



TFU

Promoting the
conservation and
sustainable development
of tropical forests

ISSN 1022-5439

TROPICAL FOREST UPDATE

Volume 32 No.1 2023



Many issues, one solution: tropical forests

The annual conferences of the parties (COPs) to multilateral environmental agreements can seem like an endless loop of endurance tests with sometimes underwhelming results. Ambitious targets and deadlines are missed; political decisions don't always reflect the latest science; global consensus means compromise. But it is important not to let frustrations and sceptical headlines hide the fact that the resulting accords, however imperfect, provide a vital framework for the accelerating shift to a more sustainable world.

As vast and threatened stores of both carbon and biodiversity, tropical forests play a critical role in any conceivable solution to the climate and nature crises. Unsurprisingly, they were often part of the discussions—although not always centre stage—in the series of COPs that took place at the end of last year.

For example, at COP27 of the UN Framework Convention on Climate Change, governments underlined their commitment to sustainable forest management (SFM); at COP19 of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), parties agreed to increase protections for more than 150 tree species; and at COP15 of the Convention on Biological Diversity, a new global framework was established to halt and reverse the loss of biodiversity through measures including the ramped-up restoration of forests and other ecosystems.

These steps forward are, in part, the product of tireless advocacy and expert input from stakeholders, including ITTO. As the only intergovernmental organization focused solely on tropical forest resources, ITTO has a unique

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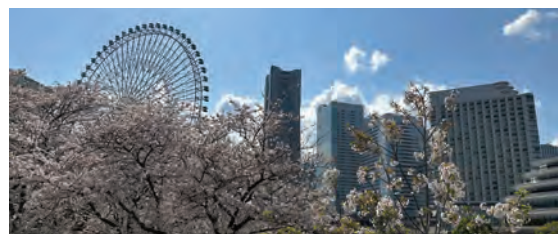
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Editor	Ramón Carrillo
Consulting editor	Stephen Graham
Editorial assistant	Kenneth Sato
Secretarial assistant	Kanako Ishii
Design	DesignOne (Australia)
Printing/distribution	Hakon Holm Grafisk ApS (Denmark)

Tropical Forest Update (TFU) is published quarterly in English, French and Spanish by the International Tropical Timber Organization (ITTO). Content does not necessarily reflect the views or policies of ITTO. Articles may be reprinted without charge provided TFU and the author are credited. The editor should be sent a copy of the publication.

Printed on PEFC matt coated paper using vegetable-based soya inks.

TFU is distributed free of charge to over 14 000 individuals and organizations in more than 160 countries. To receive it, send your full address to the editor. Please notify us if you change address. TFU is also available online at www.itto.int, as well as in Apple's App Store and Google Play.

International Tropical Timber Organization
International Organizations Center – 5th Floor
Pacifico-Yokohama, 1-1-1 Minato Mirai, Nishi-ku
Yokohama 220-0012 Japan
t 81-45-223 1110
f 81-45-223 1111
tfu@itto.int
www.itto.int

Cover image: A tall ramasala tree in the Cibodas Biosphere Reserve, Indonesia, the location of ITTO project PD 777/15. *Photo: Gunung Gede-Pangrango National Park Agency*

Above: Minato-mirai, Yokohama, Japan. *Photo: R. Carrillo*

mandate to ensure that tropical forests are managed in ways that maximize their potential to meet the needs of both people and the planet. Year after year, COP after COP, ITTO raises its voice to keep tropical forests in the spotlight where they belong.

How ITTO advocated for tropical forests on the global stage during 2022 is described in the lead article on pages 3–4 of this edition. On the one hand, ITTO Executive Director Sheam Satkuru used her remarks at high-level gatherings during the COPs to remind delegates how the sustainable use and trade of forest resources is central to their conservation outside of protected areas as well as to securing the livelihoods of forest-dependent communities and the sustainable development of rural economies. She called for greater investment in and recognition of SFM as a nature-based solution to global challenges. On the other hand, ITTO officers actively participated in numerous discussions and side-events showcasing ITTO field projects that not only put sustainable forestry into practice but also continuously deepen the pool of knowledge on how to take better care of the planet's resources.

Synergies between the conservation and sustainable management of tropical forests are also illustrated in several other articles in this issue.

On pages 5–8, Ian Thompson, Teckwyn Lim and Maman Turjaman explore the tough issues surrounding the trade, conservation and management of the agarwood-producing genera *Aquilaria* and *Gyrinops*. The authors provide a string of recommendations related to the agarwood-producing tree species, which are a perennial subject of discussions at CITES COPs.

An ITTO project that supported alternative livelihoods to strengthen conservation in an Indonesian protected area is the subject of the article on pages 9–11 by authors including the late Hiras Sidabutar (see obituary on page 28). The article describes how the

successful piloting of beekeeping in a village near the Cibodas Biosphere Reserve is encouraging more families to adopt this low-impact activity instead of exploiting forest resources.

On pages 12–15, Otávio Marangoni Souza, Vicente Guadalupe and Erilene Lima Silva explain how they used guidelines developed by ITTO and the International Union for Conservation of Nature to evaluate whether Amazon production forests are effectively conserving nature. The authors conclude that, while progress has been made through policies and legal frameworks, more work is needed on building local capacities for their implementation on the ground.

Staying in the Amazon, Gonzalo Rivas Torres, Francisco Prieto, Janeth Santiana, Juan Iglesias, and Fidel Quispe describe on pages 16–19 how an ITTO project filled data gaps and tapped Indigenous knowledge to identify ways to strengthen the conservation of endangered mahogany populations in Ecuador.

Among TFU's regular features, ITTO Fellow Madjouliba Komi Madaaté Kpabebe presents findings from his survey of the ecosystem services provided by the threatened mangrove forest in southeast Togo, offering a better understanding of their conservation value and socio-economic potential.

In this edition's "Market trends" feature, Mike Adams looks at how the pandemic, the war in Ukraine and the cost-of-living crisis have roiled the global economy and its supply chains, with knock-on consequences in markets for tropical timber products.

The sustainable use of tropical forests undoubtedly has a bigger role to play in addressing the world's environmental crisis. Examples of how to do this already exist (as shown in this edition). What is needed is stronger backing for further replication and scaling up, a task that ITTO stands ready to support.



Putting tropical forests in the global spotlight

At key UN conferences, ITTO stressed the crucial role of tropical forests in solutions to the world's environmental crises

by the ITTO Secretariat
(itto@itto.int)



Speaking up for forests: ITTO Executive Director Sheam Satkuru delivers a statement during the high-level segment of UNFCCC COP27.
Photo: S. Kawaguchi/ITTO

Investing in tropical forests and the sustainable livelihoods of the Indigenous Peoples and local communities they support is vital for combating climate change, conserving biodiversity and achieving sustainable development. This was the message ITTO delivered at a series of significant meetings on climate and biodiversity in late 2022.

The conferences of the parties (COPs) to the UN Framework Convention on Climate Change (UNFCCC), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Convention on Biological Diversity (CBD) took place in November and December last year amid increasing concern over the inadequate efforts to reduce greenhouse-gas emissions and safeguard biodiversity.

At UNFCCC COP27, governments agreed to provide “loss and damage” funding for vulnerable countries hit hard by climate disasters, and underlined their commitment to sustainable forest management; CITES COP19 agreed to increase protections for more than 150 tree species; and, at CBD COP15, a new global framework was established to halt and reverse the loss of biodiversity, including a target to protect 30% of nature on Earth by 2030 and measures such as the stepped-up restoration of forests and other ecosystems.

ITTO Secretariat staff attending the conferences and numerous side-events urged countries to recognize and harness the many benefits of conserving, restoring and sustainably managing tropical forests, and they called for more support for the responsible production and consumption of legal and sustainable wood products.

Addressing UNFCCC COP27 in Sharm El-Sheik, Egypt, ITTO Executive Director Sheam Satkuru emphasized the importance of tropical forests for combating and adapting to climate change. She said tropical forests present a paradox in which they are both a source of, and a solution to, the climate emergency.

“Emissions from the degradation and loss of tropical forests have long been identified as a major cause of climate change,” Ms Satkuru said during UNFCCC COP27’s high-level segment. “Paradoxically, however, these forests also have the strongest potential to mitigate the problem through carbon sequestration on a massive scale and to create highly useful wood and other assets in the process.”

Ms Satkuru said nature-based solutions were gaining traction as a means for building greener societies.

“Sustainable forest management is one such solution because it generates legally and sustainably produced wood—the most environment friendly construction material—and many other products and services,” she said.

A bigger role for forests

In a side-event on how to reverse deforestation, Ms Satkuru highlighted that forests were given insufficient prominence at UNFCCC COP27, even though sustainably managed tropical forests are part of the solution to climate change.

“In addition, tropical forests are a source of livelihoods for the rural poor and provide many other ecosystem services, such as clean air and water,” she said.

Sustainable forestry requires long-term commitment from all stakeholders and substantially increased funding to unlock its potential, Ms Satkuru told the audience.

At UNFCCC COP27, ITTO co-convened a side-event to showcase the potential of REDD+ as a cooperative approach and the need for more capacity building. Among other things, the event presented a successful ITTO project in Togo that empowered women to restore degraded land. It also discussed Japan’s pioneering Joint Crediting Mechanism under Article 6 of the Paris Agreement as a model for joint promotion of REDD+.



Successful events: ITTO Executive Director (third from the left) with other speakers and delegates at a side-event of UNFCCC COP27 on reversing deforestation. Photo: S. Kawaguchi/ITTO

A project under Japan's Joint Crediting Mechanism in Cambodia's Prey Lang Wildlife Sanctuary was discussed at another UNFCCC COP27 side-event, co-organized by Japan's Forestry and Forest Products Research Institute and ITTO, along with ITTO projects on fire management in Indonesia and Peru and the role of forests in mitigating disasters such as flooding and landslides while enabling climate adaptation.

Species protection

At CITES COP19, held in Panama City in November, ITTO attended discussions on new listings for tropical timber species for which ITTO had earlier provided its assessment in accordance with standing CITES decisions. Parties decided to list the entire genera of ipe (*Handroanthus*, *Roseodendron* and *Tabebuia* spp.) and cumaru (*Dipteryx* spp.) from South America as well as three African genera (*Azvelia*, *Khaya* and *Pterocarpus* spp.) in CITES Appendix II.

At a side-event of the CITES Tree Species Programme (CTSP),¹ ITTO reported on the implementation of various activities under the programme and suggested steps to collaborate with CITES to implement new and existing tropical tree species listings, given that the contract between the European Union and the CITES Secretariat funding the CTSP recently expired.

Tropical forests at risk

At CBD COP15 in Montreal, Canada, ITTO called for greater investment in tropical forests and reaffirmed its readiness to support initiatives that advance sustainable tropical forestry for the benefit of nature and people.

Tropical forests are “increasingly susceptible and vulnerable to land-use change, deforestation and forest degradation, all of which are precipitated by global challenges affecting food, wood and energy security,” said Ms Satkuru.

“The global community must change the way it interacts with sustainably managed tropical forests, which can ensure biodiversity conservation, amongst other elements, for future generations.”

ITTO co-hosted a side-event at CBD COP15 that shared best practices for the restoration and sustainable management of tropical forests in the Amazon, Mekong and Congo basins.² The side-event explored the outcomes of the Joint ITTO–CBD Collaborative Initiative for Tropical Forest Biodiversity,³ which began in 2011. It also examined the benefits of other effective area-based conservation measures (OECMs), which encompass management regimes other than strictly protected areas that achieve positive conservation outcomes.



Call for support: ITTO highlighted the need for greater investment in sustainable tropical forestry during CBD COP15. Photo: Hwan-ok Ma/ITTO

The ITTO–CBD initiative has been “extraordinarily successful in improving local livelihoods and forest management, restoring degraded forests and conserving biodiversity,” said ITTO Projects Manager Hwan-ok Ma, who moderated the event.

“ITTO strongly believes that OECMs, including the sustainable management of tropical production forests, make important contributions to biodiversity conservation while ensuring tangible benefits for local communities,” he said.

