Global Teak Resources and Market Assessment

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Photo: Björn Olin

About the study

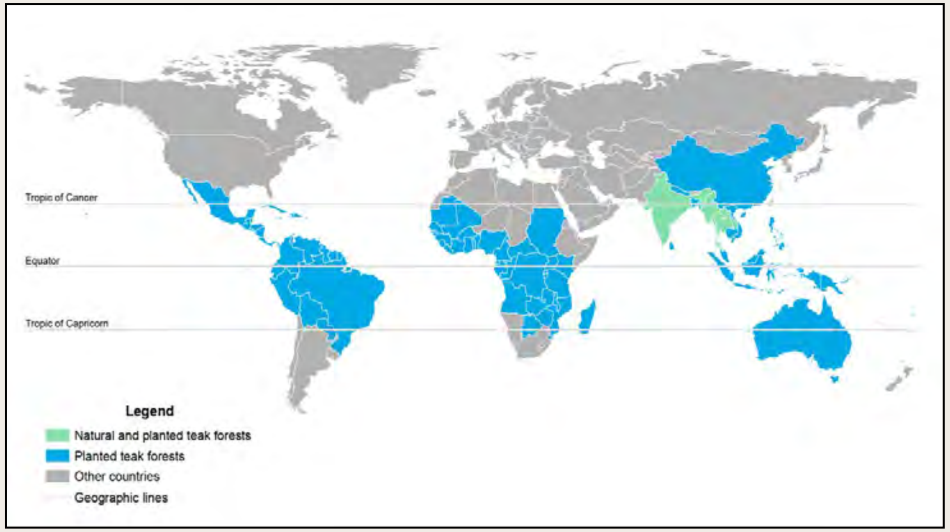
- The Teak Resources and Market Assessment (TRMA 2022) was a collaborative study by TEAKNET, IUFRO and FAO, that addressed the data gap by providing a comprehensive evaluation of the world's teak resources.

- It includes detailed information on
  - ✓ Distribution of teak at country, regional and global levels
  - ✓ Ownership status of plantations
  - ✓ Productivity aspects
  - ✓ Trade dynamics and major markets

Methodology

TRMA 2022 aimed to update, evaluate, and expand data in all teak-producing countries. Data was collected through a standardized questionnaire; prepared in five languages (Chinese, English, French, Portuguese and Spanish).

Questionnaire was sent to each country through the Regional Coordinators, who were instrumental in the process of managing the communication with the identified resource persons, data collection and verification.



Credit: J. Walotek, Waka Serviços De Investimentos Florestais Ltda., Brazil.

Data collection and quality of data

The questionnaire was sent to 80 countries. Of these, 72% reported that teak is grown in their country, but only 52% returned the questionnaire with national teak resource data.

The data was put through a thorough scrutiny. Checked for plausibility, with questionable data reviewed and corrected in collaboration with local contacts. Over 100 individuals participated in the data collection and review process.

TRMA 2022 is a useful reference for assessing country situations and trends, and there is currently no better up-to-date information available on teak resources and markets.

Outcome

Development of the area of natural teak forests by country

	TRMA 2010 (1000 ha)	TRMA 2022 (1000 ha)	Change from 2010 to 2022 (1000 ha)
India	6,810	5,935	-875
Lao PDR	1.5	16	+14.50
Myanmar	13,479	15,424	+1,945
Thailand	8,744	8,840	+96
Total	29,035	30,215	+1,180.50

Development of the area of planted teak forests by region

	TRMA 2010		TRMA 2022		Change
Region	**1000 ha**	**%**	**1000 ha**	**%**	**1000 ha**
Africa	469.80	10.8	625.59	12.9	+155.79
Asia and Oceania	3,606.17	83.0	3,866.95	79.7	+260.78
Caribbean	15.32	0.4	24.10	0.5	+8.78
Mexico and Central America	132.78*	3.1	157.82	3.3	+25.04
South America	122.30	2.8	178.94	3.7	+56.64
World	**4,346.37**	**100**	**4,853.39**	**100**	**+507.02**

- The area of natural and planted teak forests has expanded, increasing the harvest of teak round wood and its share in the global timber market.

