ITTO

TFU

Promoting the conservation and sustainable development of tropical forests

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Tropical forests: relief for a scorched Earth

Smoke from burning Canadian forests has choked US cities; the North Atlantic has warmed to unheard-of levels;[1] and millions of people from Greece and Italy to India and China have baked in life-threatening heat.

Tumbling temperature records in 2023, including Earth's hottest day for an estimated 125 000 years,[2] and a barrage of storms, floods and other extreme weather events are the latest evidence of the climate emergency unfolding on our planet.

At the time of writing, the worst impacts are being felt in temperate zones. However, tropical regions are unlikely to be spared. Meteorologists warn that the El Niño climate phenomenon, which typically brings higher temperatures and upended rainfall patterns also in low latitudes, is re-emerging.[3]

Combating climate change is the challenge of our age. Unless we meet it, we will lose the fight against hunger and poverty embedded in the Sustainable Development Goals. We will fail to extend the prosperity and security to which all nations aspire and which we owe to future generations.

Transforming land use is key. Forestry, like agriculture need to become more resilient in the face of changing conditions to deliver sustainable socio-economic benefits while reversing their contribution to greenhouse gas emissions.

1 https://www.dw.com/en/june-2023-was-the-hottest-on-record-eu-climate-body-finds/a-66143166
2 https://abcnews.go.com/US/4th-july-breaks-record-highest-temperature-measured/story?id=100702850
3 https://public.wmo.int/en/media/press-release/wmo-update-prepare-el-ni%C3%B1o

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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: Combating climate change is the challenge of our age. Sustainable tropical forestry is a powerful weapon. *Photo: G. Delgado*

Above: Yokohama's Yamashita Park. *Photo: R. Carrillo/ITTO*

As described in the lead article on page 3, ITTO used the United Nations Forum on Forests platform to highlight the potential of tropical forests as a vital pillar of an energized and sustainable global bio/circular economy.

Tropical forestry can supply fuels, timber and non-wood forest products, supporting livelihoods and economic development as it soaks up carbon and conserves biodiversity, as ITTO Executive Director Sheam Satkuru told policymakers, donors and experts during the forum, which took place in New York in May.

The sustainable production of wood and bioenergy contributes to climate-change mitigation by sequestering and storing carbon and replacing carbon-intensive materials and fossil fuels, hence increasing the economic viability of forests and forest enterprises.

But that potential is still underappreciated, preventing the tropical forestry sector from attracting the investment it needs, Ms Satkuru said.

During the forum, Ms Satkuru also underscored ITTO's strong commitment to collaborating with its members and partners in the prevention and management of wildfires, which experts fear could become more frequent as climate change advances.

ITTO is supporting members to take advantage of new technologies, such as remote sensing to improve forest fire monitoring and response. Another crucial area of technological development is timber tracking.

On page 7 of this edition of TFU, Meng Qian, Luo Xinjian and Li Yinfeng of the Global Green Supply Chains initiative describe how an ITTO study has tested the use of blockchain technology to trace logs and other wood products from the forest to the mill and on to the final market.

Best known for their use to underpin cryptocurrencies, blockchains are increasingly used for supply chain management in a range of industries. The existing use of blockchain to trace agricultural commodities indicates that the technology has significant potential to strengthen the legality and sustainability of tropical forest supply chains.

Legal and sustainable tropical timber supply chains also feature in two other articles in this edition. The articles describe studies carried out under an ITTO project on timber legality assurance schemes in China and Viet Nam to identify best practices for timber operators and ways for international stakeholders to further boost the legal and sustainable timber trade.

On page 10, Taiji Fujisaki, Xuan Phuc To and Makino Yamanoshita explore how to identify high-risk species in timber products exported from Viet Nam to Japan, including those using timber originating in other countries. The findings highlighted the importance—and limitations—of using customs data to identify shipments containing high-risk species.

In the second article, on page 14, Hiromitsu Samejima demonstrates how China's revised Forest Law is encouraging the country's wood industry to become more sustainable—good news for importers concerned about the legality of exports from a country that has become a global hub of the timber trade in recent years.

Also in this edition, ITTO Fellow Clérica Mucudos explains how she has been able to identify lesser-known tree species in the natural forests of Mozambique with the potential to substitute for overexploited mainstays of the local timber industry.

In our regular market trends feature, Mike Adams pulls together findings from recent projections of the global timber industry to warn that rising demand in a wealthier, more urbanized world risks outstripping supply in the decades to come.

Meeting that demand while helping mitigate climate change, conserve biodiversity and support human development is a central goal of sustainable forest management, and thus of ITTO. The Organization and its stakeholders are playing their part in the whole-of-society response required to address our planetary-scale challenges.

From biodiversity to wood-based bioenergy: unlocking the benefits of tropical forests

At the 18th session of the United Nations Forum on Forests, ITTO advocated for urgently needed significant investment to enable sustainable forestry to deliver big economic, social and environmental benefits

by the ITTO Secretariat

(itto@itto.int)

Fuelling conservation: If produced sustainably in tropical forests, woodfuel like this charcoal made in Côte d'Ivoire can help conserve biodiversity. *Photo: MALEBI*

Sustainable tropical forestry has huge untapped potential to supply biofuels as well as timber and non-wood forest products, supporting livelihoods and economic development as it soaks up carbon and conserves biodiversity, ITTO Executive Director Sheam Satkuru has told policymakers from around the world.

Senior ITTO officials participated alongside policymakers, donors and experts in multiple events during the 18th session of the United Nations Forum on Forests (UNFF18), held on 8–12 May 2023 at UNFF headquarters in New York, United States of America.

Presenting to a panel on the forests–energy–livelihoods nexus, Ms Satkuru highlighted how inclusive, innovative and integrated sustainable forest management (SFM) practices can realize the potential of tropical forests to deliver, amongst others, renewable energy.

"Forests have historically been a major source of energy and livelihoods and still are, especially for rural populations in the tropics," said Ms Satkuru. "They have immense potential as sources of carbon-neutral renewable energy while also generating rural jobs and increasing the profitability of the timber industry. But this potential is still very much underappreciated and under-valued."

Wood-based bioenergy is well-suited to small and community-scale projects, with its capacity to increase income, make productive use of marginal lands, and bolster rural economies, stated Ms Satkuru. Moreover, producing wood and bioenergy sustainably contributes to climate-change mitigation by sequestering and storing carbon and replacing carbon-intensive materials and fossil fuels, hence increasing the economic viability of forests and forest enterprises.

Steering toward sustainability: ITTO Executive Director Sheam Satkuru (left) moderating the Panel on Transformative Actions during UNFF18. *Photo: Angeles Estrada Vigil ENB/IISD*

"The forestry and timber sector could gain significantly by engaging more in bioenergy and exploiting the advantages offered by wood-based energy resources," said Ms Satkuru. "Among other things, wood residues produced in sawmills and other processing facilities offer good opportunities for bioenergy production by reducing reliance on traditional, more climate-harmful energy sources."

Crucially, said Ms Satkuru, the development of wood-based bioenergy must be promoted in the energy sector.

Ms Satkuru described other key elements for forest biomass to provide sustainable fuels: the restoration of degraded lands with fast-growing species for this purpose; the dissemination of technologies and know-how for wood-waste utilization; respect for traditional supply systems for woodfuel and charcoal; and ensuring that increased use of wood biomass doesn't lead to deforestation and the conversion of natural forests.

Box 1: Strengthening international cooperation against wildfires

With tropical forests accounting for about one-third of the global forest area, international cooperation is vital to protect tropical forests and the benefits they provide from the increasing threat of wildfires.

This was a key point of discussion at an ITTO workshop held as part of the 8th International Wildland Fire Conference in Porto, Portugal, on 16–19 May 2023. The conference adopted a new Landscape Fire Governance Framework to promote collaboration on fire management.

ITTO's Dr Hwan-ok Ma, moderating the workshop, said ITTO forest fire projects, the design of which drew on the principles specified in the *ITTO Guidelines on Fire Management in Tropical Forests*,[1] have been instrumental in building capacity across the tropics.

Professor Johann Georg Goldammer, Chief of the Global Fire Monitoring Center, said sharing lessons learnt among the three tropical regions is vital to advancing progress in integrated fire management and strengthening international cooperation in this field.

Dr Lucy Amissah, forest ecologist at the CSIR-Forestry Research Institute of Ghana, said an ITTO project in her country [PD 284/04 Rev. 2 (F)][2] showed that community fire management can be an effective approach, particularly when it leverages local governance structures such as traditional authorities.

Elvira Gomez Rivero, of Peru's National Forest and Wildlife Service, said a recent ITTO project there [PP-A/56-340-2][3] had helped build capacity among local authorities, local leaders and rural development promoters in the regions of Cajamarca, Huanuco, Junin Pasco and Ucayali.

Professor Bambang Hero Saharjo, of IPB University, Indonesia, said that, while a recent ITTO project to build fire capacity in Indonesia [PP-A/56-340-1][4] has achieved excellent results in a short period, more such efforts were needed.

Among other topics discussed during the workshop were the importance of involving social scientists in integrated forest management and the need for stronger enforcement of forest laws to reduce the risk of wildfires.

More details and presentation files are available at: www.itto.int/news/2023/05/26/itto_fire_guidelines_and_projects_featured_at_8th_international_wildland_fire_conference/

[1] Available at: www.itto.int/policy_papers/
[2] www.itto.int/project/id/PD284_04-Rev.2-F
[3] www.itto.int/project/id/PP-A_56-340-2
[4] www.itto.int/project/id/PP-A_56-340-1

Extinguishing the flame: Knowledge-sharing and international cooperation are vital to protect tropical forests from the increasing threat of wildfires. *Photo: G. Delgado*

Working with biodiversity: Village training in nursery management and tissue culture provided by an ITTO project in Thailand. More attention should be given to productive forests as means for conserving biodiversity. *Photo: Royal Forest Department*

During the discussion, Ms Satkuru identified certification as an effective tool for assessing sustainability, and underscored ITTO's strong commitment to collaborating with its members in the prevention and management of wildfires (Box 1).

Scaling up investment

At a panel on transformative action, Ms Satkuru pointed out that realizing the potential of sustainably managed tropical forests to deliver economic and environmental benefits urgently requires significant investment.

As moderator of the panel, which included multilateral and regional funding institutions and banks, Ms Satkuru facilitated discussions on the transformative actions that countries, organizations and stakeholders need to take to achieve UNFF priorities by 2030, as set out in its Global Forest Goals (GFGs).

Ms Satkuru highlighted the linkages between the GFGs and the Sustainable Development Goals, as well as other international commitments, including the Kunming-Montreal Global Biodiversity Framework.

Panel members confirmed that, although financing for forests has increased in recent years, much work still needs to be done to harness adequate financing for achieving global commitments in forestry, biodiversity conservation, and climate-change mitigation and adaptation.

Harbouring biodiversity

During a side-event organized by the Convention on Biological Diversity (CBD) and the UNFF Secretariat, Ms Satkuru said more attention should be given to productive forests as a means for conserving biodiversity.