ITTO officials also met with representatives of the governments of Costa Rica, France, Japan and from the United Nations University Institute for the Advanced Study of Sustainability to discuss possible ITTO inputs to the High Ambition Coalition initiative, which seeks to advance the goal of protecting at least 30% of the world's land and ocean by 2030.

Investment needed

In addition to the UN conferences, ITTO took part in the Nature for Life Hub⁴ in late November. The three-day virtual event, convened by the UN Development Programme and partners, brought together interrelated discussions on climate and biodiversity.

In a recorded message presented at the event, Ms Satkuru stressed the need for strategic investments in sustainable tropical forestry, forest-based industries and a sustainable timber trade as part of efforts to achieve a nature-positive future.

The critical role of timber production in both mitigating and adapting to climate change has yet to receive sufficient policy attention, said Ms Satkuru.

“Sustainable business development involving timber and non-timber forest products, as well as a wide range of ecosystem services, will enable local communities, Indigenous Peoples and smallholders to improve their livelihoods,” she said.

“The tropical timber industry needs transformative public and private investments to promote sustainable production and consumption with an enabling environment for private investments aimed at long-term sustainability.”

For more on ITTO's participation in the UN conferences, scroll through the stories at www.ito.int/news.

¹ <https://cites-tsp.org/>

² Five expert presentations made during the side-event are available at www.ito.int/news/2022/12/20/cop15_side_event_presents_global_lessons_on_biodiversity_conservation_in_tropical_forest_landscapes

³ www.ito.int/cbd

⁴ www.learningfornature.org/en/nature-for-life-hub-2022

Agarwood: expensive, exploited and endangered

A new ITTO report explores the tough issues surrounding the trade, conservation and management of the agarwood-producing genera *Aquilaria* and *Gyrinops*

**by Ian Thompson,¹
Teckwyn Lim² and
Maman Turjaman³**

¹ Forestry consultant
(ian.thompsonforest@gmail.com)

² Resource Stewardship Consultants
Sdn Bhd

³ Forest Microbiology Laboratory,
Forest Research and Development
Centre; Environment, Forestry
Research, Development and
Innovation Agency (FORDA)



Rare in the wild: Inflorescence of *A. malaccensis* on Penang Island, Malaysia. Photo: Lau Kah Hoo

Agarwood is a highly valued non-timber forest product sourced primarily in Southeast and South Asia from two main tree genera: *Aquilaria* and *Gyrinops*. The wood has long been used for cultural, cosmetic, and medicinal purposes, and most is now burned as incense.

All members of both genera (at least 28 species) are listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), meaning permits for their export should only be issued where trade will not affect the survival of the species in the wild. However, several of the predominant species are classed on the Red List of the International Union for Conservation of Nature (IUCN), as either critically endangered or endangered. Others are recorded as “data deficient”.

Not all *Aquilaria* and *Gyrinops* species produce agarwood, and the taxonomy of these two genera is not settled. The declining population status of these trees has resulted from decades of unsustainable harvesting driven by high demand for agarwood. While the percentage of trees with agarwood in the wild is likely less than 10%, unfortunately the trees are most often cut down to determine whether agarwood is present.

The most abundant species, *A. malaccensis*, was listed by CITES in 1995, with all other species added to Appendix II in 2005. CITES deliberations about the species have continued, with discussions about terminologies for products, developing proper non-detriment finding (NDF) reports, whether some products should be exempted from regulation, and how the products are recorded by exporters.

Plantation vs wild agarwood

The most contentious issue among exporting countries is the blanket listing that includes plantation-origin products, which are not endangered, along with the wild stock, which is declining. A major challenge remains the difficulty in

distinguishing between wild and plantation agarwood in trade. Recent research seems to have solved this dilemma using methods including DNA barcoding and/or gas chromatography/mass spectrometry. However, developing countries face challenges to access the proper equipment, meet the cost of testing, and secure trained personnel to carry it out.

The only global data on the export and import of agarwood are from the CITES database, which records information from import and export permits submitted by trading countries. These data indicate that most Southeast and South Asian countries export raw agarwood, or agarwood products, such as chips, oil, carvings, and incense. Most agarwood is exported as chips to Middle Eastern countries, Singapore and Taiwan Province of China (POC) for further processing.

Unsustainable harvesting

With wild agarwood now approaching USD 100 000/kg, there are estimates that the global agarwood industry is worth more than USD 30 billion, with a litre of oil commanding a price of USD 40 000–50 000. The major exporters of *Aquilaria* products are Indonesia, Malaysia, and Thailand, with almost exclusively (more than 98%) wild stock exported from Malaysia and Indonesia, while the wood from Thailand is all from plantations. The main countries that import *Aquilaria* include the United Arab Emirates, Saudi Arabia, Singapore, and Taiwan POC. About five times more *Aquilaria* is exported on an annual basis than *Gyrinops*. The major *Gyrinops* exporters are Indonesia (including Papua) and Sri Lanka. Starting in 2017, more plantation-origin than wild-origin agarwood exports were recorded in the CITES database. However, plantation agarwood is apparently of inferior quality and is worth considerably less than wild agarwood, so demand for wild stock remains very high.



Growing source: *A. malaccensis* in a plantation in Assam, India. Photo: Syed Quavi

The chronic unsustainable harvesting of wild agarwood seems to have been ignored by governments in favour of supporting their export industries over many decades. As wild populations have become increasingly depleted, and as a result of the CITES listing, industry and governments have responded by developing plantations, especially of *A. malaccensis*, *A. crassna*, and *A. sinensis*. Plantations are now found throughout South, East and Southeast Asia, with very large plantations in China, India, Indonesia, Malaysia, Thailand and Viet Nam. The total number of plantation trees may have exceeded 60 million in 2022.

Plantations rising

The science of producing plantation agarwood has advanced considerably since the initial listing of *Aquilaria* by CITES. Research has focused on the fungi that cause agarwood to form as part of a tree's natural defence mechanisms. In wild trees, wounds and infection result from ants and wood-boring insects that import fungi and other pathogens into the trees. The trees react by producing resins that contain a large array of aromatic chemicals and hardens to form agarwood. Plantation operators seek to duplicate the process by drilling holes in the trees and introducing fungal inoculants identified as those which cause agarwood to form. As a result of research and trial-and-error, a series of best practices have been developed to improve the production of agarwood. Trees take about eight years to reach a diameter of 10 cm diameter at breast height, the minimum recommended size for inoculation, followed by two years or more for the agarwood to develop.

Despite the development of plantations, the harvesting of wild agarwood is still permitted, though under some restrictions in Indonesia and Malaysia. Illegal harvesting also continues. Numerous instances are found each year, and some illegally harvested wood is mixed with plantation



Mimicking nature: Inoculation of a tree at the Forest Research Institute Malaysia. Photo: K. Ishii

wood of the same quality to circumvent harvest laws. While national policies continue to be primarily directed towards the export industry, there are now conservation measures in place in all countries, including wild tree restoration programmes, laws and quotas restricting or banning wild stock harvest, and registration systems for the buying, transport, and export of agarwood, including that from plantations.

A major impediment to the sustainable management of agarwood is the lack of information about the status of wild populations. There are few survey data to underpin the NDF reports on which sustainable annual allowable harvests can



Prime cuts: Workers extracting the agarwood-containing heartwood in Koh Kong Province, Cambodia. *Photo: S. Sinly*

be based. Just four countries have produced an NDF, with those from Malaysia and Indonesia now well out of date. While the more recent NDFs from India (2021) and Thailand (2016) were not available for this study, information presented at a CITES agarwood workshop in 2022 indicated that both are robust. Quotas have been set by some countries for the harvest and export of wild agarwood, but in the absence of population data, such quotas have no scientific basis.

The above insights are drawn from a new ITTO report written by the authors of this article. The report provides a comprehensive overview of the situation facing agarwood-producing genera, including CITES considerations, trade patterns, conservation measures and management practices.⁴

What can be done?

The report also makes numerous recommendations for range states, importing countries and CITES on how the conservation and sustainable use of agarwood-producing species can be enhanced.

For range states:

- Develop and implement periodic sampling to establish population data for all agarwood species (in plantations and the wild) and develop proper NDFs with quotas for all individual agarwood species.
- Ensure protection of wild trees through improved regulation and enforcement, and also possibly through the expansion of protected areas.

- Establish and strengthen national/regional databases for the identification of the origin of agarwood specimens. The database could contain site-specific profiles (including DNA profiles).
- Increase the capacity and knowledge of enforcement staff and customs officers to reduce illegal harvesting and exporting.
- Establish a national registration system for plantation and wild agarwood.
- Develop a licensing system for traders, with any illegal activities by a trader resulting in the loss of the licence.
- Develop and implement online technologies to support the registration and monitoring process for plantations, nurseries, and for exporters.
- Control the acquisition of parent stock from private or state lands or purchased internationally.
- Verify all plantations through inspection.
- Apply transportation permits.
- Samples of the labels used and lists of exporters should be communicated to the CITES Secretariat by exporting states, and then provided to all Parties through a Notification.
- Develop and implement conservation action plans for the agarwood species, including a component for assisted natural regeneration.
- Consider creating a national agarwood species fund that would collect fees paid by users of agarwood-producing populations. The funds should be used to strengthen the implementation of national strategies to ensure the conservation and sustainable management of agarwood species.

⁴ Thompson, I.D., Lim, T., and Turjaman, M. 2022. *Expensive, Exploited and Endangered. A review of the agarwood-producing genera Aquilaria and Gyrinops: CITES considerations, trade patterns, conservation, and management*. ITTO Technical Series No. 51. International Tropical Timber Organization (ITTO), Yokohama, Japan. Available at: www.itto.int/technical_report/



Expensive and endangered: A mature *A. malaccensis* tree on Penang Island, Malaysia. Photo: Lau Kah Hoo

- Out-planting programmes for agarwood species should consider genetic diversity within species and should not move seeds, seedlings, or cuttings outside the distribution range.
- Range states might wish to consider negotiating and agreeing to implement a common grading system for agarwood products based on the aromatic compounds present, colour, or other scientifically measurable characteristics.
- Range states should consider applying to funding agencies such as the Asian Forest Cooperation Organization, ITTO, the United Nations Development Programme, and others for support to develop their agarwood management plans.
- Technologies to distinguish wild from planted agarwood exist; plans could be developed/negotiated to establish regional service laboratories to carry out such analyses.

For importing countries:

- Given the lack of funding for the conservation of agarwood species, the major importing countries might reflect on the damage already done to wild populations and consider assisting range states to restore and recover wild populations, either directly or through international agencies working towards the conservation and sustainable management of forests.
- Importing countries need to adopt technologies to distinguish between wild and plantation agarwood and apply these technologies to samples of incoming agarwood on a regular basis. Further, importing countries need to upgrade the skills and knowledge within their customs agencies to ensure the legal importation of agarwood.

For CITES:

- CITES should consider obtaining funding to work with a botanical garden to develop a clear taxonomy for the two genera *Aquilaria* and *Gyrinops*, then consider listing the species individually, in part based on whether they are agarwood species.
- It is clear that most countries have spent considerable time on developing plantation methods, but limited time on understanding the importance of an NDF; as a result, CITES should consider working further with range states to provide improved information and training on developing an NDF.
- Parties to CITES should consider whether additional agarwood-producing species (such as *Aetoxylon sympetalum*, an important source of agarwood in Sarawak) should be included in Appendix II to make international trade regulations more comprehensive.
- Parties to CITES should consider whether existing regulations and export quotas adequately safeguard rare and endemic agarwood species such as *Aquilaria rostrata*.
- The current CITES “glossary of agarwood products” requires further work to reduce its scope and ensure that there is clarity of the terms. For example, “wood block” and “piece” should be a single category.
- All products should be reported in kilograms to the CITES database, except live specimens reported in numbers.
- The Plants Committee should discuss further with all range states whether the exemption of exhausted agarwood powder from CITES controls should be maintained.
- Inconsistencies in the agarwood import/export database should be addressed by working with countries to develop consistent terms for products (in line with the glossary) and to specify that products must be reported in certain units of measurement (e.g. kg). Further consideration might be given to developing an online portal for direct information input that will only accept certain terms and units.
- Consider providing guidance on: a) the appropriateness of establishing quotas based on weight or volume; b) the extent to which such quotas relate to the number of mature standing trees, using a precautionary approach; and c) focusing on the harvesting regime rather than using standard conversion factors.