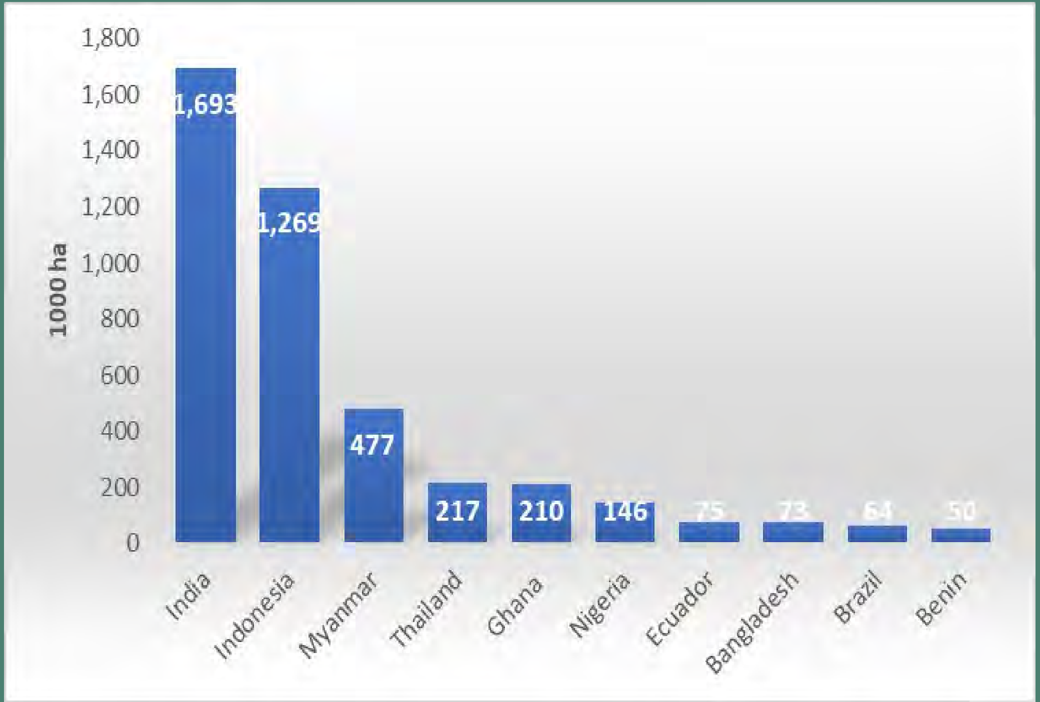
- Asia holds more than 97 percent of the world's natural and planted teak resources, and nearly 80 percent of the world’s planted teak resources. The three teak heavyweights are India with 1.693 million ha of planted teak forests (35 percent of the total), Indonesia with 1.269 million ha (26 percent) and Myanmar with 0.477 million ha (10 percent).

Natural Teak and Planted Teak Forests

Development of the area of planted teak forests in the top ten countries (area > 50,000 ha) 2010 to 2022

	TRMA 2010	TRMA 2022	Change 2010 to 2022
Country	1000 ha	1000 ha	1000 ha
India	1,667	1,693	+26
Indonesia	1,269	1,269	--
Myanmar	390	477	+86
Thailand	128	217	+89
Ghana	214	210	-4
Nigeria	146	146	--
Ecuador	45	75	+30
Bangladesh	73	73	--
Brazil	65	64	-2
Benin	26	50	+24

Top 10 countries with the largest area of planted teak forests (1 000 ha)



- Substantial increases can be observed in Thailand, Myanmar, Ecuador, India and Benin.
- The ten countries with the largest area account for 88 percent

