bamboo contributes up to 38% and 18% of the annual cash income of households, respectively. In contrast, despite the



A framework of the bamboo production-to-marketing chain in Ethiopia. Credit: Mekonnen et al. (2014).

massive natural bamboo resource bases in Masha and Asosa areas, its contribution remains very small. Market assessment at different cities and relevant information from small-scale bamboo-based manufacturers shows the presence of adequate demand for different bamboo products. This indicates that there is unrealized potential of bamboo resources to strengthen rural livelihoods and the national economy. In order to fully tap into the benefits of bamboo and mitigate poverty in Ethiopia, each stage of the value chain requires strengthening. Bolstering the bamboo value chain can enhance the overall productivity of the bamboo sector, delivering benefits to all actors and aiding poverty alleviation efforts.

Bamboo value chain development under INBAR-AECID Ethiopia

The Ethiopia Bamboo Supply Chain Development Project, funded by the Spanish Agency for International Development Cooperation, was launched on January 2023 with the objective of contributing to the building of a circular economy

The project is supporting bamboo nurseries across the country.

and improving resilience to climate change through the development of a reliable bamboo-based supply chain. Since its inception, the project has implemented several noteworthy activities, playing a key role in ramping up efforts in Ethiopia to eliminate poverty while synergizing with other priority targets of the SDGs.

Establishing and supporting bamboo nursery sites
The project established six mother bamboo nurseries (2 in Sidama, 2 in Gamo and 2 in Wolaita) and produced 60,638 quality planting materials. The project also supported government-established nurseries through input (seeds and poly bags) provision to 44 nurseries in South Ethiopia and Sidama regional states, leading to the production of 618,499 indigenous bamboo seedlings.

Improving technical skill of farmers
The project conducted five trainings on bamboo sustainable management and harvesting for 366 farmers and development agents in Gamo and Ari Zones of the South Ethiopia Regional State, a quarter of whom were women. The training equipped the beneficiaries with skills in bamboo propagation, plantation establishment and management, and harvesting methods.

Carrying out bamboo restoration
The project planted 25 hectares of indigenous bamboo species on degraded lands in Belate, Hawassa and Arbaminch areas as demonstration sites. It has also supported South Ethiopia and Sidama regional governments to cover 1546 hectares of land with bamboo plantations.

Developing multi-product supply chains
An integrated supply chain was established in the Hula, Sidama region with farmers, intermediaries and enterprises. In total, 90 farmers, almost half of whom were women, and 25 SMEs were involved in multi-product supply chains to gain access to high-quality raw materials. A market depot was established in the district for raw bamboo materials as commodities and products to facilitate the supply chain. Within the depot, bamboo preservation infrastructure has been built to deliver treated bamboo poles to enterprises and other users.

Skill development and capacity building
The project organized five skill development trainings for 147 beneficiaries on diversified bamboo products in Hawassa, Addis Ababa, Bonga and Terecha. One training of trainers workshop at Wolaita Sodo was conducted on bamboo processing technology for 20 beneficiaries, with equal gender representation. It also supported 30 youths for availing Certificate of Competency to establish bamboo enterprises with nearly equal gender representation.

Facilitating new designs and innovation, and participating in trade fairs and exhibitions
In addition, the project supported six SMEs to participate in three national trade fairs and exhibitions in Addis Ababa. It also organized a training on bamboo value chains and industrial product design in collaboration with Indian Institute of Technology, Bombay for 35 beneficiaries for bamboo SMEs and industries from Ethiopia, Kenya and Uganda.

Providing support for recycling and processing waste into bioenergy products
The project designed and developed a bamboo charcoal kiln (given the name BamChar Kiln) for converting bamboo production wastes to charcoal, biochar and vinegar for clean cooking energy and soil remediation.

In addition to the activities mentioned above, the project also supports and strengthen micro and small enterprises by constructing working sheds and providing machineries and tools, along with building the capacity of line department agencies on supply chain and supporting in other ways so as to strengthen the bamboo value chain and enhance the livelihoods of involved actors. By targeting the whole value chain, projects like this can help Ethiopia truly tap into the power of bamboo.

DAGNEW YEBEYEN BURRU

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‘RATTAN IS LIFE’: CULTURAL PRESERVATION AND ECONOMIC DEVELOPMENT IN INDONESIA

Traditional patterns often depict flora and fauna from the forests and rivers around Dayak dwellings, woven into everyday objects as a way to celebrate their roles in Dayak lives. Credit: HANDEP archive.

Forging sustainable village economies and safeguarding culture with ethical rattan products.