ITTO has worked extensively to support the sustainable management of agarwood resources, both through its country-driven projects and its long-running collaboration with CITES. In particular, ITTO assisted both Malaysia and Indonesia to develop their NDFs. This support will continue, with a short-term focus on assisting CITES to formulate appropriate recommendations regarding its agarwood NDF guidance and its agarwood glossary, as called for at the 19th Conference of the Parties to CITES in November 2022.

Buzzing livelihoods bolster an Indonesian reserve

An ITTO project promoted beekeeping and other livelihoods to build support for conservation and sustainable land use in the Cibodas Biosphere Reserve

by Hiras Sidabutar,¹
Eureka Zatnika,²
Ade Bagja Hidayat³
and Wahyu Rudianto⁴

- 1 Project advisor
- 2 Beekeeping expert
- 3 Project coordinator
(a.bagjahidayat@gmail.com)
- 4 Director of Gunung Gede-Pangrango
National Park



Sweetened livelihood: Beekeeping in Cileungsi village, Bogor district. Photo: ITTO Project PD 777/15

Beekeeping has proven an attractive and viable business in communities no longer able to exploit resources in an important Indonesian protected area, demonstrating the relevance of alternative livelihoods in securing vital local support for efforts to conserve valuable ecosystems.

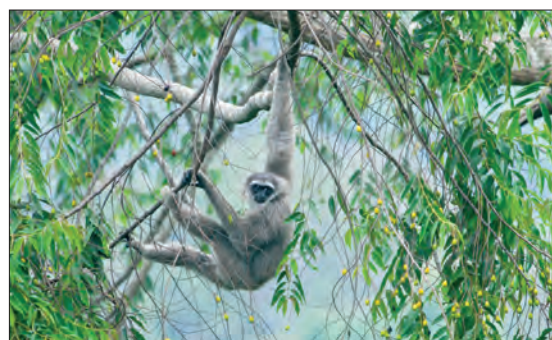
This is among the key insights gained from an ITTO project completed in February 2022 in the Cibodas Biosphere Reserve, a biodiversity hotspot in the province of West Java, Indonesia. The project⁵ was implemented by the Gunung Gede-Pangrango National Park (GGPNP) Agency. Initially planned to take 36 months, the project was granted a six-month extension due to delays caused by the COVID-19 pandemic.

The specific objective of the project was to improve the conservation and sustainable management of biodiversity and ecosystems of the reserve through the implementation of an integrated strategic management plan developed under a previous ITTO project.⁶

The follow-up project aimed to deliver three outputs: a significant reduction in the threat to biodiversity in the core area of the reserve; the demonstration and promotion of land use best practices in the surrounding buffer and transition zones; and enhanced institutional arrangements for the management of the reserve.

From production to conservation

Proclaimed by the United Nations Educational, Scientific and Cultural Organization in June 1977, the CBR initially covered 108 000 ha, comprising the 15 196 ha of the GGPNP as the



Biodiversity hotspot: Java gibbon is a key species protected by the Cibodas Biosphere Reserve. Photo: Ardi Andono, GGPNP Agency

core area, 12 700 ha of buffer zone; and 80 000 ha of transition area. In 2012, the Government of Indonesia expanded the CBR to 167 000 ha, consisting of 24 500 ha of GGPNP; 54 800 ha of buffer zone; and 87 700 ha of transition area.

Located in West Java province, the CBR holds rich and unique biodiversity, including flagship species such as the Java hawk eagle (*Nisaetus bartelsi*) and the Java gibbon (*Hylobates moloch*). Its twin volcanoes and extensive forests are also a popular and relatively accessible tourist destination as well as a vital source of water for some 30 million people in the capital Jakarta and other cities as well as municipalities located around the reserve.

The expansion of the reserve aimed to strengthen the conservation of these valuable natural resources and the benefits they provide. However, it also threatened the livelihoods of some local communities.

A significant portion of the land added to the core area was formerly managed by a private company, Perum Perhutani Co. Ltd, as a production forest, where a large number of farmers produced timber as well as other crops in agroforestry systems. As a result, the GGPNP Agency has faced the

5 ITTO Project PD 777/15 Rev. 3 (F) "Accelerating the restoration of Cibodas Biosphere Reserve functions through proper management of landscapes involving local stakeholders".

6 TFL-PD019/10 Rev.2 (M) "Developing collaborative management of Cibodas Biosphere Reserve in West Java, Indonesia". An article about this project appeared in TFU issue No. 23/2, available at www.itto.int/tfu/back_issues/.

challenge of developing alternative sources of livelihood for local people in general and for the affected farmers in particular to secure their support for enhanced conservation in the CBR.

Livelihoods key to conservation

Based on empirical evidence, decision-makers, managers, experts and researchers have realized that conservation of biodiversity and forest ecosystems will only succeed if local communities and other stakeholders support the initiative, and that local communities will provide that backing if they have an incentive in the form of decent, sustainable livelihoods. Most, if not all, local people risk entering conservation forest land solely to make a living by planting crops or collecting forest products. People are willing to stop entering the forest if alternative sources of income are available.

The GGPNP Agency has engaged local people in conservation and management operations but can only directly employ a limited number of them. In the buffer zone alone, there are 65 villages that the Agency has been assisting to develop alternative sources of income. Now, through the activities implemented under the ITTO project, the Agency and the forest farmers groups of six villages have set up six livelihood models. One of the models—beekeeping for honey production—is described in detail below.

Developing livelihood models

The process of developing the livelihood models involved a number of steps. First, social, cultural and economic information was collected from people in the villages of the buffer zone, including their sources and level of income, capabilities, dependence on the park, and need for external assistance. Dialogues were then held with local people to understand their preferences and expectations regarding assistance.

Based on the information gathered, a shortlist of villages most in need of assistance was developed. These villages were invited to develop proposals for their desired livelihood projects, with the assistance of park extension officers.

The best proposals were identified using the following criteria:

- The proposal was developed by a forest farmer group representing a village in the buffer zone.
- The proposing village was poor, located near the park, and relied on the park for livelihoods.
- Many people in the proposing village formerly worked with Perum Perhutani Co. Ltd.
- A significant portion of inputs for the proposed project, such as land and raw materials, were locally available.
- The product(s) of the proposed project were marketable locally.
- The proposal would provide benefits quickly in order to help people recover from the impacts of the COVID-19 pandemic.
- The requested capital investment was affordable for the project.



Conserving the environment: Swamp area around the Gayonggong bridge in the CBR. Photo: Randi

Through this screening process, six proposals were selected: four sheep-breeding and -fattening models in four different villages, one honey production business model and one homestay business model. Training was provided on the skills needed to develop the selected projects, which were also refined according to the funding available.

For the beekeeping model, this included:

- selecting bee species based primarily on the quality and quantity of honey they produce and the requirements they place on beekeepers;
- selecting suitable sites for bee colonies considering the availability and diversity of flowering plants in the surrounding area as well as the suitability of the ground for the erection of huts and hive shelves; and
- constructing huts and hive shelves, purchasing harvesting tools and other supplies and initiating operations after a total investment of USD 3850.

Promising results

In June 2020, after completing construction work, 11 hives of *Apis mellifera* and 50 hives of *Trigona laeviceps* were installed in Cileungsi village, Bogor district, under the supervision of a professional beekeeper. Members of the local farmer group demonstrated their ability to apply knowledge and skills they had learned in the classroom.

In the first month, the *Trigona* bees produced nearly 10 litres of honey, for a monthly yield of about 200 millilitres per hive. The honey was sold locally to park visitors and local inhabitants for IDR 250 000 (about USD 19) per litre under the brand name “Madu Pangrango” (“Madu” means honey in Indonesian while “Pangrango” is the name of a mountain in the CBR).

Using the proceeds from selling the honey, the LBC Lestari farmer group added another 250 beehives after just two months of operation, illustrating the potential of a business model that required minimal capital investment.

The *Apis mellifera* bees produced an average of 6 kg of honey per hive in the first month, for a total of 65 kg. Sold for the equivalent of about USD 8/kg, the proceeds from *Apis* honey in the month was USD 520. In the second month, production was disturbed by the presence of a pest (*Vespa* spp.), which



Alternative income: People making a living from beekeeping have less reason to enter the core conservation area of the Cibodas Biosphere Reserve. *Photo: Iyan Mulyana, ITTO Project PD 777/15*

Water provider: The CBR is a vital source of water for some 30 million people in the capital Jakarta and other nearby cities. *Photo: Ida Rohaida*

killed many bees. After unsuccessful pest control efforts, the *Apis* hives were moved 5 km to a new location. Due to the pest problem, no hives were added at the new site.

Community benefits

An immediate impact of the beekeeping model was its attractive financial return in addition to the employment opportunity it presented for the farmer group and other community members.

Another great potential benefit of the business is closely tied with the tourism industry because CBR area is a famous and preferred destination for visitors. As observed during the first months of operation, some visitors were interested in watching the on-site process of honey production. Pupils of nearby schools have also indicated interest in learning about beekeeping. This presents an opportunity to develop educational tour packages suited to different potential customers.

Yet another potential benefit is the use of stinging bees (such as *Apis* spp.) in medical care. While bee stings can cause fatal allergic reactions, some people consider them effective in alleviating pain, stress and other conditions. The farmer group could tap this market by developing health care tourism packages in collaboration with experienced professionals.

Replication potential

The initial success of the beekeeping business model indicates the potential to scale it up as an alternative source of livelihood. Many community groups and villages in the CBR area have approached the LBC Lestari forest farmer group and park officials seeking information about entering the business. Therefore, it should not be surprising if numerous other individuals and groups join the sector.

Replication of the model seems set to proceed naturally, as a result of its profitability, the small capital investment required, the simple technologies in use and the great market potential.

For conservation in the CBR, the implication is twofold: with more people employed in beekeeping, fewer will need to enter the forests to earn their living; and the business benefits accruing to local stakeholders will translate into stronger support for CBR conservation. Indeed, the GGPNP Agency will be supporting the replication process by providing information on entering the honey business while also controlling the number of beekeeping operations to avoid excessive competition between suppliers and adverse impacts on the landscape.

Dr Sidabutar, the first author of this article and a former ITTO staff member, passed away in February 2023. An obituary is published on page 28.

Project outputs can be found by inserting the project code PD777/15 Rev.3 (F) into the ITTO project search function at www.itto.int/project_search. This ITTO project was made possible by funding from the Government of Japan.

Further details can be found at the project's Facebook page at <https://www.facebook.com/itto.c.reserve>



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Are Amazon production forests sustaining biodiversity?

Analysis using ITTO/IUCN guidelines shows that more on-the-ground action is needed to protect nature

by Otávio Marangoni Souza,¹ Vicente Guadalupe² and Erilene Lima Silva³

- ¹ Senior forest specialist, ACTO consultant
² Regional project coordinator, ACTO (vicente.guadalupe@otca.org)
³ Forest specialist, Gikitaya Socioambiente



Produce and conserve: Forest management planning with Brazil's Instituto Floresta Tropical. Photo: Otávio Marangoni Souza

The Amazon covers an area of about 544 million hectares within the borders of the eight member countries of the Amazon Cooperation Treaty Organization (ACTO): Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela. This vast forest may seem to present an endless source of timber and other forest resources. But an average of 1.6 million hectares was lost every year in 2000–2015 in the ACTO member countries (ACTO 2018), driven by factors including land-use change and logging.

The importance of forests in the economies of ACTO countries is clear. The area of Amazon forest used for timber production in 2015 was 115 million hectares, or 21% of the total area. That is up by almost half since 2000. The average annual volume of wood extracted (without bark) was more than 34 million cubic metres in this period, with Brazil contributing 86% of the total (ACTO 2018).

