RAFT
Responsible Asia Forestry and Trade

High Time for Timber Tracking to Go High Tech?

The world is changing faster than ever, and the global trade in timber products is no exception.

New laws in major consumer markets like the United States and the European Union have stepped up pressure on importers to know where the timber they use comes from and to be able to prove that it was taken and traded legally. Follow the timber supply chain a little further and we see suppliers that want to maintain or gain access to these markets facing the same expectations from their buyers overseas.

In major wood producing and processing countries too, new policies demanding increased transparency and accountability of the forest products industry are raising the bar, in some cases altering traditional concepts of monitoring and enforcement.

Can technology help governments and businesses stay competitive in this changing environment?

The wide range of options is exciting, however discussions with forestry and trade regulators and experts in Asia suggest that technology alone is not the answer. Rather, it is a combination of a strong policy framework and finding the type of technology – high or low tech – that is the best fit with the objectives of a timber legality assurance system[1] and the capabilities of those who will use it.

[1] Refers to a system for ensuring that only legally produced timber is licensed for export.

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Talking About Technology

Current timber tracking technologies vary in complexity and the level of detail they are able to provide. In most tropical timber producing countries today, traditional, lower tech methods remain the norm. But there is growing interest in strengthening existing timber tracking systems to improve the credibility of claims of legality. Technology offers part of a broader reform effort needed to ensure that timber tracking systems do their job well.

A selection of technologies being used and considered today along with some observed strengths and challenges are listed in the table below. The table is not comprehensive and serves as a guide only. Many of the technologies listed are complementary and may be used together.

Technologies	Strengths	Challenges
Wood Anatomy Wood is inspected for physical characteristics.	A good first line of defense to identify species once wood products have been seized, with no complex technology required.	Inefficient, requiring substantial expertise to inspect and accurately identify each piece of wood.
Barcoding Barcodes fixed to timber provide an identification number that can be scanned and transferred electronically to a timber tracking database.	A relatively low-cost technology that tracks individual logs and is difficult to forge.	Barcodes often become detached from the products they are meant to identify and are also difficult to maintain after processing, where wood from multiple sources is often combined.
Remote Sensing Satellite imagery of the forest canopy identifies the location and species of individual trees in a specified area.	Can be used to support a barcoding system with species information, though it is unclear if this can be reliably used in tropical forests.	Requires substantial expertise and high investment in remote sensing technology, regular mapping and ground-truthing.
DNA Fingerprinting DNA samples are extracted and cross-checked against other DNA samples to find a match.	Provides reliable identification of species. Provides reliable identification and chain of custody of individual log to stump.	Requires high investment in establishing databank of DNA samples from known species to check unknown specimens against. Requires a high quality of DNA, which can be hard to acquire.
Isotopic Fingerprinting Samples undergo an analysis of their isotopic composition and are cross-checked against other 'isotopic fingerprints' to find a match.	Provides reliable identification of geographic origin on a regional scale.	Requires substantial expertise and high investment in lab equipment and initial sampling to build databank.

Combating Illegal Logging and Promoting Legal Trade in Legally Harvested Forest Products

The conversations and interviews captured in this newsletter took place July 2011 in Kuala Lumpur, Malaysia at a workshop on the role of timber tracking technology in promoting transparent timber trade in Asia. The event was jointly hosted by the United States Forest Service, TRAFFIC – the Wildlife Trade Monitoring Network, the European Forest Institute's (EFI) EU-FLEGT Asia Programme and the Responsible Asia Forestry and Trade program (RAFT).

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Setting New Standards

Over the last decade, a growing number of timber producing and processing countries have started to tighten and reform the rules and regulations governing the forest products trade. These efforts, together with actions taken by the private sector and civil society, have already helped reduce illegal logging by an estimated 50-75% percent in some countries.[2]

In 2010 for example, Indonesia introduced its new timber legality assurance system – *Sistem Verifikas Legalitas Kayu,* or SVLK – to ensure the transparent and independent verification of companies' compliance with Indonesian forest law. Under the new system all forest management units and factories producing forest products for export must be audited by an accredited verification body and certified as legal. In China, the State Forestry Administration is working with businesses, industry associations, academics and NGOs to develop a system designed to verify the legality of timber from both domestic and imported sources.