"The creation of fully protected areas is clearly important, but it is only one element in effective biodiversity conservation strategies," said Ms Satkuru. "In most tropical countries, it is essential for people to use forests productively as a means for reducing poverty and boosting economies. ITTO believes it is possible to both use forests for the production of timber and other goods and services and conserve the vast majority of the biodiversity these forests host."

Ms Satkuru said the *ITTO/IUCN Guidelines for the Conservation and Sustainable Use of Biodiversity in Tropical Timber Production Forests*,[5] published in 2009, was a landmark document that described best practices in production forests to minimize risks to biodiversity.

She also referred to the ITTO–CBD Collaborative Initiative for Tropical Forest Biodiversity, which supported 16 projects in 23 tropical countries between 2010 and 2020. For example, the initiative trained more than 400 foresters in Central Africa in sustainable forest management and improved biodiversity conservation in the Amazon within a framework of ecologically responsible forest management.

[5] Available at www.itto.int/guidelines

Housing potential: Realizing the potential of sustainably managed tropical forests to deliver economic and environmental benefits requires scaled-up investment. *Photo: Fundación Natura*

A key requirement to foster biodiversity conservation in tropical production forests is increased resource mobilization, Ms Satkuru said.

"More investment is needed to continue encouraging the uptake of sustainable forest management in production forests and to restore degraded areas," she said. "This will both reduce pressure on protected areas and generate environmental and socioeconomic benefits for local people and national economies. Sustainable forestry is one of the most powerful tools we have to protect the extraordinary biodiversity contained in tropical forests."

ITTO presentations at UNFF18 are available at: www.itto.int/direct/topics/topics_pdf_download/topics_id=7460&no=1

Presentations at the ITTO side-event at the 8th International Wildland Fire Conference are available at: https://www.itto.int/news/2023/05/26/itto_fire_guidelines_and_projects_featured_at_8th_international_wildland_fire_conference

Building a blockchain-based international tracking system for sustainable timber

An ITTO initiative has tested the use of blockchain technology to trace logs and other wood products from the forest to the mill and on to the final market

by Dr Meng Qian, Dr Luo Xinjian and Ms Li Yinfeng

Secretariat of the Global Green Supply Chains initiative
(luoxinjian@itto-ggsc.org)

A tracking challenge: Sawmills, like this one in Gabon, are key links in tropical timber supply chains along which legal and sustainable timber must be tracked. *Photo: Li Yinfeng/GGSC*

A key concern in assuring the legality of tropical forest supply chains is the ability to reliably trace logs and other wood products from the forest to the mill and on to the final market. Blockchain technology offers a promising solution to this issue for forest managers, certification bodies and other stakeholders with a vested interest in being able to prove that a given wood product comes from a given (sustainably managed) forest.

A blockchain is a distributed ledger or database composed of interlinked blocks of data, or nodes, located across a peer-to-peer computer network. Blockchains combine technologies including consensus algorithms and asymmetric encryption to ensure that transactions are traceable and tamper-proof. Blockchain-based systems have advantages in their ability to connect more users, deal with large amounts of unstructured data, and protect data ownership and privacy.

Best known for their use to underpin cryptocurrencies, blockchains are increasingly used for supply chain management in a range of industries. Moreover, the existing use of blockchains to trace agricultural commodities indicates that the technology has significant potential to strengthen the legality and sustainability of tropical forest supply chains.

Using blockchains

ITTO began a study[1] in June 2020 aimed at applying blockchain technology in tropical timber tracking systems to improve the legality and sustainability of global timber supply chains encompassing production, processing, trade and consumption in ITTO producer and consumer member countries. It was led by the secretariat of the Global Green Supply Chains initiative (GGSC),[2] and implemented in partnership with timber companies in Cameroon, Gabon and China, information technology enterprises, timber associations, governments and research institutes.

The study delivered on its two main aims: the development of a conceptual framework for a blockchain-based tropical timber tracking system, and an exploration of practical blockchain application in selected countries.

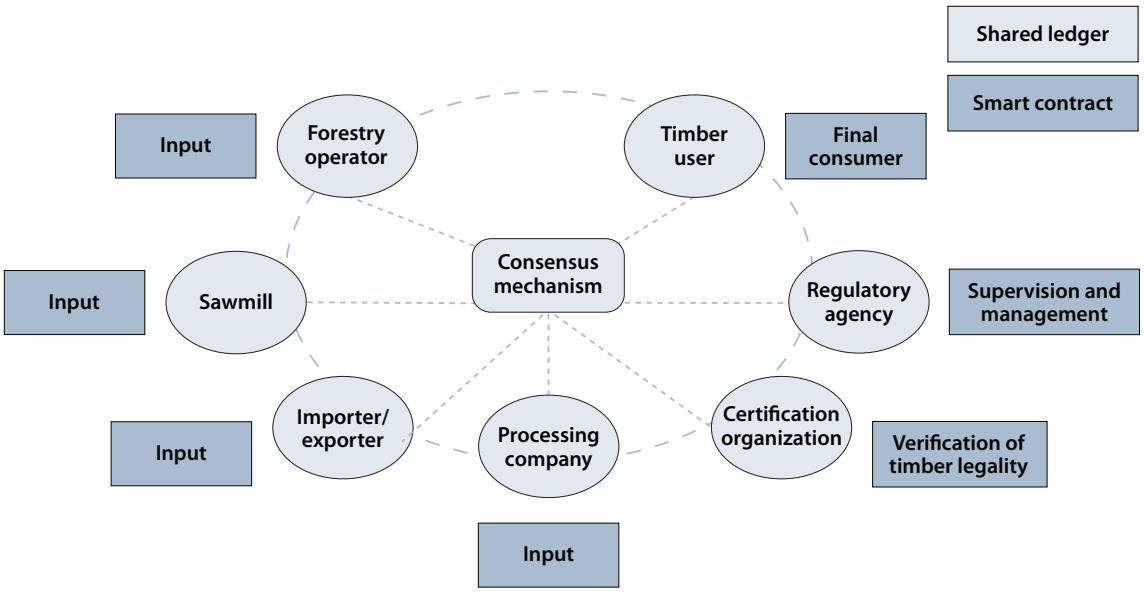
The conceptual framework was developed based on an analysis of the application of blockchains in three scenarios—commodity traceability, grain traceability, and logistics traceability—and in the tracking of selected agricultural products: pomelo from China's Guangdong Province, food products sold by US retailer Walmart, and everyday consumer goods sold by Chinese retailer Tmall.

Case studies were prepared on exports to China of tropical sawnwood from Gabon and tropical logs from Cameroon, where the feasibility of timber traceability using blockchain technology and the data needed for timber legality traceability were compared and analyzed. The results showed that it was possible to trace the source of logs or sawnwood using blockchain technology. The blockchain-based tracking system could trace the timber origin, improve the transparency and authenticity of timber source, and thus better promote the legal and sustainable utilization of timber. Enterprises in Cameroon and Gabon involved in the exercise expressed the wish that a blockchain-based tracking system be put in place as soon as possible to reduce the cost of timber legality identification and traceability and improve the efficiency of tracking.

[1] Supporting the Establishment and Operation of the Global Legal and Sustainable Supply Chain Platform of the ITTO Programme on Legal and Sustainable Supply Chains for tropical wood and forest products (PP-A/53-323) under ITTO Biennial Work Programme 2018–2019 (extended through 2020). Funded by the German Federal Ministry of Food and Agriculture (BMEL).

[2] https://itto-ggsc.org/

Figure 1: The conceptual framework for a blockchain-based timber tracking system



The conceptual framework

A complete timber supply chain covers the whole path from the forest management unit to the end consumer. Tracing timber along the supply chain involves recording and monitoring information including the source, logistics, trade, processing history, product status and location.

The conceptual framework developed under the study was based on the model of a "consortium blockchain" accessible only to pre-authorized users and governed by rules and procedures agreed among the participating stakeholders. The framework foresees three categories of users:

1) Direct participants in timber production and trade, such as forest owners, sawmills, importers and exporters, and timber (and timber products) processing enterprises.
2) The main government bodies that supervise and manage the legality of timber and timber production, such as forestry and customs authorities.
3) Third-party verification organizations that review and verify data and information reported by timber enterprises.

All of the participants can store relevant encrypted data in the blockchain, where it is accessible to all authorized users and virtually impossible to alter (Figure 1). The whole traceability process is as follows:

- As timber moves along the supply chain, the forest owner, sawmill and timber exporter each upload trade and traceability data in their turn.
- The third-party verification organization checks the legitimacy of the timber sources and the authenticity of the transactions.
- The timber importer and the processing plant in the consumer country upload their transaction data to record the specific whereabouts of the timber.
- The government (e.g. forestry and customs authorities) can obtain data and information and use these to supervise the cross-border trade of timber and take measures against illegal timber trading.

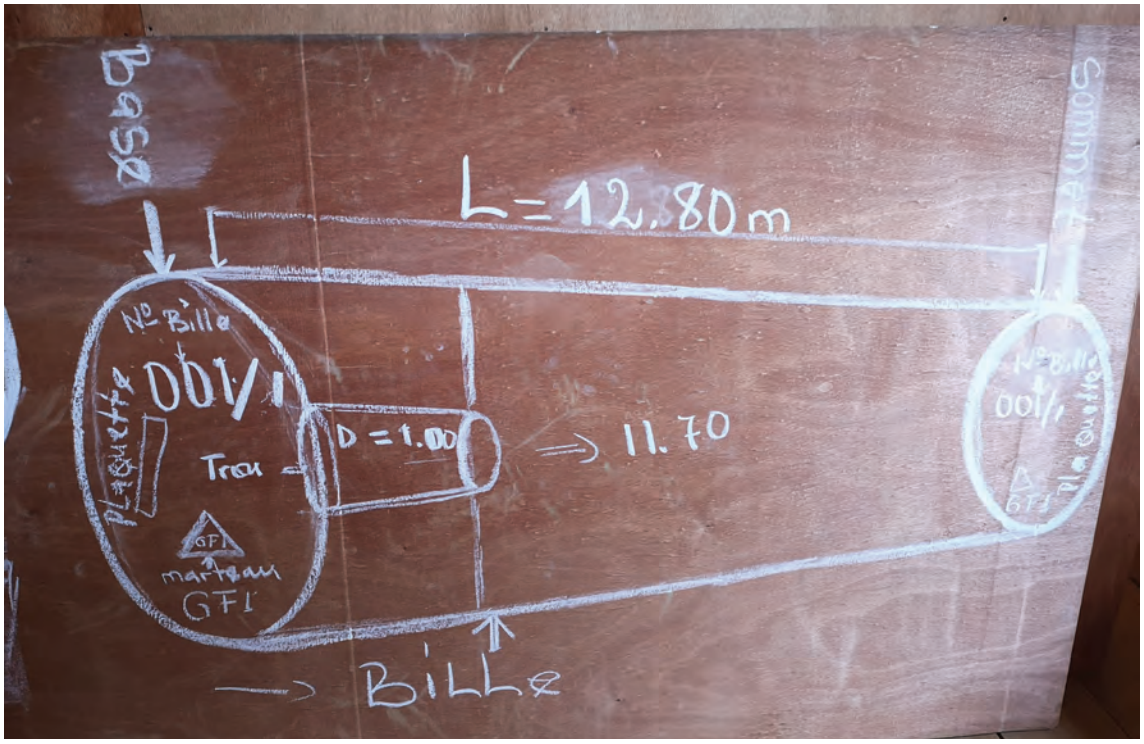
Impacts and findings

Timber stakeholders involved in the project, especially forest owners and timber importers and exporters, showed great interest in the potential of a blockchain-based timber tracking system.

