Enhancing Enforcement and Legal Timber Trade Practices through Stakeholder Collaboration and Innovation

Final Report

APEC Experts Group on Illegal Logging and Associated Trade

December 2025





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APEC Project: EGILAT 01 2025S

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Executive Summary

The <u>EGILAT 01 2025S</u> project convened policymakers, enforcement agencies, researchers, industry, and civil society from 17 APEC economies to strengthen collaboration, innovation, and policy frameworks in promoting legal timber trade. The one-day program, held on 28 July 2025 in Incheon, Korea combined high-level dialogues, technical presentations, and a miniexhibition to promote cross-fora collaboration.

Discussions underscored the critical role of **innovation**, highlighting emerging technologies – including Deoxyribonucleic acid (DNA) testing, artificial intelligence, specimen databases, and digital traceability – in improving timber species identification, enhancing transparency, and closing enforcement gaps. Equally emphasized was the need for **collaboration** - stronger inter-agency coordination among EGILAT, SCCP, ACTWG and domestic agencies, harmonized policies, and alignment with international standards to ensure consistent and credible enforcement across the region.

A key outcome was the development of EGILAT Timber Legality Enhancement Framework (TLEF), structured around **Technology and Innovation**, **Governance and Collaboration**, and **Policy and Regulation**, supported by capacity building and knowledge exchange. The project reaffirmed APEC's commitment to advancing transparent, legal and sustainable timber trade through enhanced enforcement, innovation and regional collaboration.



EGILAT 01 2025S united economies, global partners and experts—sharing case studies, cooperation strategies and wood ID innovations to advance legal timber trade across APEC.



With gratitude to participants, APEC 2025 host Dr. Myung-gil Kim underscores the project's support for *Building a* Sustainable Tomorrow.



SCCP Vice Chair, Sung Kim calls for unified efforts and collaboration to drive an integrated approach.



Urging collective action, EGILAT Chair Noraihan stresses collaboration and digital innovation to boost legal timber trade in the region.

1.1. Background

Illegal logging and associated trade continue to undermine sustainable forest management and distort timber markets across the Asia-Pacific region. APEC economies account for over 40% of global timber production and more than half of the world's forests¹, making coordinated action both urgent and strategic. The <u>APEC EGILAT Stocktaking Survey</u> (Policy Theme 2²) identified persistent enforcement challenges and called for stronger collaboration within and across economies. In response, the APEC Senior Officials' Meeting (SOM2, 2024) recommended that EGILAT expand cross-fora cooperation with customs, anti-corruption, and trade groups.

The EGILAT 01 2025S project was therefore designed to convene policymakers, enforcement agencies, industry representatives, researchers, and civil society to share knowledge, showcase innovation, and identify practical steps to strengthen enforcement and advance legal timber trade in the region. The initiative supports the APEC Putrajaya Vision 2040 and Aotearoa Plan of Action by promoting legal trade, inclusive growth, and good governance. It also contributes to the La Serena Roadmap for Women and Inclusive Growth and the Bangkok Goals on the Bio-Circular Green Economy, aligning with APEC's 2025 theme, *Building a Sustainable Tomorrow*. Furthermore, this project operationalizes EGILAT Policy Theme 3: *Promoting Legal Timber Trade through Enhanced Stakeholder Collaboration for Effective Implementation and Enforcement* by turning its priorities into concrete activities- capacity building, interagency cooperation, stakeholder engagement, and cross-fora collaboration.

1.2. Project Objectives

The project sought to bring together key stakeholders across the timber and timber supply chain to:

- 1.2.1. Provide a platform for networking and stakeholder engagement;
- 1.2.2. Facilitate the exchange of information, best practices, and innovations in timber legality and enforcement; and
- 1.2.3. Identify concrete actions and collaboration opportunities across APEC fora to promote legal timber trade.

¹ FAO. 2022. Classification on Forest Products 2022. Rome.

https://openknowledge.fao.org/server/api/core/bitstreams/ca0a8b29-6b20-4c42-bcd1-206a87bb1d00/content

² APEC EGILAT Policy Theme 2: Advancing the trade and distribution of legally harvested forest products: Navigating to legal timber

1.3. Project Deliverables

The initiative delivered four main outputs:

- 1.3.1. Two dialogue sessions on *Enhancing Enforcement and Legal Timber Trade Practices through Stakeholder Collaboration and Innovation* that cover the perspectives from economies and civil organizations;
- 1.3.2. A mini-exhibition showcasing innovation and best practices from member economies; and
- 1.3.3. A Dialogue on Wood Identification for Legal Timber Trade; and
- 1.3.4. The Final Report summarizing the key outcomes and recommendations.

1.4. Event Details

The dialogues and mini-exhibition were held on 28 July 2025 (Monday), at Meeting Room 113-114, 1st Floor of Songdo Convensia, Incheon, Korea, jointly organized by Korea and Malaysia with China as a co-sponsor. The program engaged over 105 attendees from 17 APEC economies 3, representing government agencies, customs, law enforcement, research institutions, industry, and civil society. A diverse group of experts shared perspectives on enforcement challenges, technological advances, and opportunities for collaboration. The event's detailed agenda, and list of experts and attendees are presented in **Annexes A** and **B**.

The program brought forward a line of experts⁴ as speakers and moderators, from multidiscipline as follows, to share their knowledge and insights on the topic discussed:

Details/Remarks Time Session 8:45 - 9:15 Keynote Working groups' perspectives (EGILAT and SCCP) address 9:15 - 10:20Session 1 Dialogue on Enhancing Enforcement and Legal Timber Trade Practices through Stakeholder Collaboration: Economies' Perspectives (Malaysia; The Philippines; Chinese Taipei) representing EGILAT and Customs. 10:35 - 12:00 Session 2 Dialogue on Enhancing Enforcement and Legal Timber Trade Practices through Stakeholder Collaboration: NMPs' Perspective (China Chinese Academy of Forestry [CAF], International Tropical Timber Organization [ITTO], Korea Forestry Promotion Institute [KOFPI], United Nations Office on Drugs and Crime [UNODC]). 14:00 - 16:00Wood Identification Framework (Thünen Institute of Session 3 Wood Research, Germany, Forest Research Institute of Malaysia [FRIM], National Institute of

Table 1: Summary of Program

³ Australia; Brunei Darussalam; Canada; Chile; China; Indonesia; Japan; Korea; Malaysia; New Zealand; Peru; The Philippines; Papua New Guinea; Thailand; Chinese Taipei; The United States; Viet Nam.