At the regional level too, the Association of Southeast Asian Nations (ASEAN) has endorsed a set of Regional Chain of Custody (CoC) Guidelines for Legal and Sustainable Timber. In 2015, when the ASEAN Economic Community comes into effect, all Members States are expected to have in place national CoC systems that satisfy the regional guidelines as a minimum common standard.

Voluntary Partnership Agreements (VPAs) between the EU and timber trading partners require a means to trace FLEGT-licensed timber back to known legal origins. Laws in major markets like the U.S. and the EU also place pressure on importers to require the same level of traceability from their suppliers.

This is all good progress, but even where impressive reforms have been made the journey from a good policy to widespread better practices on the ground can take upwards of a decade, or longer.

How can technology help make the leap from good policies and system design to more verifiably legal and sustainable timber flowing from Asia to global markets?

Putting Technology to the Test

Most agree that new technologies create opportunities for capturing and sharing information that can and should be used to help take timber traceability and legality verification to a new level of efficiency, transparency and credibility. It is the questions of which technologies, and how they are best used in different contexts and systems that are less straightforward.

Ultimately these are questions that must be answered by those tasked with using, monitoring and regulating the systems in different places, ideally through a careful and participatory cost-benefit analysis. As a growing number of governments and businesses begin to seriously consider the role of technology in their timber traceability and legality verification systems, there are a number of key considerations that should inform such analyses to help make the most of available technologies.

Ticket to transparency?

"Technology is only as good as the capacity to employ it, and to act on the data that a system collects."

Derek Charter, Helveta, UK

As a growing number of regulatory frameworks encourage the involvement of multiple stakeholders in timber legality monitoring and verification, accessibility and user-friendliness of timber tracking technology must be a key consideration. "Increasing transparency across the supply chain isn't just about companies; everyone must be able to access information along the way" says Balu Perumal of the Global Environment Center.

[2] Lawson, Sam and MacFaul, Larry. 2010. *Illegal Logging and Related Trade: Indicators of the Global Response.* Chatham House.

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Take Indonesia's SVLK system, in which civil society organizations play the role of independent monitors. To support transparency in Indonesia, technology used to track timber must be accessible and easy to use not only for the companies deploying the systems but for civil society monitors as well.

As new technologies are adopted by regulators and companies, adequate information must be disseminated and appropriate training programs designed for civil society monitors so that they are able not only to use the technology, but to readily access and apply the information collected to help improve management practices. As Diah Raharjo of Indonesia's Multistakeholder Forestry Programme (MFP) describes: "There is still a need to build capacity in the monitoring of documentation; we haven't even discussed technologies yet."

Rules of the game

"You need the policy first; then you can find supporters."

Eang Savet, Forestry Administration, Cambodia

One thing most countries agree on is the importance of a regulatory framework that outlines the need for timber tracking technologies and sets the parameters for how they will be used. Without a clear link to a stated policy objective, the costs of employing a new approach or technology can be difficult to justify to high-level decision makers.

A policy framework also provides the formal endorsement for technical government staff to work with researchers, businesses and civil society and raise external funds to explore and test different technology options. Research findings and results can then be used as evidence of a technology's effectiveness, further justifying larger public investment. "You have to pilot the technology with companies to test and show the government that it is a good system to improve transparency and governance, and ensure a good market price," says Eang Savet of Cambodia's Forestry Administration.

A clear policy framework also provides guidance for companies seeking to market themselves as responsible and sets a minimum industry-wide standard as a starting point for low-performing companies with limited market-based incentives to improve their management systems.