“Rattan is life” is a popular phrase that is used to explain the foundational role the plant holds in the Indigenous Dayak community. Dwelling in the vast lands of Kalimantan, Dayak is an umbrella term used to refer to up to 200 ethnic groups of people, each with its own distinct customs, laws, culture and spoken language. One of the elements that binds these groups together is their strong connection to their lands and forest.

Throughout history, the Indigenous Dayak people in Kalimantan have relied heavily on forest resources for more than their livelihoods and basic survival. While the forest is often seen as possessing economic value to fulfill everyday necessities, from farming to the provision of non-timber forest products and hunting grounds, its continued existence and environmental preservation is also intertwined with Dayak beliefs.

While various species of flora and fauna of the land are important to everyday life, rattan in particular plays an important role in the Dayak community, entwined with local culture. Pliable, yet strong and resilient, as well as fast-growing

and easily tended to, rattan is used in almost all aspects of life. From construction material, furniture, tools and crafts, the Dayak people have long known that rattan is a widely accessible and sustainable resource from which they can derive many benefits.

Its role in promoting economic growth goes beyond local borders, with records showing the global rattan trade dates back to the mid-19th century, when the Portuguese opened trade between Europe and Asia. Since then, it has continued to be a sought-after commodity and source of income for many Dayak people.

Rattan in the forest

With increasing interest in sustainable raw materials and extensive research into fast-growing alternatives to traditional timber products, rattan now finds itself in the spotlight. The climbing palm renews itself in only 4–7 years, making it one of the world's most important non-timber forest products. Considered a viable alternative to wood, discussion surrounding its sustainability has largely focused on its growth time, but the way it is harvested must also be considered for it to be sustainable long term. Rattan currently faces the threat of over-harvesting and rapid decline of supply due to land conversion to palm oil plantations and mining. For example, in Central Kalimantan where HANDEP's partner villages are located, Global Forest Watch has recorded a 25% loss of tree coverage from 2001–2022, covering 3.6 million hectares of land.

Supporting rattan management is a vital part of protecting forests. This is because the rattan that thrives in the tropical rainforests of Borneo is a balance-keeper. Its survival depends on trees and the ecology of the rainforest, incentivizing communities to conserve and restore the forest on their land.

Craft, commodities and economic growth

Rattan has long been intertwined with the livelihoods and culture of the Dayak community, playing a significant role in their traditions, economic activities, and way of life. However, relying solely on rattan as a source of income may not be sustainable or viable for the community in the long term. Diversifying their livelihoods, including traditional farming practices, is essential for ensuring economic resilience and food security.

While rattan harvesting and weaving have provided income opportunities for the Dayak people, the industry faces challenges such as fluctuating market demand, environmental degradation and limited access to resources. Rattan resources are finite, and overexploitation can lead to depletion of forests and loss of biodiversity, ultimately affecting the sustainability of rattan as an economic resource. HANDEP, a sustainable brand based in Indonesia that works with Indigenous artisans and smallholders owned by Dayak youths, is on the forefront of forging sustainable village economies in Kalimantan through ethically made crafts. It understands the untapped potential of rattan in the global market but is also cautious of the effects global trade might have towards the Indigenous communities that still look to the forest for everyday livelihoods.

"There's a balance that must be kept in exploring economic growth for rural areas in Kalimantan. We are currently working on diversifying income opportunities with our partner villages, and seeking support to create programs that allow for growth and commodity export that can still create positive impacts," explains Randi Julian Miranda, Founder and CEO of HANDEP.

HANDEP artisans largely rely on forest-grown and harvested rattan to create traditional craft products that are then sold on the global market, creating an income source that was previously unavailable in the villages, as rattan crafts have typically not been viewed as having significant economic value. With a background in sustainable development, Miranda marries development principles with traditional business practices to create a social enterprise that carefully cultivates a balance that results in sustainable village livelihoods.

Diversifying livelihoods not only enhances economic resilience but also preserves cultural

traditions and bolsters community resilience. By embracing a range of activities that reflect their deep connection to the land and natural resources, the Dayak community can build a more sustainable and prosperous future for generations to come. Therefore, while rattan remains an integral part of their heritage, it should be complemented by a diverse array of livelihood options to ensure well-being and resilience.

Miranda believes firmly in the important role that rattan holds as a commodity, but he also recognizes that programs surrounding sustainable rattan use and harvest cannot be done as short-term projects and cannot be divorced from its role in traditional communities. He went on to say that "When we are talking about sustainable development and impact, it requires a shift in the social order. Where impacted communities have to not only experience the benefits of a program, but also understand and adapt to the changes into their everyday lives." Crucially, much work remains to be done in "creating the narrative that additional financial gain can improve individual and community standings," he said.