⁴ The experts in this program referring to the Guest of Honor, speakers (including Keynote Speakers) and moderators. Total 18 of experts are involved in the program.

Time	Session	Details/Remarks
		Forest Science, Korea [NIFOS], Seoul National
		University of Korea)
16:00 – 16:30	Summary	EGILAT Chair and representative from ACTWG highlighted their views on the entire program. Members also shared their key takeaways for the mini-exhibition.
	Post-evaluation	Participants gave feedback/evaluation for the
		program.

2. Methodology

The project adopted a blended approach that combined policy dialogue, expert presentations, and experiential learning to strengthen enforcement and promote legal timber trade across the APEC region. A one-day program was structured around three main components:

- Multi-stakeholder dialogues to capture diverse perspectives from economies, enforcement agencies, research bodies, and civil society on challenges and best practices in timber legality.
- **Technical presentations** to highlight emerging innovations in wood identification, digital traceability, and enforcement frameworks.
- **Mini-exhibition** to showcase practical tools, specimen samples, and monitoring technologies, allowing participants to compare approaches and discuss opportunities for cooperation.

The program began with opening remarks from the host economy, Korea, followed by keynote addresses from the EGILAT Chair and the SCCP Vice Chair, whom stressed the importance of cross-fora collaboration. This was followed by two dialogue sessions: one focusing on economies' experiences with timber legality enforcement, and the other presenting insights from international organizations and non-member participants.

The afternoon featured a technical session on wood identification frameworks, where experts demonstrated anatomical, DNA-based, and Artificial Intelligence (AI)-powered methods for species verification. A moderated panel discussion identified lessons and future directions for integrating these tools into enforcement systems.

Throughout the day, the mini-exhibition provided participants with hands-on exposure to identification technologies, traceability platforms, and specimen collections. The interactive element enabled mutual learning, comparison of approaches, and identification of potential areas for regional collaboration.

The event concluded with a reflection session, where participants shared observations, and the EGILAT Chair, along with the representative of ACTWG summarized actionable outcomes. This structure ensured both high-level policy dialogue and practical exposure to enforcement innovations, generating outputs aligned with APEC's priorities on sustainable trade and cross-sector collaboration.

For comprehensive outcomes/deliverables and project effectiveness, the project is executed in accordance with the project framework as in **Annex C**.

The project outputs were delivered as follows:

Figure 1: Delivery of Projects Outputs

Output 1: Dialogue on Enhancing Enforcement and Legal Timber Trade Practices through Stakeholder Collaboration

Session 1: Economies' Perspectives

Moderator: Ms. HONG Chin Chin, Malaysia

- Dr. WU Chia-Chen,
- Chinese Taipei
 Attorney Ray Thomas F. KABIGTÍNG, The Philippines
- Mr. Razali bin HAIZIR, Malaysia

Session 2: NMPs' Perspectives

Moderator: Mr. Khairul ANWAR, Malaysia

- Dr. Chen YONG, CAF China
- Dr. Tetra YANUARIADI, ITTO
- iii.
- Mr. Jongmin HWANG, KOFPI, ROK Dr. Topan RENYAAN, UNODC iv.

Output 2: Dialogue on the Establishment of Wood Identification Framework for Legal Timber Trade

Session 3: Expert Presentation on Wood Identification for Legal Timber Trade

Moderator: Dr. Ratih DAMAYANTI, Indonesia

- Dr. Gerald KOCH, Thünen Institute of Wood Research, Germany
- Dr. Kevin Ng Kit SIONG, FRIM Dr. Hyumi Mi LEE, NIFOS, ROK Dr. Oh Kyung KWON, Seoul iii.
- National University of ROK.

Output 3: Mini-Exhibition

Moderator: Mr. Khairul ANWAR, Malaysia

- Exhibitor: i. KOFPI, ROK
- Malaysia Indonesia



Exploring how APEC economies are leveraging collaboration and technology to strengthen timber legality and enforcement



Showcasing global perspectives—NMPs highlight sustainable forest management, digital traceability, and multi-stakeholder cooperation.

Advancing innovation in enforcement: experts demonstrate DNA, AI, and anatomical tools for wood identification.



3. Key Discussion and Takeaways

3.1. Key Discussion

The project dialogues generated valuable insights into strengthening timber legality across the APEC region. Across all sessions, participants consistently emphasized the dual importance of innovation and collaboration as mutually reinforcing drivers of effective enforcement and sustainable trade.

This section summarize the key discussion for each project's outputs, i.e.

- 3.1.1. Dialogues on Enhancing Enforcement and Legal Timber Trade Practices through Stakeholder Collaboration that covered the perspective from
 - 3.1.1. Economies; and
 - 3.1.2. NMP.
- 3.1.2. Dialogue on Wood Identification Framework
- 3.1.3. Mini Exhibition

3.1.1. Dialogues on Enhancing Enforcement and Legal Timber Trade Practices through Stakeholder Collaboration

3.1.1.1. Session 1: Economies' Perspectives

Experts from Malaysia; The Philippines; and Chinese Taipei shared case studies on enforcement and trade, highlighting persistent gaps in coordination and the importance of bilateral and multilateral collaboration.

The session underscores that addressing the challenges of illegal timber trade strategic blend of collaboration and innovation. Their presentations illustrate how economies are strengthening enforcement capacity through inter-agency partnerships and the adoption of advanced technologies.

In Chinese Taipei, the use of DNA markers for species identification, or a QR code-based traceability system, and Al-driven wood image recognition demonstrates how **innovative tools can enhance transparency and detection in the supply chain**. These initiatives are embedded within a collaborative framework that engages forestry agencies, law enforcement, prosecutors, immigration authorities, and community patrols, ensuring enforcement is both comprehensive and inclusive.