Some enterprises and institutions contacted GGSC to inquire about the progress of the research. Timber enterprises in Cameroon and Gabon involved in the survey expressed their hope that a blockchain-based timber tracking system could be implemented soon. Some institutions also invited technicians from the study team to lecture on blockchain-based traceability for timber.

The study produced four key findings:

- **Establishing a collaborative mechanism is key to the successful implementation and operation of a blockchain-based timber traceability system**—Tracing timber requires the participation of many actors, such as forest owners, sawmills, traders, timber/timber products processing enterprises, customs, forestry authorities and third-party verification institutions. The absence of any of these undermines the system's overall effectiveness. Therefore, it is crucial to establish a collaborative mechanism, such as an alliance of stakeholders from the point of harvest to end users, to encourage broad and active engagement in the system.
- **The standard of communications network infrastructure affects the cost and efficiency of a blockchain-based timber traceability system**—Due to the varying standards



Key information: Instructions for the labelling of tropical logs in Gabon. *Photo: Li Yinfeng/GGSC*

of communications network infrastructure, blockchain-based timber tracking systems must be adapted to conditions in particular countries. For example, many African countries have poor network facilities and no mobile signal in forested areas. Maintaining the traceability of timber under such conditions means finding solutions to network problems that imply additional costs and other inputs.

- **Some enterprises have concerns over data protection in blockchain-based timber traceability systems**—Some enterprises are reluctant to input potentially sensitive commercial data into a blockchain-based timber traceability system and do not recognize its advantages, particularly regarding privacy protection. This shows the need to provide information and training to enterprises about the strengths of blockchain technology.
- **Standards for the implementation and monitoring of blockchain-based timber traceability systems are required**—The accuracy of the data entered into a timber tracking system by operators along the supply chain cannot be guaranteed by blockchain technology alone. For this reason, standards governing the implementation and supervision of blockchain-based timber traceability systems need to be established and continuously improved.

Recommendations

Based on lessons learned during the study, the following recommendations can be considered for future initiatives on blockchain-based timber tracking and traceability systems.

For producer countries, blockchain-based timber traceability systems can prove that timber has been harvested legally from sustainably managed forests. Compared to conventional systems, blockchain-based systems can also reduce costs, simplify procedures and increase transparency. Producer countries should look closely at using blockchain-based timber traceability systems to encourage the development of sustainable domestic timber industries.

For consumer countries, timber traceability information mainly involves the manufacturing, distribution and sale of timber products. This information is indispensable for a comprehensive blockchain-based timber traceability system. Consumer countries should actively contact and cooperate with producer countries to implement such systems.

For ITTO, blockchain-based tropical timber traceability systems have obvious advantages over current systems, and have great appeal for forest managers, forest certification bodies and other stakeholders. ITTO should therefore: continue to promote research on blockchain-based timber traceability systems, so that more ITTO members and other stakeholders can participate in and benefit from the technology; support the development of policies and standards for blockchain-based timber traceability; help establish the collaborative mechanisms required for their successful implementation; and consider providing information and training about blockchain technology to stakeholders.

The full final report of the study is available on request from Dr Luo (luoxinjian@itto-ggsc.org). ITTO and GGSC are currently running a second phase of the project, with financial support from Macao SAR of the People's Republic of China.

Identifying high-risk timber exports from Viet Nam to Japan

An ITTO-backed study has explored how to identify high-risk species in timber products exported from Viet Nam to Japan, including those using timber originating in other countries

by Taiji Fujisaki,[1] Xuan Phuc To[2] and Makino Yamanoshita[1]

[1] Institute for Global Environmental Strategies (IGES)
[2] Forest Trends

(fujisaki@iges.or.jp)

Clear sourcing required: Imported poles in Ninh Binh Province, Viet Nam. *Photo: T. Fujisaki/IGES*

Viet Nam has emerged as a globally important supplier of processed timber products, positioned as second in Asia and fifth in the world in export value (MARD 2021). Timber products from Viet Nam are exported to over 140 countries and territories, with the United States of America being the largest market, accounting for over 60% of the resulting export revenue, followed by Japan (10.6%), China (10.1%), the Republic of Korea (6.8%) and the European Union (4.5%) (To et al. 2021).

While domestic plantations are a major source of timber in Viet Nam, the country also relies on imported raw materials to sustain its timber industry. Annually, Viet Nam imports 5–6 million m^3 of logs and sawnwood of which 30–40% are tropical species, and 60–70% temperate species (Cao et al. 2021).

However, there has been less transparency on which imported species are used in Viet Nam's wood industry and where the sector's products are consumed. High-value tropical hardwood species are a lucrative target for illegal logging, and some Japanese importers are concerned that Vietnamese products may involve risk species imported from other countries. Despite the recent push by the Vietnamese government to establish legal frameworks to exclude illegal timber from all supply chains, the absence of comprehensive information and data could hinder efforts to promote the trade of legally harvested timber and timber products.

In this context, a study was conducted under an ITTO project[3] to generate an overview of timber products exported from Viet Nam to Japan and identify high-risk imported species in timber products. This article shares key findings and insights from the study.

The study considered products to be high-risk when Vietnamese exporters had used imported timber classified as a high-risk shipment under Decree No.102/2020/ND-CP on Viet Nam Timber Legality Assurance System (hereafter Decree 102), which was issued in September 2020. It drew on both quantitative and qualitative data. Quantitative data was obtained from timber trade statistics provided by Viet Nam's General Department of Customs. The level of risk was identified based on detailed examination of the data concerning timber products exported from Viet Nam to Japan between January 2018 and June 2021, combined with insights derived from in-depth interviews with representatives of Viet Nam's Ministry of Agriculture and Rural Development (MARD), relevant industry groups, and timber traders and processors in Viet Nam.

Risk criteria

Decree 102 stipulates that the control of timber imports be undertaken based on the country of origin and the tree species involved. Article 5 of the decree details the criteria for geographical risk identification, and Article 6 focuses on the criteria for species risk identification (Box 1).

MARD has published the list of the positive geographies and the list of imported species on the website of the Forest Protection Department.[4] Imports from countries that are not on the list of the positive geographies or of timber species not on the species list are considered high-risk shipments. In general, under Decree 102, almost all tropical timber imports into Viet Nam are regarded as high-risk, as they are from countries not listed in the positive geographical area list.

[3] ITTO Project PP-A/56-342B "Analysis of Timber Legality Assurance Systems and Good Practices in China and Viet Nam for Sustainable Timber Trade"

[4] http://www.kiemlam.org.vn/ (Vietnamese language)

High-risk traces? Even pellets, for which this plantation wood in Viet Nam's Nghệ An Province has been harvested, could contain traces of high-risk species. *Photo: T. Fujisaki/IGES*

Box 1: Risk criteria for timber shipments as stipulated by Viet Nam's Decree 102

A source country is considered low-risk if it meets one of the following criteria:

- It has a timber legality assurance and Forest Law Enforcement, Governance and Trade licensing system in place.
- It has a national regulatory framework for due diligence covering entire supply chains that is recognized by the Viet Nam Timber Legality Assurance System.
- The Governance Effectiveness Index of the country is 0 or higher (using the World Bank's most recent Global Governance Index), and the regulatory framework for the country's implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is ranked and announced as Level I by the CITES Secretariat, and one of the two following conditions are also met: (i) the country has a bilateral agreement with Viet Nam on timber, or (ii) the country has a national timber certification system recognized by Viet Nam.

A source country that does not meet one of the three criteria above is considered a "non-positive geographical area", indicating high risk. A source country meeting at least one of the criteria is considered a "positive geographical area", or of low risk. Notably, a source country refers to the country of export and does not necessarily represent the country of harvest.

An imported species is considered high-risk if it is:

- listed in the CITES Appendixes;
- listed as a critically endangered or rare species in Category IA and Category IIA according to Viet Nam's regulations;
- is being imported into Viet Nam for the first time; or
- is illegally traded or threatened with extinction in the country of harvest as identified by Vietnamese authorities.

Imported species with none of these characteristics are identified as low-risk.

Results and findings

Figure 1 shows the value of timber products exported from Viet Nam to Japan between January 2018 and June 2021 that contained high-risk species, based on the risk criteria laid down in Decree 102.

Overall, during the period covered by the study, timber products exported from Viet Nam to Japan containing imported high-risk species were small in value (Table 1). Among the high-risk species involved, *Khaya senegalensis* (trade name: faux acajen), *Dipterocarpus* spp. (keruing), *Pterocarpus* spp. (padauk) and *Entandrophragma* spp. (sapelli) were the most common, accounting for more than 70% of high-risk shipments by value over the period. These species were imported from Cambodia, the Lao People's Democratic Republic, and African countries.

The use of imported high-risk species varied among the major product groups. In value terms, joinery shows the highest percentage of risk species used, at a rate between 1% and 3.6%. High-risk species were also found in products that use wood-based panels as key materials (e.g. office, kitchen and bedroom furniture). However, the likelihood of high-risk species being used in these products was very low.

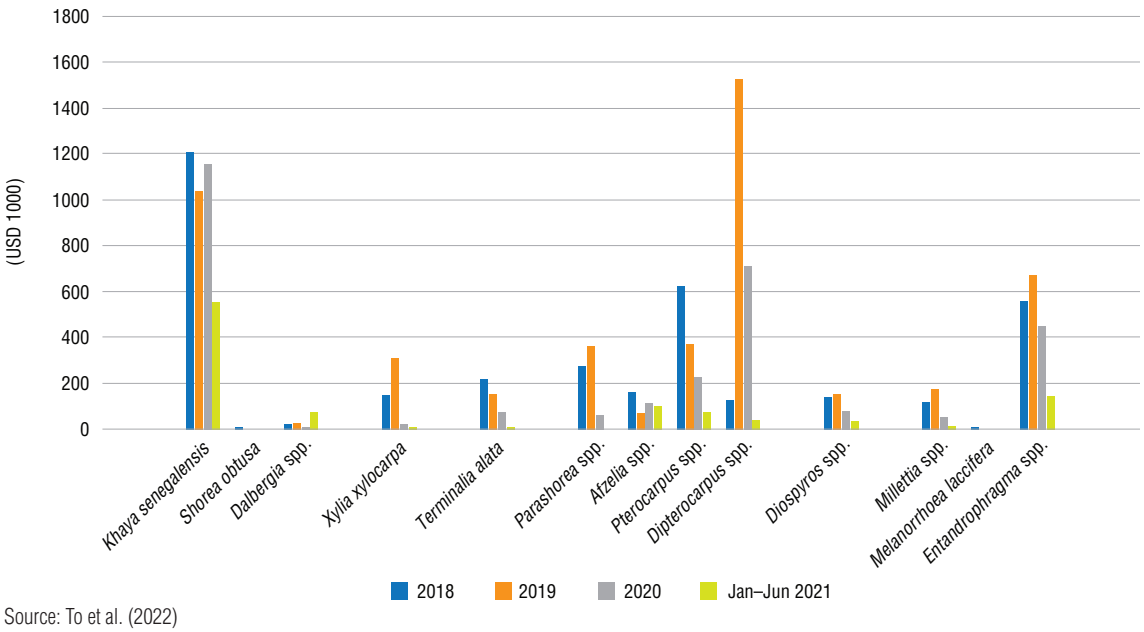
High-risk species were not found in wood chips, pellets or plywood. However, some proportion of pellets may be produced from the residues of high-risk species, depending on their sources. Some plywood products may use tropical hardwoods such as *Aucoumea klaineana* (okoumé), *Calophyllum* spp. (bintangor) and MLH (mixed light hardwood). However, any high-risk species are likely used in small amounts, and exporters may not declare them. Also, if a product is made from several species (e.g. a chair is made from 4–5 species), not all species are necessarily declared.