His work focuses on the five villages engaged with HANDEP. Initially, the weavers who signed an agreement with HANDEP only saw the opportunity as a low-priority addition to their daily commitments in the fields and forest. Weaving remained an activity that they relegated to their leisure time. It wasn't until they entered their third year that artisans saw how the added income could improve their lives. Program staff provided robust support to motivate them to fulfill their commitments in the beginning. But as weaving became a more viable livelihood option, the artisans became increasingly self-motivated.

HANDEP's initial partners originated from one village and have now grown to a team of 150 artisans spread across Central and West Kalimantan. The range of activities for collaboration has also grown, with regular capacity building initiatives that cover diverse topics tailored to the contextual needs of the villages, from sustainable agriculture, economic empowerment, and education to nurturing economically sustainable and independent local champions. HANDEP also provides scholarships for

Rattan features heavily in everyday Dayak lives, present in many shapes and forms to fulfill a range of needs and wants. Credit: HANDEP archive.

artisans to study in other villages across Indonesia to accelerate knowledge and skill transfer.

These supporting projects and initiatives rest atop the trust built through long-term commitments between HANDEP and its partners. While HANDEP also has previous experience working with international organizations to explore, generate and strengthen village livelihoods in Kalimantan, Bali and Java, the rate of success and lasting impact experienced with its partner villages in Central and West Kalimantan currently remains unmatched. Going forward, longer timelines with future partners for project work will help deliver greater, more lasting impacts to local communities.

Rattan harvested from the forest undergoes a month-long process to be turned into products that can be used. Credit: HANDEP archive.

Economic growth in rural areas is often linked to the belief that development will result in alleviating poverty. "The narrative surrounding poverty doesn't necessarily apply in traditional communities," explains Aini Abdul, the co-founder and Chief Community Officer of HANDEP. Other factors can be just as important for long-term success. She emphasizes the importance of working with local organizations who can offer deeper understanding of how Indigenous communities operate.

Ultimately, addressing poverty is a multifaceted issue that requires a comprehensive approach, a challenge the UN has also noted, hence the multi-dimensionality of the Sustainable Development Goals. "A need for increased prosperity does not always equate to poverty. Our artisans understand the need for monetary gain, but it is usually used to support educational and health care needs, while their daily needs are fulfilled by the forests," she explained.

The strive for increased prosperity becomes more complicated when met with cultural norms that typically emerge in long-term projects, further highlighting points made about the need to coordinate and cooperate with local entities more familiar with the subtle nuances of life in remote areas. HANDEP has the advantage in that it works in areas with which the social enterprise and brand is already deeply familiar. Staff grew up with the culture and understand the role rattan plays in local societies. The challenge resides in constantly learning how to best leverage the knowledge of local customs to communicate and collaborate more effectively with artisans.

Finding sustainable balance

While the role of rattan in Indigenous Dayak communities largely remains the same, the opportunities that are now becoming available to these remote communities affords them a firmer foothold in creating greater prosperity, and increased access to education and healthcare that is currently not widely available. This endeavor is fully in line with the UN SDGs, particularly SDG 1, and also maps onto the unique needs of the Indigenous communities of the area.

"Balancing using rattan in commercial settings and ensuring that it remains a protected resource is important if we want sustainable development." Miranda explains. "Investing in rattan can open a lot of opportunities for all parties involved, but it requires a deep understanding of the roles it plays in its environment. Rattan grows best in a balanced forest ecosystem, and likewise for its sustainable use — it is best done with careful consideration of the ecosystem of the communities that care for it."

ATRI PRIYAMANAYA

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EMPOWERING COMMUNITIES THROUGH BAMBOO: A SUCCESS STORY IN WESTERN UGANDA

Bamboo in the field. Credit: Divine Bamboo.

Strengthening disaster management and putting more cash into the pockets of rural residents.

In the verdant landscapes of East Africa, bamboo stands tall as a beacon of hope for poverty alleviation. Amid the challenges communities face in Uganda and beyond, this versatile plant offers a pathway towards economic empowerment and sustainable development. As we delve into the transformative potential of bamboo, we uncover a story of resilience, innovation and opportunity.

Bamboo, often referred to as "green gold," possesses remarkable qualities that make it an ideal ally in the fight against poverty. Its rapid growth rate and adaptability to diverse environments make it a readily available resource for communities across East Africa. From the lush forests of Uganda to the rugged terrain of the East African highlands, bamboo thrives, offering a sustainable solution to some of the region's most pressing challenges.