The Philippines highlights a holistic approach through the development of The Philippine Forest Certification System, and National Forest Stock Monitoring System (NSFMS), driven by multi-stakeholder committees and domestic programs that link forestry and environmental priorities with broader resource management.

Malaysia emphasizes the operational value of collaboration by showcasing joint enforcement efforts between customs, forestry departments, police,

immigration, and wildlife agencies, while also introducing innovative tools such as the "Glossary HS Classification on Timber" to standardize enforcement practices and improve regulatory clarity.

Collectively, these examples reinforce a key policy lesson: effective enforcement in the timber trade is strengthened when economies align institutional mandates, share enforcement responsibilities, and embrace technological innovation. Building on these practices can help economies advance legal timber trade, enhance regional trust, and promote Sustainable Forest Management (SFM) across the APEC region.

Table 2: Comparison of Some Key Aspects Discussed for Session 1

Speaker	Economy/ Organization	Key Initiatives in Timber Legality	Notable Technologies/Tools	Enforcement Collaboration
Dr. Wu Chia- Chen	Chinese Taipei	DNA markers for species ID; Domestic QR code traceability system	DNA database; Insite sensors; AI for wood image ID	Forestry agencies, police, prosecutor office, immigration, community patrol
Atty. Ray Thomas Kabigting	The Philippines	Philippine Forest Certification System; NFSMS	Not explicitly stated in provided text	Presidential Mining Industry Environment Awards National Executive Committee, Mining Forest Program
Razali Haizir	Malaysia	MTIB/Forestry Dept. Sabah/Sarawak permit issuance; Glossary HS Classification on Timber	Not explicitly stated in provided text	RMCD, MAQIS, Police, Wildlife & National Park Dept., Forestry Dept. Peninsular Malaysia, Immigration Dept.

Figure 2: Summary of Key Highlights, Challenges and Recommendations for Session 1

Output 1: Dialogue on Enhancing Enforcement and Legal Timber Trade Practices through Stakeholder	Key Highlights	Technological Innovation Strengthens Timber Traceability and Enforcement	Multi-Agency Collaboration Enhances Enforcement Capabilites International Collaboration and Capacity Building Remain Essential	Policy and Regulatory Frameworks Enable Legal Timber Trade
Collaboration Session 1: Economies' Perspectives Moderator: Ms. HONG Chin Chin, Malaysia	Challenges	Limited availability of reference samples and incomplete DNA databases	Jurisdictional fragmentation and inconsistent enforcement Varying technical capacity across agencies Frequent changes in international regulations	Misdeclaration of products under incorrect codes and concealment of timber among other goods remain persistent issues
i. Dr. WU Chia-Chen, Chinese Taipei ii. Attorney Ray Thomas F. KABIGTING, The Philippines iii. Mr. Razali bin HAIZIR, Malaysia	Way Forward	Expand scientific research to develop robust identification databases, integrate AI and sensor-based systems and apply advanced analytics for rapid species verification	Institutionalize regular training and joint task forces, and develop shared reference tools Promote knowledge exchange, align domestic standards with international benchmarks, and engage in joint projects or technical assistance programs to build institutional readiness	Improve inspection systems at entry and exit points, refine HS classification tools, and enhance digital integration between licensing and customs systems

3.1.1.2. Session 2: NMPs' Perspectives

International organizations and research bodies, including CAF China, ITTO, KOFPI, and UNODC – emphasized the need for capacity building, technical cooperation, and stronger institutional linkages.

Session 2 brought together diverse perspectives from China, ITTO, Korea, and UNODC, all converging on the central role of collaboration in promoting legal timber trade.

Dr. Chen Yong (China) outlined how SFM underpins timber legality, emphasizing comprehensive legal frameworks, the "Forest Chief System" for accountability, scientific and technical support, and economic incentives. China's model illustrated how government, enterprises, and research institutions can jointly implement practices such as teak plantation and near-natural forest management, demonstrating innovation in blending policy and science with stakeholder participation.

Dr. Tetra Yanuariadi (ITTO) drew attention to the global shift towards "deforestation-free" market legislation and underscored ITTO's Legal Sustainable Supply Chains (LSSC) Programme, which leverages tools such as Global Timber Index (GTI), blockchain traceability systems, and the Green Supply Chain platform to foster innovation, enhance business collaboration, and strengthen forest governance through inclusive **multi-stakeholder engagement**.

Building on this, Mr. Hwang Jongmin (KOFPI, Korea) presented Korea's timber legality verification system under the "Act on the Sustainable Use of Timbers," highlighting how its domestic enforcement relies on **mutual recognition with trading partners and international certifications**. Korea **complements regulatory oversight with innovation** in wood identification, establishing a

Xylarium and applying Al-based tools and Near-Infrared (NIR) Spectroscopy, while collaborating with importers and public through information sessions and customer services.

Finally, Dr. Topan Renyaan (UNODC) emphasized enforcement innovation through the Passenger and Cargo Control Programme (PCCP), which strengthens interagency capacity to detect high-risk cargo, including timber. The programme prioritizes **establishing multi-disciplinary units, interagency task forces, and data sharing platforms**, while introducing advanced tools such as Xylotron for timber identification.

Across all four presentations, the key message was: **innovation and collaboration must hand in hand**. While technologies such as blockchain, Al, DNA profiling, and digital traceability offer powerful tools for enforcement, their effectiveness depends on shared databases, joint training, and coordinated implementation across economies. The session concluded that combating illegal logging and fostering sustainable forest management require **a concerted, multi-stakeholder effort** — bringing together governments, international organizations, the private sector, and local communities to align policies, and resources, and build resilient systems for legal timber trade.

