

# Sustainability certification and legality verification in Indonesian natural forest-based wood products value chains

D. SUSILAWATI and P.J. KANOWSKI

*Fenner School of Environment and Society, The Australian National University, Building 141, Linnaeus Way, Canberra, ACT, 2601, Australia*

Email: [depi.susilawati@anu.edu.au](mailto:depi.susilawati@anu.edu.au), [peter.kanowski@anu.edu.au](mailto:peter.kanowski@anu.edu.au)

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## HIGHLIGHTS

- The case study natural forest-based value chains were largely compliant with the Indonesian timber legality verification system (SVLK).
- SVLK includes sustainability requirements (PHPL), but these are less stringent than voluntary forest certification, primarily because of a lesser emphasis on field performance.
- SVLK fostered legality compliance in both domestic and export value chains, but some loopholes remain.
- Weaknesses in SVLK architecture and implementation impact on both sustainability and legality of Indonesian natural forest-based value chains.
- This study suggests five areas for improvement of SVLK.

## SUMMARY

Indonesian natural forest concessions and value chains are governed by a mandatory Timber Legality Verification System (SVLK), which includes assessment of Sustainable Production Forest Management (PHPL). Concessionaires and processors may also pursue voluntary forest certification. This study explores actors' compliance with these instruments along wood product value chains originating primarily from natural forests. Empirical results demonstrate that SVLK fostered legality compliance in domestic as well as export value chains, but still allows some possible loopholes. It is easier for actors to comply with SVLK than with Forest Stewardship Council (FSC) certification, because SVLK has less stringent requirements, and uses an assessment system that allows poor field performance and does not foster continuous improvement of practices. These results identify weaknesses in the architecture and implementation of the regulatory instruments, and suggest measures to strengthen Indonesia's sustainable forest management and timber legality systems.

Keywords: forest certification, Indonesian natural forests, timber legality verification, sustainable forest management, wood value chains

## Certification de durabilité et vérification de la légalité dans les chaînes de valeur basées sur les produits du bois provenant des forêts naturelles, en Indonésie

D. SUSILAWATI et P. KANOWSKI

Les concessions des forêts naturelles en Indonésie et leurs chaînes de valeur sont gouvernées par le Système de vérification de la légalité du bois (SVLK), qui inclut une évaluation de la Gestion de la production forestière durable (PHPL). Les concessionnaires et les processeurs peuvent également chercher à obtenir une certification forestière. Cette étude explore l'adhésion des acteurs à ces instruments tout au long des chaînes de valeur des produits du bois, provenant principalement des forêts naturelles. Des résultats empiriques démontrent que le SVLK favorisait une adhésion à dans les chaînes de valeur domestiques, tout comme de l'export, mais laissait néanmoins la possibilité d'échapper aux critères. Il est plus facile pour des acteurs d'obéir au SVLK qu'à la certification du Conseil de la forêt stewardship (FSC), car le SVLK a des demandes moins contraignantes, et il utilise un système d'évaluation qui tolère une piètre performance sur le terrain et n'encourage pas une amélioration constante des pratiques. Ces résultats identifient des faiblesses dans l'architecture et la mise en pratique des instruments de régulation, et suggère des mesures pour renforcer la gestion forestière durable et les systèmes de légalité de l'Indonésie.

## Certificación de la sostenibilidad y verificación de la legalidad en las cadenas de valor de productos de madera de bosques naturales de Indonesia

D. SUSILAWATI y P. KANOWSKI

Las concesiones forestales naturales y las cadenas de valor de Indonesia se rigen por un sistema de verificación de la legalidad de la madera (SVLK) de carácter obligatorio, que incluye la evaluación de la Gestión Forestal para la Producción Sostenible (PHPL). Las empresas concesionarias y de transformación también pueden buscar lograr la certificación forestal voluntaria. Este estudio examina el cumplimiento de

estos instrumentos por parte de los actores a lo largo de las cadenas de valor de los productos madereros procedentes principalmente de los bosques naturales. Los resultados empíricos demuestran que el SVLK fomentó el cumplimiento de la legalidad tanto en las cadenas de valor nacionales como en las de exportación, pero que aún sigue permitiendo que se aprovechen algunos resquicios legales. Es más fácil para los actores cumplir con el SVLK que con la certificación del Forest Stewardship Council (FSC), debido a que el SVLK tiene requisitos menos estrictos y utiliza un sistema de evaluación que permite un mal rendimiento en el campo y no fomenta la mejora continua de las prácticas. Estos resultados identifican las deficiencias en la arquitectura y en la aplicación de los instrumentos normativos, y sugieren medidas para reforzar los sistemas de gestión forestal sostenible y de legalidad de la madera en Indonesia.

## INTRODUCTION

The area of natural forest globally declined from 3961 M ha to 3721 M ha between 1990 and 2015 (Keenan *et al.* 2015), primarily in countries of the global South, and the extent of sustainable forest management in these countries remains limited (Sloan and Sayer 2015). Wood panels are a major product of natural forests (Wegner *et al.* 2010), with 62% of global production originating from the Asia-Pacific Region (FAO 2016). In Indonesia, the export value of wood panel products ranks second after pulp and paper, at USD 2.2 billion in 2019 (SILK 2019). These panel products are sourced primarily from c.18.8 million ha of state production forests<sup>1</sup>, allocated to 255 natural forest concessions<sup>2</sup> (MoEF 2019a).

The impact of selective harvesting of tropical forests on their rich biodiversity and ecosystem services has long been an issue of global concern (e.g. Malhi *et al.* 2014, World Bank 1978), and one that remains debated (Burivalova *et al.* 2014, Putz *et al.* 2012). In Indonesia, as elsewhere, natural forests allocated for wood production are also susceptible to illegal logging (Tacconi 2007, Tsujino *et al.* 2016), forest encroachment and conversion (Abood *et al.* 2015, Hoare 2015), and social conflicts (Duncan 2007, Meijaard *et al.* 2013). The Indonesian Government has sought to address these issues with a series of policy instruments: log export bans in 1985 (Tachibana 2000) and 2001 (Resosudarmo and Yusuf 2006); mandatory sustainable production forest management certification (*Pengelolaan Hutan Produksi Lestari/PHPL*) for natural forest concessions in 2002 (MoF 2002); a Presidential Instruction on combating illegal logging in 2005 (INPRES 2005); the Indonesian Timber Legality Verification System (SVLK) in 2009 (Maryudi 2016); a two-year moratorium on new concession licences in primary natural forests and peatlands in 2011 (Murdiyarso *et al.* 2011); and the cessation of issuing new concession licences from 2019 (INPRES 2019).

SVLK was developed as part of a Voluntary Partnership Agreement (VPA) under the European Union Forest Law Enforcement, Governance and Trade (EU-FLEGT) Action Plan (Obidzinski and Kusters 2015), which aimed to strengthen

domestic forest governance, in part by promoting policy learning (Cashore and Stone 2012). SVLK incorporated the existing PHPL certification of sustainable forest management, as well as addressing the legality of wood in Indonesian market chains (Maryudi 2016). SVLK is mandatory for all actors in wood value chains (MoEF 2016a); it requires third party auditing against specified standards, and so are classified as a hybrid forest governance instrument (Cashore and Stone 2012).

Given the global significance of its forests and forest products industries, Indonesia has also been a focus for forest certification (Muhtaman and Prasetyo 2006, Romero *et al.* 2015, Ruslandi *et al.* 2014). The international Forest Stewardship Council (FSC) and national Indonesian Ecolabel Institute (LEI) schemes were introduced to Indonesia in 1990 and 1993, respectively (Muhtaman and Prasetyo 2006); and PEFC has subsequently introduced an Indonesian Forestry Certification Cooperation (IFCC) focusing on industrial plantations (Romero *et al.* 2015). Natural forest concessionaires have generally preferred FSC over LEI certification due to the former's advantages of premium prices and market access (Romero *et al.* 2015).

A number of studies have addressed the design and implementation of SVLK (Maryudi 2016, Maryudi *et al.* 2017), its implications for domestic forest governance and adverse impacts on small-scale actors (Obidzinski *et al.* 2014, Setyowati and McDermott 2017). Some studies (Savilaakso *et al.* 2017, Wibowo and Giessen 2018, Wibowo *et al.* 2019) have compared SVLK with voluntary measures, in the context of Cashore and Stone's (2012) characterisation of legality verification as "certification light", but these have not explored the application of SVLK along wood value chains. This study responds to this gap by investigating actors' compliance with SVLK in natural forest-based value chains and comparing the outcomes of this mandatory instrument with those of voluntary forest certification. This topic has both theoretical interest and practical consequence, and this study complements our earlier studies of actors' compliance with SVLK in plantation- and smallholder-based value chains (Susilawati and Kanowski 2020, Susilawati *et al.* 2019).

<sup>1</sup> The total area of state production forests in Indonesia is 68.8 million ha, of which 34.2 million ha has been allocated for natural forest concessions, industrial tree plantations, and the state-owned company Perum Perhutani (MoEF 2019a). Indonesian state production forests are classified as: 1) Limited Production Forests – may be allocated to natural forest concessions, which may only use selective harvesting; 2) Permanent Production Forests – may be allocated for natural forest or industrial tree plantation concessions, using selective harvesting and forest conversion, respectively; 3) Converted Production Forests – may be allocated for a wood harvesting permit (*Izin Pemanfaatan Kayu/ IPK*), for forest conversion to other land uses (MoF 2009).

<sup>2</sup> Seventy-three of the 255 natural forest concessions were not operational in 2019. Some natural forest products are also sourced from legally-converted forests (MoEF 2019a).

## SVLK ARCHITECTURE AND COMPLIANCE

SVLK consists of two standards, sustainable production forest management (PHPL) and timber legality verification (VLK), which were developed through multistakeholder processes facilitated by the Ministry of Environment and Forestry (MoEF) (Overdevest and Zeitlin 2014). They are governed under (most recently) Regulation P.30/2016 (MoEF 2016a). The PHPL standard consists of four criteria: precondition, production, ecological, and social (Table 1 and Annex 1). Each criterion is assessed according to several indicators, and each indicator by several verifiers that are categorised either as 'dominant' or 'co-dominant'<sup>3</sup>. Half of these verifiers are licence-related documents and standard operating procedures; the other half require performance assessment in the field (Annex 1; MoEF 2016a). Assessment applies a scoring system which assigns points (1–3) to each verifier, each of which must score at least 2 for certification to be awarded. The score of each indicator is the sum of accumulated scores of its associated verifiers, and the final result is expressed as a percentage of the total possible. PHPL certification is granted if the overall score is either 'good' (>80% of the maximum possible) or 'intermediate' (60–80% of the maximum possible, with all dominant verifiers passed; see Annex 2) (Maryudi *et al.* 2017, Susilawati and Kanowski 2020), and if all VLK requirements are met, as explained below (MoEF 2016a).

VLK requirements for each stage of the value chains represented in the case study are summarised in Table 1. Some requirements apply to all actors: forest ownership or a valid licence; a wood traceability system<sup>4</sup>; wood transport documents; an environmental management system; procedures and implementation of work health and safety; and fulfilment of workers' rights. Management and harvesting plan requirements apply only to forest concessions; payment of wood royalties is required of both concessions and wood harvesting permit (*Izin Pemanfaatan Kayu/IPK*) holders<sup>5</sup> (MoEF 2016a). Some VLK requirements overlap with those for PHPL (Astana *et al.* 2020). VLK verification does not use a scoring system like PHPL; rather, each regulated actor must comply with all relevant VLK requirements, as summarised in Table 1 (MoEF 2016a).