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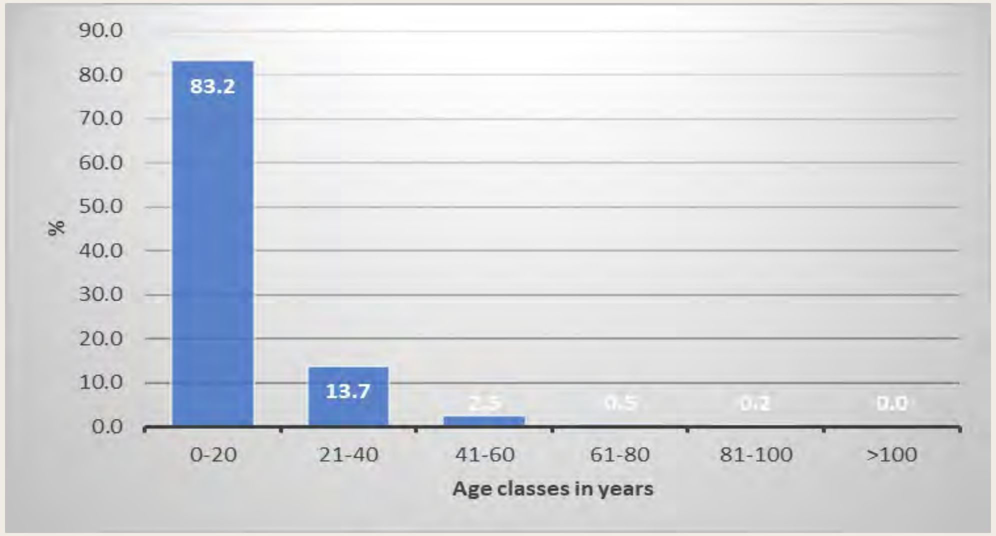
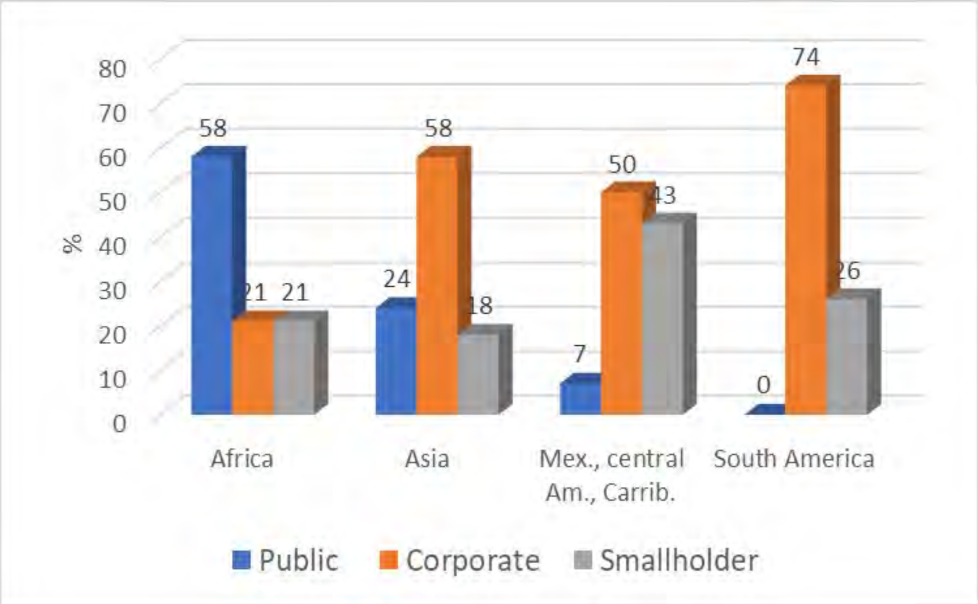
Age class distribution and ownership status of planted teak forests

Age class distribution of planted production forests



Ownership (%) of planted production forests by region



Age Class Distribution

The majority of planted teak forests (94%) are under 40 years old, reflecting increased planting efforts and short rotation management over the past 30 years. This has led to a significant rise in the supply of small diameter logs for the international market

Ownership

While public ownership is still common in Africa, private ownership is growing worldwide as more companies and farmers recognize teak's commercial potential. Smallholders own and manage 25% of the world's planted teak forests, covering 1.2 million hectares.

Growth performance and rotation age

Mean annual increment (MAI) and rotation age by region

Region	TRMA 2010				TRMA 2022			
	MAI (m^3/ha/yr)		Rotation (yrs)		MAI (m^3/ha/yr)		Rotation (yrs)	
	Min	Max	Min	Max	Min	Max	Min	Max
Africa	3	21	4	60	3.0	18.0	3	60
Asia, Oceania	2	14	20	80	0.4	28.6	15	80
Mexico and Central America	5	30	6	30	4.2	8.3	16	22
South America	10	27	20	30	5.0	19.0	5	40
World	2	30	4	80	0.4	19	3	80

In most countries < 12 m^3/ha/year

Exceptions

China - 28.6 m^3/ha/year

Lao PDR - 21.3 m^3/ha/year

Brazil - 19 m^3/ha/year

- ❑ The reported rotation periods between 20 and 30 years leading to production of lower quality small diameter logs
- ❑ Small diameter logs are in high demand on the international market as multi-purpose timber for less demanding construction purposes, furniture, flooring, reconstituted wood products and power poles.
- ❑ Good quality from longer rotations- Benin, Togo, Tanzania, India, Sri Lanka, Thailand and Brazil (40 and 80 years).