Biodiversity declines associated with forest loss and degradation in ACTO countries are strongly related to planning deficiencies and financial constraints that limit law enforcement, as well as the lack of incentives to dissuade landowners from converting forest to other, possibly more economically attractive, uses. Exploiting forests for timber production is also often cited as a major threat to biodiversity. However, there is enough evidence to suggest that, if properly managed, forests can play an important role for both national economies and biodiversity conservation (ITTO/IUCN 2009).

ACTO countries have made important progress towards the sustainable management of forests in the region, mainly through the creation of forest policies and legal and regulatory frameworks. However, to what extent these instruments are being applied and are therefore effectively conserving biodiversity has been little studied. Much of the authors' knowledge on this subject is based on the experience of forest officers in the application of regulations and norms.

Key insights include that:

- landowners, managers and other forest stakeholders typically lack clear knowledge on how to integrate biodiversity conservation with forest management codes and practices;
- common forest management approaches are unsustainable and do not protect forest biodiversity; and
- logging operations are often inefficient or poorly executed.

Under these conditions, adverse effects on forests will likely intensify, threatening their economic sustainability and the livelihoods of dependent communities, and accelerating the fragmentation and loss of habitats and species that are important for forest resilience.

In response, ACTO, with financial support from the ITTO–Convention on Biological Diversity (CBD) Collaborative Initiative⁴ implemented the project “Building capacities of ACTO member countries in ecologically responsible forest management and biodiversity conservation in managed forests of the Amazon” (PP-A/47-266) to help member countries conserve forests and biodiversity through improved practices and models and with an emphasis on community-based forest management.

The ITTO/IUCN guidelines

The ACTO project, which ran from June 2015 to December 2018, included an evaluation of the measures implemented in member countries to conserve and sustainably use biodiversity in managed forests using guidelines developed by ITTO and the International Union for Conservation of Nature (ITTO/IUCN 2009). The results of the evaluation

⁴ www.itto.int/cbd/



Amazon landscape: The Amazon covers part of eight ACTO member countries. *Photo: Otávio Marangoni Souza*

Box 1: ACTO in action

ACTO has built on the capacity-building project concluded in 2018 with the approval in 2021 of regional programmes for biodiversity and forests.

The biodiversity programme seeks to improve the management of biological diversity and the protection of the traditional knowledge of Indigenous Peoples in the context of CBD objectives. The forest programme promotes the conservation and sustainable management of forests with measures including the development of capacities to meet the requirements and deadlines of the global forest and biodiversity agendas.

The programmes have already improved the ability of member countries to act in the face of international agreements and conventions in the areas of forestry and biodiversity; provided continuity in ACTO member countries’ cooperation with international organizations like ITTO; and supported and complemented national forest management in addressing needs that require regional cooperation.

Resources such as the *ITTO/IUCN Guidelines for the Conservation and Sustainable Use of Biodiversity in Tropical Timber Production Forests*, *ITTO Guidelines on Fire Management in Tropical Forests*, and ITTO’s collaborative work with the Convention on International Trade in Endangered Species of Wild Fauna and Flora, are providing valuable support in the implementation of the two regional programmes.

helped inform the design of capacity-building modules undertaken in the project and later ACTO initiatives (Box 1).

The ITTO/IUCN guidelines are designed to provide forest policy decision-makers and other stakeholders with comprehensive direction on how to conserve biodiversity in tropical timber production forests. The guidance comprises 46 guidelines grouped around 11 principles.



Sustainability measured: Wood processing in the field in the Chico Mendes Extractive Reserve, Acre, Brazil. *Photo: Otávio Marangoni Souza*

Under the ACTO project, project focal points and national forest experts examined to what extent ACTO countries have incorporated ITTO/IUCN guidance into forest management policies and instruments, and how this is reflected in management practices.

For the evaluation, the authors of this article grouped the 11 principles into three categories—strategic, enabling, or operational—based on the focus and scope of each principle and their related guidelines (Table 1). Using expert judgement, the level of application of each guideline was graded along the following scale: 1=Poor, 2=Fair, 3=Good, and 4=Excellent.

... Are Amazon production forests sustaining biodiversity?

Table 1: ITTO/IUCN principles grouped by evaluation category and number of guidelines per principle and category

Category/Principle	No. of guidelines by principle	No. of guidelines by category
Strategic (national institutional and regulatory arrangements in accordance with international commitments)		
I. Sovereignty and societal choice	2	6
II. International commitments	2	
III. Political commitment, policies and laws	2	
Enabling (institutional and regulatory national arrangements that affect forest management)		
IV. Land use and spatial planning	2	14
V. Decentralization, forest tenure and natural resource access rights	2	
VI. Incentives	4	
VII. Knowledge, learning, technology transfer and capacity building	6	
Operational (institutional and regulatory national arrangements that allow intervention in the territory)		
VIII. Managing tropical production forests at a landscape scale	3	26
IX. Biodiversity considerations at the forest management unit level	14	
X. Biodiversity conservation in planted forests	5	
XI. Maintaining functioning forest ecosystems	4	

Results: “fair” to “good”

Overall, the results of the analysis show that many important actions have already been undertaken in the eight ACTO countries to promote the conservation and sustainable use of biodiversity in managed forests (Figure 1). Most progress was made through the creation of policies and legal or regulatory instruments, reflected in the “good” (average score 2.83) application of the strategic guidelines. On the other hand, the implementation of operational guidelines was only “fair” (average score 2.42), indicating that, despite the existence of national legal frameworks aligned with the international regime to protect tropical forest biodiversity, more on-the-ground efforts are needed for countries to meet their international commitments.

ACTO countries recorded some of their highest scores for individual principles within the strategic and enabling categories. For example, the average score for both principle II (International commitments) and principle IV (Land use and spatial planning) was about 3.0 (Figure 2). This indicates that national governments have committed themselves, through intergovernmental agreements, to address biodiversity conservation issues in the management of production forests and have taken steps to include conservation objectives in land allocation and spatial planning in their territories. These results are consistent with the relatively high score for principle I (Sovereignty and societal choice), showing that governments have responded to the concerns of citizens with regard to the conservation and sustainable use of the Amazon and its biodiversity.

On the other hand, the relatively low scores achieved for principles VIII, X and XI (average 2.36) demonstrate that more efforts are needed from governments, the private sector, and academic and research institutions to develop institutional and local capacities to effectively protect forest habitats and maintain ecosystem function at the landscape scale as well as to manage plantation forests sustainably.

Figure 1: Implementation of ITTO/IUCN principles by category

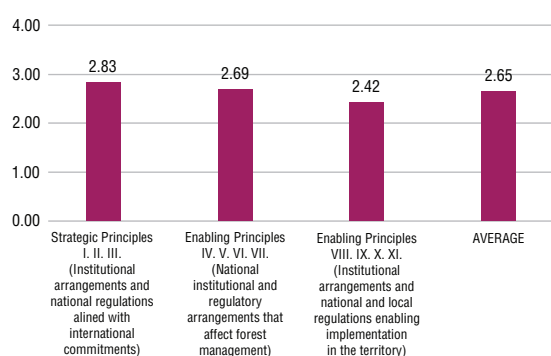
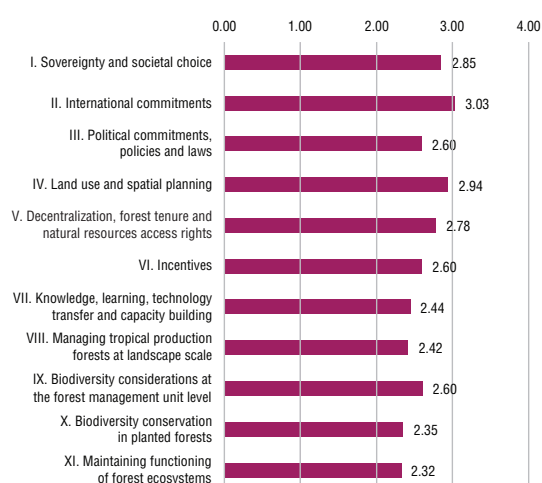


Figure 2: Implementation of individual ITTO/IUCN principles



At the level of individual guidelines, the analysis helps identify in even greater detail the areas where ACTO countries have focused their efforts, and where they need to do more.

For instance, the highest average implementation scores (3.0 or more, “good”) were recorded for guidelines on: creating regulatory and legal frameworks that guide



Forest specialist: the white hawk (*Pseudastur albicollis*) breeds throughout the Amazon basin. Photo: Otávio Marangoni Souza

the allocation and use of production forest land to address the conservation of biodiversity; addressing issues of conservation and sustainable use of biodiversity within national land-use planning processes and forest and environmental laws; and applying special precautionary measures to protect populations and maintain the within-species variability of the most valuable timber species.

The lowest implementation scores (below 2.2, “fair”) were recorded for the guidelines on: developing capacities for biodiversity conservation in technical agencies, planning departments and timber companies and among local forest owners and managers; minimizing the risk of introducing and spreading invasive alien species during forestry operations; developing management systems that favour natural processes and native species and enhance the productivity and resilience of the planted forest; improving and applying ecological knowledge to ensure that forest management enhances or maintains biodiversity and, thus ensures forest functions such as pollination, seed dispersal and nutrient cycling; and understanding fire ecology and including biodiversity considerations in fire management measures.

Conclusions

Evaluating the actions of ACTO member countries against the yardstick of the ITTO/IUCN guidelines shows that all countries have taken important steps towards the conservation of biodiversity in their production forests, mainly through the development of forest policies and legislation. However, the analysis also indicates the need for more work to implement forest-related legislation on the ground and make forest management more ecologically responsible. To that end, governments must prioritize the development and strengthening of the capacity of stakeholders at the field level to improve forest management practices and ensure long-term ecological, social and economic sustainability.

References

- ACTO. 2018. *Regional Report on the situation of Forests in the Amazon Region*. Permanent Secretariat – Amazon Cooperation Treaty Organization (ACTO). Brasília, Brazil.
- ACTO. 2021. *Atlas de Vulnerabilidad Hidroclimática de la Región Amazónica*. Amazon Cooperation Treaty Organization (ACTO). Brasília, Brazil.
- ITTO/IUCN. 2009. *ITTO/IUCN guidelines for the conservation and sustainable use of biodiversity in tropical timber production forests*. ITTO Policy Development Series No. 17. International Tropical Timber Organization (ITTO), Yokohama, Japan. Available at: www.itto.int/policy_papers/

Tapping knowledge and custom to conserve mahogany in Ecuador

An ITTO project has filled data gaps and mined Indigenous knowledge to strengthen efforts to conserve endangered mahogany populations in the Amazon

**by Gonzalo Rivas Torres,¹
Francisco Prieto,²
Janeth Santiana,²
Juan Iglesias,³
and Fidel Quispe³**

¹ San Francisco de Quito University (USFQ) (grivast@usfq.edu.ec; proyectoahuano@gmail.com)

² REDD Early Movers (REM) Programme

³ Ministry of Environment, Water and Ecological Transition (MAATE)



Local knowledge: Social research is key to improving the conservation and sustainable management of big-leaf mahogany in Ecuador's Pastaza Province.
Photo: Catalina Campo, S. macrophylla baseline information generation project, USFQ

In Ecuador, the classification of species as critically endangered means that, based on the best available information, there are clear threats and a high risk of extinction in the future. At the same time, it signifies the need to take immediate action. This is currently the status of big-leaf mahogany (*Swietenia macrophylla* King) in Ecuador, where it has low presence in native forests and very little natural regeneration, while at the same time is vulnerable to clandestine and informal trade with few initiatives to improve its management. These problems, not unique to Ecuador, led to the listing of *S. macrophylla* in CITES Appendix II for all neo-tropical populations in 2003.

In view of this, the Ministry of Environment, Water and Ecological Transition of Ecuador (MAATE) in cooperation with San Francisco de Quito University (USFQ) and the National Institute for Biodiversity (Instituto Nacional de Biodiversidad (INABIO)) launched the project "Support for the sustainable management of endangered tree species listed in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)", which was funded by ITTO and implemented from December 2021 to March 2023. The project was funded under ITTO's Biennial Work Programme activity to assist countries implementing CITES' provisions, was an ITTO contribution to the recently completed CITES Tree Species Programme. The objective of the project to generate baseline information for the formulation of public policies for forest conservation, planning and management in Ecuador, with special emphasis on *S. macrophylla*, known locally as ahuano.