Table 1: Presence of high-risk tree species by major product type in exports from Viet Nam to Japan, January 2018–June 2021

Customs code (product)	Overview of export trade (values approximate)	High-risk species identified
HS 440122 (Wood chips)	Annual export value USD 400–500 million. Acacia commonly used, also eucalyptus and pine.	None
HS 440131 (Wood pellets)	Annual export value USD 160 million. Acacia commonly used, also rubber, eucalyptus and pine.	None
HS 4412 (Plywood)	Annual export value USD 40–50 million. Acacia commonly used, also eucalyptus and styrax.	None
HS 4418 (Joinery)	Annual export value USD 50 million. 40 species used; rubber, oak, ash and pine most prominent.	Five, keruing and padauk most common, accounting for 1–3.6% of export value.
HS 9401 (Seats)	Annual export value USD 120 million. Rubber, acacia, eucalyptus and oak (imported) commonly used.	Five, faux acajen most common, accounting for 0.4–0.9% of export value.
HS 94033 (Office furniture)	Annual export value USD 80 million. Rubber, oak (imported), ash and pine commonly used.	Three, sapelli most common, accounting for only 0.002–0.050% of export value.
HS 94034 (Kitchen furniture)	Annual export value USD 60 million. Rubber, acacia and pine commonly used.	One, accounting for negligible share of export value; none since 2019.
HS 94035 (Bedroom furniture)	Annual export value USD 110 million. Rubber, MDF and pine most commonly used.	One, rosewood, in 2018, accounting for negligible share of export value.
HS 94036 (Other wood furniture products)	Annual export value USD 110 million. Rubber, acacia, pine, walnut and oak commonly used.	Five, accounting for 0.26–0.35% of export value.

Source: To et al. (2022)

Figure 1: Value of timber products containing high-risk species exported to Japan, January 2018–June 2021



Source: To et al. (2022)

Lessons from the study

Although timber exports from Viet Nam may vary in volume and product type depending on the destination country, and may also differ in terms of the timber species used in the products, the findings of this study focused on exports of timber products from Viet Nam to Japan seem broadly applicable to other countries.

It is important that competent authorities of countries importing timber products from Viet Nam are familiar with the high-risk species identified under Decree 102 and request importers to clearly declare both species and country of harvest, which would ensure compliance with regulations such as the Japanese Clean Wood Act, and the EU Timber Regulation. If the species in products from Viet Nam are high-risk according to Decree 102, authorities need to ask importers to exercise due diligence to mitigate the risk.

The findings of the study are also applicable to the overall timber trade. As Figure 1 and Table 1 show, customs data can help identify species contained in traded timber products, providing a valuable basis for authorities in importing countries to carry out risk-based management.

Also, identifying risks could help importers mitigate risks associated with their shipments. On the other hand, it is important to recognize the limitations of customs data, which are derived from the declarations of traders. The study indicates that there are cases where traders did not declare the species used in their timber products; for example, traders might only declare the major species in a product and omit minor species.

The risk criteria laid out in Viet Nam's Decree 102 can be easily applied. However, different countries use different criteria for risk assessment and may have different views on geographical and species risks. The authorities of exporting and importing countries should communicate with each other to better understand the legal frameworks and legality criteria of their trading partners. Authorities should inform their importers/exporters of any differences in risk criteria between countries so that adequate due diligence can be conducted.

More details of the project can be found at: www.itto.int/news/2023/04/05/new_analysis_of_timber_legality_assurance_systems_and_good_practices_in_china_and_viet_nam_released/

Project outputs can be found by inserting the project code PP-A/56-342B 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.

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JAPANGOV
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The growth of timber legality verification in China

China's revised Forest Law is encouraging the country's wood industry to become more sustainable

by Hiromitsu Samejima

Institute for Global Environmental Strategies
(samejima@iges.or.jp)

Legally covered: Woodflooring manufacture in Nanxun, China. *Photo: R. Carrillo/ITTO*

A recently completed ITTO project[1] assessed the status of timber legality assurance schemes in China and Viet Nam and identified best practices for operators in various timber sectors as well as steps that international stakeholders can take to further boost the legal and sustainable timber trade.

This article presents results from the project relating to China, specifically an assessment of the current status of measures to address the legality of harvested timber and timber products in China under its amended Forest Law, as well as implementation by timber-related businesses.

Timber legality assurance is developing in China against the backdrop of growing international efforts to counter the illegal harvesting of timber and promote sustainable forest management (SFM). The United States of America amended its Lacey Act in 2008, followed by the adoption of the European Union Timber Regulation in 2010 and Australia's Illegal Logging Prohibition Act in 2012. In 2016, Japan enacted its Clean Wood Act, and the Republic of Korea amended its Act on Sustainable Use of Timber in 2017.

With China becoming a central hub for global timber and timber product trade in recent years, there has been growing concern over the legality of exports from this major producer. Some businesses in China exporting to European and US markets have, however, voluntarily conducted legality verification. Moreover, China's Forest Law was revised in 2019 to explicitly prohibit the handling of illegally harvested timber.

Strengthened legal framework

Prior to the 2019 revision, the Forest Law, which was adopted in 1984 and already amended in 1998 and 2009, had required permits for the logging, transport, and processing of domestically produced timber. It did not have provisions for handling illegally harvested timber. However, the Criminal Law enacted in 1997 stipulated penalties for illegal or arbitrary felling that violates the provisions of the Forest Law, as well as for the purchase or transport of timber derived from illegal or arbitrary felling.

In the 2019 revision, which came into effect in 2020, Article 65 makes it illegal to "purchase, process, and transport woods in full awareness of their illegal origins such as illegal felling or wanton deforestation", while Article 78 stipulates penalties for violations. Three years after the amendment, the relevant regulations have not yet been revised. However, there have been at least two cases where penalties were imposed on businesses in China that had purchased or processed illegally harvested wood on the basis of Article 65 and provincial-level regulations.

Voluntary initiatives

Alongside this strengthening of the legal framework, several voluntary initiatives have been launched to promote legal timber trade in China. One example is the "China Timber Legality Verification Implementation and Standard System" proposed by the Chinese Academy of Forestry (CAF) in 2015. Two years later, "Guidelines for the China Timber Legality Due Diligence System" were released. Also in 2017, the China National Forest Products Industry Association (CNFPIA) formulated the "Timber Legality Verification in China" standard, which applies to both domestic and imported timber. Although the CNFPIA encourages member companies to procure timber according to the standard, it is not mandatory.

Furthermore, in 2016, the China Responsible Forest Product Trade and Investment Alliance launched the "China Timber Legality Supply Chain Management and Risk Assessment Platform". Under this initiative, applicants who pass a review

[1] ITTO Project PP-A/56-342B "Analysis of Timber Legality Assurance Systems and Good Practices in China and Viet Nam for Sustainable Timber Trade"

Raw materials: Imported logs in Suifenhe, China. *Photo: CTWPDA*

process can receive a wood legality due-diligence certificate and join the National Innovation Alliance for Trade and Investment for Forest Products. In 2021, the latter organization released a rapid assessment version of the platform to further support businesses in verifying legality. CAF also invited companies to participate in a pilot project for the risk assessment platform in 2021, and three selected companies began testing the platform and country-specific guidelines for legal wood procurement.

Overseas operations

Even before the Forest Law revision, Chinese government agencies and industry organizations have been promoting compliance with local laws and regulations and SFM for Chinese companies doing forestry business overseas. In 2007, the State Forestry Administration (SFA) published *A Guide on Sustainable Overseas Silviculture by Chinese Enterprises*. The guide includes chapters on silviculture planning, biodiversity protection, and the environmental impacts of forestry activities, as well as on compliance. In 2009, SFA published *A Guide on Sustainable Overseas Forest Management and Utilization by Chinese Enterprises.* CAF has conducted training workshops for Chinese enterprises engaged in overseas forestry operations to support the utilization of the two guides.

Furthermore, since 2009, SFA and CAF have published manuals specifically for Gabon, Guyana, Indonesia, the Lao People's Democratic Republic, Mozambique, Myanmar and the Russian Federation. The manuals provide information and practical advice on local laws and regulations aimed at helping companies strengthen environmental and social safeguards in their local operations to promote SFM. They include provisions for timber processing and transport, training, and multi-stakeholder negotiations. The manuals have undergone further revision following field testing and review by experts.