When PHPL certification for natural forest concessions was first introduced in 2002, it did not require an independent

third-party audit. The Ministry of Forestry directly accredited auditors, evaluated their audit reports, and proposed recommendations to the Minister of Forestry (Brown *et al.* 2008). When SVLK was introduced, the independent auditing and monitoring that it requires were extended to PHPL. Conformity Assessment Bodies (CABs), accredited by the National Accreditation Board (KAN), provide third-party verification of actors' compliance with PHPL and VLK, and issue verification decisions. CABs are assessed and appointed by MoEF to act as the 'Licence Authority' issuing the legal documents required for exported wood products: a FLEGT-Licence for the EU, or a V-Legal document for other export destinations. This system also allows NGOs and civil society to conduct independent monitoring of the implementation of PHPL and VLK; their findings or complaints can be reported to the CABs, KAN or MoEF (Maryudi 2016).

Forest concessions must comply with PHPL standard, which includes VLK requirements<sup>6</sup>. The assessments of PHPK and VLK are done jointly, and undertaken by the same CAB; passing all VLK requirements is a prerequisite for obtaining PHPL certification (MoEF 2016a). Other actors in the case study value chains are required to meet only VLK requirements (Fishman and Obidzinski 2015), as summarised in Table 1. The case study value chains also include some farmer-grown wood. Farmer tree growers are not required to meet PHPL criteria, and have two general exemptions: a Supplier's Declaration of Conformity (*Deklarasi Kesesuaian Pemasok/DKP*) or *Nota Angkutan*<sup>7</sup>, and group verification. Farmer tree growers can issue a *DKP/Nota Angkutan* to declare that the supplied wood is legal and sourced from private forests. Group verification requires that all members of the group to comply with VLK requirements (Setyowati and McDermott 2017, Susilawati *et al.* 2019).

## FSC CERTIFICATION AND NATIONAL STANDARD FOR INDONESIA

Voluntary forest certification, a market-based instrument promoting sustainable forest management pioneered by the FSC, arose as a response by environmental NGOs to the failure of state initiatives for conservation and sustainable management of forests (Auld *et al.* 2008). FSC certification comprises both Forest Management (FM) and Chain of

<sup>3</sup> Verifiers are categorised based their relevance to the associated indicator and whether the concession permit is of more or less than 5 years' duration (MoEF 2016a).

<sup>4</sup> For selectively-harvested natural forest concessions, SVLK requires the workers to tag each log and its stump with an identity (ID) barcode that must be traceable to the stump at least for one year after harvesting. For natural forest concessions being converted to industrial tree plantations, each log must be tagged with an ID barcode traceable to the harvesting plot (MoEF 2016a). All forest concessions record the ID barcodes electronically through the Information System for Timber Forest Products Administration (SIPUHH), under MoEF Regulations P.66/2019 and P.67/2019, for natural forest and tree plantation concessions respectively (MoEF 2019b).

<sup>5</sup> IPK is a permit to harvest the trees inside or outside the state forests to be converted to the non-forestry land uses, such as palm oil plantations or coal mining. MoEF issues IPKs for state forest areas, and the Provincial Investment Coordinating Board issues IPKs for areas outside of state forests. The duration of the permit is one year only, with a maximum extension of six months, which can only be used for transporting harvested wood (MoEF 2015).

<sup>6</sup> Concessions may elect to meet VLK requirements only, and opt out of PHPL standard compliance, for the first three years (MoEF 2016a).

<sup>7</sup> *Nota Angkutan* is a wood transport document for wood originating from farmer tree growers that may be substituted for a DKP (MoEF 2017).

TABLE 1 PHPL and VLK criteria, certification duration and audit cycle for case study value chain actors

	Forest concessions	Farmer tree growers	IPK holders	Wood panel processors
<b>VLK criteria</b>				
Forest ownership or valid licence or permit	IUPHHK-HA or IUPHHK-HT	Land certificate or Letter C/D or Girik	Wood harvesting permit (IPK)	Primary and/or secondary wood processor permit
Management and harvesting plans	RKU and RKT	N/A	Harvesting plan and RLHC	N/A
Wood traceability system	Online system	Offline system	Online system	Online system
Wood transport documents	SKSHHK-KB	<i>Nota Angkutan</i>	SKSHHK-KB	FLEGT-Licence, V-Legal Document or company receipt
Payment of wood royalties	PSDH and DR	N/A	PSDH and DR	N/A
V-Legal stamp	On the logs or transport documents	On the logs or transport documents	On the logs or transport documents	On the timber products or transport documents
Environmental management	AMDAL and UKL-UPL	SPPL	AMDAL and UKL-UPL	AMDAL and UKL-UPL
Work and health safety	Procedures, safety equipment, and record of work accident	Procedures, safety equipment, and record of work accident	Procedures, safety equipment, and record of work accident	Procedures, safety equipment, and record of work accident
Workers' rights	Labour union and no employee under 18 years	No employee under 18 years	No employee under 18 years	Labour union and no employee under 18 years
<b>PHPL criteria</b>				
Precondition	See Annex 1	N/A	N/A	N/A
Production	See Annex 1	N/A	N/A	N/A
Ecological	See Annex 1	N/A	N/A	N/A
Social	See Annex 1	N/A	N/A	N/A
<b>Duration of certification</b>	5 years	10 years	1 year; 6 months extension	3 years
<b>Audit cycle</b>	Annual	Biennial	N/A	Annual
<b>Exemptions for small-scale operators</b>	N/A	DKP and group verification	N/A	N/A

**Definition of abbreviations:**

AMDAL: *Analisis Mengenai Dampak Lingkungan* (Environmental Impact Analysis)

DKP: *Deklarasi Kesesuaian Pemasok* (Supplier's Declaration of Conformity)

DR: *Dana Reboisasi* (Reforestation Fund)

IPK: *Izin Pemanfaatan Kayu* (Wood Harvesting Permit for Forest Conversion)

IUPHHK-HA: *Izin Usaha Pemanfaatan Hasil Hutan Kayu-Hutan Alam* (Licence of Natural Forest Concession)

IUPHHK-HT: *Izin Usaha Pemanfaatan Hasil Hutan Kayu-Hutan Tanaman* (Licence of Tree Plantations)

Letter C/D, *Girik*: Formal Letter of Land Title

N/A: Not Applicable

PSDH: *Provisi Sumber Daya Hutan* (Provision of Forest Resources)

RLHC: *Rekapitulasi Laporan Hasil Cruising* (Recapitulation of Timber Cruising Report)

RKT: *Rencana Kerja Tahunan* (Annual Harvesting Plan)

RKU: *Rencana Kerja Usaha* (Ten-year Management Plan)

SKSHHK-KB: *Surat Keterangan Sah Hasil Hutan Kayu-Kayu Bulat* (Legal Transport Document for Logs)

SPPL: *Surat Pernyataan Pengelolaan Lingkungan* (Statement Letter of Environmental Management)

UKL: *Upaya Pengelolaan Lingkungan* (Environmental Management Report)

UPL: *Upaya Pemantauan Lingkungan* (Environmental Monitoring Report)

Custody (CoC) certification, addressing respectively sustainable forest management and assurance that FSC-labelled products are sourced from FSC-certified forests (FSC International 2019a). Under the FSC Controlled Wood (CW) scheme, wood processors can mix material from FSC-acceptable sources<sup>8</sup> with that from FSC-certified forests (FSC International 2019b). FSC products receive one of three labels: FSC 100%, FSC Recycled, and FSC Mix. The FSC 100% and Recycled labels identify products within which wood is sourced entirely from FSC-certified forests and re-used material, respectively. The FSC Mix label allows incorporation of Controlled Wood (FSC International 2019c).

A set of ten principles and fifty-seven criteria apply globally to FSC-certified forests (FSC International 2019a). The standards that give effect to these principles and criteria are developed nationally; since 2014, FSC Indonesia has collaborated with a National Standard Development Group led by LEI in development of a National Forest Stewardship Standard (NFSS) for Indonesia, which will apply from December 2020 (FSC Indonesia 2020). Prior to implementation of the NFSS, FSC auditors used the harmonised FSC Standard for Indonesia (FSC International 2013) to assess the performance of forest concessions, including the case study concessions.

Independent certification bodies conduct annual assessments of FSC FM and CoC certificates, and are themselves checked by Assurance Services International (FSC International 2016). Non-conformities identified by an audit are classified as either minor or major<sup>9</sup>. The auditee is required to address minor and major non-conformities within 12 and 3 months, respectively; and the former is upgraded to the latter if an auditee fails to address it within 12 months (FSC International 2009).

## ANALYTICAL FRAMEWORKS

A number of analytical frameworks inform this study. We use the value chain framework described by Collins *et al.* (2015) to map the structure of case study value chains, to identify the chain actors, their roles, and interactions with regulatory and voluntary instruments. We use a framework adapted from Ruslandi *et al.* (2014) to characterise the core components of sustainable forest management and compare results from the mandatory and voluntary systems. We draw on Gunningham and Sinclair's (2017) concept of 'smart regulation', characterised by the use of multiple rather than single policy instruments, and the involvement of both public and private actors; from the work of Cashore and Stone (2012) and Overdevest and Zeitlin (2014), which explored the interactions between

regulations addressing illegal logging and certification addressing sustainable forest management, noting the latter is a form of non-state market-driven governance (Cashore *et al.* 2004); and from Parker and Nielsen's (2017) 'holistic compliance model' for the regulatory compliance of actors.

## RESEARCH METHODS

### Case study location and characteristics

All Indonesia's natural forest concessions are located in state-owned production forests on the 'outer Islands', viz. those other than Java and Madura (Romero *et al.* 2015). The case study value chains source wood from c. 20 selectively-harvested natural forest concessions, from natural forests licenced for conversion to industrial tree plantations and other land uses, and from farmer tree growers, to supply a vertically-integrated wood panel processor. Case study selection was based on literature review, and on reports from the Indonesian Government and the Forest Concession Holders and Wood Processors Associations (APHI and APKINDO, respectively). The case study selectively-harvested natural forest concession is one of the 211 members of Indonesian Association for Forest Concession Holders (APHI 2019), and one of the 152 nationally that has achieved both PHPL certification and VLK verification (MoEF 2019a). The case study processor is managed by one of the 124 VLK-compliant members of the Indonesian Wood Panel Association (APKINDO 2019). Both the case study natural forest concession and the processor have also received FSC FM and CoC certification, respectively, amongst the 34 FM and 283 CoC certificate holders nationally (FSC Indonesia 2019). The case study value chain is typical of those based on natural forests, in which *Shorea* species (trade name – meranti) are sourced from company-managed natural forest concessions, and processed along with wood from other concessions and permit holders at company-managed and -operated wood panel processing facilities.

### Data collection

We followed the methods outlined by Collins *et al.* (2015) to investigate the case study value chains, using several methods: document analysis, fieldwork, literature review and secondary data collection. Prior to the case study selection, we reviewed the sources and regulations related to SVLK and wood value chains in Indonesia, and the sources related to FSC certification. We then requested and received approval to

<sup>8</sup> 'Acceptable sources' for FSC Controlled Wood are defined as: "raw materials from low-risk sources which excludes five unacceptable categories: 1) illegally harvested, 2) harvested in violation of traditional and civil rights, 3) harvested in forests where high conservation values are threatened, 4) harvested in forests being converted to plantations or non-forest use, 5) harvested in forests where genetically modified trees are planted" (FSC International 2017: 5).