The project is part of an initiative to improve the management capacity for CITES-listed forest species, thus contributing to the sustainable management of ahuano in Ecuador. To this end, forestry and social researchers collected information in the Indigenous Kichwa communities of Ceploa and Elena Andy, located in the province of Pastaza, in the Amazon region of Ecuador.

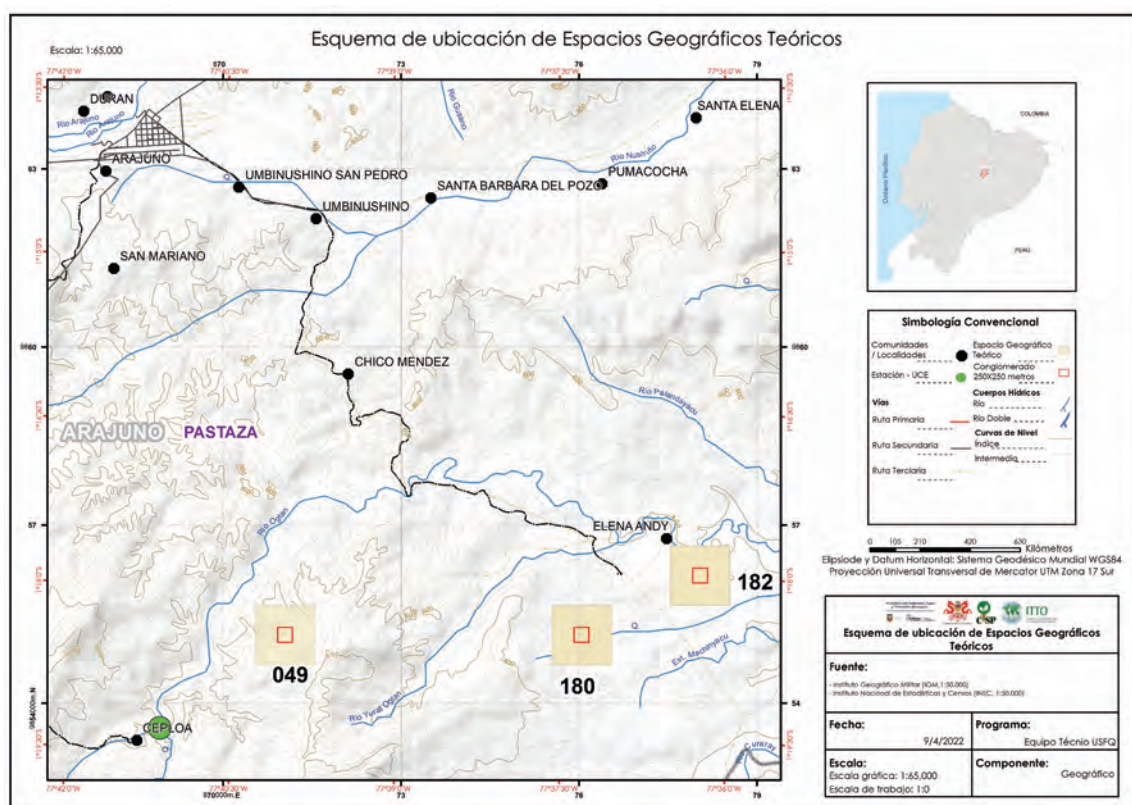
The 2003 listing of neotropical populations of *S. macrophylla* in CITES Appendix II required measures to be taken to ensure that international trade does not threaten the species' survival. The listing reflects how centuries of intense logging to supply local and international markets, together with inadequate management of the species, have caused a drastic decline in populations.

Research in Ecuador has determined that ahuano populations in the country are critically endangered due to an 83% reduction of the number of trees and a 47% decrease in the area of occupancy in just 24 years (MAE 2014).

In response, the Ecuadorian Government, through MAATE, as the National Environmental Authority, has adopted several administrative and technical measures for the conservation of the species. In 2007, a two-year ban on harvesting the species in natural forests was enacted through a Ministerial Agreement. In 2009, the ban was renewed and extended to include naturally regenerated trees, relict trees and individuals found in other formations. When the ban ended in 2011, an administrative resolution was issued, whereby, under the precautionary principle, Provincial Directorates were ordered to refrain from approving forest harvesting plans and licenses until they had sufficient information on the population status of the species in the country. In 2014, MAATE conducted a pilot study in the communities of Uyuimi and Mangalpa, in Pastaza Province, on condition that no harvesting or post-harvesting disturbance took place, where a field methodology was implemented to sample adult trees (≥ 10 cm diameter at breast height (dbh)) and examine the natural regeneration of the species.

In 2017, the ban was re-established through Ministerial Agreement 090, prohibiting the logging and harvesting of parts and derivatives of this species for a period of 10 years.

Figure 1: Map showing the location of communities surveyed as part of the project



Source: *S. macrophylla* baseline information generation project, USFQ

This agreement includes, among other provisions, the prioritization of studies to obtain information to meet national needs as well as CITES requirements, especially those related to regulations for international trade such as the non-detriment findings required for exports of CITES Appendix II listed species. It also highlights the need to work closely with local communities in the areas where the species is found to promote opportunities for the conservation and sustainable management of their natural resources.

Laying the groundwork

Against this background, and prior to starting their field work, the team implementing the ITTO-funded project in Pastaza held meetings with communities and Indigenous organizations in Ceploa and Elena Andy. After the presentation of the project and its objectives, a memorandum of understanding was signed allowing the researchers to enter the territory and arranging the training of villagers as field guides.

The field work included compiling forest inventories and gathering data on social perceptions related to the species in the Ceploa and Elena Andy communities. The forestry study located the most abundant ahuano populations in a strip about 15–30 km wide at altitudes of 500–700 m on well-drained hills. The potential range area extends from the mountains of Surakú (Simón Bolívar parish) in the south, to the surroundings of the town of Arajuno, in the north. Towards the southeast, the occurrence of the species is associated with old river sediments.

Field research also found that populations of this species have two abundance peaks in the number of individuals according to tree size: one for mature trees of more than 60 cm dbh and up to 25 m in height, and another for juvenile individuals, with a height of less than 30 cm. On the other hand, there was very low occurrence of individuals of more than 1 m in height but less than 60 cm dbh.

While the number of trees found during field work was relatively small, given the importance of ahuano for the communities and the country, MAATE (in collaboration with other stakeholders) will continue surveying the species after the completion of the ITTO project. This will involve working with a larger number of communities in Pastaza. Data from this wider survey will help further determine the status of ahuano populations and support conclusions about management and conservation measures for this species.



Laying the groundwork: Project staff meeting with community representatives in Ceploa in May 2022. Photo: Samay Calapucha, *S. macrophylla* baseline information generation project, USFQ



Strong specimen: Seed tree found in the land of the Elena Andy community. Photo: Walter Palacios, *S. macrophylla* baseline information generation project, USFQ

Next steps

The information generated by this project has made it possible to formulate valuable recommendations. Based on the ecological niche occupied by the species in the province, it has been suggested that the distribution model be adjusted for the implementation of future field surveys. This will help to focus surveying efforts in the areas where the species is present. Furthermore, the protection of the populations found in the communities of Mangalpa, Uyuimi and especially Pitirishca (located in the south of the province), where the greatest concentration of large trees is estimated to be (MAE 2014; Palacios et al. 2023), is proposed as a matter of urgency.

Botanical samples were also collected for genetic laboratory analysis, under the coordination of the USFQ. The analysis of this information is expected to generate molecular tools that will complement the knowledge currently available and will contribute to the conservation and management of the species.

In addition to establishing the distribution of ahuano, an objective of the project was to understand how communities regarded the species in order to support their role in responsible use and harvesting. A survey of community members found that most considered ahuano an integral part of the forest, highlighting its relationship with other components of the forest and its functions. From the Kichwa perspective, the interrelations of individual plants within the forest reflect human society and its interactions.

The survey results also indicate that this species is embedded in the collective memory of the people, that their knowledge of it came mainly from the paternal line, being transmitted from grandparents/parents to children, and that this transmission is linked to traditional activities such as the construction of houses and the making of canoes, furniture and pans used to prepare chicha, a drink made from fermented yuca.

Unsurprisingly, given the species' importance for local culture and the forest ecosystem, the idea of establishing a management plan that would involve harvesting ahuano (even sustainably) generated multiple concerns, including from an economic perspective, as it would involve the removal of large trees that help to maintain the fertility of the soil.

Successful approach

The approach used in the project generated synergies between participating organizations and communities and thus ensured the effective implementation of field work during and following the project. This synergetic approach was extended to other projects and complementary processes within MAATE and other government agencies, promoting knowledge-sharing both at the inter-institutional level and with other relevant stakeholders. These stakeholders participated in workshops that helped identify potential threats to the species, possible solutions, and proposals with a view to the co-development of a national action plan for the species.



Family heirloom: A member of the Elena Andy community with a chicha pan made of ahuano inherited from her grandmother. Photo: Catalina Campo, *S. macrophylla* baseline information generation project, USFQ



Better informed: Presentation of results to representatives of the Ceploa and Elena Andy communities in December 2022. Photo: Luis Astudillo, *S. macrophylla* baseline information generation project, USFQ

An important outcome of this project was the sharing and presentation of the results of the research in the target area. Through this process, local residents became better informed about the pressures and challenges faced by the species.

This is key to reaching decisions in coordination with the communities and will support future coordination with government and non-government institutions seeking to ensure the conservation and management of ahuano.

Overall, the project represents an important step in addressing four problems related to *S. macrophylla* in Ecuador: the lack of a participatory national forest inventory; limited knowledge about species distribution and ecology; weak organization and outreach among key stakeholders with a view to the management of species of commercial interest; and the need to improve information on forest resources. The results obtained supplement the baseline information that is still scarce for this species in the country, and the new information and methodologies will be used in new initiatives aimed at improving the management and conservation of timber species of significance for Ecuador and the region.

References

Ministry of Environment (MAE). 2014. Report on the Pilot Study of *Swietenia macrophylla* King (Ahuano/Mahogany) Populations and Regeneration in Pastaza.

Fellowship report

An ITTO Fellow surveyed the ecosystem services provided by mangrove forest in southeast Togo and found a need for sustainable management

**by Madjouliba Komi
Madaaté Kpabeba¹**

¹ National Higher Institute of Agriculture (ENSA), Iba Der Thiam University, Thiès, Senegal; c/o Ministry of Environment and Forest Resources, BP 4825 Lomé, Togo (benitokpa78@gmail.com).



Threatened resource: Mangrove forests like this one in Senegal are being cleared and degraded in West Africa and other regions. *Photo: Curioso Photography/Unsplash*

In Togo, mangrove forests are found in the coastal lagoon system, the Gbaga Channel, and the lower reaches of the Mono River. Located in the southeastern prefectures of Lacs and Vo, these ecosystems are subject to strong human pressures and continue to degrade. Currently, only fragments of the once-extensive mangrove forest ecosystems remain, covering an estimated area of 112 531 ha (Kudzo et al. 2020). However, mangrove forests still provide significant resources to local populations and play a considerable role in sequestering atmospheric carbon. Mangroves also contribute to processes that regulate, protect and conserve the environment, such as providing spawning grounds for fish. It is therefore important to assess the economic value of the goods and ecosystem services provided by mangrove forests in order to raise awareness of the need for their protection.

The study described in this article is part of the report from an ITTO Fellowship awarded in November 2018 for a master's degree in natural resource management at the University of Thiès, National Higher Institute of Agriculture (ENSA), Senegal. The report gathers information and data that could be used in designing proposals for the conservation and sustainable management of the remaining mangroves of the Gbaga Channel.