Table 3: Comparison of Some Key Aspects Discussed for Session 2

Speaker	Organization	Key Focus	Enforcement/ Verification Mechanisms	Key Initiatives/ Approaches
Dr. Chen Yong	China (RIFPI, CAF)	Sustainable Forest Management (SFM) & Legal Timber Supply	Comprehensive Legal Framework, Forest Classification Management, Forest Chief System	Economic Incentives, Smart Forestry, International Collaboration, Cultivation Technologies
Dr. Tetra Yanuariadi	ІТТО	Sustainable Tropical Forest & Legal Supply Chains	Risk-based Systems/Due Diligence, Forest Governance Requirements	LSSC Programme (GGSC Platform, Timber Trade Portal, GLSTF), Sustainable Wood Use Promotion, IT Innovation
Mr. Hwang Jongmin	KOFPI	Verification on Timber Legality in Republic of Korea	Act against Illegal Timber Trade, Import Declaration Process, Document Inspections	Customer Support Service, Wood Identification (Xylarium, Al-based apps, NIR), Business Organization
Dr. Topan Renyaan	UNODC	Enhancing Enforcement & Legal Timber Trade	Passenger and Cargo Control Programme (PCCP), LEAP	Capacity Building, Inter-agency Cooperation, Data Collection (Xylotron, Dart MS/DNA, Mobile App), Targeting Bottlenecks, Collaboration

Figure 3: Summary of Key Highlights, Challenges and Recommendations for Session 2

Output 1: Dialogue on Enhancing Enforcement and Legal Timber Trade	Key Highlights	Multi-Stakeholder Collaboration Strengthens Enforcement and Supply Chain Integrity	Sustainable Forest Management (SFM) is Fundamental to Legal Timber Supply	Innovative Technologies and Traceability Systems are Essential for Effective Forest Monitoring and Ensuring Legal Timber Trade
Practices through Stakeholder Collaboration Session 2: NMPs' Perspectives	Challenges	Fragmented institutional responsibilities and limited stakeholder coordination across the supply chain	Disparity in understanding and implementation of SFM principles across regions; unsustainable practices	 High cost and limited local capacity to deploy and maintain advanced tools Difficulty in detecting false declarations Technical barriers in developing robust species databases
Moderator: Mr. Khairul ANWAR, Malaysia i. Dr. Chen YONG, CAF China ii. Dr. Tetra YANUARIADI, ITTO iii. Mr. Jongmin HWANG, KOFPI, ROK iv. Dr. Topan RENYAAN, UNODC	Way Forward	Create inter-agency platforms for coordinated enforcement, align roles/responsibilities, and build a culture of collaboration under clearly defined mandates	Broaden adoption of SFM through economies' strategies, ensure forest growth exceeds harvest rates, and promote forest multi-functionality (economic, social, and environmental)	Scale pilot technologies, promote capacity-building, and secure investment in real-time monitoring platforms and smart forestry systems Strengthen verification processes through digital customs integration, expand reference libraries (e.g., wood specimen exchanges), and benchmark global best practices in species identification

3.1.2. Dialogues on Wood Identification Framework

Session 3, Dialogue on Wood Identification for Legal Timber Trade, brought leading experts who presented a range of methodologies such as traditional anatomical analysis, DNA- based techniques, and advanced artificial Al-powered systems- for strengthening timber species identification and verification.

Dr. Gerald Koch (NMP) highlighted the continued importance of anatomical methods, supported by scientific collections and reference databases, while also acknowledging limitations in processed products.

Dr. Kevin Ng Kit Sion (Malaysia) emphasized the role of DNA barcoding and profiling for species-level accuracy and origin tracing, noting the challenges of DNA extraction and the need for comprehensive databases.

Dr. Hyun Mi Lee (Korea) outlined efforts to expand certified specimen collections and establish international wood identification databases, stressing their importance in meeting global regulatory requirements such as The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and the European Union Deforestation-Free Regulation.

Finally, Dr. Oh Kyung Kwon (Korea) presented research on Al-powered automation for microscopic feature detection, offering a transparent and scalable solution to overcome bottlenecks in traditional wood anatomy.

Discussions highlighted that while each identification method carries distinct strengths and limitations, international collaboration remains critical—especially in developing shared reference databases, strengthening technical capacity, and aligning with global regulations. Moreover, advances in Al applications, DNA databases, specimen libraries, and cross-verification systems demonstrate the transformative potential of technology in enhancing timber enforcement and verification.

Table 4: Comparison of Some Key Aspects for Session 3

Presenter	Focus Area	Key Points	Challenges / Limitations	Opportunities / Way Forward
Dr. Gerald Koch (Thunen Institute of Wood Research, Germany)	Anatomical Wood Identification	Gold standard; macroscopic & microscopic analysis; databases & apps (e.g., macroHOLZdata, CITESwoodID).	Slow, expert- dependent; less effective for processed wood products.	Maintain collections, expand reference libraries; strengthen scientific exchange.
Dr. Kevin Ng Kit Siong (Malaysia)	DNA Barcoding & Profiling	Species-level accuracy, forensic use, origin tracing, supports enforcement.	DNA extraction from processed wood is costly and often fails; it requires extensive genetic databases.	Build DNA databases, conduct training, and apply for CITES enforcement.
Dr. Hyumi Mi Lee (Republic of Korea)	Specimen Databases	Expanding certified wood sample collections; building international wood ID databases to meet regulations.	Resource- intensive; fragmented efforts across economies.	Promote international collaboration, joint projects, and capacity building.
Dr. Oh Kyung Kwon (Republic of Korea)	AI-Powered Microscopic Feature Detection	Automated, scalable, objective; "glass box" Al ensures verifiable results.	Requires large, high- quality image databases; early development stage.	Global cooperation to build shared datasets; scale automation to enforcement systems.

Figure 4: Summary of Key Highlights, Challenges and Recommendations for Session 3

Output 2: Dialogue on the Establishment of Wood Identification Framework for Legal Timber Trade

Session 3: Expert Presentation on Wood Identification for Legal Timber Trade

Moderator: Dr. Ratih DAMAYANTI, Indonesia

- Dr. Gerald KOCH, Thünen Institute of Wood Research, Germany
- ii. Dr. Kevin Ng Kit SIONG, FRIM
- iii. Dr. Hyumi Mi LEE, NIFOS, ROK
- iv. Dr. Oh Kyung KWON, Seoul National University of ROK.