One of the key avenues through which bamboo contributes to poverty alleviation is livelihood diversification. In rural communities where traditional sources of income may be limited, bamboo cultivation presents a viable alternative. By harnessing the potential of bamboo, communities can engage in activities such as handicraft production, furniture making and construction, generating additional income streams and reducing reliance on precarious livelihoods.

Divine Bamboo, established in 2016, is a pioneering forestry and energy firm addressing deforestation and poverty by offering holistic

bamboo-based solutions. With a certified nursery and over 300 hectares of bamboo plantations, it engages 3200 farmers, fostering bamboo forest management, briquette production and rural income diversification.

Collaborating with the World Wide Fund for Nature Uganda Country Office, Divine Bamboo has trained over 200 beneficiaries and planted over 15,000 seedlings through a project dubbed "Innovative and Gender-sensitive Nature-based Solutions for Resilience and Green Jobs" which is being implemented in the Greater Virunga Landscape.

The overall objective of the project is to use nature-based solutions to reduce the impacts of climate change and poverty on communities within the Greater Rwenzori Sub-Landscape. In working towards this, the project seeks to achieve three outcomes: 1) Communities have secured improved ecosystem resilience to climate change in targeted areas; 2) more women and youth are in green jobs and benefiting from diversified nature-based livelihoods; and 3) sustainable finance for nature-based enterprises and green jobs is secured.

The project area is undeniably rich in natural resources, with great potential for delivering sustainable socio-economic improvements. However, the region faces a multitude of challenges, particularly in the Rwenzori Landscape and sub-landscape of Rwenzori Mountains National Park, which also encompasses World Heritage Sites for the Convention on Wetlands and the UN Educational, Scientific and Cultural Organization. Spanning six districts including Kasese, Kaborole, Bunyangabo, Ntoroko, Bundibugyo and Rubirizi, this region is now under considerable strain.

The communities within the Rwenzori Landscape are exceptionally vulnerable to climate change impacts. Rapid population growth has exacerbated this vulnerability, with a sharp increase over the years. This population surge, coupled with high poverty rates ranging from 15 to 30% among rural inhabitants, intensifies pressures on natural resources. These communities heavily rely on the landscape's resources for sustenance, including energy, food and construction materials, practicing subsistence farming with limited access to modern techniques.

Climate change compounds these challenges, leading to erratic rainfall patterns, seasonal dry spells and the degradation of vital wetlands. Land degradation is widespread, with visible reductions in forest cover. These environmental changes threaten the region's fragile ecological balance and the livelihoods of its residents. For example, the waters of the Nyamgasani River in Kasese are prone to run over the riverbanks in the rainy season, damaging agricultural land and property.

The unstable environment also contributes to devastating natural disasters. Between 1–15 May 2013 and again on 6 September 2022, Kasese District in Uganda faced widespread flooding and landslides. In 2013, 13 rivers flooded, causing losses of schools, bridges, power facilities and health facilities, as well as displacing 1820 households. The 2022 landslide resulted in 15 reported deaths, profoundly impacting Kasika village. These repeated weather-related disasters highlight the ongoing plight of Kasese, necessitating urgent and sustained measures for resilience and disaster management.

Beneficiaries of the project, women and youth, are ethnically diverse and live in both rural and urban locales. They bear the brunt of these challenges, facing limited opportunities for economic empowerment and participation in decision-making processes. In summary, the Rwenzori Landscape region faces the complex interplay of socio-economic and environmental issues, exacerbated by rapid population growth and climate change.

Addressing these challenges requires holistic interventions that empower communities, conserve natural resources and build resilience to climate impacts. The project's impact in this regard has been significant, contributing to both environmental conservation and social empowerment. Communities have witnessed tangible improvements, notably in areas such as the village of Burombeka in Kasese, where bamboo planting along the banks of the River Kabiri and Nyamgasani River has helped stabilize

soil and prevent erosion.

Socially, the project has empowered marginalized groups, particularly women. In villages like Kyondo and Muhokya in Kasese as well as Kichwamba, Magambo and Ryeru in Rubirizi, women and youths participating in bamboo-crafting cooperatives have gained financial independence, reducing their vulnerability to poverty and rates of domestic violence. Their newfound economic autonomy has empowered them to assert their rights within their households and communities, leading to positive social transformations.

Economically, the project has also generated significant income opportunities. Trainees have seen their incomes supplemented by selling bamboo crafts and products, putting cash directly into the pockets of rural residents and fighting against poverty in the region. Moreover, the establishment of bamboo-based enterprises has created job opportunities for unemployed youth, stimulating economic growth and stability within these communities.