Removal of teak logs

Log removals from planted teak forests by region 2010 and 2022

	Log removals (m^3)		Change	
Region	**TRMA 2010**	**TRMA 2022**	**m^3**	**%**
Africa	141,146	454,991	+313,845	+322
Asia, Oceania	522,710	835,443	+312,733	+160
Caribbean, Central America	141,845	141,845	--	--
South America	140,912	359,684	+218,772	+255
World	946,613	1,791,963	+845,350	+189

Top ten countries producing teak roundwood from planted forests

- Globally, roundwood removals in 2022 were almost twice as high (189 percent) as in 2010. In 2010, 946,613 m^3 of wood were harvested, whereas in 2022, 1,791,963 m^3 were harvested.

- The largest increases are in Africa and South America

- The largest volume is cut in Indonesia, Brazil and Ghana, the three countries that account for 65% of the globally harvested teak.

Markets and Trade - Price and quality

- The domestic and export market prices in Africa and Asia have increased from TRMA 2010 to TRMA 2022 across all three dimensions, while the domestic market prices in Latin America, where prices have considerably decreased;
- Domestic and export market prices are highest in Asia. Asia is followed by Africa and Latin America that shows the lowest price level across all dimensions.
- In most countries the domestic and export market prices show a distinct gradation across the three dimensions small, medium and large. The domestic market prices of larger logs are 1.5 to 4 times higher than the prices of smaller logs..

	Planted teak, domestic market prices (USD/m^3)					
	TRMA 2010			TRMA 2022		
Region	small	medium	large	small	medium	large
Africa	124	203	271	182	233	284
Asia, Oceania	149	282	448	281	720	1,213
Latin America	129	199	267	54	85	144
	Planted teak, export market prices (USD/m^3)					
	TRMA 2010			TRMA 2022		
Region	small	medium	large	small	medium	large
Africa	--	--	--	550	613	697
Asia, Oceania	--	--	--	--	513	870
Latin America	--	--	--	203	285	463

Photo W. Kollert

Markets and Trade - International trade in teak round wood

- In 2022, the international trade in teak roundwood was governed by India that imported 97 percent of the total trade volume from 43 source countries.

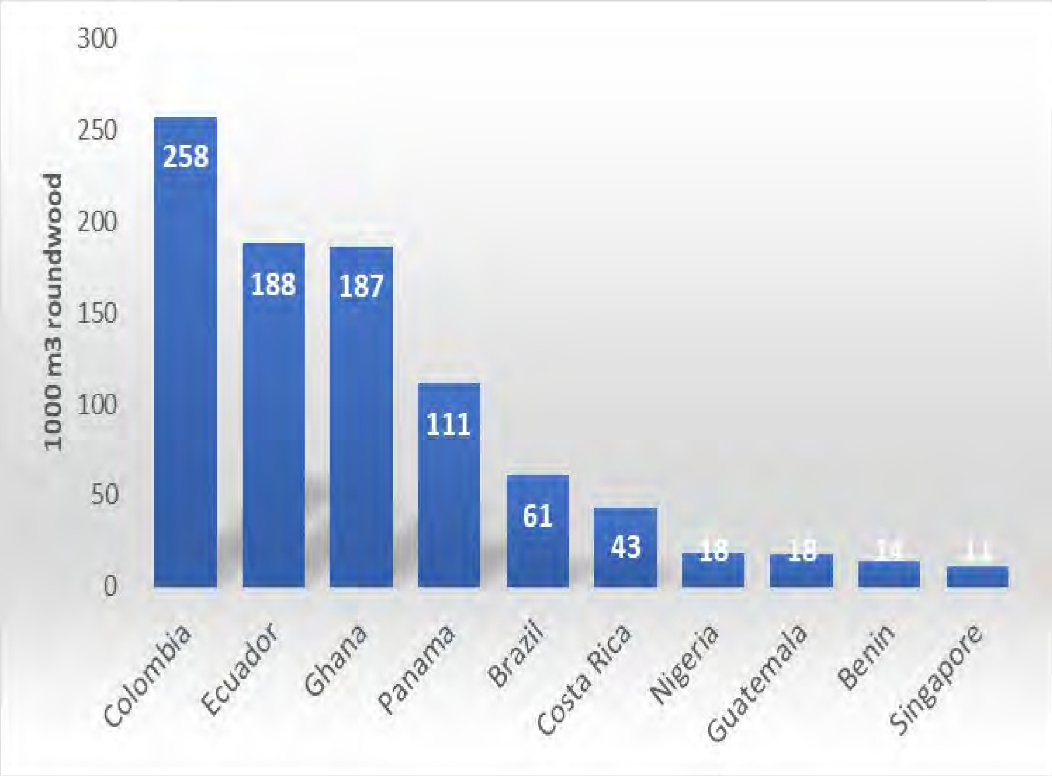
- More than two thirds (72.5 percent) of India´s import volume was sourced from Latin American countries and African countries covering the remaining one quarter (25 percent).