<sup>9</sup> "A minor non-conformity represents a temporary lapse, non-systematic, and non-fundamental failure in meeting FSC requirements. A major non-conformity is a fundamental failure which continues over a long period of time and systematically repeated, or accumulative impact of similar minor non-conformities that are not adequately addressed by the concession" (FSC International 2009: 19).

conduct fieldwork from the ANU Human Research Ethics Committee (Protocol 2017/456), the case study concessionaire and processor, and relevant government institutions. The first author collected primary data in September and October 2017, following the value chain from harvesting at the case study company-managed natural forest concession through transport to and processing at the wood panel processor. She also conducted semi-structured interviews with 20 value chain actors, and with 20 Provincial and National government and local and national non-government actors (Table 2).

Secondary data were collected from the period 2015 to 2019 to complement the primary data described above. These were drawn from public summaries of 49 PHPL audits and VLK verifications of company-managed and other forest concessions supplying the case study processor, and from public summaries of 30 VLK verifications of other forest concessions, IPK holders and the wood panel processor<sup>10</sup>. Public summaries of 16 FSC FM audits of company-managed and other natural forest concessions were drawn from the FSC website<sup>11</sup>. Summaries of FSC CoC audits are not made public. The identities of all case study actors have been kept confidential; this was a condition of conducting the research.

### Analytical methods

We summarised interview notes and transcriptions of recordings and validated them using field notes. We assessed compliance with mandatory and voluntary sustainability

standards based on public summaries of PHPL assessments (n = 49) and FSC audits (n = 16) for the company-managed and other natural forest concessions. We then compared the results of PHPL assessment of company-managed natural forest concessions with FSC audit findings for the same period (2015–2019), based on an adaptation of Ruslandi *et al.*'s (2014) framework, and triangulated with our fieldwork. All PHPL verifiers that scored 'intermediate' for three consecutive years or more were assumed to indicate potential areas of non-compliance, and were compared with minor and major FSC non-conformities during 2015–2019.

We assessed public summaries of VLK compliance for all forest concessions and other regulated chain actors (n = 30) to assess the conformity of the verification process with MoEF regulations, and triangulated the auditors' assessment of sources of wood supply, transport documents and permit validity with the authors' assessment against VLK requirements. It was not possible to compare the outcomes of VLK and FSC CoC assessments because the latter are not public.

## RESULTS

### Case study wood products supply chains

The case study wood products supply and products chains are represented in Figure 1. The end products of these chains are wood panels (plywood and blockboard) and sawn wood. In

TABLE 2 Case study value chain actors and stakeholders interviewed

Actors or Stakeholders	Number of Interviewees
Natural Forest Concession and Wood Panel Processor	
• Natural Forest Concession Staff	13
• Wood Panel Processor Staff	7
	<b>20</b>
Government and Non-Government	
• Indonesian National Association for Forest Concession Holders Officer	1
• Indonesian National Wood Panel Association Officer	1
• Local Community Leader	1
• National Accreditation Body and CABs (including auditors) Staff	5
• National Ministry of Environment and Forestry Officers	4
• Provincial Government Agencies (Environment; Forestry; Industry, Trading, Cooperative and Small Medium Enterprises; Investment Coordinating Board) Officers	5
• Provincial Non-Government Organization Staff	3
	<b>20</b>
<b>Total</b>	<b>40</b>

<sup>10</sup> Public summaries from 2014 onwards should be available at the MoEF website ([silk.dephut.go.id](http://silk.dephut.go.id)), but not all summaries were available at the time of data collection (August – September 2019). Therefore, some summaries were accessed from CABs' websites, and others were requested directly from the CAB.

<sup>11</sup> [info.fsc.org](http://info.fsc.org)

this case, plywood is manufactured by bonding multiple layers of rotary-peeled meranti (*Shorea* spp.). Blockboard comprises an internal “bare core” of less valuable sawn wood enclosed between veneers of more valuable wood, glued together under high pressure. Here, the external veneer is made from meranti logs sourced from natural forest concessions. Meranti logs that do not meet veneer specifications are instead sawn at the same processing facility, for either sale as sawn wood or use as bare core. The bare core is also made from sengon (*Paraserianthes falcataria*) logs sourced from farmer tree growers, who sell these to market brokers. As with poor-quality meranti logs, the sengon logs are first sawn and then processed into bare core at the same processing facility.

The wood panel processor obtains 80% of total supplied wood from natural forest concessions (Figure 1; chains A and B), industrial tree plantation concessions (Figure 1; chain C), and IPK holders (Figure 1; chain D), and 20% from farmer tree growers (Figure 1; chain E). Twenty percent of natural forest wood originates from a company-managed natural forest concession (chain A), 70% from other natural forest concessions<sup>12</sup> (chain B), 5% from concessions being converted to industrial tree plantations (chain C), and 5% from IPK

holders (chain D). All suppliers are located on the same island as the case study processor. FSC-certified logs are separated from others in the log yard, and are processed in a separate production line. Some 90% of product output is plywood, 5% is blockboard, and 5% sawn wood and bare core. More than 75% of product sales are exported, and the remainder are sold domestically.

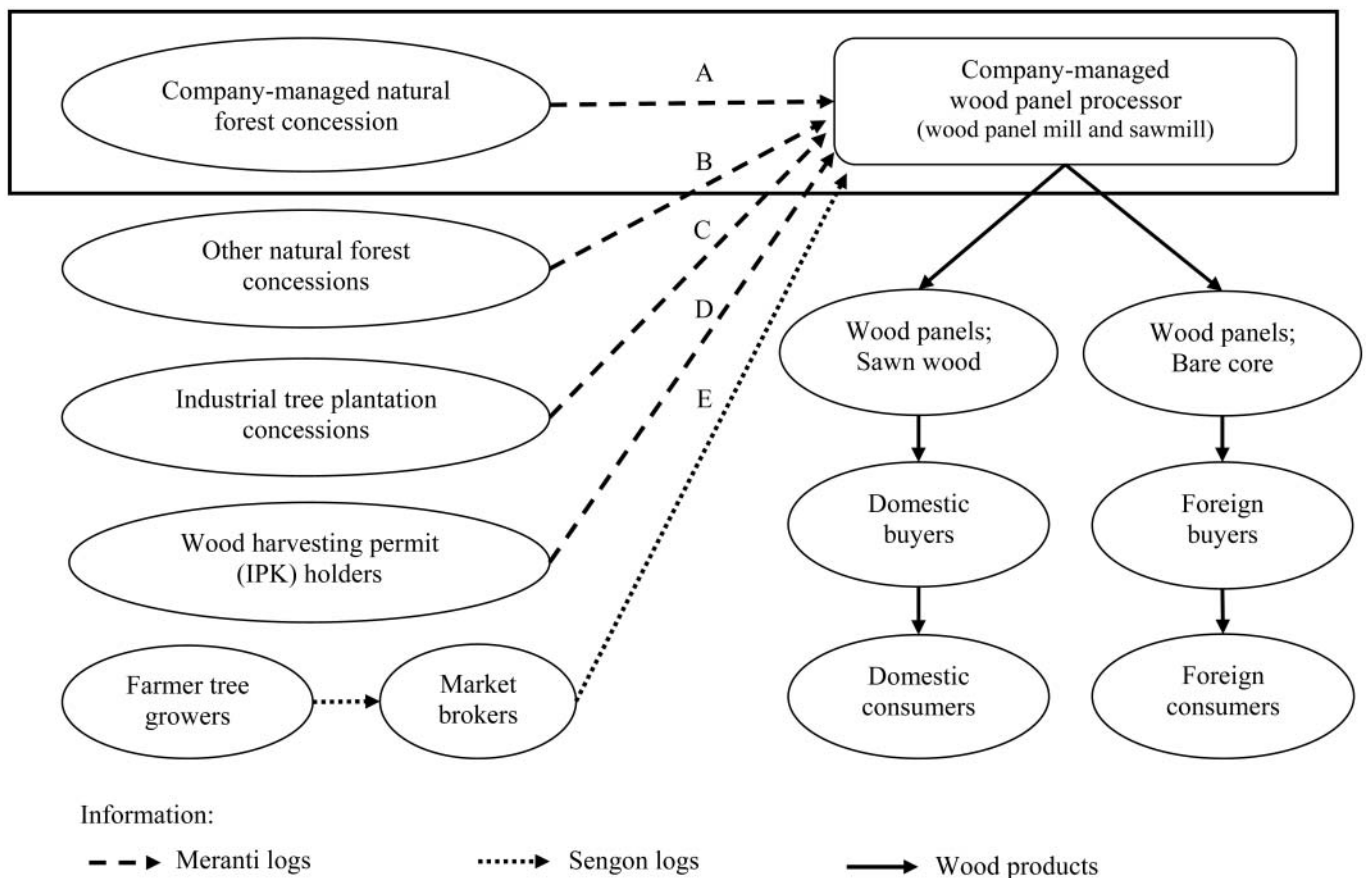
In the sections below, we first compare the compliance of all natural forest concessions supplying the product chains with mandatory (PHPL) and voluntary (FSC) sustainability standards. We then compare the performance of the company-managed natural forest concession against PHPL and FSC standards in the period 2015 to 2019, triangulated by the first author’s fieldwork in 2017. Lastly, we assess VLK compliance of all regulated actors in the case study chains.

**Mandatory (PHPL) and voluntary (FSC) sustainability compliance**

*All forest concessions*

The number of forest concessions that supply natural wood to the wood panel processor (Figure 1; chains A, B and C) varies

FIGURE 1 Case study wood products supply and market chains



<sup>12</sup> In Bahasa Indonesia, a natural forest concession is known as ‘Izin Usaha Pemanfaatan Hasil Hutan Kayu pada Hutan Alam’ (IUPHHK-HA). The case study company-managed natural forest concession is a IUPHHK-HA, managed by the same company which owns the case study wood panel processor. The other natural forest concessions reported here are managed by different companies.

from year to year (Table 3). A total of 18 supplier concessions have complied with PHPL standard (including VLK requirements); six concessions (B-15, B-16, B-17, C-4, C-5, C-6) have complied with VLK only; five concessions (A-1, B-1, B-2, B-9, B-10) have also achieved voluntary FSC certification.

All forest concessions demonstrated a high level of compliance with mandatory (PHPL) sustainability requirements. All concessions were assessed as 'good' overall, other than one concession (B-14) which received an 'intermediate' result in 2018 and 2019. In contrast, FSC audits of five concessions identified some areas of poor performance that were not reflected in the PHPL assessment, as discussed below. As a result, FSC certification of one concession was terminated in 2017, another was terminated in 2018 and re-certified in 2019, and another was suspended in 2019; in all cases, PHPL certification was granted. The suspension or termination of FSC certifications occurred because the concessions were not

able to address major non-conformities within three months of notification of these breaches, as required by the FSC.

The performance of the company-managed concession (A-1), as assessed under PHPL and FSC in the period 2015 to 2019, and triangulated by the first author's fieldwork in 2017, is discussed below.