The project aimed to alleviate poverty and promote environmental conservation by training over 200 beneficiaries across two cohorts. Participants were taught various craft skills using bamboo, including how to make a wide variety of kitchenware, furniture and woven items. The training focused on equipping individuals with the necessary skills to create sustainable products from bamboo, creating income generation opportunities while simultaneously promoting the use of bamboo as a tool for environmental conservation.

Looking ahead, the project envisions a future where bamboo continues to play a pivotal role in poverty alleviation and environmental conservation efforts across Uganda and East Africa. Central to this vision is the cultivation of strategic partnerships with governmental bodies, NGOs and the private sector. By linking our efforts with these stakeholders, the project aims to scale up our impact and replicate successful models, ensuring sustainable socio-economic development and environmental stewardship. A large-scale model would involve the establishment of a

Close-up of the versatile plant. Credit: Divine Bamboo.

Bamboo Empowerment Hub in a suitable rural area, facilitated by collaboration between multi-stakeholders. Through comprehensive training programs, farmers would learn modern techniques and sustainable harvesting practices, leading to the establishment of bamboo plantations. These plantations would serve as a sustainable source of raw materials for various industries, supported by a dedicated Bamboo Training and Innovations Center fostering research, innovation and skill development. Local community members would be encouraged to establish bamboo-based enterprises, ranging from small-scale workshops to larger manufacturing units, with market linkages facilitated for their products. Success stories would attract private investment, further fueling the project's expansion and contributing to sustainable socio-economic development and environmental stewardship in the region within a five-year time frame.

Through these partnerships, Divine Bamboo will focus on expanding our reach, accessing crucial resources and fostering market-driven solutions. By collaborating with local governments, actors can leverage existing infrastructure and policies to facilitate large-scale bamboo-planting initiatives. Concurrently, partnerships with NGOs and international organizations like INBAR will provide access to expertise, funding and networks vital for capacity-building and knowledge dissemination.

A wide range of durable goods can be made with bamboo. Credit: Divine Bamboo.

Engaging the private sector will spur sustainable economic growth by boosting demand for bamboo products and nurturing entrepreneurship. This involvement will also enhance the recognition of bamboo as a viable alternative to wood products. Private sector investments across the entire bamboo value chain, including distribution and value-added product development, will drive innovation and amplify the impact of bamboo initiatives. These collaborative endeavors will lead to a future where bamboo brings about positive transformation, benefiting both livelihoods and environments for future generations.

Bamboo's remarkable fast growth rate makes it an excellent substitute for traditional forestry needs, providing a sustainable resource for energy and various products. Its unique properties make it a viable option for stabilizing river banks, outperforming other trees in erosion control. Beyond this, bamboo offers the potential for intercropping and agroforestry, promoting diversified land use. Leveraging these qualities not only contributes to environmental conservation but also creates income-generating opportunities for local communities, establishing bamboo as a key driver for sustainable development in Kasese District.

As we reflect on the role of bamboo in poverty alleviation, the untapped potential of this remarkable plant becomes clear. Through recognizing its innate qualities and leveraging the collective efforts of communities, governments and organizations, a brighter future exists for East Africa and beyond. Western Uganda serves as a compelling case study for the transformative potential of bamboo in combating poverty and environmental degradation.

By harnessing bamboo's rapid growth and diverse applications, local communities unlock avenues for income generation, entrepreneurship and ecological resilience. Through bamboo-based industries and agroforestry systems, Western Uganda exemplifies how strategic utilization of bamboo can drive meaningful, positive and sustainable change, offering a beacon of hope amid socio-economic challenges and ecological strains.

DIVINE NABAWEESI, JAMES KYEWALABYE, RACHEAL LANYERO

This article was compiled by Divine Nabaweesi, CEO of Divine Bamboo Group Limited, James Kyewalabye, Managing Director, and Racheal Lanyero, Project Officer.

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

Bamboo scaffolding erected around a building in Hong Kong. Credit: iStock.

Centuries-old construction technique gets passed down in Hong Kong

In Hong Kong, bamboo is commonly used as an affordable and environmentally friendly material to aid in construction, maintenance and repair. This is made possible by bamboo's flexible and strong but lightweight nature, allowing for its easy assembly and disassembly. In fact, bamboo scaffolding techniques have been in use for thousands of years, with an extensive history in China. Nowadays, nearly 2500 bamboo scaffolders are registered in Hong Kong, with dozens more learning the trade each year. One of the main requirements for students of the trade is to have a "daring heart," according to Mo, one of the students currently undergoing training.