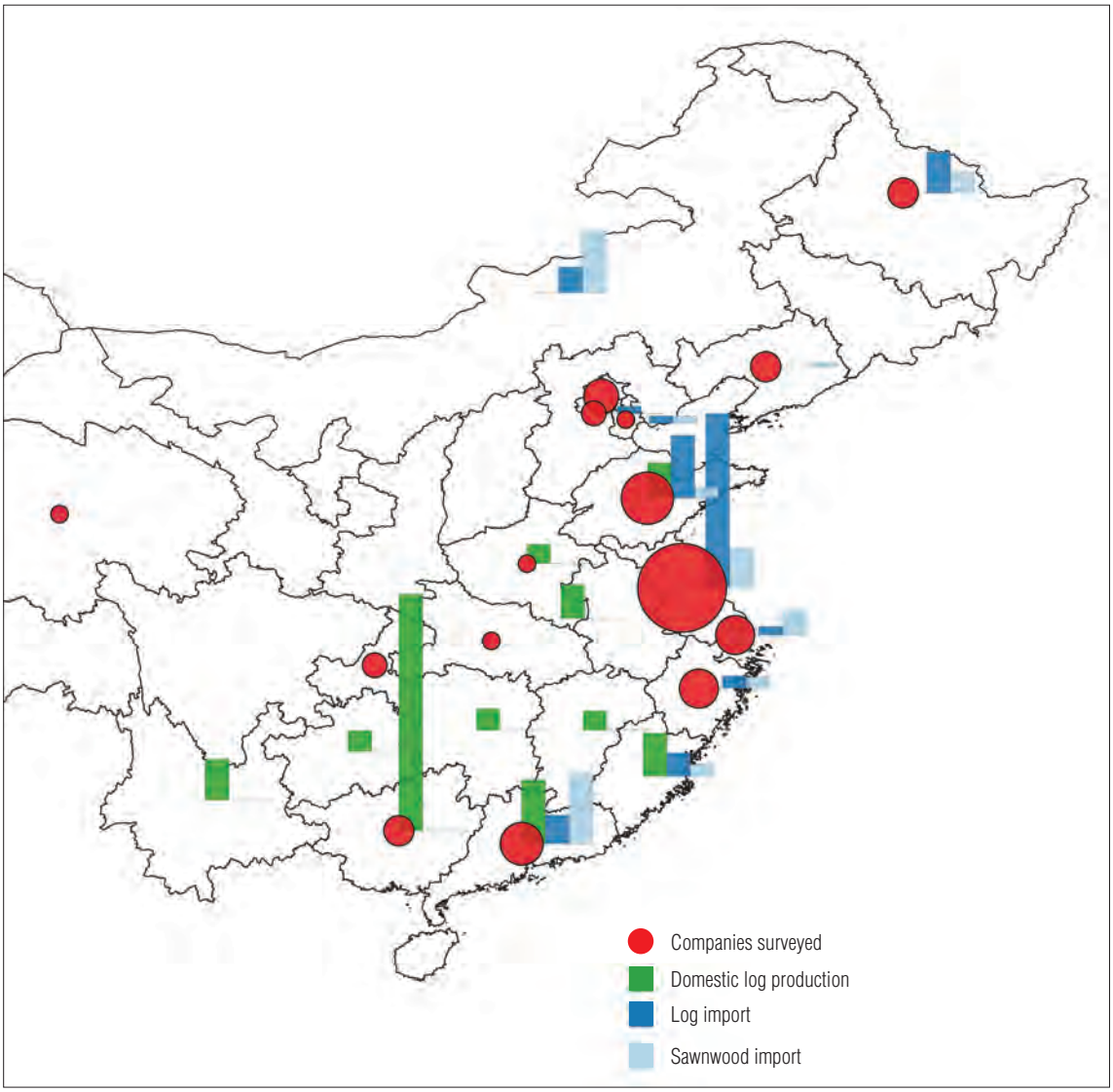
On the industry side, the China Timber and Wood Products Distribution Association (CTWPDA) has been organizing targeted group sourcing and business-to-business meetings to assist its members to diversify their timber import sources and reduce the risk of sourcing illegal timber. CTWPDA has published country-specific checklists for importers to verify timber legality since 2019. As of 2022, checklists have been released for imports from Cameroon, Gabon, Liberia and the Republic of the Congo, including items on forest usage rights, logging permits, business registration, and export processing. The China Responsible Forest Product Trade and Investment Alliance also has a page for country-specific guidelines on its website, even though the number of countries for which information is included remains small.

Businesses surveyed

Another part of the ITTO project involved a survey of timber-related businesses in China to assess their legality verification efforts (Figure 1). The CTWPDA cooperated with the survey, which was conducted in two phases. The first phase focused on CTWPDA member businesses, mainly involved in distribution or processing. The second phase targeted businesses certified under Japanese Agricultural Standards, primarily manufacturers of plywood, laminated veneer lumber, and flooring.

Of the 72 businesses from which data were collected, 70 reported having a due-diligence system in place for ensuring the legality or sustainability of their timber procurement and providing related information to customers. The revised Forest Law of 2019 requires all timber distribution and processing businesses to maintain a standing book for the entry and exit of timber and wood products, and 70 businesses confirmed they had one. Among them, 66 businesses stated that their standing book included information related to the legality of their timber.

Figure 1: Map indicating provinces of China with significant timber businesses and where the ITTO project survey was carried out



Disregarding businesses that procure timber and sell products only domestically, about half of the businesses in the other three categories (i.e. those who procure timber overseas, sell products overseas, or both) reported having obtained legality certification for all their procured timber. Although it was expected that a higher percentage of businesses selling to overseas markets would have obtained legality certification for all volumes than those selling to the domestic market, there was no significant difference. Similarly, it was expected that more businesses would have obtained legality certification for domestic timber procured than for imported timber, but the difference was again insignificant.

Regarding the reasons for requiring legality certification from suppliers, most businesses cited the revised Forest Law and other laws and regulations in China. This was particularly notable among businesses selling in the domestic market but, even among those selling overseas, many cited this as the reason, particularly for domestic timber. Overseas marketing or requirements from customers were also cited by many businesses as reasons for requiring legality certification from suppliers.

Importing from China

The results of the ITTO project are a useful resource for importers of wood products from China in various countries who must conduct due diligence to avoid sourcing illegal products. Specifically, importers should be aware that, according to Article 65 of the amended Forest Law, Chinese suppliers are obligated to handle only legally harvested timber, regardless of its origin or destination of sale. This means that importers can inquire about how suppliers comply with the law and ensure the legality of their procurements.

On the other hand, it is important to note that Chinese government authorities and businesses may have priorities (such as a stable supply of timber to China) that influence which items and tree species are required to meet which legality standards. Thus, it is important for importers to confirm and understand any differences between their own standards and those of their Chinese suppliers.

It is also essential to recognize that not all Chinese companies are fulfilling their responsibility to verify legality. Only 40–70% of businesses surveyed said they had obtained legality certification for all the timber they procure, and

Exportable products: A woodflooring showroom in Nanxun, China. *Photo: R. Carrillo/ITTO*

60–70% of businesses reported that they are facing some challenges in verifying the legality of imported or domestic timber. Nonetheless, many of them are making efforts to ensure legality and sustainability, such as changing procurement sources and investing in upstream activities. To ensure sustainable procurement of legal wood products from China, it is critical to support the efforts of suppliers to ensure legality.

More details of the project can be found at: https://www.itto.int/news/2023/04/05/new_analysis_of_timber_legality_assurance_systems_and_good_practices_in_china_and_viet_nam_released/

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Identifying alternative timber species in Mozambique

An ITTO Fellow pinpointed tree species with the potential to substitute for overexploited mainstays of the local timber industry

by Clérica Mucudos

(lisangela20@gmail.com)

Seeking alternatives: An ITTO Fellowship enabled Clérica Mucudos (right) to research alternative tropical timber species in Manica District, central Mozambique. *Foto: Clérica Mucudos*

Mozambique's miombo woodlands, tropical rain forests and savannas cover about 78% of the land surface of the country and offer a rich diversity of flora and fauna (Ali 2011). The forests provide goods and services to local people and constitute one of the major sectors of the country's economy.

While the three types of forest host 118 usable wood species, only 18 of these, having known properties and uses, are used in selective logging systems (DNFFB 2002). Stocks of several key species have declined due to overexploitation, and the trees are now scarce in the country's natural forests.

For this reason, some authors (Ogle and Nhantumbo 2006; Ali et al. 2008; Uetimane et al. 2009) have stressed the need to explore the potential of lesser-known or lesser-used native timber species in order not only to minimize pressure on the most sought species, but also to increase the productivity of the forest sector. Therefore, the harvesting of abundant but lesser-used timber species needs to be gradually encouraged and increased in Mozambique.

This study, undertaken in March 2022 under an ITTO Fellowship granted the previous year, sought to advance this goal by identifying species that could potentially substitute for the most-exploited timber species in Manica District, a heavily forested part of the Manica Province of central Mozambique.

In a first step, two sawmills and three timber markets in the district were selected for a survey of the species processed and sold for different purposes. The focus was to determine the most commonly used native species and thus enable, in a second step, the identification of other species with similar qualities.

Surveying markets and sawmills

The author selected one large sawmill (processing more than 100 m^3 of roundwood per day) and one of medium scale (processing 5–100 m^3 of roundwood per day). Managers of the sawmills were interviewed about their timber sources and customer bases as well as the timber species processed. In both sawmills, the list of species processed was similar, reflecting their common provenance (the districts of Sussundenga, Bárue, Macossa and Tambara in Manica Province; and some districts of Tete and Sofala Provinces) as well as market demand.

The survey identified four heavily exploited timber species: *Afzelia quanzensis*, *Millettia stuhlmannii*, *Pterocarpus angolensis* and *Colophospermum mopane* (Table 1). The first three species are processed in large volumes and commercialized in local markets in the form of beams, planks and slats, which are in high demand from furniture

Table 1: Timber species most commonly used in Manica District (ranked by prevalence)

Rank	Scientific name	Trade name	Local name (in Manica)
1	*Afzelia quanzensis*	Chanfuta	Mugoriondo
2	*Millettia stuhlmannii*	Panga-panga	Mussara
3	*Pterocarpus angolensis*	Umbila	Mucurambira
4	*Colophospermum mopane*	Chanate	Mondzo

makers. Timber from *Colophospermum mopane*, while also of high quality, is difficult for most local carpenters to work due to its hardness. It is mostly processed in large sawmills and exported to China as sawnwood.

Identifying alternatives

To search for lesser-known species, the author consulted the Forestry Officer in the Manica District Directorate of Forests. The official provided a checklist elaborated by the National Directorate of Forests that describes the characteristics of timber species that occur in the various forest types in each province of the country. With this tool, it was possible to identify 12 species that occur in most of the forest ecosystems of Manica Province and could potentially substitute for currently overexploited timber species (Table 2). The characteristics of these species, such as their density, hardness and strength, make them appear suitable for the making of elaborate furniture, smaller wooden products for use in the kitchen, handicrafts, decorations, and many more uses.

Not the only option: Processed timber in Manica District, Mozambique, where research identified 12 lesser-used species that could potentially substitute for mainstays of the local timber industry. *Photo: Clérica Mucudos*

Table 2: Alternative timber species in Manica Province

Scientific name	Trade name	Local name[1]
Amblygonocarpus andongensis	Mutiria	Mutindiri
Berchemia zeyheri	Pau-rosa	n/a
Bridelia micrantha	Metacha	Mussunguno
Burkea africana	Mucarala	Mucarati
Combretum imberbe	Monzo	Mugodo
Cordyla africana	Mutondo	Mutondo
Dalbergia melanoxylon	Pau-preto	Mfiti
Erythrophleum lasianthum	Missanda	Mussanda
Khaya anthotheca	Umbaua	Mumbaua
Pericopsis angolensis	Muanga	Chianga
Pseudolachnostylis maprouneifolia	Mutolo	Mussondzoa
Swartzia madagascariensis	Pau-ferro	Txindzondzondzo

[1] In Mozambique, tree species typically have various local names in each province.

Opportunities for wood users

The ITTO Fellowship provided the author with an excellent opportunity to acquire a deeper understanding of the forest sector in Manica, including the reasons for the intensive harvesting of particular timber species, and the underexploitation of others. Based on the insight gained, the author recommends that timber users approach district or provincial forest offices to get up-to-date information on alternative timber species that could substitute for those species that are currently expensive in the market due to their scarcity in the forest. This is an opportunity for them to gather experience with new species that could give them similar or better results. The findings of the research will be shared with academic institutions in Mozambique so that students, teachers and other researchers can become more aware of the potential of alternative timber species in the country's natural forests.