#### *Company-managed natural forest concession*

##### PHPL compliance

The compliance of the company-managed natural forest concession (A-1) with the PHPL standard (Annex 1) was assessed from 2015 to 2019 by CAB-1. Most indicators were scored as 'good', and none was assessed as 'poor'. Some verifiers for some indicators were scored 'intermediate' for three consecutive years of assessment or more, but none were assessed as 'poor' (Annex 3). These 'intermediate' results

TABLE 3 *Status of regulatory compliance and voluntary certification of case study forest concessions*

Concession code	Year of supply to wood panel processor				Regulatory compliance		Voluntary certification
	2015–2016	2016–2017	2017–2018	2018–2019	PHPL & VLK	VLK only	FSC
<b>A-1</b>	√	√	√	√	√		√
<b>B-1</b>	√	√	√	√	√		√
<b>B-2</b>	√	√	√	√	√		√
B-3	√				√		
B-4	√	√	√		√		
B-5	√	√	√		√		
B-6	√	√	√	√	√		
B-7	√	√	√	√	√		
B-8	√				√		
<b>B-9</b>	√				√		√
<b>B-10</b>	√				√		√
B-11		√			√		
B-12			√		√		
B-13			√		√		
B-14				√	√		
<i>B-15</i>	√					√	
<i>B-16</i>	√					√	
<i>B-17</i>			√			√	
C-1	√	√	√	√	√		
C-2				√	√		
C-3				√	√		
<i>C-4</i>				√		√	
<i>C-5</i>				√		√	
<i>C-6</i>				√		√	
<b>Total</b>	14	9	11	12	18	6	5

Notes: bold font – PHPL, VLK and FSC; ordinary font – PHPL and VLK; italic font – VLK only; '√' indicates supply or participation



were related to forest boundary delineation (Verifier 1.1.2); sustainability commitment and organisational structure (Verifiers 1.2.3 and 1.4.1); implementation of Reduced Impacted Logging (RIL) (Verifier 2.4.3); sustainable harvesting practices (Verifiers 2.2.3, 2.5.3 and 2.5.4); silviculture system and forest regeneration (Verifiers 2.3.1 and 2.3.2); forest protection, soil and water monitoring (Verifiers 3.2.2, 3.2.3 and 3.3.5); corporate social responsibility (Verifiers 4.2.3 and 4.3.4); tenure and Indigenous peoples' rights (Verifiers 4.1.4, 4.3.2, 4.3.3); and workers' rights and prosperity (Verifiers 4.5.1 and 4.5.2).

There was some inconsistency in the results of PHPL assessments in terms of tenure and Indigenous people's rights. About 93% of all verifiers related to Free, Prior, and Informed Consent from Indigenous peoples (Precondition Indicator 1.5) were assessed as good; but some verifiers related to tenure and Indigenous peoples' rights (Social Indicators 4.1 and 4.3) were assessed as 'intermediate' for three consecutive years of assessment or more.

#### FSC compliance

The compliance of the company-managed natural forest concession (A-1) with the FSC National Standard for Indonesia (FSC International 2013)<sup>13</sup> was assessed in 2015–2016 by CAB-13 and in 2017–2019 by CAB-14. The FSC audits reported 13 major and 17 minor non-conformities (Annex 3). Eight major non-conformities were related to workers' rights, health and safety (Indicators 4.1.4, 4.1.7, 4.2.4, 4.2.8, 4.2.9, 4.2.12, 4.2.13, and 4.2.14). The remainder were related to the long-term commitment of the company to adhere to the FSC Principles and Criteria (Indicators 1.6.2 and 1.6.3); preparation and implementation of RIL (Indicators 6.5.2 and 6.5.10); environmental impact assessment (Indicator 6.1.2); oil spillage management (Indicator 6.7.4); and public consultation to assess social impacts (Indicators 4.4.1 and 4.4.3).

Five minor non-conformities were related to workers' rights, health and safety (Indicators 4.1.6, 4.2.1, 4.2.5, 4.2.6, and 4.3.1). The remainder were: supervision of contractors (Indicator 1.2.3); forest regeneration (Indicator 6.3.3); environmental management and monitoring (Indicators 6.2.5, 6.5.8, 7.1.13, and 8.1.2); biodiversity conservation (Indicator 6.2.1, 9.1.2, and 9.4.2); social impact assessment (Indicators 4.4.2 and 4.5.4); and tenurial conflicts (Indicator 2.3.3).

#### Comparison of PHPL and FSC findings

Some findings of the PHPL and FSC audits in the company-managed concession (A-1) were comparable, but others were not because of differences in assessment criteria. Of the comparable elements, some findings were similar across the PHPL and FSC audits. These are identified in Annex 3, as are those where PHPL assessment results were 'intermediate' for three consecutive years or more, and where FSC audits

reported major and/or minor non-conformities. These 'comparable and similar' findings were related to forest boundary delineation, implementation of RIL, silvicultural system and forest regeneration, environmental management and monitoring, community development programs, tenure and Indigenous peoples' rights, and workers' rights and prosperity.

Other findings are comparable but differed between PHPL and FSC audits; these are also identified in Annex 3. In these cases, FSC audits reported some non-conformities, both major and minor, that were scored by PHPL assessments as 'good'. These findings were related to biodiversity conservation and workers' health and safety. For the former, the FSC assessment found that the company did not comply with the harvesting guidelines for IUCN Red List species or implementation of a High Conservation Value Forest assessment. For the latter, which were verified by VLK as compliant<sup>14</sup>, the FSC audit reported deficiencies in heavy equipment safety, an unclear mechanism for recording work accidents, and that some workers did not use personal protective equipment properly.

Some findings from the PHPL and FSC audits are not comparable. PHPL verifiers that were not assessed by FSC related to the sustainability commitment and organisational structure of the company. FSC indicators that were not assessed by PHPL related to compliance with FSC policy on Partial Certification<sup>15</sup>, supervision of contractors, and social impact assessment.

#### Mandatory legality (VLK) compliance

The VLK compliance of each regulated actor in the case study value chains was assessed and reported by the CABs; we triangulated these outcomes with analysis of VLK public summaries (Table 4). The main elements of VLK compliance for each actor group are described below.

##### *Forest concessions*

All forest concessions complied with VLK requirements (Table 4). The company-managed and other 17 natural forest concessions have valid licences for selective harvesting, and the remaining six (C-1 – C-6) are licenced to clear forest for industrial tree plantations. The 18 concessions that complied with PHPL developed and self-approved their annual harvesting plan for wood production. The annual harvesting plans of the 6 concessions (B-15, B-16, B-17, C-4, C-5, C-6) that complied only with VLK were approved, as required, by the Provincial Forestry Service.

The audits confirm that all concessions have the requisite system to trace each log back from the processor's log pond to its origin. In selectively-harvested concessions, workers tag each harvested log and its stump with an identity (ID) barcode, and record it electronically through the national

<sup>13</sup> The company received international donor-funded capacity-building assistance from a NGO acting as a 'certification coach'.

<sup>14</sup> As noted previously, the concession must pass all VLK requirements as prerequisite for obtaining PHPL certification (MoEF 2016a).

<sup>15</sup> The FSC Policy on Partial Certification of Large Ownerships requires that all concessions under the same management be certified under FSC Forest Management or Controlled Wood schemes (FSC International 2000).

TABLE 4 VLK compliance of case study value chain actors 2015 to 2019, as reported by Conformity Assessment Bodies and from authors' assessment of public summaries

Actor	Actor Code	Valid licence/ permit	Validity period/ Audit cycle	CAB auditing VLK compliance	Actor compliance with VLK	
					CAB verification	Authors' assessment
Company-managed natural forest concession	A-1	IUPHHK-HA	Five years/ Every year	CAB-1	Fully compliant	Fully compliant, with some caveats: - Some of ID barcodes cannot be traced to the stump because they are missing or unreadable. - Inconsistent results between VLK verification and PHPL assessment.
Other natural forest concessions	B-1 – B-17	IUPHHK-HA	Five years/ Every year	CAB-1 – CAB-12	Fully compliant	Fully compliant, with one caveat: - Inconsistent results between VLK verification and PHPL assessment.
Industrial tree plantation concessions	C-1 – C-6	IUPHHK-HTI	Five years/ Every year	CAB-1, CAB-5, CAB-8		
Wood harvesting permit (IPK) holders	D-1 – D-8	IPK/IPPKH/ HGU	One year/ Six months	CAB-8	Fully compliant	Fully compliant, with some caveats: - Permit to harvest was extended more than once.
Farmer tree growers (via market brokers)	E-1, E-2	Land certificate	Ten years/ Every two years	NA	Unverified	Fully compliant; using <i>Nota Angkutan</i> (DKP) in lieu of VLK verification.
Wood panel processor	WP-1	Primary and secondary wood processor	Three years/ Every year	CAB-8	Fully compliant	Fully compliant; with the exception that IPK log data may be adjusted in the online system.

**Notes:**

CAB: Conformity Assessment Body

DKP: *Deklarasi Kesesuaian Pemasok* (Supplier's Declaration of Conformity)HGU: *Hak Guna Usaha* (Permit to use non-forest area for agriculture, plantation, fishery and livestock)IPPKH: *Izin Pinjam Pakai Kawasan Hutan* (Wood Harvesting Permit for Forest Conversion inside the state forests)IPK: *Izin Pemanfaatan Kayu* (Wood Harvesting Permit for Forest Conversion)IUPHHK-HA: *Izin Usaha Pemanfaatan Hasil Hutan Kayu-Hutan Alam* (Licence for Natural Forest Concession)IUPHHK-HTI: *Izin Usaha Pemanfaatan Hasil Hutan Kayu-Hutan Tanaman Industri* (Licence for Industrial Tree Plantation Concession)

online timber administration system (SIPUHH). The company pays royalties and a restoration fund levy through an online payment system as a prerequisite for the self-issuance of a consignment document (SKSHHK-KB) bearing a V-Legal stamp. This document accompanies the logs, which are transported by road and river from the concession to the processor's log pond. However, in fieldwork in the company-managed concession (A-1), some samples of ID barcodes could not be traced to the stump due to technical constraints, such as the barcode on the stump being missing or unreadable. Some of ID barcodes on logs in the log pond were unreadable; in these cases, the source concession was asked to re-print a new barcode<sup>16</sup> replacing an unreadable one. In the

case of logs missing in transport<sup>17</sup>, the log pond workers file a missing log report in the online timber administration system (Wood panel processor interviewee).

The audits also confirm that all concessions have undertaken an Environmental Impact Analysis (AMDAL) and reported implementation of environmental management through management and monitoring reports (UKL/UPL); and have complied with other VLK requirements. These include procedures for and implementation of Work, Health and Safety requirements; provision of safety equipment; reporting of work accidents; and fulfilling labour rights. In a few cases, there are inconsistencies between the VLK verification and PHPL assessment. For example, in the

<sup>16</sup> The workers refer to a consignment document, detailing information on number, size and species of logs, to decide which barcode(s) should be re-printed.

<sup>17</sup> The log rafts have to pass through river rapids and take about 14 days to reach the log pond.

company-managed forest concession, some of the VLK requirements relating to environmental management and workers' rights were assessed as 'pass', whereas PHPL verifiers related to forest protection, soil and water monitoring, and to workers' rights and prosperity, were scored only as 'intermediate' (see Annex 3 and Table 4).