Socioeconomic surveys were conducted with 240 people in 21 communities in the area using questionnaires, focus groups and interviews with resource persons such as village and neighbourhood chiefs. The data collected were used to:

- map the value chains of products from the exploitation of fisheries, forest resources and agricultural land in the study area;
- estimate the value of these ecosystem goods and services (using the market price method);

- gauge the contribution of these resources to the well-being of populations bordering the study area; and
- assess interest in mangrove conservation and people's willingness to pay for it (using the contingent evaluation method).

Findings

Asked about their income-generating activities, 51% of respondents said that they derived their income from the fishing sector. The remaining 49% earned their living in other economic sectors, in particular from agriculture, river transport, and the utilization of timber and non-timber forest resources.

People were also asked about the status and importance of mangrove ecosystems. The survey found that 75% of respondents felt concerned about the conservation of mangrove forests and that 78% were aware of the need to protect mangroves for their benefits to local artisanal fishing.

Regarding conservation and restoration efforts, 49% of respondents said they had already participated at least once in mangrove reforestation. An existing mangrove forest monitoring system was known to 56% of those surveyed, while 62% were aware of the local management committee. A large majority of respondents (84%) had a very favourable opinion of reforestation to restore mangrove forests.

The socioeconomic valuation of selected goods and ecosystem services resulted in an estimated annual value of about CFAF 6.3 billion (Table 1). Agricultural resources (which benefit from regulatory and support services provided by the mangrove ecosystem) contribute 70% of the total economic value, followed by fishery resources at 19.5%. Other goods and services represent relatively small shares

Table 1: Estimated total economic value of ecosystem goods and services (2020)

Ecosystem services	Total value (CFAF)	Share (%)
Agricultural resources	4 430 100 000	70
Fishery resources	1 239 047 125	19.50
Mangrove conservation	245 550 000	3.85
Lake and river transportation	190 600 000	3
Fodder resources	77 921 280	1.20
Forest resources	73 640 000	1.15
Tourism/leisure	64 438 800	1
Water resources	19 561 500	0.30
Total	6 340 858 705	100

of the total value: mangrove conservation represents 3.9%, lake and river transport 3%, fodder resources 1.2%, forest resources 1.2%, tourism 1%, and water resources 0.3%.

About 59% of respondents were willing to pay for the conservation and protection of mangrove forest ecosystems, while 47% of respondents who collected surface water from mangrove areas for various uses were willing to pay for it.

Discussion

The survey found that more people were employed in fishing (51%) than in other sectors, such as agriculture, river transport and forestry. This is in line with the findings of Djangbedja et al. (2013) for Lake Togo, where 59% of the active population earned their living from fishing, and 19% (all women) from the processing and marketing of fishing products. Other research has also shown that fishing is one of the predominant activities of populations along the coast of West Africa (Adite et al. 2013; Aheto et al. 2016; Teka et al. 2019).

The results reflect how agricultural development and the diversification of income-generating activities has occurred to the detriment of mangrove ecosystems. Developing aquaculture and especially fish-farming, for instance, could significantly boost livelihoods while reducing pressure on fishery resources in the mangrove ecosystem. The decline of mangrove fisheries explains why agriculture today has the greatest added value.

The survey provided further evidence of how fishery resources are degrading. According to the communities, several species of fish have vanished or become very rare in their catches. It was reported in recent work (Assou et al. 2018) that only 40 species of fish were identified in Togo's coastal lagoons. In contrast, 139 species in the lagoon system had previously been reported (Laë 1994; Paugy and Bénech 1989). Moreover, data from the Directorate of Fisheries and Agriculture indicate that annual fish production in Lake Togo declined by about half between 2011 and 2019.

All three of the main economic activities of local communities, namely agriculture, fishing, and forest logging, are closely linked to the proximity of the Gbaga Channel. However, strong demographic growth and uncontrolled human activities represent threats to the mangroves and habitats for wild plants and animals.

ITTO Fellow seeks crowdfunding for Amazon community forest enterprises



Photo: Felipe Gutierrez

ITTO Fellow Felipe Gutierrez is seeking crowdfunding to support Terra do Meio Network's conservation efforts in the Brazilian Amazon working with forest enterprises led by riverine communities, Indigenous Peoples and small farmers. The funds will be used to help:

- alleviate hunger among marginalized urban communities living on the outskirts of Altamira, a town in Pará state;
- enable these communities to invest more in their microfinancing hubs (cantinas), which directly support forest producer activities;
- buy harvesting safety equipment for network forest producers; and
- improve basic infrastructure.

Mr Gutierrez, a PhD candidate in University of Florida's Forest Resources and Conservation Program, said his research on social innovation, entrepreneurship and collective action was inspired by how collaboration, creativity and hard work can transform peoples and places through scaled-up conservation solutions for sustainable development in tropical forests.

"As part of my commitment to the Indigenous and riverine communities in Terra do Meio, my case study, we are launching a crowdfunding campaign to support their network and community-based forest enterprises, one of the most cutting-edge and large-scale conservation and advocacy networks in Brazil and the world," he said.

Mr Gutierrez and the Terra do Meio Network are organizing the crowdfunding campaign in cooperation with some of the network's leading organizations, such as the Iriri River Extractive Reserve Grassroots Association and the Socioenvironmental Institute. Decision-making and accountability are being managed by the network's lead organizations and head office.

More information on the crowdfunding is available at <https://gogetfunding.com/terra-do-meio-amazon-rainforest>. A video introducing the Terra do Meio Network and some of its members in Amazon communities is available at <https://youtu.be/-jqxjeQnmjk>

Among the anthropogenic pressures are poor agricultural practices on the banks of rivers in defiance of regulations. Farmers are replacing mangroves with sugar cane and coconut plantations, threatening the sustainability of waterways. Poor fishing practices using unconventional mesh nets or poison are still common in some localities. Added to this is the absence of effective monitoring and controlling of fishing activities according to prescribed standards. Water pollution, including from the dumping of waste, is a further threat.

Conclusion

Highlighting the ecological and economic values associated with Togo's mangrove forest ecosystems can give authorities and development partners a better understanding of the socio-economic potential of this area.

While the results are preliminary, this survey shows that Togo's mangrove forest ecosystems are of considerable social and economic importance for local populations and contribute greatly to their well-being despite their current state of degradation.

The rational and sustainable management of natural resources requires the rehabilitation of mangrove forests to maintain ecological functions that promote the production of goods and ecosystem services. It is important that sustainable agriculture and aquaculture become major economic levers in the area. Such improvements will contribute to significantly reducing anthropogenic pressures on mangrove resources and facilitating the recovery of fish stocks. Awareness raising and mangrove forest reforestation campaigns already underway should be continued to ensure the restoration of degraded mangrove forest areas.

References

- Adite, A., Imorou Toko, I. & Gbankoto, A. 2013. Fish assemblages in the degraded mangrove ecosystems of the coastal zone, Benin, West Africa: implications for ecosystem restoration and resources conservation. *Journal of Environmental Protection*, 4, 1461–1475.
- Aheto, D.W., Kankam, S., Okyere, I., Mensah, E., Osman, A., Jonah, E.F. & Mensah, C.J. 2016. Community-based mangrove forest management: implications for local livelihoods and coastal resource conservation along the Volta estuary catchment area of Ghana. *Ocean & Coastal Management* 127, 43–54.
- Assou D., Segniagbeto G. H., Lederoun D., Dendi D., Ketoh K. K. G., Laleye P. & Luiselli L. 2018. Diversity patterns and community characteristics of the fish assemblages of a West African lagoon system. *Folia Zoologica*, 67 (3–4): 129–142.
- Djangbedja, M., Boukpepsi, T., Kouya, A. E., Alassane, A. & Kpedenou, K. D. 2013. Contribution à l'évaluation socio-économique des ressources du lac Togo (sud-Togo). *Revue Togolaise des Sciences*, 7(2), 136-149.
- Kudzo, G., Hodabalo, P. & Oyétoundé, D. 2020. *Cartographie des acteurs et des écosystèmes de mangrove du littoral togolais*. Lomé, FAO. Available at: www.fao.org/3/ca8640fr/CA8640FR.pdf
- Laë, R. 1994. Évolution des peuplements (poissons et crustacés) dans une lagune tropicale, le lac Togo, soumise à un régime alternatif de fermeture et d'ouverture du cordon lagunaire. *Aquatic Living Resources*, 7(3), 165-179.
- Paugy D. & Bénech V. 1989. Les poissons d'eau douce des bassins côtiers du Togo (Afrique de l'Ouest). *Revue d'hydrobiologie tropicale*, 22(4): 295-316.
- Teka, O., Houessou, L.G., Djossa, B.A., Bachmann, Y., Oumorou, M. & Sinsin, B. 2019. Mangroves in Benin, West Africa: threats, uses and conservation opportunities. *Environment, Development and Sustainability*, 21, 1153–1169.

Market trends

The pandemic, the war in Ukraine and the cost-of-living crisis have roiled the global economy, including the housing sector, with serious consequences in markets for tropical timber products

**Compiled by
Mike Adams from ITTO's
Market Information
Service and other sources**

(mis@itto.int)



Trade under pressure: A shipment of legally produced timber is checked at Takoradi Port, Ghana, prior to export. *Photo: FAO Forestry*

The year 2022 will be remembered for the Russian invasion of Ukraine and the beginning of the global “cost-of-living crisis” driven by inflation, supply chain disruptions and uncertainty. Beset by higher energy costs and interest rates as well as the lingering impact of the COVID-19 pandemic, global economic activity experienced a broad and sharper-than-expected slowdown in the second half of 2022. The outlook also darkened, with 2023 growth likely to be the weakest since 2001.¹

Housing, which has a big influence on demand for and imports of tropical wood products, will not escape this dynamic. At the end of 2021, things looked rosy for the global housing sector. Across the 38 countries in the Organisation for Economic Co-operation and Development, house prices were growing at the fastest pace since records began 50 years earlier. This rise was supported by record low borrowing costs and buyers with accumulated savings to spend. Now the picture is completely different. While homeowners around the world struggle with rising mortgage payments, prospective homebuyers face house prices that are rising faster than incomes. In late 2022, it became clear that the housing sector in the main timber-importing countries will experience a downturn that is expected to stretch into 2023.

The sections below highlight the impact of these developments on the trade of primary tropical wood products, logs, sawnwood and plywood. It includes tables for each of the major markets comparing trade in tropical wood products in 2022 with that in 2019, before the pandemic, and 2021, before the war in Ukraine.

China

China, the world's biggest market for tropical timber products, recorded one of its worst economic performances in decades in 2022, dragged down by regular COVID-19 lockdowns. China's economy grew around 3.6% in 2022, much less than in 2021 and below the 5.5% target. In December 2022 all pandemic restrictions were lifted and, at the World Economic Forum, a senior Chinese official forecast that the economy will see a “significant turnaround” in 2023.

China's property sector, once a pillar of growth, slowed sharply in 2022, also as a result of a government clampdown on excessive borrowing by developers. Despite stimulus policies including an easing of purchase restrictions and decreasing down-payment requirements, the property slump widened, with potentially serious implications for demand for tropical wood products.

Log imports down

According to China Customs, log imports in 2022 totalled 43.70 million cubic metres valued at USD 8.53 billion, a decline of 31% in volume and 26% in value year on year. Hardwood log imports in 2022 fell 9% to 12.53 million cubic metres.

Of total hardwood log imports, tropical log imports were 6.18 million cubic metres valued at USD 1.87 billion, down 8% in volume (Table 1) and down 10% in value from 2021, and accounting for 14% of total import volume in 2022.

Papua New Guinea (PNG) and Solomon Islands were China's main suppliers of tropical logs in 2022, together accounting for around 60% of total imports. Imports from PNG rose 8% while imports from Solomon Islands fell 18%. Other suppliers in 2022 were the Republic of the Congo (427 000 cubic metres, down 21% year on year), Cameroon (424 000 cubic metres, down 8%), Equatorial

¹ www.imf.org/en/Blogs/Articles/2023/01/30/global-economy-to-slow-further-amid-signs-of-resilience-and-china-re-opening

Guinea (372 000 cubic metres, up 56%), Mozambique (235 000 cubic metres, down 35%) and Suriname (127 000 cubic metres, down 12%).