Impact of ITTO Fellowship on my career and future expectation

I am passionate about teaching and learning from others. Every opportunity to exchange knowledge and create a positive impact is really rewarding for me. I have been granted two ITTO Fellowships. The first allowed me to involve forestry students in the promotion of sustainable forest management, while the second has enabled interaction with timber industry professionals to build knowledge of the species harvested from Mozambique's natural forests for different purposes. Both grants provided unique opportunities to enhance my skills as a forestry researcher, for which I am very grateful. Following the work detailed in this article, I expect to establish a strong network with timber users that can work to promote the sustainable use of alternative species while reducing the pressure on forests and preserving their natural status.

Clérica Mucudos

Data source: Workers processing timber at one of two sawmills surveyed to identify the most commonly used local tree species. *Foto: Clérica Mucudos*

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Photo: R. Cardillo/ITTO

Market trends

A forecast future shortage of timber, especially wood for construction, could have its greatest impact in developing economies

by Mike Adams

(mis@itto.int)

Supplies in demand: Sawnwood at a depot in Malaysia. *Photo: S. Lori*

Forecasts of demand for timber point to a significant imbalance in future wood supply and demand by mid-century. Driven by rising living standards and urbanization, demand for timber is expected to grow dramatically in the next decades. But long growing times and constraints on the expansion of plantations mean that supply will struggle to keep up.

The World Bank was among the first to point to a looming wood shortage. In a 2016 report,[1] the Bank noted that global demand for timber products was growing rapidly and predicted that demand for industrial roundwood (IRW) would quadruple by 2050. Such an increase would far surpass supply growth in the same period, raising the risk of unsustainable harvesting.

Since then, several other analyses have reinforced the impression that markets will tighten significantly in future. This article summarizes key findings from three credible sources and draws some ominous conclusions, especially for countries making progress toward their development goals.

The outlook for tropical timber

In 2021, ITTO published an analysis of tropical timber supply and trade through 2050.[2] Its forecasts were developed using a model with the goal of identifying future supply gaps and opportunities to invest in sustainable forestry.

According to the ITTO study, overall roundwood timber production in tropical regions will decline through 2050 due to decreasing woodfuel consumption, though total woodfuel production will remain higher than IRW production.

Still, across the three tropical timber producing regions of sub-Saharan Africa, Latin America and Southeast Asia, IRW production will grow by nearly one-quarter between 2015 and 2050. These three regions will be net exporters of IRW in 2050, accounting for 19% of global production.

Plantation forestry will be the main source of IRW in tropical producer regions in 2050. IRW production in natural forests will remain fairly stable.

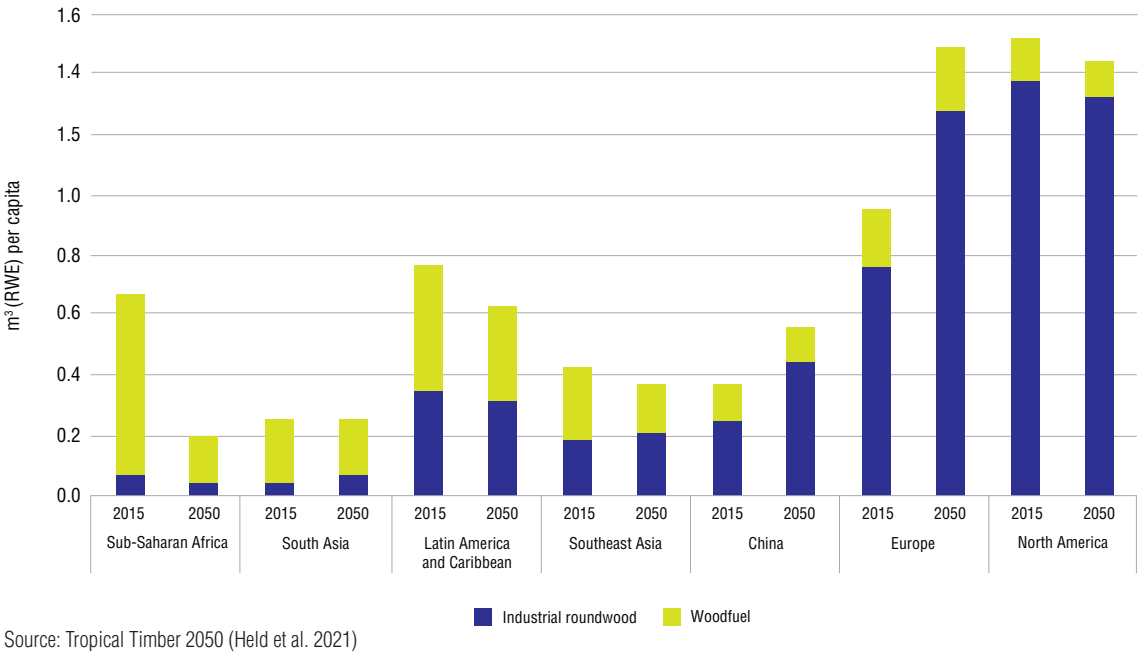
Other key forecasts from the ITTO report include:

- Total global production of roundwood will increase by 13% by 2050, to 4.3 billion m^3. Total production volume of roundwood in tropical timber producer regions in 2050 is projected at 1.3 billion m^3, of which woodfuel will account for 57%.
- Global woodfuel production will decrease from 1.8 billion m^3 in 2015 to 1.5 billion m^3 in 2050, a decline of 21%. The decrease will mainly be due to reduced consumption in sub-Saharan Africa.
- Global IRW production is projected to grow by 45% by 2050, to 2.8 billion m^3, but tropical production will increase by only 24%, to 533 million m^3.
- Plantations produced an estimated 67% of IRW supply in the tropical regions in 2015 and this proportion is projected to increase to 73% by 2050. The biggest increases in forest plantation area are expected in Southeast Asia and Latin America.
- With limited expansion possibilities for large-scale plantations, smallholders and agroforestry systems will become important producers. Both need further improvements in productivity and timber quality.
- Private equity capitalization and incentives for small-to-large plantation-based enterprises will be crucial for stimulating sector growth.

[1] World Bank. 2016. *World Bank Group Forest Action Plan FY16–20.* World Bank, Washington DC. Available at: https://documents1.worldbank.org/curated/en/240231467291388831/pdf/106467-REVISED-v1-PUBLIC.pdf

[2] Held, C., Meier-Landsberg, E. & Alonso, V. 2021. *Tropical timber 2050: an analysis of the future supply of and demand for tropical timber and its contributions to a sustainable economy.* ITTO Technical Series No. 49. International Tropical Timber Organization (ITTO), Yokohama, Japan. Available at: www.itto.int/technical_report/

Figure 1: Per-capita consumption of industrial roundwood and woodfuel in 2015 and 2050, by selected world region



Source: Tropical Timber 2050 (Held et al. 2021)

Plantations needed

In 2022, the Food and Agriculture Organization of the United Nations (FAO) published an analysis of the global forestry sector also featuring an outlook through 2050.[3]

FAO projects that consumption of primary processed wood products will increase by 37% between 2020 and 2050 to 3.1 billion m³ roundwood equivalents (RWE) (Table 1). Demand for wood products to substitute non-renewable materials (mass timber and man-made cellulose fibre) may increase by up to 272 million m³.

Depending on the use intensity of wood industry residues, the resulting IRW demand may grow by 0.5–0.9 billion m³ by 2050 compared to 2020. In addition, up to 199 million m³ would be required to substitute for non-renewable materials.

Scenarios for future woodfuel consumption are wide-ranging. Most indicate global consumption of wood from forests in energy uses of 2.1–2.7 billion m³ in 2050, compared to 1.9 billion m³ in 2020.

The report concludes that at least 33 million ha of additional highly productive plantation forests would need to be established to meet the basic increase of demand for IRW through 2050, if naturally regenerated forest production remains stable. This estimate is roughly in line with other studies that estimate plantation area growth of between 20 million and 40 million ha by 2050.

The FAO study estimates the investments required to maintain and expand IRW production at about USD 40 billion per annum by 2050.

Growing demand: House construction is set to drive up global demand for timber. *Photo: P. Bholanath*

Meeting future demand for woodfuel will require optimized resource allocation and a clear political vision of the contribution of wood energy to the renewable energy mix in 2050. Woodfuel will remain the main energy source for many households in emerging economies.

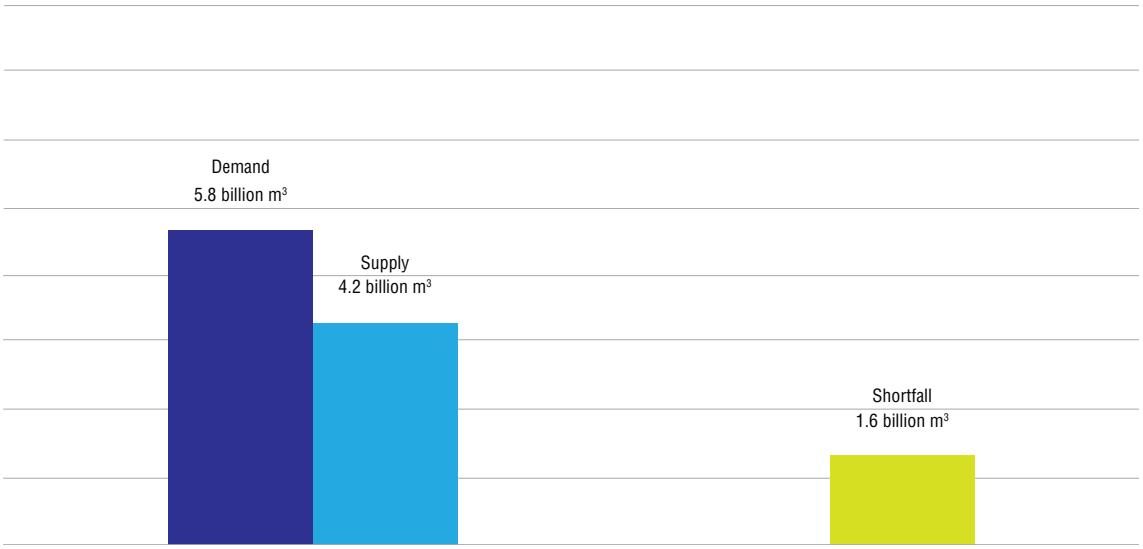
Table 1: 2050 outlook for key primary processed wood products

	2020 million m³	2050 million m³	% change
Sawnwood	929	1205	30
Veneer and plywood	267	539	102
Particle and fibre board	345	593	72
Wood pulp	745	786	6
Total	**2286**	**3123**	**37**

Data source: *Global Forest Sector Outlook 2050 (FAO 2022)*

[3] FAO. 2022. *Global forest sector outlook 2050: Assessing future demand and sources of timber for a sustainable economy – Background paper for The State of the World's Forests 2022.* FAO Forestry Working Paper, No. 31. Rome. Available at: www.fao.org/3/cc2265en/cc2265en.pdf

Figure 2: Forecast global supply and demand for timber in 2050



Data source: *Global Timber Outlook* (Gresham House 2020)

The FAO study suggests increasing demand for some wood products as substitutes for non-renewable materials, mainly in the construction sector and to substitute for mineral oil-based polymers (such as plastics and polyester fibre). The forest sector has developed and introduced suitable products for these markets, though production capacities are still small and production prices are often not yet competitive.