Re-booting mindsets

"You need technologies that help change mindframes."

Jonathan Geach, Double Helix Tracking Technologies, Singapore

It is important to look at technology not only as a tool to achieve a pre-determined outcome but also as a resource offering new ways of thinking about old problems. From this angle, it is not as simple as policy dictating the type of technology that is the best option in a given context. Technology can also be used to inform and inspire new and strengthened regulatory frameworks designed to make the most of available tools and knowledge to bring more credibility to the wood products industry.

Here the issue of accessibility is once again critical. "If people have access to the different technologies, it helps them to think about different ways to use or change the technology. That's how technology can be transformative." says Brook Milligan, a populsyion genetics expert from New Mexico State University in the U.S. "If the goal is to change the way people think about forestry and trade, the technology needs to be accessible enough that people are able to come into contact with it." Technology is still not popular," adds the MFP's Diah Raharjo. " More effort is needed to raise awareness of timber tracking technologies with government and academia, to look at how academics can work with government to inform policy-making about how to promote timber technology in Asia."

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Calculating cost

"Cost goes both ways. There is a lot of unrecovered cost in lost government revenue."

Brook Milligan,
New Mexico State University, U.S.

Not surprisingly the cost of using new technologies and systems to perform the not-so-new tasks of timber tracking and legality verification is at the top of the list of potential barriers to technology uptake for all stakeholders involved.

Although the costs of reforming or upgrading existing systems may seem large at the outset, there is plenty of evidence that they are outweighed by longer term efficiencies and savings, some of which do not have to take very long to materialize. For example, paper systems may appear less expensive because the institutions and the procedures established to deal with the paperwork have been around for decades, but they require a lot of manpower to verify documentation all along the supply chain. Technology may present opportunities to reduce these costs and help governments redeploy staff to other tasks such as monitoring and enforcement. For businesses too, traceability systems often reveal waste and other opportunities for efficiencies in the supply chain that yield savings over time.

A thorough and comprehensive cost-benefit analysis can help bring some of these less obvious savings to light. Such an analysis should also take into account the broader context of related areas of forestry operations, such as forest inventories and other management systems, which can also benefit from investments in technology and related capacity building or re-structuring.

Grappling with governance

"Issues of taxation and corruption are a problem, but this is a separate issue."

Chen Hin Keong, TRAFFIC, Malaysia

While timber legality verification systems are not designed to target corruption head-on, the increased transparency and accountability they require often reduce opportunities for corruption and fraudulent behavior along the supply chain. In Indonesia for example, SIPUHH-online,[3] a new electronic timber tracking system, enables monitoring of payments by companies to the National Reforestation Fund, as required by law, for the first time. "In the past we didn't know how many logs were harvested and how much revenue was owed to the Reforestation Fund," says Alan Purbawyatna of Lembaga Ekolabel Indonesia (LEI).

Introducing random spot checks, such as taking DNA samples, into an existing timber tracking system can also help improve law enforcement by identifying where illegal activity, and possible corrupt behavior, is most likely to be taking place. To date, penalties for such acts remain low, but prosecutions or other penalties, like the recent US$ 350,000 fine paid to the U.S. government by Gibson Guitar, could change that. Here again, clear linkages to a national policy priority with high-level support can provide the political motivation needed to strengthen enforcement.

Credible timber legality verification systems can also help discourage corruption by enabling consumers to reward corruption-free supply chains through their product choices. Timber tracking technologies have an important role to play in making the evidence to support claims of legal and 'clean' supply chains readily available. Companies can use this evidence to enhance marketing strategies by educating their consumers and promoting responsible wood products.

[3] Refers to *Sistem Informasi Penatausahaan Hasil Hutan* (Information System for Forest Products Administration).

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Big leaps start with little steps

"If you try to put in place a high-tech system all at once, you'll feel it's quite difficult, but if you establish a system over time, beginning with a responsible purchasing policy, then setting up a database and so on, step-by-step, it is much more manageable."