Key Expert Presentations/ Discussion:

- (i) Dr. Gerald Koch (Germany):
- AI and global cooperation are essential for wood products under the newly emerging regulation.
- (ii) Dr. Kevin (MAS):
- Established DNA databases and SOP for enforcement and regulation efforts.
- (iii) Dr. Hyumi LEE (ROK):
- Building an international specimen database and cross-verification frameworks.
- (iv) Dr. Oh Kyung Kwon (ROK):
- Integration of techniques for advanced AI to overcome the current limitations.

Panel Discussion Insights

- Key elements: sustainable, database, applicability, and international cooperation.
- Supply chain improvement to ensure transparency for rapid legality verification.
- Need collaboration among each wood identification experts for timber legality.

Briefly, the technical dialogue showcased complementary methods:

- 3.1.2.1. Anatomical analysis remains a gold standard but is expert-intensive and less effective on processed products.
- 3.1.2.2. DNA barcoding enable high accuracy and origin tracing but requires extensive databases.
- 3.1.2.3. Specimen collections and databases are critical for global regulatory compliance but resource intensive.
- 3.1.2.4. Al-powered tools offer scalable solutions but depend on large, high-quality datasets.

Participants acknowledged that on international cooperation to build shared databases, expand technical capacity, and align with global regulations is essential.

3.1.3. Mini-Exhibition

The mini-exhibition highlighted innovative solutions that strengthen timber legality efforts. It highlights the cutting edge technologies such as Korea's portable NIR and Albased wood identification tools, and Indonesia's AIKO-KLHK (Automatic Wood Identification System), both of which improve speed, accuracy, and credibility in enforcement and legal verification processes. Malaysia's exhibition emphasizes digital transformation initiatives, including satellite monitoring, centralized geospatial system, and integrated digital platforms, all underscoring the role of advanced technology in tackling illegal logging and streamlining timber trade monitoring. Meanwhile, the exhibition also underscores the importance of cross-agency cooperation, private sector engagement, and community participation. Together, these elements directly advance the project's objectives of enhancing enforcement capacity and promoting a legal, transparent, and sustainable timber trade.

Table 5: Summary on the Mini-exhibition

Economy / Name of Exhibitor	Brief Description of the Exhibition (Key Technologies/Strategies)
Korea/ Korea Forestry	Demonstration and introduction of Portable NIR (Near
Promotion Institute	Infrared Spectroscopy) and Al-Based Wood Species
(KOFPI)	Identification Technologies.
Indonesia/ National	Demonstrate on AIKO-KLHK, an automatic wood
Research and	identification system available as a free application, with the
Innovation Agency	database encompassing almost 1,800 species of
	Indonesian and imported species.
Malaysia/ Forestry	Video presentation on the technologies and strategies
Departments of	adopted uniquely by the forestry departments from the
Peninsular Malaysia,	region of Peninsular, Sabah and Sarawak – focusing on
Sabah, and Sarawak;	digital innovation in timber enforcement, and collaborative
and Sarawak Timber	efforts to combat illegal logging and promote sustainable
Industry Development	timber trade. This includes Sarawak's Integrated Digital
Corporation.	Ecosystem (TEAMS, Revlog, EFIMS, Digital Portals,
	TRACE, ePermit), Peninsular's "War Room" with daily
	satellite monitoring and a centralized geospatial database
	(e-Geospatial Perhutanan), and Sabah's intelligence-led
	Problem Oriented Enforcement (POE) with specialized
	units like the PROTECT Team and a K9 Unit.

Figure 5: Reflection on the Mini-exhibition



3.2. Key Takeaways

Three main points drawn from the discussions of EGILAT 01 2025S are as follows:

3.2.1. Governance and Cross-Fora Collaboration

Opening remarks by Korea noting the linkages of the project with the APEC Korea 2025 theme. Whereas, in the keynote speeches, the need for integrated efforts and collaborations across customs, forestry, and enforcement agencies and researchers/ experts were highlighted. Key proposal included:

- 3.2.1.1. Through data sharing, risk profiling, technology for traceability, single windows, mutual recognition, and joint border operations to support an integrated approach;
- 3.2.1.2. Developing shared timber legality frameworks and updating the Timber Legality Guidance Templates (TLGT); and
- 3.2.1.3. Mainstreaming technological solutions such as e-certification, digital traceability, and online verification.

Participants noted that the coordinated cross-fora engagement, particularly with ACTWG and SCCP, is essential for improving operational efficiency and closing gaps exploited by illegal trade.

3.2.2. Role of Technology and Innovation

Discussions underscored the transformative potential of emerging technologies for species identification and supply chain transparency. DNA testing, AI-driven verification and blockchain-based traceability systems were recognized as powerful tools to combat misdeclaration and improve monitoring. Barriers such as high costs, an insufficient specimen database, and uneven capacity were acknowledged. Solutions included scaling pilot projects, expanding international reference libraries, and investing in training.

3.2.3. Policy and Regulatory

Participants highlighted persistent challenges such as misdeclaration of timber products, concealment of shipments, and shifting global market requirements. Recommendations included refining Harmonized Standard (HS) classification tools, strengthening inspection systems, and promoting digital integration between customs and licensing. Blockchain, single-window customs systems, and digital certificates of origin were identified as promising innovations for harmonizing enforcement.

In addition, delegates noted that SFM is the foundation of a legal sustainable timber supply chain. Ensuring regeneration exceeds harvest and balancing forests' economic, social, and ecological functions were identified priorities. However, the disparities in applying SFM principles across economies remain requiring stronger knowledge exchange and capacity building. Accordingly, economies are encouraged to align SFM principles to promote coherence and consistency across the region.

3.2.4. Summary

The project successfully convened key stakeholders in the timber supply chain to foster networking, share best practices and innovations in timber legality and enforcement, and identify actionable collaboration opportunities across APEC for at advance sustainable legal timber trade.