The most promising wood products for large-scale substitution are mass timber and engineered wood products for use in construction. The FAO study focuses on these products to illustrate the potential impact of enhanced demand for wood in a sustainable economic context.

Low-carbon construction

Another study of the outlook for the global timber industry was published in 2020 by Gresham House, a London-based financial asset management company.[4]

The Gresham House analysts noted that over the previous 20 years global timber consumption had increased by 1.1% per annum. In the 30 years through 2050, that growth is expected to accelerate to 3.1% per annum, driven by urbanization, decarbonization and increased housebuilding.

The global urban population is forecast to rise 53% between 2020 and 2050 and prosperity will increase for most people. Both urbanization and rising gross domestic product per capita increase demand for wood. In China, for example, which has experienced a 96% increase in the number of urban residents in 20 years, consumption of IRW also rose by 96%, the report noted.

Regarding decarbonization, the report points out that the vast majority of countries have set targets to reduce carbon emissions towards net zero by 2050, and that timber will play a critical part in this transformation. In addition, demand for biomass as a renewable energy source is also rising fast.

"The dual effect of urbanization and decarbonization will be more new homes and cleaner low carbon intensity buildings being built from timber," the report said. "Wood will increasingly replace high carbon intensive steel and concrete."

As a result, Gresham House forecasts an almost three-fold increase in timber consumption over the next 30 years, from 2.2 billion m^3 in 2020 to 5.8 billion m^3 in 2050 (Figure 2).

But this rise in demand is set against a constrained supply fixed by the growth rate of trees and the limited land area available for afforestation. The report cited forecasts for long-term, sustainable timber supply through 2050 of 3.7–4.7 billion m^3 and predicted that the shortfall (of some 1.6 billion m^3) imbalance will result in higher timber prices.

An unfillable gap?

Most of the global commercial timber supply is sourced from temperate forests in the northern hemisphere (Canada, the United States of America, northern Europe and the Russian Federation) and plantations in Oceania (New Zealand and Australia), where climates permit the growing of softwood timber.

Afforestation rates have been low and future afforestation and restocking of commercial plantations will not be able to meet increasing demand. Even if softwood afforestation levels were to increase rapidly, supply would not be impacted for at least 30 years. Further, most of the current standing stock not yet harvested is in remote areas such as northeastern Russian Federation and northern Canada, where it will be harder and more expensive to harvest.

[4] *Global Timber Outlook*. Available at https://greshamhouse.com/wp-content/uploads/2020/07/GHGTO2020FINAL.pdf

An unfillable gap? The growing prosperity of consumers and investments in housing will drive up timber demand for construction.
Photo: Universidad de Guadalajara

Meanwhile, the increase in urban dwellers is concentrated in regions with insufficient resources of mature construction timbers. The growing prosperity of consumers in Asia and Africa and their investment in housing will drive up timber demand for construction.

Natural tropical forests contain a wide diversity of species which exhibit widely different strength and durability characteristics which would present a challenge in producing mass timber products such as laminated veneer lumber (LVL) or cross-laminated timber (CLT), for example, which are more suited for production from uniform plantation wood.

Given this difficult outlook, alarm bells should be ringing in tropical countries experiencing strong economic growth and rapid urbanization and plans need to be prepared to deal with a coming supply gap in traditional timber construction products.

Tropical and topical

ITTO project releases smartphone app for calculating timber volumes in products

Software for smartphones developed by Guatemala's National Forest Institute can be used to calculate log volumes requiring only photographs and a few simple measurements. The app also enables the scaling of logs for products such as sawnwood, rectangular boards, round billets, sawdust, chips, fuelwood, wood pieces and charcoal. The mobile app is an output of an ITTO project to improve traceability in forest production chains in Guatemala. It is based on the methodology, products and formulas set out in a practical guide to forest product scaling that was also developed through the project.

Read the full story: www.itto.int/news/2023/06/09/itto_project_releases_app_for_calculating_timber_volumes_in_products_using_smartphones/

Study links deforestation to lower rainfall; El Niño could make it worse

A new study has reportedly found worrying connections between deforestation and decreased precipitation in tropical regions, with potential implications for agricultural productivity and food security. Researchers from the University of Leeds in the United Kingdom are also concerned that El Niño events, which bring hotter and drier conditions to some tropical areas, could compound the impacts, *Mongabay* reports. The 2015–16 El Niño caused significant crop losses, disease outbreaks, malnutrition, food insecurity, livestock fatalities, and other hardships that affected about 60 million people worldwide. The researchers say these trends underscore the need for greater climate resilience in local communities.

The study is available in Nature *at www.nature.com/articles/s41586-022-05690-1*

USD 130 billion a year needed to reverse deforestation, thinktank says

A minimum of USD 130 billion a year will be required to safeguard at-risk tropical forest areas by the end of the decade and meet a global pledge to halt and reverse deforestation, a thinktank has reportedly warned. Reductions in beef and dairy consumption and government bans on deforestation will also be needed to reach the goal agreed by 140 world leaders at the 26th Conference of the Parties to the UN Framework Convention on Climate Change in 2021, the Energy Transitions Commission said, according to a report in *The Guardian* newspaper. Currently, forest protection funding averages just USD 2–3 billion a year, the thinktank said in a report on meeting the Paris Agreement goal of holding global warming below 1.5ºC and building a net zero global economy.

The Energy Transitions Commission report is available at www.energy-transitions.org/publications/financing-the-transition-etc-avoiding-deforestation/

Illegal land clearing threatens a state forest reserve in Mexico

A state reserve in southern Mexico is reportedly suffering significant deforestation as a result of illegal land clearance for ranching and other activities. A total of 510 deforestation alerts within the boundaries of the Balam-Kú State Reserve were documented in 15 months from December 2022 and February 2023, *Mongabay* reports. Most deforestation is happening in the municipality of Candelaria, where unlawful settlers are clearing forests for ranching and agriculture without the requisite permits.

Read the full story: https://news.mongabay.com/2023/06/illegal-settlements-hunting-and-logging-threaten-a-state-reserve-in-mexico/

Tropical timber can cut demand for fossil-derived plastics and contribute to a circular economy

Timber, especially tropical timber, has considerable potential to reduce the environmental footprint of plastics by replacing them in everyday uses, ITTO Executive Director Sheam Satkuru has said. Ms Satkuru made the case for wood as a sustainable material on World Environment Day, June 5, which this year was focused on accelerating action to cut plastics pollution and transition to a circular economy. Using wood products instead of plastic ones can reduce plastic pollution in the near term; according to an ITTO study on the future of tropical timber supply and demand, competitive cellulose-based plastic substitutes could be on the market by 2050.

Read the full story: www.itto.int/news/2023/06/05/tropical_timber_can_cut_demand_for_fossil_derived_plastics_and_contribute_to_a_circular_economy/

Road through forest to new Indonesian capital city raises environmental concerns

A road being built in Indonesia to improve access to the interior of Borneo, including the new capital city, Nusantara, is reportedly raising environmental concerns. The toll road cuts through an integrated forest and coastal ecosystem that supports species including orangutans, sun bears, proboscis monkeys, and Irrawaddy dolphins, *Mongabay* reports. Conservationists argue that the construction of the road contradicts the Indonesian government's claims of green and sustainable development for the new capital.

Read the full story: https://news.mongabay.com/2023/04/to-build-its-green-capital-city-indonesia-runs-a-road-through-a-biodiverse-forest/

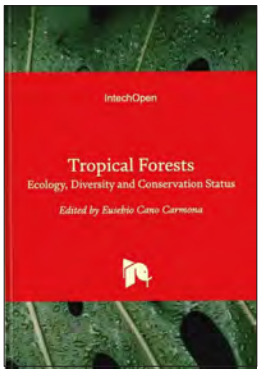
Recent editions

Pohnan, E., Cammaert, B. and Cavanagh, T. 2022. *Enabling micro, small and medium-sized enterprises to participate in legal timber production and trade – Transformational changes generated by the FAO-EU FLEGT Programme*. FAO Forestry Paper, No. 189. Rome, FAO.

ISBN: 978-92-5-137301-9

Available at: www.fao.org/documents/card/en/c/cc3107en

Micro, small, and medium-sized enterprises (MSMEs) help meet global demand for forest products, promote responsible supply chains and boost economic growth. However, more countries are implementing controls that require forest product legality. To meet and capitalize on these new market demands and opportunities, forest sector MSMEs will need significant support. This paper draws on 110 initiatives in 20 countries supported by the FAO-European Union Forest Law Enforcement, Governance, and Trade (FAO-EU FLEGT) Programme between 2016 and 2022 to demonstrate how to integrate forest sector MSMEs into domestic and international legal timber value chains cost-effectively and at scale. It discusses initiatives to improve forest-dependent livelihoods, social equity, and sustainability in timber supply chains. A portfolio of these strategies in a comprehensive support package can create transformational changes that help MSMEs achieve sustainable growth and generate more inclusive, resilient economies.



Cano Carmona, E., Maria Musarella, C. and Cano Ortiz, A. (eds). 2023. *Tropical Forests - Ecology, Diversity and Conservation Status*. IntechOpen. DOI: 10.5772/intechopen.104009.

ISBN: 978-1-83768-575-2

This publication considers different ways of approaching the conservation and development of tropical biomes. The chapters analyze biodiversity and highlight ecosystem services as a fundamental element for the conservation and eco-development of tropical forests. Chapter authors propose the involvement of country institutions in conservation efforts and present studies on the ecology, flora, and vegetation of tropical ecosystems.

ITTO. 2018 (re-issued 2023). *ITTO policy guidelines on gender equality and empowering women*. Policy Development Series No. 22. International Tropical Timber Organization (ITTO), Yokohama, Japan.

ISBN: 978-4-86507-055-2

Available at: www.itto.int/policy_papers/

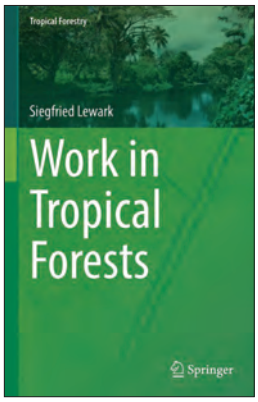
ITTO has underlined its commitment to gender mainstreaming and enhancing gender equality outcomes across its policy work by re-issuing its 2018 policy guidelines on gender equality and empowering women. For ease of reference, the guidelines include a reproduction of Appendix D of the *ITTO manual for project formulation*, which provides additional guidance on gender analysis. The policy guidelines serve as a framework for gender integration and mainstreaming in ITTO policies, plans, programmes, projects, activities and internal functioning and are intended to enhance the impact and effectiveness of the Organization's operations in all areas and at all levels.