Sawnwood bucks the trend

In the first half of 2022, the most recent period for which data are available, China's sawnwood imports totalled 13.04 million cubic metres valued at USD 3.83 billion, down 7% in volume (Table 1) but up 7% in value. Sawn hardwood imports rose 9% to 4.78 million cubic metres. Volumes from top sources Thailand, the Russian Federation, the Philippines and Gabon rose 13%, 20%, 14% and 11%, respectively. Of total sawn hardwood imports, tropical sawn hardwood imports were 3.16 million cubic metres valued at USD 954 million, up 10% in volume and 4% in value and accounting for about 24% of the national total.

Table 1: Percentage change in Chinese imports in 2022 compared to 2019 and 2021

Product category	2022 compared to 2019	2022 compared to 2021
Tropical logs	-14%	-8%
Tropical sawnwood	0.5%	7%

Data source: China Customs

Japan

Japan, another major market for tropical wood products, has also been affected by the global economic downturn, though inflation has not reached the highs seen in other developed economies. Japan's GDP slowed to 1.1% in 2022 on weaker export growth and barely made an annualized 0.6% growth in the last quarter of 2022.

Japan is a major importer of products from Southeast Asia including wooden furniture and parts, builders' woodwork (mouldings, flooring, doors and windows) and commodity products, logs, sawnwood and plywood.

The weakening of the yen against major currencies in the second half of 2022 has driven up the cost of imports, including timber products.

Activity in the housing market has a direct effect of the consumption of wood products and towards the end of 2022 there were warning signs that the housing sector will face headwinds in the near future. Many of the wood products used to construct residential properties are imported, and as the cost of these products rise so do building costs. This along with the decision by the top five banks in Japan to raise interest rates on home loans will dampen the market.

More logs sourced domestically

Twenty years ago Japan was a big importer of tropical logs, sourcing over 1 million cubic metres annually mainly from Malaysia and PNG with some of the major Japanese trading houses having logging operations in Southeast Asia. Over the past years imports of tropical logs have fallen steadily and in 2022 were around 10–15 000 cubic metres per month. In 2022 domestic logs accounted for 80% of consumption at 6.6 million cubic metres.

Sawnwood imports stagnant

Until recently, Japan imported around 200 000 cubic metres of tropical sawnwood annually. This dropped to about 150 000 cubic metres in 2019 and remained at that level in 2020 and 2022 (Table 2). In 2022 over 80% of tropical sawnwood imports came from Asian sources, mainly Malaysia and Indonesia, with small volumes coming from Thailand, the Philippines and Viet Nam. Even smaller volumes were shipped to Japan from Fiji, PNG, Cameroon, Gabon and Myanmar.

Viet Nam supplying more plywood

With Japan's plywood market stagnating, supplies of hardwood plywood from Indonesia and Malaysia, the country's main sources, have declined in recent years while the share of domestically produced softwood plywood has increased, reaching 58% of total demand in 2022. Imports have also been substituted by other domestically produced panel products such as waterproof particleboard, reflecting considerable investment in Japanese plywood processing using domestic species.

The shift to domestic plywood has been in response to the relatively high prices and reduced availability of plywood from Southeast Asian shippers, the risk of exchange rate fluctuations affecting the cost of imported plywood, and government promotion of domestic wood use.

In 2022 imports of plywood were just under 2 million cubic metres with 75% of the total being shipped from Indonesia and Malaysia. In recent years shippers in Viet Nam have captured market share and in 2022 accounted for around 12.5% of all arrivals. Shippers in China have consistently supplied just under 10% of Japan's annual plywood imports over the past decade.

Exchange rates have had a major effect on imports of tropical plywood with demand influenced by the price differential between imported tropical plywood and domestic softwood plywood.

Table 2: Percentage change in Japanese imports in 2022 compared to 2019 and 2021

Import category	2022 compared to 2019	2022 compared to 2021
Tropical plywood	2%	4%
Tropical sawnwood	-21%	-3%
Tropical logs	-60%	180%

Data source: Ministry of Finance, Japan

European Union

Tropical wood import growth slowing

In the first ten months of 2022 the EU27 (the 27 members of the European Union excluding the United Kingdom) imported 1.68 million tonnes of tropical wood and wooden furniture products with a total value of USD 3.79 billion, respectively 15% and 24% more than in the same period the previous year. However, imports have been slowing since mid-2022 and the economic outlook in the EU deteriorated sharply in the last quarter of the year.

Imports of tropical sawnwood up 24%

After two slow years during the global pandemic, EU27 imports of tropical sawnwood recovered ground in the first ten months of last year. Imports of 869 000 cubic metres between January and October last year were 24% higher than the same period in 2021 and 34% more than the same period in 2020 (Table 3).

Sawnwood imports increased during the ten-month period last year from all the largest tropical suppliers to the EU27 including Cameroon, Brazil, Gabon, Malaysia, the Republic of the Congo and Ghana. In contrast, EU27 imports of tropical mouldings/decking were slow between January and October 2022: imports of 156 600 tonnes were just 1% more than in the same period in 2021.

Log imports up 14%

Between January and October 2022 the EU27 imported 98 100 cubic metres of tropical logs, 14% more than the same period in 2021 (Table 3). EU27 log imports increased from all three of the largest African supply countries: the Republic of the Congo, the Central African Republic and the Democratic Republic of the Congo. However, log imports from Cameroon and Liberia declined.

Large gains in veneer imports from Africa

Between January and October 2022, the EU27 imported 298 300 cubic metres of tropical veneer, 22% more than the same period in 2021 (Table 3). Imports of tropical veneer from Gabon, by far the largest supplier to the EU27, increased 16%. There were also large gains in imports from Côte d'Ivoire, Cameroon and Equatorial Guinea.

Plywood imports up 39%

Between January and October 2022, EU27 tropical plywood imports were 39% more than in the same period of 2021 (Table 3). Imports from Indonesia were up 17% compared to the same period in 2021. However, the biggest percentage increases were in imports from Gabon and Viet Nam. Imports of tropical plywood also increased from Morocco, Brazil, and India. These gains offset a 28% decline in imports from China.

Table 3: Percentage change in EU27 imports in 2022 compared to 2019 and 2021

Import category	2022 compared to 2019	2022 compared to 2021
Tropical plywood	8%	39%
Tropical sawnwood	8%	24%
Tropical veneer	14%	22%
Tropical logs	22%	14%

Data source: ITTO analysis of Eurostat data

United States of America

Hardwood imports strong in 2022 but trending lower

While US imports of tropical hardwood and related products showed significant growth in 2022, optimism is tempered by declining numbers over the last quarter of the year. Import totals were up across the board in 2022 as gains over the previous year ranged from 6% for hardwood plywood and wooden furniture to 57% for tropical hardwood veneer (Table 4). However, imports of sawn tropical hardwood, hardwood plywood, mouldings, assembled flooring panels, and wooden furniture all ended the year trending downward for each of the last three months of the year or longer.

Hardwood plywood imports hit ten-year low

After sinking 20% in November, US imports of hardwood plywood skidded an additional 31% in December to their lowest level since February 2012. The 152 707 cubic metres imported were well below half the volume imported the previous December. Due to the downturn, total hardwood plywood imports for 2022 exceeded those of 2021 by only 6% after being much further ahead for most of the year.

Sawnwood imports end 2022 on weak note

Imports of sawn tropical hardwood ended 2022 at their lowest level of the year in December with volumes falling for the third consecutive month. The 17 929 cubic metres imported in December was down 3% from November. Because the US Department of Agriculture altered its categories for sawn tropical hardwood in 2021 and again at the beginning of 2022 it is hazardous to compare 2022 data with previous years. However totals for the year were up sharply for most species and from most trading countries.

Veneer imports rose 57% in 2022

US imports of tropical hardwood veneer grew by 57% year-on-year in 2022 with imports from nearly all top trading partners rising by more than 25% (Table 4). Imports from Italy, which alone account for nearly a third of all veneer imports, rose by 27% in 2022, while imports from the second largest trading partner, India, rose 63%. Imports from Cameroon tripled in 2022 and imports from Ghana more than doubled.

Table 4: Percentage change in US imports in 2022 compared to 2019 and 2021

Import category	2022 compared to 2019	2022 compared to 2021
Tropical plywood	60%	6%
Tropical sawnwood	14%	180%
Tropical veneer	3%	57%

Data source: US Census Bureau, Foreign Trade Statistics

Tropical and topical

Plant roots fuel tropical soil animal communities

Researchers have shed new light on the importance of plant roots for below-ground life, particularly in the tropics, according to a report in ScienceDaily. Millions of small creatures toiling in a single hectare of soil including earthworms, springtails, mites, insects, and other arthropods are crucial for decomposition and soil health. For a long time, it was believed that leaf litter is the primary resource for these animals. However, research led by the University of Göttingen, Germany, reportedly provides the first proof that resources derived from plant roots drive soil animal communities in the tropics.

Read more at www.sciencedaily.com/releases/2023/03/230307174312.htm

Tropical timber sector shrank in January

Tropical timber production and operations declined in January in Brazil, the Congo, Indonesia, Gabon, Malaysia and Mexico, and timber manufacturing dropped in China, according to the January *Global Timber Index* (GTI) report. Factors in the sector's below-average performance in January included poor weather, weak demand, decreased productivity due to the Chinese New Year holiday, and rising costs. Other challenges were the commencement of a ban on log exports in the Congo, a derailment on the trans-Gabon railway, increasing product inventories, below-cost prices and long payment times. Monthly GTI reports are an output of the GTI Platform being developed as part of a framework of cooperation and collaboration between ITTO and the Macao Trade and Investment Promotion Institute. The work is being implemented by the Secretariat of the Global Green Supply Chains initiative.

Read more (see also "Latest editions") at www.itto.int/news/2023/02/17/tropical_timber_sector_shrinks_again_in_january_latest_gti_report/

Restoration brings back wildlife in Brazil's Atlantic Forest

Experts say fragmentation and deterioration in Brazil's Atlantic Forest are worse than in the Amazon after centuries of aggressive deforestation, Mongabay reports. However, restoration can supplement primary forest conservation by reconnecting pieces of original forest and bringing back lost biodiversity. According to the report, a non-profit group protecting 12 000 ha of Atlantic Forest in the Guapiaçu River Basin has planted 750 000 trees over two decades, witnessed the return of hundreds of birds, and reintroduced the lowland tapir (*Tapirus terrestris*) to Rio de Janeiro for the first time in a century.

Read more at <https://news.mongabay.com/2023/03/restoration-turns-pastures-into-wildlife-haven-in-brazils-atlantic-forest/>

Deforestation threatens rainfall across the tropics

Large-scale deforestation, from the Amazon to the forests of Africa and Southeast Asia, threatens reductions in rainfall across the tropics, RFI reports, citing new research. A study published in the journal *Nature* used satellite observations over recent decades to corroborate predictions in climate-change computer models that rainfall will be reduced in the tropics as more forest is cut down. The Congo Basin, which is predicted to experience rapid deforestation in the future years, might witness a 10 percent decrease in precipitation by the end of the century, according to the report.

Read more at www.rfi.fr/en/international/20230302-tropical-deforestation-significantly-reduces-rainfall-study-finds

Clarification

The "Tropical and Topical" section of TFU 31-3/4 omitted to mention the main new tropical tree species listed in CITES Appendix II at the 19th conference of the parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES COP19). At COP19, held in November 2022, parties added more than 150 tree species to Appendix II with the aim of ensuring that their trade is not detrimental to their sustainability in the wild. These species included the entire genera of ipe (*Handroanthus*, *Roseodendron* and *Tabebuia* spp.) and cumaru (*Dipteryx* spp.) from South America as well as three African genera (*Alzelia*, *Khaya* and *Pterocarpus* spp.). Malagasy ebonies (*Diospyros* spp.) and brazilwood (*Paubrasilia echinata*), which were mentioned in TFU 31-3/4, were listed in CITES Appendix II at earlier COPs. Discussions of these species at COP19 focused on the implementation of their existing listings. The new African species listings are already entering into force following the standard 90-day period after adoption of the listing proposal; the South American species listings will enter into force at the end of 2024 following COP19's approval of an appeal from the main range states for more time to prepare for implementing the listings.