3.3. Conceptual Structure of EGILAT Timber Legality Enhancement Framework

The EGILAT Timber Legality Enhancement Framework (TLEF) presented in Diagram 1 encapsulates the collective findings and discussions from the APEC EGILAT 01 2025S. It outlines a holistic approach to achieving a **transparent**, **resilient**, **and sustainable legal timber trade**, structured around three interrelated focus areas: Technology and Innovation, Governance and Collaboration, and Policy and Regulation.

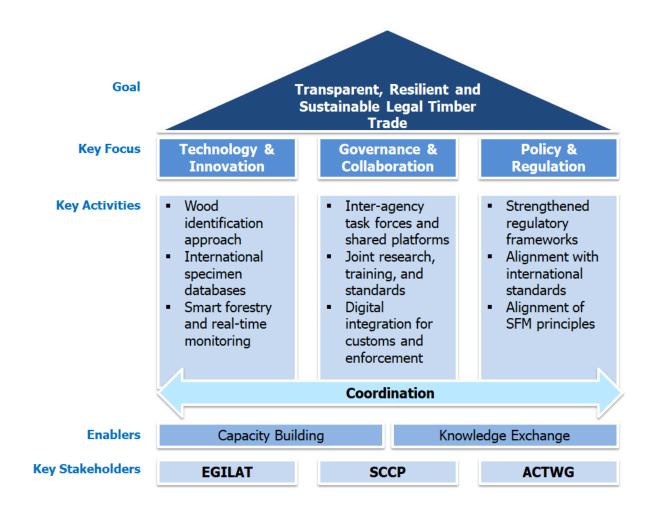
Under **Technology and Innovation**, participants underscored the importance of leveraging advanced tools and digital systems, and strategic approaches to enhance timber legality verification. Key initiatives discussed include the development of robust wood identification technologies, the establishment of international specimen databases, and the implementation of smart forestry applications for real-time monitoring and datadriven decision making.

The **Governance and Collaboration** component emphasized the need for stronger and structured inter-agency cooperation and the creation of shared platforms among customs authorities, enforcement bodies, and research institutions. The discussions highlighted the benefits of joint research, training, and the development of common standards, alongside digital integration mechanisms that facilitate information exchange and coordinated enforcement across borders.

In the area of **Policy and Regulation**, participants recognized the necessity of strengthening regulatory frameworks and ensuring alignment with international standards and Sustainable Forest Management (SFM) principles. Such policy coherence is critical to supporting transparent trade mechanisms, promoting market confidence, and reducing opportunities for illegal timber and associated trade.

Finally, the discussions identified capacity building and knowledge exchange as key enablers that underpin all areas of focus, ensuring sustained progress and long-term institutional resilience. Effective coordination among APEC fora, namely – EGILAT, SCCP and ACTWG was highlighted as essential for integrating technological, governance, and policy dimensions to advance collective regional efforts toward sustainable and legal timber trade.

Diagram 1: Conceptual structured of EGILAT Timber Legality Enhancement Framework (TLEF)



3. Project Evaluation

Women made up 57% of attendees—excluding speakers and experts—demonstrating strong alignment with the La Serena Roadmap for Women and Inclusive Growth (2019–2030). Women currently represent a smaller share of experts at 27%, reflecting the male-dominated nature of forestry, enforcement, and research. However, in general, this also highlights significant potential to further expand women's participation as experts in future EGILAT initiatives. As recorded, the program surpassed its initial targets for both expert and economy participation, engaging 18 experts (118% of target) and 17 economies (130% of target). This strong turnout reflects the **high level of interest and commitment across APEC** in advancing legal timber trade. It also demonstrates the program's success in attracting diverse expertise and broad regional representation, strengthening its credibility and potential for impactful outcomes.

A post-event survey of 39 participants confirmed the project's high relevance to economies' enforcement, trade priorities and, in some cases, its indirect relevance through links to governance and corruption issues. The project's results and achievements were consistently recognized as significant, particularly in terms of knowledge sharing, enhancing awareness of best practices, strengthening collaboration across fora, and successfully delivering meaningful outcomes.

In terms of capacity building, respondents highlighted the acquisition of new skills and knowledge related to advanced technologies such as DNA markers, A.I. technology and wood identification systems, understanding the role of research institutions in promoting traceability, exposure to different technical solutions, and opportunities to learn from the perspectives and experiences of other economies. This contributed to a stronger foundation for both technical enforcement and policy-level discussions.

Knowledge levels after participation were generally rated as high or very high, with respondents noting that the event/ program improved their understanding of wood identification technologies and technical approaches to timber legality. Some participants, however, pointed out that certain subjects were highly technical and difficult to follow in depth.

Looking forward, participants suggested that APEC may prioritize next steps such as developing more cross-fora initiatives, preparing additional concept notes, continuing engagement across working groups, and strengthening monitoring of legal timber trade. These proposals underscored the importance of sustaining momentum and linking the project's outcomes to future collective or economy-level actions.

Regarding improvements, several respondents recommended extending the project's duration to allow deeper discussions, ensuring a more balanced focus beyond a few economies, and creating more opportunities for interactive exchanges. Others felt that the project was already well implemented, with comments such as 'good enough' and 'all is great', reflecting overall satisfaction with its structure and delivery.

4. Conclusion and Recommendation

The EGILAT 01 2025S project successfully advanced dialogue and cooperation on promoting legal timber trade across APEC. By integrating policy discussions, technical expertise, and practical exhibitions, it reinforces the importance of both innovation and collaboration in strengthening enforcement systems.

Emerging technologies such as AI, DNA barcoding, specimen databases, and traceability tools were recognized as critical for tackling misdeclaration and improving transparency. SFM was reaffirmed as the foundation of sustainable supply chains, while the need for stronger inter-agency coordination and harmonized policies was highlighted as a priority.