#### *Wood harvesting permit (IPK) holders*

All wood harvesting permit (IPK) holders supplying natural forest wood to the wood panel processor have complied with VLK (Table 4). However, the public summaries reported that some IPK holders (D-1, D-5, D-7, and D-8) obtained an extension of their permit more than once<sup>18</sup>, in contravention of MoEF Regulation P. 62/2015, but remained verified under VLK. The Provincial Investment Coordinating Board issued these extensions more than once because IPK holders provided a technical recommendation<sup>19</sup> issued by the MoEF Regional Unit<sup>20</sup> and the Provincial Agencies with responsibilities related to forest conversion. Despite this caveat, all IPK holders had conducted timber cruising, provided a harvesting plan, and paid 25% of the wood royalties and restoration fund levy in advance. IPK concessionaires then follow identical royalty and levy payment, log barcoding<sup>21</sup>, electronic recording and transport formalities as do natural forest concessionaires. However, staff of Provincial Government Agencies reported that they were aware of several cases where wood from conversion forests was harvested and traded before the issuance of an IPK.

#### *Farmer tree growers*

In the case study value chain, none of the individual farmers was verified under VLK (Table 4). These farmers usually sell their wood to the processor through market brokers (E-1 and E-2), to whom they delegated the completion of the *Nota Angkutan* as the self-declaration of legally harvested wood. The company staff interviewed reported that market brokers play significant positive roles in providing detailed information about each wood supplier. Our field observation of random samples of *Nota Angkutan* also confirmed that they satisfied VLK requirements, by clearly detailing the wood origin and destination, farmer's identity and their land certificate, transaction date, modes of transport, and consignment details. Before SVLK was implemented, the processor bought both natural forest and privately-grown wood from the market brokers. After SVLK implementation, the processor bought

only sengon, an exotic species grown by the farmers on their own land (Wood panel processor interviewee).

#### *Wood panel processor*

The public summaries report that the wood panel processor (WP-1) has complied with VLK requirements (Table 4). This company has a permit for primary wood processing with production capacity of more than 6000 m<sup>3</sup> per year to produce sawn wood, and a permit for secondary wood processing to produce wood panel products. The wood panel processor reported that all natural forest wood suppliers were verified under PHPL and/or VLK from 2014 to 2019 (Table 4); that wood from forest concessions and IPK was accompanied by a consignment document (SKSHHK-KB) bearing a V-Legal stamp; and that sengon wood supplied by farmer tree growers through market brokers was accompanied by *Nota Angkutan*. However, there were many mismatches of the online system of log data with the logs delivered to the processor's log pond. In such cases, the workers double-checked the logs in the log pond, then adjusted the online data to match with the logs in the log pond<sup>22</sup> (Wood panel processor interviewee). The processor sells their sawn wood, bare core and wood panel products to domestic and foreign buyers using a Company Receipt or FLEGT-Licence/V-Legal document, respectively.

### **Summary: sustainability and legality compliance of case study product chains**

The compliance of actors at each stage of the case study value chains with mandatory (PHPL/VLK) and voluntary (FSC) requirements is presented schematically in Figure 2. All actors in the case study chains have satisfied the mandatory requirements. Five of the 24 case study forest concessions had also achieved voluntary FSC Forest Management certification, although it remains current for only three of them. The wood panel processor was certified under FSC Chain of Custody.

VLK compliance requires that the wood panel processor buy only VLK-compliant wood, or privately-grown wood accompanied by a DKP or *Nota Angkutan* (MoEF 2016a). This was the case in all case study value chains, including for the 10% of natural forest wood supplied from forests that were being converted into industrial tree or oil palm plantations, or for coal mining (Figure 1, chains C and D). As illustrated in Figure 2, the VLK-compliant wood products in

<sup>18</sup> We were not able to interview IPK holders to establish why they sought multiple permit extensions. However, staff of Provincial Government Agencies reported that some IPK holders did not operate their concessions directly after receiving a permit, due to constraints such as weather, access to remote locations, and lack of staff.

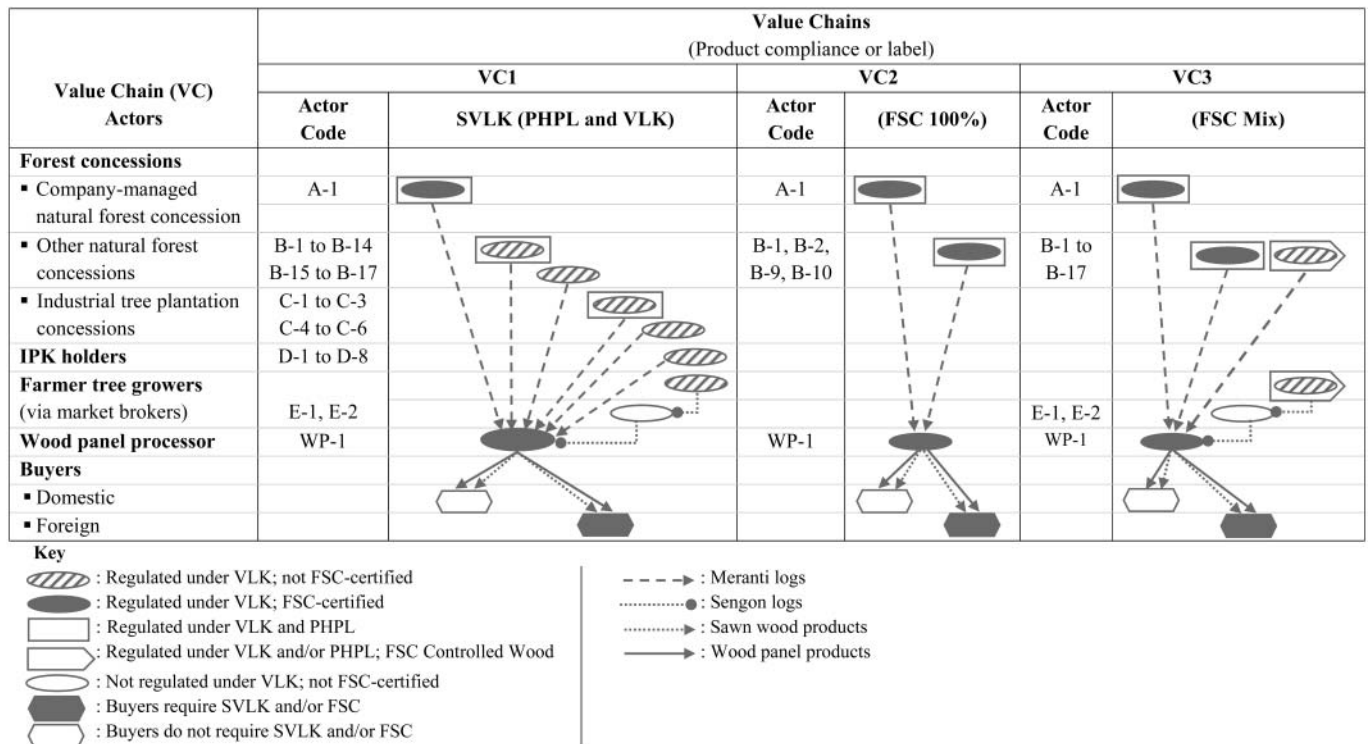
<sup>19</sup> The permit can be granted if the applicant receives a technical recommendation issued by relevant National or Provincial Government Agencies. This recommendation is based on analysis of the applicant's compliance with IPK requirements (MoEF 2015).

<sup>20</sup> BPHP/Balai Pengelolaan Hutan Produksi (Production Forests Management Agency) and BPKH/Balai Pemantapan Kawasan Hutan (Forest Gazettement Agency).

<sup>21</sup> For IPK holders, as for industrial tree plantation concessions, logs are traceable only to the harvesting plot.

<sup>22</sup> The log pond workers add an annotation in the online timber administration system (SIPUHH) if there are additional logs delivered to the log pond that are not listed in a consignment document (SKSHHK-KB). At the time the fieldwork was conducted in 2017, the SIPUHH regulation for forest concessions did not regulate the adjustment of the online log data (MoEF 2016b). However, the latest regulation allows for adjustment of the online log data to ensure its accuracy (MoEF 2019b).

FIGURE 2 Compliance of actors in three value chains with regulatory and voluntary instruments



VC1 are sourced from a mix of PHPL and/or VLK-compliant natural forest and industrial tree plantation concessions; VLK-compliant IPK forest conversion holders; and VLK-compliant farmer tree growers.

In contrast to VLK, the wood panel processor is not allowed to introduce wood harvested in forests being converted to plantations or other non-forest uses into any FSC-labelled product (FSC International 2019c). Therefore, the wood panel processor does not include the wood sourced from six industrial tree plantation concessions or IPK holders in value chains 2 and 3, even though the wood is VLK-compliant. In the case study value chains, wood products from VC2 are sourced fully from FSC-certified forest concessions, and products are labelled FSC 100%. Products from VC3, where the wood is sourced from both FSC-certified concessions and those that are not FSC-certified but which are compliant with FSC Controlled Wood specifications, are labelled FSC Mix.

**DISCUSSION**

All actors in the case study value chains were assessed as complying with mandatory PHPL and/or VLK requirements. This positive outcome is consistent with sustainability and legality commitments of the Indonesian Government and wood panel industry sector (APHI 2019, APKINDO 2019, MoEF 2019a). However, the case study reveals a number of areas of regulatory weakness that should be addressed, related to the wood traceability system, inconsistent results between PHPL and VLK, issuance of IPK permits, and a likely ‘wood legalisation’ loophole.

In addition to this regulatory compliance, five of the 24 case study forest concessions had also achieved voluntary FSC certification for at least part of the five-year review period. The audit reports and authors’ assessment summarised in Annex 3 identify both commonalities and differences in compliance audits of the mandatory and voluntary systems. Contrasts between PHPL and FSC certification were also evident; FSC certification of three concessions were either suspended or terminated during the period 2015–2019, whereas PHPL certification was granted in all cases.

We discuss below the results in these contexts, and the implications for sustainability certification and legality verification in Indonesian natural forest-based wood products value chains.

**Results in the context of sustainability and legality regulatory systems**

The architecture of SVLK incorporates a mix of regulations, third-party verification, and self-reporting instruments; voluntary forest certification was intended to complement these regulatory measures in promoting sustainable forest management in Indonesia (Romero *et al.* 2015, Savilaakso *et al.* 2017). The use of multiple policy instruments and involvement of a broad range of actors is consistent with Gunningham and Sinclair’s (2017) concept of smart regulation, which seeks to address the limitations of any single policy instrument. The generally high levels of compliance with PHPL and VLK are as expected of large-scale actors for mandatory requirements (Gunningham and Sinclair 2002). Also as expected, small-scale actors – in this case, farmer tree

growers – preferred to use the simple, self-reporting mechanism of DKP/*Nota Angkutan* as a substitute for VLK verification, as reported elsewhere in Indonesia (Setyowati and McDermott 2017, Susilawati *et al.* 2019).

There are several factors influencing actors' compliance with each of mandatory and voluntary requirements. Parker and Nielsen (2017) explain actors' compliance in terms of a mix of economic, social and normative motives. Here, compliance with PHPL and VLK requirements represents a normative commitment to legal obligations, as a prerequisite for export licences (Maryudi 2016, MoEF 2016a), which in turn allows VLK-compliant wood products to enter the EU market through the 'green lane', viz. without further regulation (Overdevest and Zeitlin 2018). This export market signal has fostered implementation of SVLK in the case studies, and colaterally fostered the supply of legal wood products to domestic markets. This result is consistent with Astana *et al.*'s (2020) conclusion that the SVLK at the wood processors has 'added legality value' for the Indonesian public and forest industry interests. While unclear sanctions for illegality and the lack of market incentives for legal wood might lead to greater non-compliance in domestic value chains, particularly those that are informal and not linked to global markets (Setyowati and McDermott 2017), there was no evidence of these outcomes here, reflecting the integration of supply chains and processing of export and domestic wood products.