In addition to bamboo's superior construction qualities, it can also play a role in contributing to the mitigation of climate change. This is because steel manufacturing is an incredibly emissions-intensive industrial process. Aluminum also has a very high environmental impact and produces toxic waste as a byproduct. This makes bamboo an ideal alternative green material in the sector, as it grows easily on degraded soils without the need for heavy watering or fertilizers/pesticides. At the same time, it also sequesters a comparatively high amount of carbon. Though it may be considered old-fashioned by some, builders are increasingly looking to wood to meet sustainability goals in the construction sector, and bamboo is perfectly situated for wider application.

Source: The Cool Down, 11 February

Creating more carbon sinks in India

India's Ministry of Environment, Forest and Climate Change is now providing technical and financial assistance to local government actors

on climate change mitigation under three main policy schemes. The primary goal of this effort is to create additional carbon sinks, thereby contributing to India's commitments under Nationally Determined Contributions. The Green India Mission, which was initiated from 2015 to 2016, was aimed at protecting, restoring and enhancing India's forest cover by restoring degraded forest lands and launching afforestation activities. At the same time, the Ministry is implementing the Pilot Scheme of Nagar Van Yojana, which seeks to enhance forests and green cover in urban and peri-urban areas, ultimately elevating biodiversity levels. The final main policy scheme is the Compensatory Afforestation Fund, which is a pool of funding made available to local government actors in order to facilitate afforestation and forest protection activities.

Outside of these main schemes, regular programmatic work has also continued apace within coordinating policy frameworks like the Mahatma Gandhi National Rural Employment Guarantee Scheme, National Bamboo Mission, Sub-Mission on Agroforestry, and more under schemes of State Governments and Union Territory Administrations.

Source: India Ministry of Environment, Forest and Climate Change, 8 February

Pangasinan's oyster production uses modified bamboo raft

In one region of the Philippines, a unique partnership between a research institution and a local fishing community is strengthening aqua-farming production and livelihood resilience. The National Fisheries Research and Development Institute (NFRDI) adapted modified bamboo raft technology and distributed it to oyster-producing fisherfolk associations in the municipalities of Alaminos, Bani, Bolinao, Anda and Sual. The technology uses bamboo as the raft, plastic drums to support flotation and plastic straps dangling vertically from the raft on which oyster can attach and grow. Given its mobility, it can also travel to other sites.

Local governments are supporting these modified rafts by issuing relevant certificates. This helps build the supportive policy environment, allowing farmers to receive maximal benefits. The rafts are not only environmentally friendly but also benefit oyster-growers by "reducing mortality rates, enabling faster growth, and producing better-quality meat" according to one expert. The project was implemented by a joint effort between NFRDI and the Bureau of Fisheries and Aquatic Resources.

Source: Daily Tribune, 10 February

Bamboo can provide a new source of protein

According to a new Chinese study in *Trends in Food Science & Technology*, bamboo has a high protein content similar to cow's milk. This hints at the potential of the plant as a possible sustainable food staple of the future, capable of feeding a growing global population. It also opens up opportunities for trade and export, creating new jobs while driving growth in the burgeoning responsible consumption sector. This is critical because bamboo resources grow abundantly across many countries of the Global South, and can play a role in national strategies and action plans as a catalyst for advancing comprehensive green policy.

Bamboo provides seven of the nine essential amino acids needed by humans, with higher values than common vegetables like carrots, celery and cabbage. Its shoots contain more iron than spinach and pumpkin while also having dietary fibers, low fat content and a range of other necessary vitamins. Other studies have already indicated that bamboo shoots have the potential to prevent a wide range of diseases like diabetes and cancer while simultaneously offering antioxidant and antimicrobial benefits. Shoots can be prepared a number of different ways, from being pickled in salt, fermented, dried, canned, frozen, made into juice and powder, and cooked fresh like ordinary vegetables. This gives it great flexibility in global cuisine, reflected by increasing trade for bamboo shoot products.

Source: South China Morning Post, 22 March

INBAR commissions research, conducts project work and raises awareness about bamboo and rattan across its 50 Member States.

Former INBAR Director General Mr. Ali Mchumo (right) shakes hands with incoming INBAR Director General Mr. Teshome Toga Chanaka (left) at INBAR Headquarters.