Call for abstracts for session on teak at IUFRO World Congress 2024

The deadline for the submission of abstracts for the session "Strengthening Teak Forest Management for Sustainable Teakwood Supply Chains and Trade", which will be held as part of the IUFRO World Congress 2024, is **2 June 2023**. The session is being co-organized by TEAKNET, the IUFRO Teakwood Working Party and ITTO. Abstracts for the session should be submitted via the Congress website at <https://iufro2024.com/call-for-congress-abstracts>

The IUFRO World Congress 2024 will take place on 23–29 June 2024 in Stockholm, Sweden.

Recent editions



Tuiwawa, S.H. 2022. *A Mangrove Management Guideline: Community-based Management Guideline for Mangrove Rehabilitation and Restoration in Fiji*. Ministry of Forestry, Suva, Fiji.

Available at: www.itto.int/files/itto_project_db_input/3081/Technical/A%20Mangrove%20Management%20Guideline-08-12-22.pdf?v=1672295894

The “Community-based Management Guideline for Mangrove Rehabilitation and Restoration in Fiji” was prepared based on activities undertaken

in an ITTO project that has supported the government of Fiji and communities in the Rewa Delta in restoring mangroves and wetlands and improving the management of their natural resources. The guideline describes how to empower local communities by informing them about the value of mangroves and the threats they face, identifying drivers of degradation, and providing an overview of regeneration techniques.



European Investment Bank 2022. *Forests at the heart of sustainable development. Investing in forests to meet biodiversity and climate goals*. European Investment Bank (EIB), Luxembourg.

ISBN: 978-92-861-5403-4 (PDF/EN)

Available at: www.eib.org/en/publications/20220173-forests-at-the-heart-of-sustainable-development

Forests, forestry and forest-based industries are moving towards a sustainable forest-based bioeconomy. The European Green Deal includes the EU Forest Strategy for 2030. This strategy, together with the EU Biodiversity Strategy for 2030, shapes the policy framework for the forestry sector in line with the UN 2030 Agenda for Sustainable Development. This paper provides an overview of sustainability in the forestry sector. It sets out the benefits for society, describes the regulatory environment and examines the challenges encountered by companies and investors operating in this sector. Finally, it addresses the role of public banks in helping to develop the sector.



ITTO/IMM 2022. *VPA partner country timber trade and market perceptions update No. 3/2022*. ITTO, Yokohama, Japan, and Independent Market Monitor, Brussels.

Available at: www.itto.int/other_technical_reports/

This report of the FLEGT Independent Market Monitor (IMM) provides an update on the trade of timber and wood products between the European Union and voluntary partnership agreement (VPA) countries in the first half of 2022, with a specific focus on Indonesia. It also presents an outlook

for the rest of 2022 and the results of the 2022 IMM European Union trade survey and an IMM stakeholder consultation in Ghana.

The IMM is a multi-year project implemented by ITTO and financed by the European Union to support the implementation of bilateral VPAs between the European Union and timber-supplying countries. This was the IMM's third modular report published in 2022.

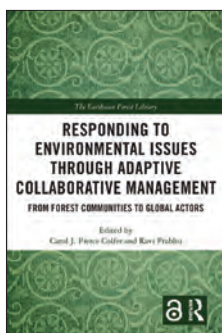


FAO and UNECE. 2023 *Forecast of the Committee on Forests and the Forest Industry: Forest Products Production and Trade 2022-2023*. Geneva Timber and Forest Discussion Paper 94. United Nations and the Food and Agriculture Organization of the United Nations, Geneva.

ISBN: 978-92-1-002388-7

Available at: <https://unece.org/info/Forests/pub/375680>

The statistical supplement to the 80th session of the Committee on Forests and the Forest Industry, this publication provides detailed figures and projections on current and future forest products markets. Forest products production and trade forecasts by country for 2022 and 2023 are provided in the form of tables. The data are generated from submissions by member States in the United Nations Economic Commission for Europe region (Europe, Eastern Europe, Caucasus; Central Asia; and North America). The tables presented cover roundwood (logs, pulpwood and fuel wood), sawnwood (coniferous and non-coniferous), wood-based panels (plywood, particle board, OSB and fibreboard), pulp, paper and wood pellets.



Pierce Colfer, C.J. & Prabhu, R., eds. 2023. *Responding to Environmental Issues through Adaptive Collaborative Management: From Forest Communities to Global Actors*. Routledge, Abingdon, UK and New York, USA.

ISBN: 978-1-003-32593-2

Available at:

<https://doi.org/10.4324/9781003325932>

Focused on forest management and governance, this book examines two decades of experience with adaptive collaborative management (ACM),

assessing both its uses and the improvements needed to address global environmental issues. The volume argues that the activation and the empowerment of local peoples are critical to addressing current environmental challenges and that this must be enhanced by linking and extending such stewardship to global and national policymakers and actors on a broader scale. This can be achieved by employing ACM's participatory approach, characterized by conscious efforts among stakeholders to communicate, collaborate, negotiate and seek out opportunities to learn collectively about the impacts of their action. Case studies presented in the book reflect decades of experience working with forest communities in three Indonesian Islands and four African countries.



GGSC and ITTO 2023. *Global Timber Index: GTI monthly report. No. 1/2023*.

Available at: www.itto.int/gti

The Global Timber Index (GTI) is a monthly report on tropical timber production and operations. The GTI aims to facilitate information and data exchange on the timber trade and promote collaboration among stakeholders in a stable, transparent and predictable business environment. It is part of the GTI Platform, which compiles, verifies, processes, analyzes and releases timber-related data from seven pilot countries—Brazil, the Congo, Indonesia,

Gabon, Malaysia, Mexico and China—based on mathematical modelling. The Platform is being developed as part of a framework of cooperation and collaboration between ITTO and the Macao Trade and Investment Promotion Institute, which is supporting the activity financially. The work is being implemented by the Secretariat of the Global Green Supply Chains initiative. About 160 enterprises and companies are participating in the initial phase of the GTI Platform.

For more about the GTI, read the “Tropical and Topical” section of this issue of TFOU and see: www.itto.int/news/2023/02/17/tropical_timber_sector_shrinks_again_in_january_latest_gti_report/

Obituaries

ITTO mourns the loss of former staff members Mr John Leigh and Dr Hiras Sidabutar

Mr Leigh died in his home city of Lima, Peru, on 12 February 2023, aged 69. He joined the ITTO Secretariat in 1992 and served as Conservation Officer from 1995 until his retirement in 2016.

Mr Leigh's duties included ensuring that conservation concerns were given appropriate consideration in the implementation of ITTO projects, monitoring such projects, and promoting ITTO guidelines for the conservation and sustainable management of tropical forests.

Mr Leigh was appointed Executive Director of Peru's National Forestry and Wildlife Service in 2016 and held the position until 2019; he also served as Vice-Chair and Chair of the International Tropical Timber Council in 2018–19 when he led the Council through a series of sensitive debates. At the time of his sudden passing, Mr Leigh was Chair of the ITTO Expert Panel for Technical Appraisal of Project and Pre-Project Proposals and a member of the Board of Directors of the Asia-Pacific Network for Sustainable Forest Management and Rehabilitation. He held a Master of Science in Forestry from the University of Toronto.

John was a much-loved member of the ITTO family, a larger-than-life character with a passion for life, a great love of family and friends, a wonderful sense of humour and a lifelong commitment to sustainable forestry. He was well-known internationally, especially in Latin America and the Caribbean. He will be greatly missed, not only in the official meetings that he contributed so much to, but also in the after-hours gatherings where his participation was equally renowned.

Dr Sidabutar died in Jakarta, Indonesia, on 21 February 2023, aged 77. He was a valued member of the ITTO Secretariat from 2003 to 2007 and performed many other roles for the Organization and more generally in the service of sustainable forestry.

Dr Sidabutar devoted his career to increasing the uptake of sustainable forest management in the tropics and creating economic opportunities for forest-dependent people. His duties as ITTO Projects Officer for Asia-Pacific included monitoring tropical forest resources and activities related to their sustainable development; assessing project proposals submitted by member countries; monitoring projects under implementation; evaluating completed projects and assessing their impacts; and providing member countries with advice.

Dr Sidabutar was a highly regarded forester who continued to be in high demand after retiring from ITTO. Among other things, he was a member of the Consultative Committee of the Common Fund for Commodities; coordinator of the ITTO project, "Promoting biodiversity conservation in Betung Kerihun National Park as a transboundary ecosystem between Indonesia and Sarawak"; and management adviser for an ITTO project to promote renewable wood-based energy in North Sumatra. He also served several terms on the ITTO Expert Panel for the Appraisal of Project Proposals. He held a doctorate from the University of Washington and a Master of Forest Resources from the University of Idaho.

With his warm personality, Hiras was very popular in the communities in which he worked, as well as among his colleagues. With his excellent singing voice and a passion for karaoke, he liked nothing better than singing with friends. He will be greatly missed in the ITTO Secretariat and by the forestry fraternity more broadly.



John Leigh. Photo: R. Carrillo/ITTO



Dr Hiras Sidabutar. Photo: Directorate General of Forest Protection and Nature Conservation, Ministry of Forestry, Indonesia

ITTO meetings

13–17 November 2023
59th Session of the International Tropical Timber Council and Sessions of the Associated Committees
Pattaya, Thailand
The International Tropical Timber Council is ITTO's governing body. It meets once a year to discuss a wide-ranging agenda aimed at promoting sustainable tropical forest management and the trade of sustainably produced tropical timber. Council sessions are open to official delegates and accredited observers.
More: www.itto.int/events

Other meetings

8–12 May 2023
18th session of the UN Forum on Forests
New York, United States of America
More: www.un.org/esa/forests/forum/index.html

ITTO side-event at UNFF 18
10 May 2023
(13:15–14:30 hrs, EST)
"Enriching Biodiversity in Production Landscapes through Sustainable Forest Management in the Tropics"
Conference room 8
More: www.itto.int/events/

15–19 May 2023
LIGNA: "Making more out of wood"
Hanover, Germany
More: www.ligna.de/en

16–19 May 2023
8th International Wildland Fire Conference
Porto, Portugal
More: www.wildfire2023.pt/

4–8 June 2023
IUFRO All Division 5 Conference 2023: "The Forest Treasure Chest – Delivering Outcomes for Everyone"
Cairns, Australia
More: www.iufro-div5-2023.com/

24–27 August 2023
27th Lucerne International Forestry Fair 2023
Lucerne, Switzerland
More: www.forstmesse.com/de/fuer-besucher

18–20 September 2023
IUFRO 1.05 & 1.09 Conference: "Uneven-aged silviculture – insights into forest adaptation in times of global change"
Brno, Czech Republic
More: <https://iufro2023.idf.mendelu.cz/>

19–20 September 2023
2023 SDG Summit
New York, USA
More: www.un.org/en/conferences/SDGSummit2023

2–6 October 2023
30th Session of the Asia-Pacific Forestry Commission: "Sustainable Forests for a Sustainable Future"
Sydney, Australia
More: <https://www.fao.org/events/detail/APFC-30/en>

15–18 October 2023
2023 ANZIF Conference: "Embracing Our Natural Capital: The Science, Technology and Art of Managing Forests For All Values"
Gold Coast, Australia
More: www.forestryconference.com.au/

16–20 October 2023
2nd World Forum on Urban Forests: "Greener, Healthier and Happier Cities for All"
Washington DC, United States of America
More: www.worldforumonurbanforests.org/

17–19 October 2023
IUFRO Latin American Conference 2023: "Sustainable Landscape Management – the Role of Forests, Trees, Agroforestry and their Interaction with Agriculture"
Curitiba, Brazil
More: <https://eventos.galoa.com.br/iufro-2023/page/2479-inicio>

25–28 October 2023
Society of American Foresters National Convention: "Forestry: It's in Our DNA"
Sacramento, United States of America
More: www.eforester.org/Safconvention2023