The pursuit of voluntary FSC certification may be motivated by both economic factors, viz. market access and price premiums (Aguilar and Vlosky 2007, Guan and Ip Ping Sheong 2019, Yamamoto *et al.* 2014), and those related to social licence (Tricallotis *et al.* 2019, Tyler 2006). While all 24 natural forest concessions have to commit resources to implement mandatory PHPL and/or VLK systems, only five chose to make the additional resource commitment to pursue FSC certification. These concessions also received assistance from an international donor in meeting certification requirements, as subsidies for the cost of certification and for capacity building (in reduced-impact logging, biodiversity management, high conservation value forests, and chain of custody; Provincial NGO interviewee). Echoing previous studies (Auld 2014, Cashore *et al.* 2004), the wood panel processor's greater exposure to FSC certification-demanding international markets was the main driver for them seeking forest certification. Their willingness to pursue FSC certification was facilitated by their prior experience in achieving product certification under other schemes required by their export markets, such as those of the Japan Agriculture Standard and California Air Resources Board.

### **Inconsistencies and potential loopholes in PHPL and VLK**

As Susilawati and Kanowski (2020) reported for a plantation-sourced case study, there were some inconsistencies between PHPL assessments and VLK verification of criteria that are common to both (see Table 4). These appear to have arisen for the same reasons as in that plantation case; as VLK verification requires full compliance with all criteria, auditors

interviewed (CAB-8) advised that they felt that had no choice but to pass VLK requirements for environmental management and worker's rights, even though these overlapped with PHPL criteria that were assessed as not fully compliant. There was also inconsistency between some PHPL assessment indicators in concession A-1, where the auditors (CAB-1) assigned different scores to similar indicators of tenurial issues and Indigenous people's rights. The regulations governing the conduct of audits do not provide clear guidance on the level of sampling required of auditors, and the flexibility that this 'regulatory silence' allows in the conduct of audits might also bias results towards favourable outcomes (Susilawati and Kanowski, *ibid*). These results support Fishman and Obidzinski's (2015: 17) observation that SVLK system architecture and implementation may put "too much power in the hands of the auditors", without sufficient independent monitoring, and are consistent with Susilawati and Kanowski's (*ibid*) conclusion that there is insufficient 'witness auditing' (*sensu* FSC International 2016) of SVLK audits.

There were two areas of non-compliance of SVLK implementation for IPK holders. First, four IPK holders (D-1, D-5, D-7, and D-8) remained VLK-verified even though their permits were extended more than once, in contravention of MoEF Regulation P.62/2015. This was possible because there is no explicit preclusion in P.62/2015 of the issuance of a second IPK extension, provided IPK holders can provide a technical recommendation from relevant National or Provincial Government Agencies, and because there is no prohibition in VLK against verifying IPK holders operating under this extension. Interviews with auditors (CAB-8) confirmed their understanding that they could not refuse an VLK application because IPK holders have fulfilled VLK requirements by providing an IPK permit, notwithstanding that the further extension violated MoEF Regulation P.62/2015. VLK does not require auditors to check the procedure for IPK extension; this regulatory silence allowed CAB-8 to verify these IPK holders.

Second, there were several cases where IPK holders harvested wood before their permits were granted (Provincial Government Agency interviewee). This is likely to be a consequence of lack of monitoring and weak law enforcement by National and Provincial Government Agencies. Similarly, JPIK (2020) also reported a range of non-compliance by IPK holders nationally, including harvesting wood before permit issuance, harvesting wood after obtaining the permit but prior to VLK verification, and harvesting wood in State Production Forests outside of the designated IPK area.

Some potential loopholes related to the wood traceability system were also identified in this study. First, before the revision of the regulation on online data adjustment (MoEF 2019b), log data in the online timber administration system (SIPUHH) were corrected by both the concession holder and the wood panel processor. Some of these corrections, such as those where ID barcodes are displaced during river transport, appear inevitable and justified. However, others, such as those associated with wood from conversion forests, seem more prone to abuse. The latest regulations allowing the adjustment of online data do not explicitly mention the maximum number

of logs for which data can be adjusted; this lack of clarity provides an opportunity for introducing illegal wood into value chains (Richards *et al.* 2003), and could also allow unreported log production leading to significant losses of timber royalties and reforestation funds (KPK 2015, Mumbunan and Wahyudi 2016). Without adequate monitoring by government agencies<sup>23</sup>, CABs and independent monitoring agencies, this represents a substantial weakness in legality verification. Further, forest concessionaires or permit holders can still access the online timber administration system and sell their wood even though they do not hold a VLK certificate, or if their certificate has been suspended or terminated. While all case study concessions had valid VLK certification, a series of independent monitoring reports (JPIK 2014, 2016, 2018) suggests that this flexibility might provide a 'wood legalisation' loophole, defined by Richards *et al.* (2003) as a process by which illegal wood is introduced into legal value chains.

### Differences between PHPL and FSC certification, and with VLK compliance

The contrast between suspension or termination of FSC certification of some natural forest concessions and their ongoing PHPL certification illustrates important differences between the two sustainability certification systems, and between FSC CoC and VLK requirements.

First, as previous studies (Maryudi *et al.* 2017, Susilawati and Kanowski 2020) have reported, the PHPL assessment is a mix of document-based and performance-based evaluation, in which auditors use the scoring system that requires only achievement of a passing grade (for explanation, see Maryudi *et al.* 2017, Susilawati and Kanowski 2020). Given that a passing grade can be achieved by complying with all document-related verifiers, field performance can be poor, and there is no incentive for its improvement. In contrast, FSC applies performance-based audits in which auditors grade non-conformities as either major or minor, and which must be resolved within a defined period (FSC International 2009); this in turn fosters continuous improvement (Hermudananto *et al.* 2018, Ruslandi *et al.* 2014).

Second, a number of studies (Ruslandi *et al.* 2014, Savilaakso *et al.* 2017, Wibowo *et al.* 2019) report that FSC has more stringent and complex requirements than PHPL and VLK. Wibowo *et al.* (2019) used the *Forest Certification Assessment Guide* (WWF and World Bank 2006) to compare the FSC, IFCC, LEI and PHPL/VLK systems, and found the former to be both the most complex and most demanding in terms of standards. Their findings are consistent with the results of this study, in which FSC audits reported non-conformities related to biodiversity conservation and workers' health and safety, whereas these elements were assessed by PHPL as 'good'. Correspondingly, forest managers reported

that they found it easier to comply with PHPL after being FSC-certified, and so preferred FSC auditing to precede PHPL assessment (Natural forest concession A-1 interviewee).

Third, in terms of timber sourcing, SVLK allows wood sourced from legal forest conversion activities, while FSC and other certification systems, such as LEI and PEFC-endorsed schemes, exclude such wood from value chains (see IFCC 2020, LEI 2020, MTCC 2020). Therefore, FSC Mix products from case study value chains do not include wood sourced from the six industrial tree plantation concessions and eight IPK holders, even though it is SVLK-compliant<sup>24</sup>. There have been reports of 'greenwashing' uncertified wood into certified products; several such cases have been reported (in China, Peru and Romania; (EIA 2018), because FSC CoC certified-wood processors used FSC-certified wood in combination with FSC Controlled Wood, which does not require traceability back to the harvesting plot, and for which field checks are conducted only on a limited sample of suppliers (FSC International 2017). In this case study, the processor operated separate production lines for FSC-certified and FSC Mix products, and there was no evidence of such non-compliance.

Overall, these results from our case study are consistent with expectations from both theory and previous studies. Mandatory legality verification represents a lower compliance threshold than voluntary certification, reflecting the narrower scope of the former.

### Implications for Indonesian sustainability certification and legality verification

Although our findings suggest the level of compliance with PHPL and VLK in the case study value chains was high, it also revealed some weaknesses that are likely to have adverse impacts on both sustainability and legality of Indonesian natural forest-based value chains. Our results suggest several ways to address these weaknesses.

First, some key areas of regulatory silence and potential loopholes should be addressed. The multiple regulations around IPK, and their implementation at national and provincial levels, should be clarified and harmonised. There should be stronger and more transparent monitoring of IPK holders, and enforcement of permit and VLK regulations. VLK verification should also explicitly address the process by which IPK permits are issued and extended. PHPL and VLK criteria that overlap, and the levels of discretion in auditing of like elements are consistent (see also Susilawati and Kanowski 2020). Allowable procedures for log data adjustment in the online timber administration system need to be further revised; access to the online system should be limited to actors with current VLK certificates, to minimise the risk of

<sup>23</sup> The agencies with primarily responsibility are Provincial Forestry Services (Dishut Provinsi) and MoEF Regional Production Forest Management Agency (BPHP).

<sup>24</sup> Contrary to Astana *et al.*'s (2020) interpretation, the FSC CoC scheme does not allow wood sourced from SVLK-compliant IPK to enter FSC Mix wood products chains.

illegal logs or wood being recorded in the system and thus entering the value chain; and limits should be placed on the extent of adjustment possible without approval from MoEF.

Second, the scoring system applied in PHPL assessment should be revisited to require a pass grade in performance-related verifiers, as well as for the overall assessment. Implementing this change would strengthen the original purpose of PHPL, which was to foster sustainable practices appropriate for Indonesian forests. Otherwise, a performance-based system more like that used by the FSC would encourage continuous improvement of sustainability practices, and help move PHPL and VLK beyond simply being minimum threshold requirements from which to pursue voluntary forest certification (Savilaakso *et al.* 2017, Susilawati and Kanowski 2020, Wibowo *et al.* 2019).

Third, a more harmonised approach between PHPL and voluntary certification systems would benefit both by reducing the additional cost associated with two different systems, and ensuring that preparation for compliance with one system also facilitated that for the other (as our A-1 concession respondents noted of FSC in relation to PHPL). As Astana *et al.* (2020) noted, there is currently a double cost burden associated with implementing both mandatory and voluntary sustainability certification<sup>25</sup>; this could be addressed by greater harmonisation between the two systems (Susilawati and Kanowski 2020), or by financial incentives such as the differentiated forest taxation that Karsenty (2019) proposed to encourage the adoption of forest certification in the Congo Basin.

Fourth, separately identifying wood sourced from forest conversions and that sourced from sustainably-managed production forests would better align SVLK and certification systems that represent *de facto* international standards. This could be achieved by additional labelling, for example as “Indonesian sustainable natural wood”, for which 100% of wood originates from PHPL-certified natural forest concessions. Such labelling is consistent with the current efforts of MoEF to promote Indonesian wood as both legal and sustainable (Chatham House 2020).

Fifth, in contrast to the findings of Susilawati *et al.* (2019) for private forest-based value chains, market brokers in this case study played positive roles in fostering legality compliance. These good practices were the result of an effective partnership between the wood processing company and market brokers, and are a model that could be emulated more widely in Indonesia.

## CONCLUSION

Over the past decades, both regulatory (PHPL and VLK) and voluntary (forest certification) measures have been introduced to curb illegal logging and promote sustainable forest

management in Indonesian natural forests (Ehrenberg-Azcárate and Peña-Claros 2020, Kleinschmit *et al.* 2016, Romero *et al.* 2015). Although there have been several studies on the implementation of PHPL and VLK (Maryudi *et al.* 2017, Savilaakso *et al.* 2017, Wibowo *et al.* 2019), few have explored the outcomes of their implementation along wood value chains.