INBAR under new management

At the end of March, the fresh air of spring arrived at INBAR Headquarters, bringing with it new life and new leadership. INBAR bid farewell to Ambassador Ali Mchumo for serving out his five-year term as INBAR Director General. Under his steadfast leadership, INBAR saw many notable achievements, reaching 50 Member States, launching the Bamboo as a Substitute for Plastic Initiative, holding the Africa Bamboo and Rattan Congress, the Second Bamboo and Rattan Congress, and the First International Symposium on Bamboo as a Substitute for Plastic. These and more contributed to bamboo and rattan's growing presence on the international stage and INBAR's increased capacity for undertaking cross-country project work.

On 1 April, Ambassador Teshome Toga Chanaka stepped into his new role as INBAR Director General. He brings with him a wealth of experience which will fortify INBAR's institutional mandate and strengthen operational practices. During his august career, he has occupied senior leadership positions within Ethiopia's government as Minister of Public Enterprises and Minister of Youth, Sports and Culture. He also has extensive experience in diplomacy at bilateral and multilateral levels, representing Ethiopia as Ambassador in 17 countries while maintaining accreditation to EU institutions in Brussels. He also acted as the Permanent Representative of Ethiopia to UNESCO, UNEP and UN-Habitat and presided over major international conferences.

After joining INBAR, the new Director General laid out his strategic vision for INBAR's future development. In his welcoming message, he mentioned that INBAR is "well poised

to spearhead South-South and Triangular Cooperation" and that going forward "enlarging membership and mobilizing more resources" will be top priorities. He issued a clarion call, declaring that "The strength of any organization largely depends on the commitment and determination of its members. I call upon the governing organs of INBAR to renew their commitments to the founding vision, mission and values of INBAR so that jointly we can elevate INBAR to the next level. I warmly invite countries with bamboo and rattan resources as well as consumer countries who are not yet members to join INBAR. INBAR will continue to strive for cooperation and solidarity for people, planet, prosperity and a shared future."

The Editors at BRU wish to re-affirm their commitment to this sentiment. We will continue to work with all partners to tap into the great promise of bamboo and rattan, and help deliver their many benefits to communities where they are needed most. A heartfelt welcome to our new Director General, Ambassador Teshome Toga Chanaka!

Engineering the future

A new international standard for engineered bamboo proposed by INBAR, known as ISO 5257:2023 Bamboo structures – Engineered bamboo products – Test methods for determination of mechanical properties using small size specimens, was officially released by the International Organization for Standardization (ISO). Bamboo is a renewable low-carbon material that offers numerous advantages, including a high strength-to-weight ratio, seismic resistance, low thermal conductivity, and excellent insulation performance. This makes it an ideal material for engineering purposes. Engineered bamboo products have achieved standardization and modernization while also preserving ecological sustainability. These products meet requirements for industrialization and also have significant potential for engineering applications.

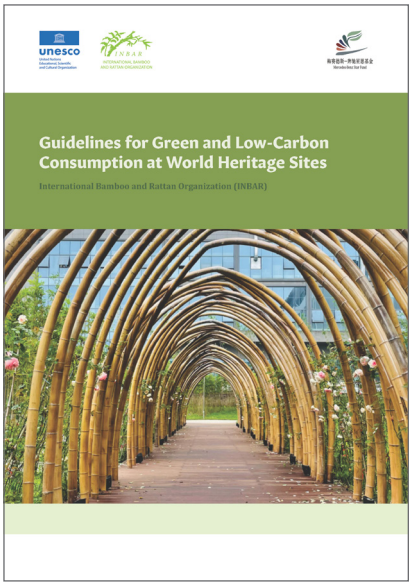
This standard in particular, ISO 5257:2023, specifies testing methods, using small-size specimens suitable for determining a suite of mechanical properties of engineered bamboo products, providing users with an alternative test method to ISO 23478. This standard stands as a remarkable achievement in international collaboration, led by Prof. Huang and jointly drafted by Assistant Prof. Liu Yanyan and Postdoctoral Researcher Shen Yurong from Nanjing Forestry University, along with Assistant Prof. Huang Zirui from Southeast University. Approved in May 2020, this standard has advanced amid the many challenges of the pandemic, thanks to the efforts of the ISO/TC 165 WG12 on Structural Uses of Bamboo.

Throughout its development, representatives from INBAR and multiple countries, including the US, UK, Netherlands, Philippines, Canada and Australia actively participated in multiple rounds of extensive online discussions and solicited opinions. The draft was revised and developed with involvement from multidisciplinary experts around the world. Two additional international standards for engineered bamboo are currently in development to accompany the other four currently published ISO standards on bamboo structures.