At the APEC level, advancing legal timber trade requires sustained commitment to both collaboration and innovation. Building on the momentum of this initiative, several pathways can further strengthen regional cooperation and maximize shared benefits. First, expanding cross-fora and inter-agency collaboration offers a strong opportunity to build on existing partnerships between forestry, customs, law enforcement, and judicial authorities, such as the Network of Anti-Corruption Authorities and Law Enforcements Agencies (ACT-NET). Institutionalized discussion/ regular dialogues, joint task forces, and coordinated training will not only improve enforcement efficiency but also foster mutual trust and understanding across economies and stakeholders. This collaborative spirit will allow member economies to respond more effectively to the shared challenges while amplifying the impact of collective action. Thus, to signify the EGILAT, SCCP and ACTWG commitment and efforts in advancing legal timber trade in the region, delivering a unified statement, highlighting shared common goals and commitment to conduct concrete activities, as a launching pad to boost the momentum of the collaboration.

Second, the region is well placed to harness the potential of APEC should support the adoption and scaling of **innovative technologies**. DNA barcoding, Al-based wood identification, and digital traceability systems have already shown promising results in pilot applications. Scaling these tools will enhance supply chain transparency, strengthen enforcement, and open new opportunities for technological leadership within APEC. Shared reference databases and targeted capacity building initiatives will further enable economies to adopt these tools on ways tailored their local contexts.

Third, policy and regulatory alignment represent an important step toward building trust in regional and global markets. By harmonizing timber classification systems, certification protocols, and customs procedures, APEC can help ensure that legal timber trade flows smoothly across borders while reducing compliance costs for businesses. Digital integration of systems such as e-certification and single-window customs platforms will create more transparent and efficient trade environments that benefit both governments and industry. In addition, EGILAT to consistently promote and optimize the Timber Legality Guidance Template (TLGT) and compendium of resources⁵ within the cross-fora as a tool to provide clarity and transparency for stakeholders on what constitutes legal timber trade within individual APEC economies.

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⁵ The Compendium of Resources for the Facilitation of the Trade and Distribution of Legally Harvested Forest Products in the APEC Region (2021); and Compendium of Resources for the Facilitation of the Trade and Distribution of Legally Harvested Forest Products in the APEC Region (2024)

Fourth, **expanding stakeholder engagement** offers significant value in reinforcing accountability and inclusivity. Actively involving the private sector, local communities, and civil society in certification programs, monitoring, and compliance processes will strengthen the legitimacy of timber legality systems. This whole-of-society approach can also foster innovation, encourage shared responsibility, and build stronger connections between forest governance and local livelihood.

Finally, **sustaining the momentum** from this project through follow-up initiatives will economies to continue building on progress achieved. The conceptual structure of TLEF can be utilized to guide the formulation of cross-fora initiatives. In addition, future projects can focus on strengthening specimen databases, expanding digital traceability platforms, or piloting block chain based customs solutions. In doing so, it contributes to achieving the APEC Putrajaya Vision 2040 of an open, dynamic, resilient Asia-Pacific that delivers prosperity for all people and future generations.

Collectively, these efforts reaffirm APEC's role as a global driver of innovation, cooperation, and sustainable growth in the legal timber sector.

Annex A

Tentative Programme and Annotated Agenda

Time	Annotated Agenda
8.30 – 8.45 a.m.	Registration
Mini-Exhibition	
8.30 a.m 5.00 p.m.	Session 1: Touring at Mini-Exhibition
	Participants visit the mini-exhibition, obtain and exchange information with the exhibitor, and network with fellow participants on enforcement, legal timber trade, and related innovation. They also discuss the potential area of collaboration.
Opening Session	
8.45 a.m. – 9.15 a.m.	Welcoming remarks (10 min)
	- The host of APEC 2025, Dr. Myung-gil KIM, Director General, National Institute of Forest Science (NIFOS), The Republic of Korea (ROK)
	Keynote speech by
	- Mr. Sung KIM , The Vice Chair of the Sub-Committee on Customs Procedures (<u>SCCP</u>)
	- Madam Noraihan ABDUL RAHMAN, The Chair of the <u>EGILAT</u>
	The ROK welcomes the participants and chart/relate the program's expected contribution to the APEC hosting theme.
	The Chair for each working group presents/ outlines the significance of collaboration and potential key areas (common elements) for cooperation that complement the working groups' focuses. In addition, based on their mandates and existing or future projects/plans to promote legal timber and associated trade through enhanced stakeholder collaboration for effective implementation and enforcement. Moreover, to address concerns that hinder the legal timber trade in the Asia-Pacific region. All the Chairs to concur (express) agreement for effective (active) and comprehensive dialogue, periodically.

Time	Annotated Agenda
Stakeholder Collaboration	
9.15 a.m. – 10.00 a.m.	Session 1: Economies Perspective (15 mins/speaker) Moderator: Ms. HONG Chin Chin, Malaysia
	 EGILAT: Dr. WU Chia-Chen, Chinese Taipei EGILAT: Attorney Ray Thomas F. KABIGTING, The Philippines Customs: Mr. Razali bin HAIZIR, Malaysia
	Economy shares their best practices/ case study on collaboration in enhancing enforcement and legal timber trade domestically and internationally . In addition, it highlights areas for improvement and outlines potential collaboration and/ or innovation that can be offered bilaterally/ APEC to enhance enforcement and legal timber trade.
10.00 a.m. – 10.20 a.m.	Panelist Discussion and Q & A
10.20 a.m 10.35 a.m.	Coffee break
10.35 a.m. – 11.35 a.m.	Session 2: NMP Perspective (15 mins/speaker) Moderator: Mr. Khairul ANWAR, Malaysia
	Dr. Chen YONG, Chinese Academy of Forestry (CAF), China
	Dr. Tetra YANUARIADI, International Tropical Timber Organization (ITTO)
	Mr. Jongmin HWANG, Korea Forestry Promotion Institute (KOFPI), ROK
	Dr. Topan RENYAAN, United Nations Office on Drugs and Crime (UNODC)
	Civil society shares their approaches to enhance collaboration in promoting legal timber trade and enforcement.
11.35 a.m 12.00 noon	Panelist Discussion and Q & A
12.00 noon – 2.00 p.m.	Touring at Mini-ExhibitionLunch