While all actors in the case study wood value chains have complied with PHPL and VLK, only a few obtained FSC certification. These results are consistent with expectation: large-scale businesses normally demonstrate high levels of regulatory compliance (Gunningham and Sinclair 2002), whereas only those who engage with niche international markets are likely to seek voluntary forest certification, given its additional costs and constraints (Auld 2014, Cashore *et al.* 2004). Our case study demonstrates, also consistent with expectation, that it is easier to achieve regulatory compliance than voluntary certification, because the former has less stringent requirements and uses a scoring system that allows a pass grade regardless of field performance. This, in turn, means that the PHPL certification process does not provide an incentive for continuous improvement of field performance as does FSC; thus, over time, there is likely to be greater divergence in the quality of forest management certified by PHPL compared to that certified by FSC.

There has been ongoing debate about whether the emergence of timber legality regimes might strengthen (Cashore and Stone 2012, Cashore and Stone 2014) or weaken (Bartley 2014, Giessen *et al.* 2016) the adoption of forest certification in the Global South; these results provide no evidence for the former, but rather suggest ways in which the adoption of practices that are standard in forest certification, if not certification itself, could strengthen timber legality verification. In particular, addressing areas of regulatory silence and potential loopholes, requiring PHPL assessment to take more account of field performance, identifying efficiencies and synergies between mandatory and voluntary systems, and introducing sustainability labelling of Indonesian wood products, would enhance the sustainability and legality performance of Indonesian natural forest-based wood products value chains.

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<sup>25</sup> PHPL assessment cost is around US\$ 25 000 to 30 000 per concession (MoEF 2016c); FSC forest certification cost is around US\$ 300 000 to 700 000 per concession (Ruslandi *et al.* 2014).

## DECLARATION OF INTEREST

The authors report no conflict of interest. The authors alone are responsible for the content and writing of this article.

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## ANNEX 1 Criteria, indicators and verifiers for PHPL certification of natural forest concessions (MoEF, 2016)

Criterion	Indicator	Verifier	Verifier category				
			≤ 5 years <sup>1</sup>		≥ 5 years		
			D <sup>2</sup>	CD	D	D	CD
1. Precondition	1.1. Concession license and delineation of the concession area	1.1.1. Availability of a legal document of concession license and its delineation (SK IUPHHK-HA, procedures of forest delineation and its map)	√				√
		1.1.2. Implementation of forest delineation and its boundaries	√				√
		1.1.3. Recognition from the stakeholders on the existence of the concession area				√	√
		1.1.4. Concessionaires' action plan if there is a change in the allocated concession area (Not applicable if there is no change)				√	√
		1.1.5. The utilisation of the concession area for other sectors (Not applicable if there is no utilisation other than forestry sector)				√	√
1.2.	Commitment to implement sustainable production forest management	1.2.1. Provision of the company's vision, mission, and objectives following PHPL principles	√				√
		1.2.2. The socialisation of the company's vision, mission, and objectives	√				√
		1.2.3. The suitability of the company's vision and mission with PHPL implementation				√	√
1.3.	Sufficient professional and trained employees	1.3.1. Recruitment of the professional foresters to be placed in each division that responsible for performing forest management				√	√
		1.3.2. Capacity building of human resources	√				√
		1.3.3. Availability of employment contract documents	√				√
1.4.	The internal mechanism of monitoring and evaluation	1.4.1. The organisational structure and job description that support PHPL implementation	√				√
		1.4.2. Provision of Management Information System and its operator	√				√
		1.4.3. Implementation of Internal Monitoring System and its effectiveness in controlling the forest management activities	√				√
		1.4.4. Preventive action and management improvement based on internal monitoring and evaluation				√	√
1.5.	Free, prior informed consent from local communities or indigenous people	1.5.1. Endorsement of annual harvesting plan from local communities or indigenous people through a participatory process				√	√
		1.5.2. Endorsement of the delineation of concession boundaries from local communities or indigenous people	√				√
		1.5.3. Endorsement of the planning and implementation of Company Social Responsibility or Community Development programs				√	√
		1.5.4. Endorsement of the designation of the protection area	√				√

Criterion	Indicator	Verifier	Verifier category			
			≤ 5 years <sup>1</sup>	CD	D	CD
2. Production	2.1. A ten-year management plan and delineation of harvesting area for supporting SFM	2.1.1. Availability of the ten-year management plan that has been approved by the MoEF	✓	CD	D	CD
		2.1.2. The implementation of delineation of annual harvesting area following the ten-year management plan	✓			✓
		2.1.3. Provision and maintenance of the boundary marking of harvesting area	✓			✓
	2.2. Sustainable harvesting rate for wood products for each ecosystem type	2.2.1. Data availability on forest stand for each ecosystem type based on forest inventory	✓			✓
		2.2.2. Data availability on standing stock and its increment rate	✓			✓
		2.2.3. Self-calculation of Annual Allowable Cut based on forest inventory data	✓			✓
	2.3. Implementation of silviculture system to ensure forest regeneration	2.3.1. Availability of the Standard Operating Procedure (SOP) for all stages of silviculture system	✓			✓
		2.3.2. The SOP implementation on all stages of silviculture system	✓			✓
		2.3.3. The adequacy level of standing stock before harvesting to ensure sustainable harvesting	✓			✓
		2.3.4. The adequacy level of concession regeneration to ensure sustainable harvesting	✓			✓
	2.4. Availability and implementation of reduced impact logging	2.4.1. Availability of the SOP for reduced impact logging	✓			✓
		2.4.2. Implementation of reduced impact logging	✓			✓
		2.4.3. Minimum damage to residual trees and openness of the forest area	✓			✓
		2.4.4. Minimal waste of wood harvesting	✓			✓
	2.5. Logging activities must consistent with the harvesting plan and area	2.5.1. Availability of annual harvesting plan that developed based on the ten-year management plan, and has been approved by Provincial Forestry Service or self-approval	✓			✓
		2.5.2. Availability of the map of harvesting and protected area, and its consistency with the ten-year management plan	✓			✓
		2.5.3. Implementation of boundary marking in the harvesting and protected area	✓			✓
		2.5.4. The consistency of location and total of harvesting area, wood species and harvesting volume with annual harvesting plan	✓			✓
	2.6. Adequate financial health to meet sustainable forest management	2.6.1. Rates of financial health (liquidity, solvency, and profitability rates)	✓			✓
		2.6.2. Adequate fund allocation based on the company financial statement that has been audited by a public accountant	✓			✓
		2.6.3. The balanced proportion of fund allocation for all divisions	✓			✓
		2.6.4. The efficient disbursement of funding for forest management activities	✓			✓
		2.6.5. The capital invested back into the concession	✓			✓
		2.6.6. The achievement of targeted tree planting	✓			✓

Criterion	Indicator	Verifier	Verifier category			
			≤ 5 years <sup>1</sup>	CD	D	CD
3. Ecological	3.1. Protected area in each forest type	3.1.1. The consistency of allocation of a protected area with an environmental management plan (AMDAL/UKL-UPL/DPPL/DPLH)	✓			✓
		3.1.2. The zones of the protected area and its boundary		✓		✓
		3.1.3. The state of forest covers in the protected area		✓		✓
		3.1.4. Stakeholders' recognition of the protected area		✓		✓
		3.1.5. Availability of the management report of the protected area		✓		✓
	3.2. Forest protection from the forest fire, illegal logging, illegal grazing, forest encroachment, illegal poaching, and forest disease	3.2.1. Availability of the SOP for forest protection for each type of forest disturbance		✓		✓
		3.2.2. Provision of facilities and infrastructures for forest protection		✓		✓
		3.2.3. Professional human resources related to forest protection		✓		✓
		3.2.4. The implementation of forest protection (preemptive, preventive, or repressive)		✓		✓
	3.3. Soil and water conservation and monitoring	3.3.1. Availability of the SOP for soil and water conservation and monitoring		✓		✓
		3.3.2. Provision of facilities and infrastructures for soil and water conservation and monitoring		✓		✓
		3.3.3. Professional human resources related to soil and water conservation and monitoring		✓		✓
		3.3.4. Planning and implementation of soil and water conservation		✓		✓
		3.3.5. Planning and implementation of soil and water monitoring		✓		✓
		3.3.6. The indications of the impact on soil and water		✓		✓
3.4. Identification of protected, endangered, rare, threatened, and endemic flora and fauna	3.4.1. Availability of the SOP for identification of protected, endangered, rare, threatened, and endemic flora and fauna		✓		✓	
	3.4.2. Implementation of identification of protected, endangered, rare, threatened, and endemic flora and fauna		✓		✓	
3.5. The undisturbed area allocated in the concession for flora; management of protected, endangered, rare, threatened, and endemic flora	3.5.1. Availability of the SOP for protected, endangered, rare, threatened, and endemic flora		✓		✓	
	3.5.2. Implementation of management of protected, endangered, rare, threatened, and endemic flora		✓		✓	
	3.5.3. The state of protected, endangered, rare, threatened, and endemic fauna in the undisturbed area		✓		✓	
3.6. The undisturbed area allocated in the concession for fauna; management of protected, endangered, rare, threatened, and endemic fauna	3.6.1. Availability of the SOP for protected, endangered, rare, threatened, and endemic fauna		✓		✓	
	3.6.2. Implementation of management of protected, endangered, rare, threatened, and endemic fauna		✓		✓	
	3.6.3. The state of protected, endangered, rare, threatened, and endemic fauna in the undisturbed area		✓		✓	

Criterion	Indicator	Verifier	Verifier category			
			≤ 5 years <sup>1</sup>	≥ 5 years	D <sup>2</sup>	CD
4. Social	4.1. Clear delineation between the concession area and community lands or indigenous people	4.1.1. Availability of the document/report on local wisdom of natural resource management, identification of customary rights, and natural resource management plan from the company	✓	✓	D	✓
		4.1.2. Availability of the SOP for participatory mapping of forest boundaries and tenurial conflict resolution	✓	✓	D	✓
		4.1.3. Provision of a mechanism to recognise the customary rights and local communities in the natural resource management plan	✓	✓	D	✓
		4.1.4. The existence of clear boundary marking between the concession area and indigenous people or local community lands	✓	✓	D	✓
		4.1.5. Stakeholders' recognition of the concession area and its boundaries	✓	✓	D	✓
	4.2. Implementation of corporate social responsibility programs	4.2.1. Availability of the SOP for corporate social responsibility programs	✓	✓	D	✓
		4.2.2. Provision of a mechanism to implement corporate social responsibility programs	✓	✓	D	✓
		4.2.3. The socialisation of corporate social responsibility to the local communities or indigenous people	✓	✓	D	✓
		4.2.4. Implementation of corporate social responsibility and the fulfilment of customary rights on natural resources management	✓	✓	D	✓
		4.2.5. Availability of the implementation report of corporate social responsibility including the compensation	✓	✓	D	✓
	4.3. Mechanism and implementation of fair benefit distribution	4.3.1. Availability of data and information on indigenous people or local communities that involved, depend on, affected by the company's natural resources management activities	✓	✓	D	✓
		4.3.2. Provision of a mechanism to increase the participation of indigenous people or local communities and their livelihood	✓	✓	D	✓
		4.3.3. Availability of the planning document to increase the participation of indigenous people or local communities and their livelihood	✓	✓	D	✓
		4.3.4. The implementation of activities which increase the participation of indigenous people or local communities and their livelihood	✓	✓	D	✓
		4.3.5. Availability of the implementation report or fair benefit distribution	✓	✓	D	✓
4.4. Mechanism and implementation of conflict resolution	4.4.1. Provision of a mechanism of conflict resolution	✓	✓	D	✓	
	4.4.2. Provision of a conflict mapping	✓	✓	D	✓	
	4.4.3. Availability of conflict resolution institution supported by stakeholders, including human and financial resources	✓	✓	D	✓	
	4.4.4. Availability of the implementation report of conflict resolution that has happened	✓	✓	D	✓	
4.5. Protection of labour rights and the improvement of employees' prosperity	4.5.1. Provision of the company's relationship with all employees	✓	✓	D	✓	
	4.5.2. Planning and implementation of capacity building for all employees	✓	✓	D	✓	
	4.5.3. Provision of a mechanism for career promotion and its implementation	✓	✓	D	✓	
	4.5.4. Provision of a mechanism for employees' prosperity allowance and its implementation	✓	✓	D	✓	