Next generation of bamboo stewards

On 13 February 2024, INBAR's Central Africa Regional office hosted 21 pupils of the Gamaliel Bilingual Elementary School of Messamendongo to learn more about bamboo, seeds, the nursery and how to make bamboo products. The program occurred as part of the events on Youth Day in Cameroon. The overall goal of the day's event was to inspire the next generation of bamboo stewards to think more about bamboo and the ways in which it can be used to help our world.

In this respect, the event was a large success. Throughout the day, the children were fascinated by the versatile plant. They were especially enthusiastic and curious about how it can be used to make chairs, tables, cotton buds, beds, building structure and more. They even visited the nursery and saw firsthand how bamboo seeds are planted and grow. As their perceptions transformed about the huge potential of bamboo, one student happily declared that he can't wait to be a "bamboo engineer."



Guidelines for Green and Low-Carbon Consumption at World Heritage Sites

A new manual co-published by INBAR and UNESCO is setting clear rules for how to facilitate the sustainable development of World Heritage Sites.

What is green and low-carbon consumption? In 1997, the United Nations Environment Programme (UNEP) offered a definition of sustainable consumption as "the use of services and related products, which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of future generations." Since then, other countries and bodies have provided similar definitions that largely align with UNEP's initial definition.

However, there are numerous obstacles to overcome regarding the widespread adoption of green consumption from the perspective of the consumer, including the following constraints. 1) The supply of green products is insufficient. Wherever you go, be it a convenience store or a street corner, monetarily cheap but environmentally costly products and structures dominate our world, with limited options for green food, energy-saving products and low-energy buildings and public transportation. 2) Consumer income does not yet match the higher pricing. Green products feature high manufacturing costs given their lower environmental impact, and these costs are passed along to consumers on the sticker price. 3) Awareness of green and low-carbon consumption remains relatively weak. Despite growing calls for low-carbon lifestyles, consumers remain uninformed about the consequences of excessive or conspicuous consumption, which is responsible for significant waste, pollution and ecological degradation. Finally, 4) policies and measures are inadequate. Fiscal and taxation policies are lacking, bidding mechanisms are incomplete, market regulations are weak, and publicity and promotion remain anemic.

Bamboo features unique characteristics that allow it to be a versatile nature-based solution to store carbon and mitigate global warming. Bamboo forests are capable of acting as powerful carbon sinks; indeed, one hectare of Moso bamboo can sequester 5.09 tons of carbon per year, which is 1.33 times that of a tropical mountain rainforest. Durable bamboo products can act as a carbon pool, and life cycle assessments have also indicated that bamboo products used in construction are carbon-negative, with much smaller carbon footprints than traditional construction materials. Substituting bamboo over other energy- and emissions-intensive materials like plastics, concrete and steel can also create synergies between reducing emissions and pollution while also being naturally biodegradable after use. Finally, development of the associated bamboo-based circular economy and the subsequent increase in efficiency via low-carbon industry parks will also help lower overall carbon emissions.

The authors conclude by stating that strategically introducing bamboo into eco-tourism initiatives can help visitors recognize the delicate relationship between humans and nature while also promoting sustainable development at World Heritage Sites.

UNESCO and INBAR. (2024) *Guidelines for Green and Low-Carbon Consumption at World Heritage Sites.* Beijing, China. INBAR.

EVENTS

7 - 9 February
Local Exchange of Experiences Amazonia: Bamboo Workshop School
Manabi, Ecuador

18 - 20 February
Local Exchange of Experiences Amazonia – Bamboo Workshop School
Manabi, Ecuador

21 February
Workshop in Construction: Bamboo's Sustainable Footprint
Dpto Amazonas, Perú

28 February
Trainer of Trainers Graduation Ceremony in Sustainable Bamboo Management: IDB Project
Tena, Ecuador

29 February
Opening Ceremony 3rd Promotion Bamboo Workshop School for Sustainable Constructions
Chone, Ecuador

26 February - 1 March
6th Session of the UN Environment Assembly (UNEA-6)
Nairobi, Kenya

8 March
Inauguration of the Agroecological Store and Cultural Cafeteria Bamboo Structure
Portoviejo, Ecuador

14 March
AECID Field Monitoring Session
Portoviejo - El Carmen, Ecuador

15 March
Graduation Second 2nd Bamboo Workshop School for Sustainable Constructions
El Carmen, Ecuador

29 March
Inauguration of the Museum Comunidad Unión De Colonape Bamboo Structure
El Carmen, Ecuador

Schoolchildren explore the wonderful world of bamboo at INBAR's Central Africa Regional Office on Youth Day in Cameroon.

The river provides easy transportation for rattan materials that are unwieldy for forest trek. Credit: HANDEP archive.

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