- Major roundwood exporters in Latin America - Colombia, Ecuador, Panama, Brazil and Costa Rica.

- Major round wood exporters in Africa - Ghana, Nigeria and Benin. South Sudan and Tanzania did not show up in the statistics as there is a ban on log exports.

- The roundwood imports appears to be good with average values (CIF) ranging from 363 USD/m^3 for logs imported from Latin America to 458 USD/m^3 from Africa.

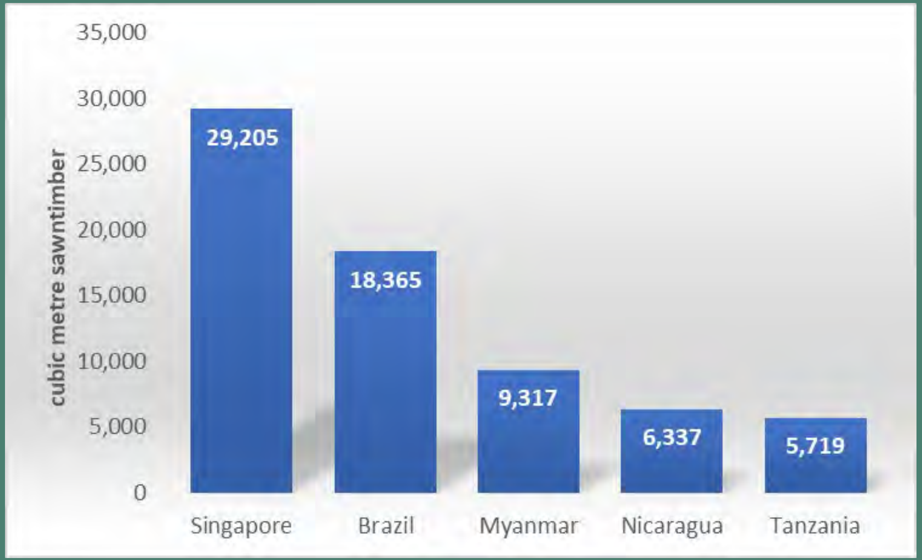
The top ten countries exporting teak roundwood to India in 2022 (Source: UN Comtrade database)



Markets and Trade - International trade in teak sawnwood

The top five importers of teak sawntimber 2022

The top five exporters of teak sawntimber 2022



- The leading sawntimber exporter is Singapore covering 38 percent of the total exports. The city state is reported to be the business location of 261 active teak wood companies that trades with 200 suppliers worldwide (Volza Grow Global, 2023).

- The major exporter in South America is Brazil accounting for 24 percent of the total trading volume, while Nicaragua in Central America covers 8 percent of the total.
- In Asia, besides Singapore, Myanmar is an important sawntimber exporter (12 percent of the total). The biggest exporter in Africa is the United Republic of Tanzania accounting for 7 percent of the world exports.

- The Netherlands serve as an inter-European trading hub for teak sawntimber. The country imports teak sawntimber from 29 countries and re-exports it to many other European countries.