Time	Annotated Agenda		
Dialogue on the Establish Trade	Dialogue on the Establishment of Wood Identification Framework for Legal Timber Trade		
2.00 p.m. – 2.10 p.m.	Introduction		
	The ROK present a brief seminar introduction with two (2) objectives:		
	(i) First, this session aims to share the current status of wood species identification technology, and implementation cases of system operation for wood identification for legal timber trade as well as its future prospects from EU; ROK and Malaysia.		
	(ii) Second, discussions and Q&A session conducted between speakers and participants to generate key elements for enforcing legal timber law enforcement as well as tracking illegality.		
2.10 p.m. – 3.10 p.m.	Session 3: Expert Presentation on Wood Identification for Legal Timber Trade (15 mins/speaker)		
	Presenter 1: Dr. Gerald KOCH , Thünen Institute of Wood Research, Germany		
	Presenter 2: Dr. Kevin Ng Kit SIONG , Forest Research Institute Malaysia (FRIM)		
	Presenter 3: Dr. Hyumi Mi LEE , National Institute of Forest Science (NIFOS), ROK		
	Presenter 4: Dr. Oh Kyung KWON , Seoul National University of ROK.		
3.10 p.m. – 3.30 p.m.	Coffee Break		
3.30 p.m. – 4.00 p.m.	Panel Discussion and Q&A session		
	Moderator: Dr. Ratih DAMAYANTI, Indonesia		
	Four (4) presenters and Professor Dr. Seo Jeong-wook of Chungbuk National University, provide their insights on developing key elements for law enforcement of legal timber and tracking illegality. A Q&A session regarding presentation topics and panel discussion themes, followed		
Closing Session			
4.00 p.m. – 4.15 p.m.	Reflection on the mini-exhibition experiences		
	Moderator: Mr. Khairul ANWAR, Malaysia		

Time	Annotated Agenda
	The moderator randomly obtains feedback/responses from participants on their observations over the mini-exhibition, reflecting on lessons learned, and indicating which area they can potentially adapt to collaborate/enhance collaboration.
4.15 p.m. – 4.45 p.m. (10 min/working group)	Closing remarks
	The Chair/ representative of EGILAT, ACTWG, and SCCP to infer the response in the panelist discussions and observation at the mini-exhibition, and summarize the actionable outcome of the dialogues, and mini-exhibition. Furthermore, to note the actionable way forward for the working groups to enhance collaboration in APEC.
4.45 p.m. – 5.00 p.m.	Group photo session

Annex B

Table: List of speaker and experts for the APEC EGILAT Project 01 2025S

No.	Economy/ Organization	Name	Role	Sector
1.	China	Dr. Chen Yong	Speaker	Researcher
2.	Indonesia	Dr. Ratih Damayanti	Moderator	Researcher
3.	Republic of Korea	Dr. Mung-gil Kim	Guest of Honor/ Director General, National Institute of Forest Science (NIFOS)	Researcher
4.		Mr. Sung Kim	SCCP Vice Chair	Customs
5.		Dr. Hyun Mi Lee	Speaker	Researcher
6.		Dr. Oh Kyung Kwon	Speaker	Researcher
7.		Mr. Jongmin Hwang	Speaker	Industry
8.		Professor Dr. Seo Jeong- wook	Panelist	Researcher
9.	Malaysia	Madam Noraihan binti Abdul Rahman	EGILAT Chair	Industry
10.		Mr. Razali bin Haizir	Speaker	Customs
11.		Dr. Kevin Ng Kit Siong	Speaker	Researcher
12.		Ms. Hing Chin Chin	Moderator	Anti-corruption
13.		Mr. Khairul Anwar	Moderator	Industry
14.	The Philippines	Attorney Ray Thomas F. Kabigting	Speaker	EGILAT
15.	Chinese Taipei	Dr. WU Chia Chen	Speaker	EGILAT
16.	International Tropical Timber Organization (ITTO)	Dr. Tetra Yanuariadi	Speaker	Non-member Participant (NMP)
17.	The United Nations Office on Drugs and Crime (UNODC)	Dr. Topan Renyaan	Speaker	NMP
18.	Thünen Institute of Wood Research, Germany	Dr. Gerald Koch	Speaker	NMP

Annex C

Project Framework for the APEC EGILAT 01 2025S

OUTCOME

- 1. Strengthened relationships and coordination between government agencies, industry players, civil society, and multilateral organizations involved in timber trade enforcement.
- 2. Clear, actionable steps to enhance enforcement of timber legality measures, addressing gaps and inconsistencies in policies across different economies.
- 3. Exchange of best practices among APEC economies, highlighting successful approaches to promoting legal timber and enforcing trade regulations.
- 4. Increased knowledge and capacity among stakeholders to implement and enforce timber legality measures, fostered through expert presentations, discussions, and training.
- 5. Greater alignment and cooperation between different working groups and fora (e.g., EGILAT, ACTWG, SCCP) in APEC, creating a unified approach to timber trade issues.

 OBJECTIVE
- 1. Provide a **networking platform and inculcate relevant stakeholder (interdisciplinary) engagement** and coordination to promote legal timber and associated trade through the understanding on its significance.
- 2. Exchange of **views, information, experiences, and analyses based on real-time case studies, best practices, innovations,** and relevant matters on promoting legal timber through stakeholder collaboration, within APEC economies.
- 3. **Outline potential collaboration/ concrete steps/ actions** (approaches) toward enhancing APEC cross-fora and stakeholders to promote legal timber and associated trade in the Asia Pacific region.

FOCUS AREAS							
Legality standards	Transparency and Traceability	Government Oversight and Enforcement	Market Access and Trade Facilitation				
SCOPE							
APEC member economies, law enforcement bodies, industry stakeholders, civil society	Upstream to downstream of timber process (harvesting, processing, transporting and trading)	Law, enforcement and governance - producer and consumer economy	Domestic and international collaboration/ engagement				
OUTPUT							
Dialogue session on Enhancing Enforcement and Legal Timber Trade Practices through Stakeholder Collaboration	Mini-exhibition	Dialogue on Wood Identification for Legal Timber Trade	Project Summary Report - Outline of potential collaboration within and beyond APEC EGILAT				