Brady, M., Sharma, S., Baral, H. and Nasi, R. 2023. *Bioenergy sustainability in the global South: constraints and opportunities. Occasional Paper 2*. CIFOR (Center for International Forestry Research), Bogor, Indonesia; and World Agroforestry (ICRAF), Nairobi, Kenya.

ISBN: 978-92-5-135864-1

Available at: www.cifor.org/knowledge/publication/8846

Many countries have adopted bioenergy as part of a strategy to reduce greenhouse gas emissions and meet targets under the Paris Climate Agreement. Bioenergy is becoming a substitute for fossil fuels due to increased efficiency, lower production costs, legislative support, and investment incentives. This study provides a better understanding of bioenergy issues, potential and sustainability to inform countries in the global South and provide guidance on integrating bioenergy into their national energy plans by proposing a simplified sustainability framework for wood-based bioenergy.



Lewark, S. 2022. *Work in Tropical Forests*. Springer Verlag, Berlin, Germany.

ISBN: 978-1-905164-78-3

Available at: https://link.springer.com/book/10.1007/978-3-662-64444-7

This book presents a synopsis of the abundance, types and conditions of work performed in tropical plantation and natural forests from a work science perspective. It covers work of the formally and informally employed, and of own-account small-scale forest users, women and children. The abilities of workers and their efforts while fulfilling their tasks, resulting in performance and workload, are described with examples from published studies. Influencing variables including organizational, technical and managerial aspects are considered. To aid understanding, the development of forest work science is also described.

Konijnendijk, C., Devkota, D., Mansourian, S. and Wildburger, C. (eds.). 2023. *Forests and Trees for Human Health: Pathways, Impacts, Challenges and Response Options*. A Global Assessment Report. IUFRO World Series Volume 41. IUFRO, Vienna, Austria.

ISBN 978-3-903345-20-1

Available at: www.iufro.org/science/gfep/gfep-initiative/panel-on-forests-and-human-health/

This report presents findings of the eighth global assessment of the Global Forest Expert Panel (GFEP). The report consolidates available scientific evidence on the interlinkages between forests and human health and identifies trade-offs, synergies, and opportunities for strengthening policies, programmes and activities to enhance the positive health impacts of forests in diverse populations and settings. Established in 2007 as an initiative of the Collaborative Partnership on Forests, GFEP responds to critical forest-related policy concerns by consolidating knowledge and expertise to provide decision-makers with relevant, objective and accurate information, and thus contribute to better and more effective international forest governance.

New global forum on legal and sustainable timber

21–22 November 2023 at the Galaxy International Convention Center in Macao SAR, China

ITTO and the Macao Trade and Investment Promotion Institute (IPIM) will co-host the inaugural Global Legal and Sustainable Timber Forum in Macao SAR, China with the aim of accelerating development of legal and sustainable wood product supply chains.

The two organizations announced the creation of the Forum to support the global timber industry in increasing the production of legal and sustainable wood products while also maintaining important forest values. The Forum will encourage collaboration and the exchange of views and information among timber industry stakeholders worldwide—producers, buyers, processors and market players.

ITTO's ongoing Legal and Sustainable Supply Chain Programme is directly linked to the building of legal and sustainable tropical timber supply chains through a multipronged, integrated approach of governmental frameworks, private-sector initiatives, financial resources and capacity building. As part of the programme and in collaboration with partners, ITTO convened the international forum, "Together towards Global Green Supply Chains", in October 2019 in Shanghai, China—the first global dialogue on improving the legality and sustainability of tropical timber supply chains.

Co-hosts and organizer

The Global Legal and Sustainable Timber Forum will be co-hosted by ITTO and IPIM and organized by the Secretariat of the Global Green Supply Chain Initiative (GGSC). The theme of this year's event will be "Connect, cooperate and share to promote the recovery of the global tropical timber market".

Specialized parallel forums will be organized by partner agencies to contribute to the theme of the main forum. These might be on selected topics related to timber legality and sustainability, sustainable timber resources and trade, advanced technology and machinery for wood processing, green finance, and the sustainable development of the timber industry.

Date and venue

The Global Legal and Sustainable Timber Forum 2023 will be held on 21–22 November 2023 at the Galaxy International Convention Center in Macao SAR, China.

Objectives

The Global Legal and Sustainable Timber Forum will increase networking, collaboration and business exchanges among timber industry stakeholders—producers, buyers, processors and market players—with a view to promoting sustainable forest management, expanding legal and sustainable wood product supply chains, facilitating the legal and sustainable use and trade of wood products in a stable, transparent and predictable business environment, and contributing to sustainable development and climate-change mitigation.

Photo: Sukiman

Forum structure

The Forum will be held annually, and will have two components:

1) the Global Legal and Sustainable Timber Forum; and

2) specialized parallel forums.

Additional information

The Global Legal and Sustainable Timber Forum 2023 is expected to attract around 500 participants from wood enterprises and trading companies, industrial and business associations, governments, international organizations and research institutions.

A legal and sustainable timber industry exhibit will be organized in parallel with the global forum and specialized forums, at a trial scale of 20–30 booths.

Sponsorship will be available for selected speakers and panelists and a limited number of participants from selected developing countries. Simultaneous interpretation will be provided in Chinese (Mandarin), English, French, Portuguese and Spanish.

More information on the venue, registration procedures and accommodation will be posted on ITTO's website in due course at www.itto.int/events.

For more information contact:
ITTO: Mr Li Qiang at li@itto.int
IPIM: Mr. Steve CHAN at pcel@ipim.gov.mo
GGSC Secretariat: Ms Gao Xuting at gaoxuting@itto-ggsc.org

Vacancy announcements at ITTO:

- Director – Forest Management
- Director – Forest Industry

Written applications, comprising a resumé and a cover letter explaining how the candidate meets the required qualifications, should be sent by email to oed@itto.int no later than **4 September 2023 (17:00 JST)**.

For more details visit the announcements section on ITTO's homepage at www.itto.int

Meetings

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

21–22 November 2023
Global Legal and Sustainable Timber Forum 2023
Galaxy International Convention Center, Macao SAR, China
The forum will increase networking, collaboration and business exchanges among timber industry stakeholders—producers, buyers, processors and market players—with a view to promoting sustainable forest management, expanding legal and sustainable wood product supply chains, facilitating the legal and sustainable use and trade of wood products in a stable, transparent and predictable business environment, and contributing to sustainable development and climate-change mitigation.
Read the announcement on page 27
More: www.itto.int/events

Other meetings

22–26 August 2023
Seventh GEF Assembly
Vancouver, Canada
More: www.thegef.org/events/seventh-gef-assembly

24–27 August 2023
26th Lucerne International Forestry Fair 2023
Lucerne, Switzerland
More: www.forstmesse.com/de/fuer-besucher

28–30 August 2023
Expert Forum for Producers and Users of Climate Change-related Statistics 2023
Geneva, Switzerland
More: https://unece.org/info/Statistics/Forests/events/375549

17–21 September 2023
Joint meeting IUFRO WP 07.02.13 and 07.02.03: "Novel and classical strategies to manage forest health in plantations"
Campo Grande, Brazil
More: https://eventos.galoa.com.br/secondiufrowpmeeting/page/2462-home

18–19 September 2023
2023 SDG Summit
New York, United States of America
More: www.un.org/en/conferences/SDGSummit2023

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

20–22 September 2023
55th FORMEC and 7th Forest Engineering Conference (FEC): "Improving access to sustainable forest materials in a resource-constrained world"
Florence, Italy
More: www.formec.org/

2–4 October 2023
IUFRO Symposium on Forest Education: "Merging theory and practice with help of digital tools"
Helsinki, Finland (hybrid event)
More: www.helsinki.fi/en/conferences/iufro-symposium-forest-education

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

4–7 October 2023
3rd World Conference on Forests for Public Health
Sherbrooke, Canada
More: https://fphcongress.org/

4–7 October 2023
25th International Wood Machining Seminar (IWMS-25)
Nagoya, Japan
More: https://www.agr.nagoya-u.ac.jp/~mechbio/IWMS-25/index.html

12–16 October 2023
FLARE Annual Meeting 2023
Nairobi, Kenya
More: www.cifor.org/event/flare-annual-meeting-2023/

15–18 October 2023
2023 ANZIF Conference: "Embracing Our Natural Capital: The Science, Technology and Art of Managing Forests For All Values"
Tweed Heads, 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

17–20 October 2023
Woodrise Congress
Bordeaux, France
More: https://woodrise-congress.com/en

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

26–28 October 2023
Summit of The Three Basins of Biodiversity Ecosystems and Tropical Forests
Brazzaville, Congo
More: https://thethreebasinsummit.com/

6–10 November 2023
Seventy-seventh meeting of the CITES Standing Committee
Geneva, Switzerland
More: https://cites.org/eng/sc/77

20–24 November 2023
IUFRO Conference of Working Group 2.08.03: "Enhancing the performance and sustainability of eucalypt plantations to broaden their benefits"
Colonia del Sacramento, Uruguay
More: https://iufroeucaliptusuy2023.org/

30 November–12 December 2023
UN Climate Change Conference (UNFCCC COP 28)
Dubai, United Arab Emirates
More: https://unfccc.int/cop28

15–19 January 2024
International Conference "Role and Fate of Forest Ecosystems in a Changing World" and 31st Biennial Conference of IUFRO Research Group 8.04 on "Air pollution and climate change"
Bangkok, Thailand
More: www.iufro.org/fileadmin/material/science/divisions/div8/80400/bangkok24-1st-announcement.pdf

10–12 April 2024
International Forest Policy Meeting 5 (IFPM5)
Helsinki, Finland
More: www.helsinki.fi/en/conferences/international-forest-policy-meeting-5

13–16 May 2024
Short Rotation Woody Crops International Conference: "The Future is Green: Integrating Short Rotation Woody Crops, Agroforestry, and Ecosystem Services for Sustainable, Productive Landscapes"
Columbia (Missouri), United States of America
More: www.iufro.org/fileadmin/material/science/divisions/div1/10300/columbia-srwc-24-save-the-date.pdf

23–29 June 2024
IUFRO World Congress 2024: "Forests and Society Towards 2050"
Stockholm, Sweden
More: https://iufro2024.com/

21–23 August 2024
IUFRO Division 7 Joint Meeting: "Theory and Practice to Address Defoliating Insects, Invasive Pests and Biological Control of Insects and Pathogens in Forests"
Tokyo, Japan
More: www.iufro2024tokyodiv7.com/

17–21 March 2025
IUFRO Unit 1.01.04: "Forest Establishment and Early Growth Dynamics"
Rotorua, New Zealand
More: www.iufro.org/fileadmin/material/science/divisions/div1/10104/rotorua25-1st-announcement.pdf

Note that all meetings are subject to change or cancellation. Please check the contact addresses for the latest information.

ITTO provides this list of international meetings as a public service and is not responsible for changes in date or venue or for other errors.