Environmental and social aspects

The global increase of about 500,000 hectares in planted teak forests raises concerns about environmental and social impacts, such as biodiversity, water supply, soil erosion, carbon sequestration, and landscape management. However, these systems can provide a multitude of positive environmental and social features as:

Socio-economic significance: The vast majority (99 percent) of planted teak forests are grown for timber production. As such, planted teak forests can support rural livelihoods, help communities improve their standard of living, provide a financially attractive option for forest landscape restoration and contribute to sustainable development.

Multiple values: Planted teak forests can reduce the pressure on natural teak forests for forest products and allow them to be designated for other protection and conservation purposes. They can also complement and supplement the REDD and REDD+ initiatives.

Ecological landscape element: Planted teak forests form ecological corridors and maintain biological connectivity in the landscape, particularly where intact remnants of natural forest are maintained within the planted area as reservoirs for biodiversity conservation.

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High carbon sequestration: Planted teak forests are a fast-growing resource with the capacity to sequester carbon on a large scale, helping to mitigate climate change.

Continent	Area	MAI	Carbon capture	
	1000 ha	m^3/ha/yr	10^3 tons C/yr	Gg CO_2/yr
Africa	625.59	10.5	2,162.94	7,930.78
Asia and Oceania	3,866.95	14.5	18,462.98	67,697.61
Latin America	360.85	16.1	1,913.01	7,014.38
World	4.853.39	14.1*	22,538.94	82,642.77

Notes: *weighted average; Gg = Gigagrams; 1 Gg is equivalent to 1,000 tons.
Calculation method according to the IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry (GPG-LULUCF).
Source: Glauner, 2024.

A model calculation based on IPCC technical specifications shows that the area of 4.85 million hectares of planted teak in the world would have the potential to sequester annually 22.54 million tonnes of carbon or 82.64 million tons of CO2. For the investor, carbon sequestration is seen as an additionality or environmental service that adds value to the resource and can help increase its cash flow. Even after harvesting, teak is mainly used in durable products and is a good choice for generating carbon credits.

Summary and Conclusions

- **The global situation.** Teak grows in nearly 80 countries in tropical regions.

- **The growing importance of teak.** The global import value of teak roundwood is estimated at USD 311.6 million and represents 10.1 percent of the total import value of non-coniferous tropical industrial roundwood from all tropical countries, and exceeds its share of global production.

- **Natural teak forests**. The area of natural teak forests in India, Lao PDR, Myanmar and Thailand combined was estimated at 30.215 million ha, of which more than half is in Myanmar. Over a decade, natural teak forests have increased by 1.180 million ha globally (+4.1 percent).

- **Planted teak - an emerging global hardwood resource**. The global area of planted teak forests is estimated at 4.854 million hectares, of which 80 percent is in Asia, 13 percent in Africa and 7 percent in Latin America. The global area of planted teak forests has increased by 507 thousand hectares from 2010. Significant increases were recorded in Asia (+261 thousand ha) and Africa (+156 thousand ha).

- **Age class distribution and rotation age:** The majority of planted teak (94 percent) is less than 40 years old resulting in a significant increase in the supply of small diameter logs to the international market as a general utility timber.

- **Ownership:** Public ownership is still prevalent in Africa, but a shift towards private ownership is evident in many countries. A quarter of the world's planted teak forests (1.2 million hectares) are owned and managed by smallholders.