<sup>1</sup>Duration of the concession licence<sup>2</sup>D = Dominant; CD = Co-dominant

ANNEX 2 Example of scoring system in PHPL certification (MoEF, 2016)

Criterion	Indicator	Verifier	Dominant/ Co-dominant (weight)	Auditor's score for verifier	Verifier: realised score	Verifier: maximum score
Precondition	1.1	1.1.1	a CD (1)	b 2	a x b 2	a x 3 3
		1.1.2	D (2)	2	4	6
		1.1.3	CD (1)	3	3	3
		1.1.4	CD (1)	3	3	3
		1.1.5	CD (1)	3	3	3
<b>Total</b>				<b>15</b>	<b>18</b>	

Explanatory notes:

- Total score for indicator 1.1 = (15/18) x 100% = 83%, within the "Good" range (81-100%)
- A verifier must be scored at least '2' to pass

ANNEX 3 PHPL and FSC requirements and compliance assessments for company-managed natural forest concession, 2015–2019

Forest Management components (adapted from Ruslandi et al. 2014)	System requirements			Compliance assessment		
	PHPL criteria	FSC principles <sup>3</sup>	PHPL assessment	Major non-conformities	Minor non-conformities	Authors' assessment from fieldwork
Compliance with laws and satisfaction of financial obligations	Precondition	1	<ul style="list-style-type: none"> <li>• 80% of all Precondition Indicators were assessed as good</li> <li>• Verifiers 1.1.2 (forest boundary delineation), 1.2.3 (sustainability commitment)*, and 1.4.1 (organisational structure)* were assessed as intermediate for three consecutive years of assessment or more</li> </ul>	<ul style="list-style-type: none"> <li>• Indicators 1.6.2 and 1.6.3: other forest areas managed by different concession but under one company group did not adhere to the FSC Principles and Criteria**</li> </ul>	<ul style="list-style-type: none"> <li>• Indicator 1.2.3: the concession has not ensured the contractors' obligations in paying workers' minimum wages and liability insurance**</li> </ul>	<ul style="list-style-type: none"> <li>• Sister company did not adhere to FSC Principles and Criteria</li> </ul>
Implementation of reduced-impact logging (RIL)	Production	5, 6, 7, 8	<ul style="list-style-type: none"> <li>• 70% of all verifiers associated with RIL (Indicator 2.4) were assessed as good</li> <li>• Verifier 2.4.3 (damage to residual trees and openness of the forest area) was assessed as intermediate for four consecutive years of assessment</li> </ul>	<ul style="list-style-type: none"> <li>• Indicators 6.5.2 and 6.5.10: A side logging road constructed in a slope of more than 50%, which has resulted in severe damage to soil and surrounding vegetation</li> </ul>	None	<ul style="list-style-type: none"> <li>• Lack of internal monitoring on the implementation of Reduced-Impact Logging – associated activities are conducted by contract workers</li> </ul>



Forest Management components (adapted from Ruslandi <i>et al.</i> 2014)	System requirements			Compliance assessment		
	PHPL criteria	FSC principles <sup>3</sup>	PHPL assessment	Major non-conformities	FSC audit	Authors' assessment from fieldwork
Yield sustainability and silviculture	Production	6, 7, 8, 10	<ul style="list-style-type: none"> <li>93% of all Production Indicators were assessed as good</li> <li>Verifiers 2.2.3 (annual allowable cut), 2.3.1 (procedures for silviculture system), 2.3.2 (implementation of silviculture system), 2.5.3 (boundary of harvesting area), and 2.5.4 (implementation of harvesting plan) were assessed as intermediate for three consecutive years of assessment or more</li> </ul>	None	<ul style="list-style-type: none"> <li>Indicator 6.3.3: the company has not replanted on the side roads of post logging area.</li> </ul>	<ul style="list-style-type: none"> <li>The company hasn't conducted research and development on a replanting strategy (e.g. with pioneer species).</li> <li>Not successful with replanting activities.</li> </ul>
Environmental management and monitoring plans	Ecological	6, 8	<ul style="list-style-type: none"> <li>83% of all Ecological Indicators were assessed as good</li> <li>Verifiers 3.2.2 (facilities and infrastructure for forest protection), 3.2.3 (human resources for forest protections), and 3.3.5 (soil and water monitoring) were assessed as intermediate for three consecutive years of assessment or more</li> </ul>	<ul style="list-style-type: none"> <li>Indicator 6.1.2: No site-specific environmental impact assessment for potential negative impacts prior to each operational activity</li> <li>Indicator 6.7.4: ineffectively oil spillage controlling so that some of spillages entering the water resources</li> </ul>	<ul style="list-style-type: none"> <li>Indicator 6.2.5: the company has not carried out annual monitoring of protected area</li> <li>Indicator 6.5.8: evidence of siltation or other damage to water resources (i.e. crossing the river without bridge)</li> <li>Indicator 7.1.13: the company has not evaluated the needs for fire management and control, including the establishment of the team and organisational structure</li> <li>Indicator 8.1.2: poor maintenance of infrastructure and its negative impacts on the environment</li> </ul>	<ul style="list-style-type: none"> <li>Evidence of oil spillage entering the water resources</li> </ul>

Forest Management components (adapted from Ruslandi <i>et al.</i> 2014)	System requirements			Compliance assessment		
	PHPL criteria	FSC principles <sup>3</sup>	PHPL assessment	Major non-conformities	FSC audit	Authors' assessment from fieldwork
Biodiversity conservation	Ecological	6, 9	<ul style="list-style-type: none"> <li>90% of all verifiers associated with flora and fauna management (Indicator 3.4, 3.5, 3.6) were assessed as good</li> </ul>	None	<ul style="list-style-type: none"> <li>Indicator 6.2.1: the company cannot ensure that the IUCN red list species are not harvested</li> <li>Indicator 9.1.2: the intact forest landscape areas have not been determined clearly and identified through High Conservation Value Forest/HCVF assessment</li> <li>Indicator 9.4.2: some of monitoring and management activities for HCVF areas have not been implemented</li> </ul>	<ul style="list-style-type: none"> <li>Evidence of wildlife hunting.</li> </ul>
Social impact assessment and community development programs	Precondition Social	4	<ul style="list-style-type: none"> <li>84% of all Social Indicators were assessed as good</li> <li>Verifiers 4.2.3 (socialisation of Corporate Social Responsibility/CSR) and 4.2.4 (implementation of CSR) were assessed as intermediate for three consecutive years of assessment or more</li> </ul>	<ul style="list-style-type: none"> <li>Indicator 4.4.1 and 4.4.3: the company has not conducted public consultation regularly to assess the social impacts of its activities on company's and contractor's workers**</li> </ul>	<ul style="list-style-type: none"> <li>Indicator 4.4.2: the company has not fully implemented some recommendations resulted from the social impact assessment**</li> <li>Indicator 4.5.4: the company has not yet developed a timeline of complaints handling from the local communities.</li> </ul>	<ul style="list-style-type: none"> <li>Delayed implementation of Corporate Social Responsibility programs</li> </ul>
Tenure and Indigenous peoples' rights	Precondition Social	2, 3	<ul style="list-style-type: none"> <li>93% of all verifiers associated with Free, Prior, and Informed Consent from Indigenous peoples (Indicator 1.5) were assessed as good</li> <li>Verifiers 4.1.4 (clear boundary with Indigenous land), 4.3.2 (mechanism to involve Indigenous peoples), and 4.3.3 (participatory planning document) were assessed as intermediate for three consecutive years of assessment or more</li> </ul>	None	<ul style="list-style-type: none"> <li>Indicator 2.3.3: the company has not considered and explored potential tenurial conflicts in adjoining villages; and Indigenous people's concern on the government's plan to build infrastructure near the villages</li> </ul>	<ul style="list-style-type: none"> <li>The company hasn't finished the participatory mapping for the customary land inside the concession</li> </ul>

Forest Management components (adapted from Ruslandi <i>et al.</i> 2014)	System requirements			Compliance assessment		
	PHPL criteria	FSC principles <sup>3</sup>	PHPL assessment	Major non-conformities	FSC audit	Minor non-conformities
Workers' rights, health, and safety	Social	4	<ul style="list-style-type: none"> <li>65% of all verifiers associated with workers' rights and prosperity (Indicator 4.5) were assessed as intermediate</li> <li>Verifiers 4.5.1 (company's relationship with the workers) and 4.5.2 (capacity building for the workers) were assessed as intermediate for five consecutive years of assessment</li> </ul>	<ul style="list-style-type: none"> <li>Indicator 4.1.4: delayed payment of workers' salary</li> <li>Indicator 4.1.7: some workers received a salary under minimum wage</li> <li><i>Indicator 4.2.4: some workers do not use safety equipment</i></li> <li>Indicator 4.2.8: the company has not provided basic first aid training for the contract workers</li> <li><i>Indicator 4.2.9: the company has not made a written emergency plan in case of serious injury to any worker</i></li> <li><i>Indicator 4.2.12: the mechanism of recording incidents of work accident is not clear</i></li> <li>Indicator 4.2.13: No provision of health insurance</li> <li>Indicator 4.2.14: the company has not been able to show period reviews for employee welfare</li> </ul>	<ul style="list-style-type: none"> <li>Indicator 4.1.6: the workforce procedure did not cover the qualifications for all positions and levels</li> <li>Indicator 4.2.1: Person in charge of WHS in the sub-contractor company had never attended training on WHS</li> <li><i>Indicator 4.2.5: some heavy equipment safety requirements are incomplete</i></li> <li>Indicator 4.2.6: lack of sanitation facilities at the workers' shelter</li> <li><i>Indicator 4.3.1: some workers did not understand the company policy on workers' right to form a union and until to date the workers have not established a union</i></li> </ul>	<ul style="list-style-type: none"> <li>Delayed salary payment</li> <li>Weak monitoring on the sub-contracted company and its workers</li> <li>Some workers do not use safety equipment</li> <li>Lack of professional and trained personnel.</li> </ul>

<sup>3</sup>Refer to the Harmonised Certification Bodies' Forest Stewardship Standard for the Republic of Indonesia (FSC International 2019d)

\* Non-comparable findings: PHPL verifiers that are not audited by FSC

\*\* Non-comparable findings: FSC indicators that are not assessed by PHPL

*Italic font* – comparable audit findings but different results between PHPL and FSC