Xie Na, WWF-China

As with any new system, it is often the novelty itself that is the most difficult hurdle to overcome. While the end goal of setting up a transparent and credible timber legality verification system using a combination of the appropriate technologies is daunting, it becomes a lot easier to digest when broken down into manageable and necessary steps. These steps reveal a seemingly insurmountable task to be easier and more affordable than expected. They also ensure that a strong foundation – such as the required human and organizational capacity – is in place from the beginning helping to avoid system breakdown and poor return on investments in technology later on. "There is a tendency for governments to think about the need for the traceability system, and not so much about the capacity building," says Helveta's Derek Charter. "But you actually need to have all the training and capacity building for how you use the system first. You need staff that don't yet exist."

Organizations like WWF, TFT (The Forest Trust), the Tropical Forest Foundation (TFF) and others have developed 'stepwise' processes that allow companies to track their progress from an individual baseline, to traceability, legality and ultimately to full sustainability or Forest Stewardship Council (FSC) Chain of Custody certification, with multiple steps in between. "We face a lot of challenges in developing countries, mostly in social aspects," says LEI's Alan Purbawiyanta. "Technology requires a phased approach; training staff and socialization takes time."

Globally compatible?

"The question is how to match technology with real conditions – forest conditions and policy conditions, and also how to match it with international forest policy."

Su Haiying, Centre for International Forest Products Trade, State Forestry Administration, China

New laws in major consumer markets, like the amended Lacey Act in the U.S. and the EU Timber Regulation (EU TR), hold importers responsible for taking the necessary steps to ascertain the legality of the products they import and sell – taking 'due care' or doing their 'due diligence'. Importantly, neither law recognizes any single verification or certification standard as a guarantee of legality and both defer to existing national laws in countries along the supply chain – rather than creating new standards and definitions – to determine what is legal and what is not.[4] Timber tracking technologies can play an important role in helping suppliers develop and put in place tailor-made legality verification systems to meet their buyers' transparency and credibility needs.

New technologies also create opportunities for cross-border cooperation all along the supply chain. Improved communications and the ability to collect and share trade data more easily for example, make it possible for both companies and customs or other officials to work together to identify and address information gaps and suspicious activity. The level of cooperation can vary from agreeing on a common licensing system (such as under Voluntary Partnership Agreements with the EU), to cross-checking customs data, to providing buyers with the information they need to complete a Lacey Act Declaration form or an EU TR information requirement.

[4] This refers to the EU TR independently of VPAs, which do include creating a sub-set of legal definitions from existing legal framework of a country via multi-stakeholders consultation

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Beyond timber tracking

"We cannot do it by ourselves. Illegal logging is really a poverty alleviation issue."

Subroto Widyatmoko, Perum Perhutani, Indonesia

Last, but certainly not least, timber tracking must not be considered in isolation from other measures needed to combat the underlying drivers of illegal and unsustainable logging. Transparency is immensely valuable, often as a precursor to larger aims like education, empowerment and increased participation in decision-making processes. However, transforming the timber trade from 'business-as-usual' to widespread responsible practices also requires thinking beyond transparency.

If the goal is to bring an end to illegal and destructive logging, efforts to bring more efficiency and transparency to timber tracking and legality verification systems must be supplemented by efforts to engage forest dependent communities. This includes supporting sustainable livelihoods development and ensuring that use, access and tenure rights are respected and taken into account when concessions are awarded. Similarly, efforts to promote sustainable agriculture and infrastructure development that does not take place at the expense of healthy forests will also become an increasingly important factor in the success of measures targeting the forest sector.

Importantly, the forest sector has something to offer others as well. A relatively long experience developing measures and tools to promote responsible forestry and trade – from policy reform processes to timber tracking technologies – provide valuable lessons for other sectors, such as agriculture and mining, where concerns about sourcing and impacts of the production process are increasing in importance.

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