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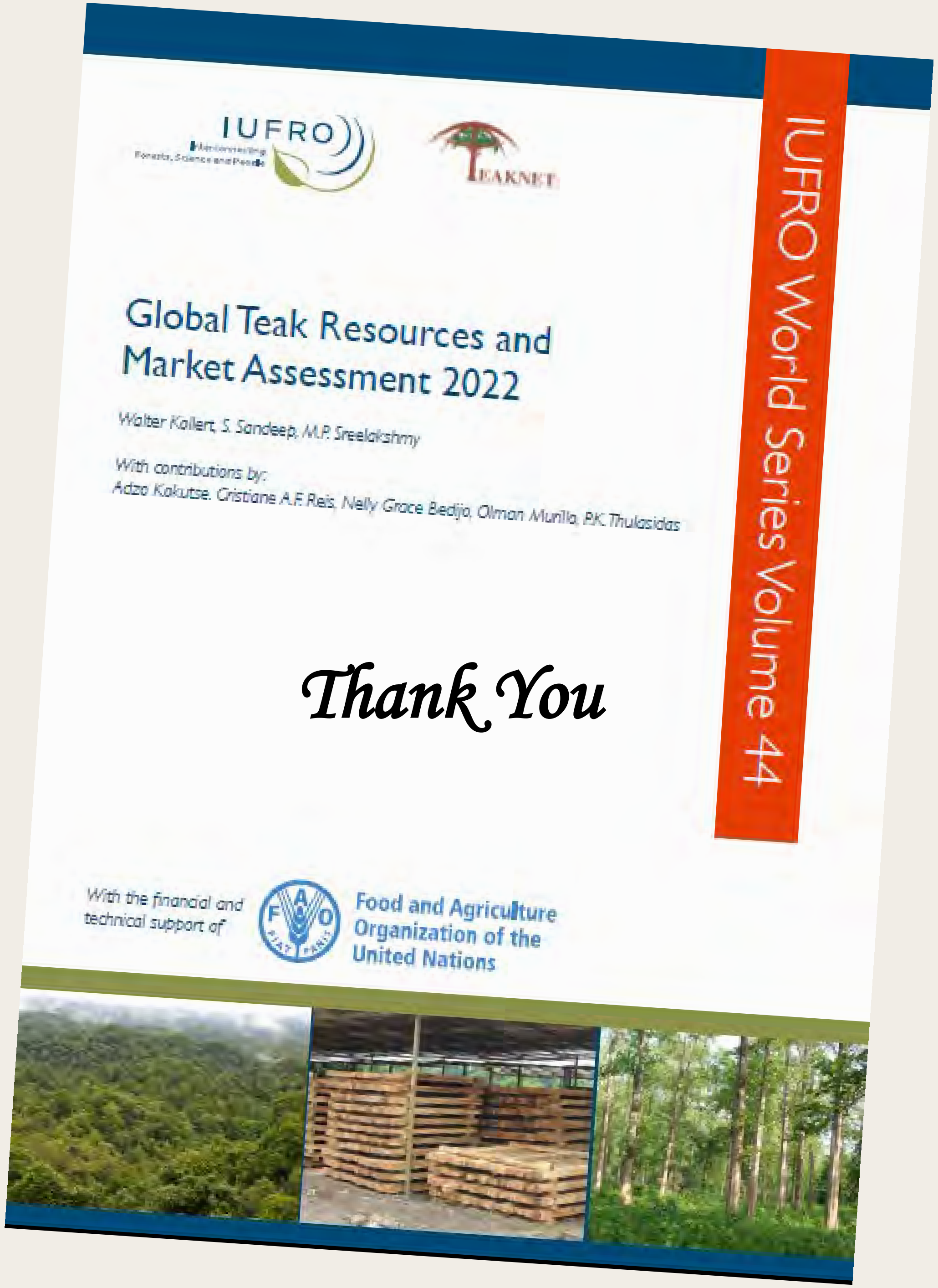
- **Growth performance.** The vast majority of planted teak (99 percent) is grown and managed for timber production. The mean annual increment (MAI) reported in most countries for TRMA 2022 does not exceed 12 m^3/ha/year.

- **Log harvesting.** The production of mature, high quality teak is limited to the traditional producers of Myanmar, as well as India, Indonesia and Sri Lanka. The data reported for TRMA 2022 suggest that the supply of teak from natural forests is declining to below 0.5 million m^3, while the supply of teak from planted forests is estimated to be around two million m^3 per year.

- **Trade.** The international teak market has been and will continue to be driven by trends in the Asian market. Asia holds more than 95 percent of the world's teak resources and India alone manages 35 percent of the world's planted teak forests. The salient points in the timber trade are:
    a. India remains the dominant trading power in the teak roundwood and sawntimber market. India imports 97 percent of the total trade volume from 43 source countries. The second largest importer is China with 2.5 percent of the total.
    b. Important trading centers with little or no teak resources have developed in Singapore for teak roundwood and sawntimber, and in the Netherlands for teak sawntimber;
    c. An increasingly important issue affecting the trade in plantation grown teak is forest management certification and legality.
    d. Meeting consumer expectations and legal requirements significantly influence growers and processors, particularly those dependent on the markets in North America and Europe.



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