

**Current REDD+ and FLEGT-VPA-Related Achievements and
Limitations for Sustainable Forest Management
on the Subnational Level**

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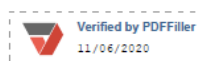
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Summary

Global forest governance is shaped by numerous instruments and initiatives. These approaches, referred to hereafter as forest-based approaches (FbAs), strive to promote the holistic concept of sustainable forest management (SFM). Yet, despite their common goal, FbAs often vary in scope, focus and their applied strategies and measures, depending on the purpose and actual priority of each approach and, therefore, also their relevance to SFM. Two current FbAs are REDD+ (Reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries) and FLEGT (Forest Law Enforcement, Governance and Trade). REDD+ aims to compensate developing countries for foregone costs related to avoiding deforestation and forest degradation, the conservation and enhancement of forest carbon stocks and SFM. FLEGT, through the implementation of legally binding trade agreements between the EU and a timber producing country outside the EU, so called Voluntary Partnership Agreements (VPAs), aims to address the issue of illegal logging and related trade.

The purpose of this study is to investigate the contributions made by REDD+ and FLEGT-VPA to the holistic concept of SFM on the subnational level with a focus on five specific research questions:

1. What are the current REDD+ achievements and limitations relevant to SFM on the subnational level?
 - 1.1 Do subnational REDD+ activities contribute to forest loss reduction on the jurisdictional level?
2. What are the current FLEGT-VPA-related achievements and limitations relevant to SFM on the subnational level?
 - 2.1 Do national forest certification schemes under a FLEGT-VPA contribute to forest loss reduction on the concession level?
3. What are the current driving forces of and hindrances to subnational REDD+ implementation?

Research was carried out in the Indonesian East Kalimantan Province and Berau District where both FbAs have been implemented. To address research question 2 and 2.1, the study examines the following FLEGT-VPA-related certification schemes in Indonesia: Timber Legality Assurance System (TLAS), the Sistem Verifikasi Legalitas Kayu (SVLK) that became the core of the Indonesian VPA, and the Pengelolaan Hutan Produksi Lestari (PHPL) – the Indonesian SFM certification adopted under the legal framework of the SVLK.

REDD+ achievements and limitations relevant to SFM on the subnational level

Subnational REDD+ (and FLEGT-VPA) achievements to SFM in the focus area were identified from interview surveys and the analysis of REDD+ (and FLEGT-VPA) policy, implementation and evaluation reports. The seven International Tropical Timber Organization (ITTO) criteria¹ were used as an evaluative framework.

The study shows that REDD+ has the potential to contribute to the holistic concept of SFM. No contradictions were found. REDD+ achievements (as those of FLEGT-VPA) are mostly classified as outputs (i.e. immediate results of an intervention) while only fewer outcomes (i.e. behavioral, institutional or social changes that take place over 3-10 years of an intervention's output) were observed. Major achievements were identified in relation to the establishment of enabling conditions for SFM (criterion 1) and to the improvement of the land use (changes) data base (criteria 3 and 2).

Results suggest that REDD+ can promote (ongoing) governance reforms on the subnational level, but that the process is slow. Achievements related to the criteria 'forest ecosystem health and resilience', 'forest production', 'forest biological diversity' and 'economic, social and cultural aspects' remain in the pilot stages without a clear outcome on the jurisdictional level. Progress generally decreased from the provincial to district level.

¹ Criterion 1: Enabling conditions for SFM, criterion 2: Extent and condition of forests, criterion 3: Forest ecosystem health and resilience, criterion 4: Forest production, criterion 5: Forest biological diversity, criterion 6: Soil and water protection, criterion 7: Economic, social and cultural aspects.

Contribution of subnational REDD+ activities to forest loss reduction

This part of the study draws on an analysis of satellite data. Results suggest that the REDD+ readiness process was unable to reduce forest loss on the provincial or district level between 2009/10 – when REDD+ was introduced – and 2016. Triangulating study results reveal that the major sources of forest loss remained unaddressed under the district and provincial REDD+ programs. Over 60% of the total forest loss between 2001 and 2016 in both jurisdictions occurred on land officially classified as ‘non-forest land’ (the Indonesian land classification system does not necessarily coincide with the actual forest cover). Accordingly, more than half of Berau’s forest loss occurred within industrial land use permit boundaries (natural forest, timber plantation, mining or oil palm permits).

FLEGT-VPA-related achievements and limitations relevant to SFM

Results reveal that the VPA between the EU and Indonesia both contributes to and contradicts with SFM. Key achievements were identified in relation to the establishment of enabling conditions for SFM (criterion 1) and to the criterion ‘forest production’. As a result of the SVLK implementation, consulted stakeholders perceive a decreasing trend in illegal logging of timber destined for the export market (criterion 2), but the data to prove this is limited. Issues related to ‘forest biological diversity’, ‘soil and water protection’ and ‘economic, social and cultural aspects’ remain unaddressed under the SVLK.

Gaps were found in relation to land and forest allocation, whose clarity is vital under the Indonesian TLAS. Despite related objectives to improve forest governance, this study demonstrates that no measures to influence subnational governance and improve the spatial planning process are provided under the VPA.

The study also reveals that FLEGT-VPA reinforces traditional unsustainable practices anchored in Indonesian law; among those the application of an outdated harvesting system and the legal conversion of forests to other land uses. Results demonstrate that timber defined as ‘legal’ under the VPA might not originate from a sustainably managed forest.

Contribution of VPA certification schemes to forest loss reduction

Results of the remote sensing analysis offer no evidence that the VPA-related certification schemes contributed to forest loss reduction on the forest concession level in Berau, neither on loss associated with forest management nor with loss associated with the conversion of forests. Most of the loss in the investigated concessions is associated with mining or the permanent conversion of natural forests to oil palm plantations, the remaining is linked to forest management activities. Study findings demonstrate that large-scale forest loss is highly prevalent in PHPL-certified concessions.

Driving forces of and hindrances to the REDD+ implementation

Empirical material for this part of the study was drawn from expert interviews and REDD+ policy, implementation and evaluation reports. Results reveal that international organizations and academics are the main drivers of the REDD+ process. The forestry faculty in the focus area played an important role in this process. The long history of conservation programs, the existing technical know-how and financial and human resources facilitated the REDD+ process.

Reasons for the failure to achieve many intended objectives of the REDD+ readiness process in the focus area involve the lack of political support beyond the political leader and the late integration of related strategies into regional development plans. The low level of ownership and support among subnational governments is explained by a lack of autonomy from other sectors that drive deforestation, limited involvement of the subnational parliament, a poor understanding of and interest in REDD+ related issues among policy decision-makers, other nationally-driven priority strategies and limited translation of REDD+ related national policies at the local level.

Conclusion and implications

Based on the study results and their discussion, conclusions were made on the achievements and limitations of REDD+ and FLEGT-VPA for SFM on the subnational level. It is concluded that REDD+ and FLEGT have different strengths and weaknesses in terms of SFM. Both approaches support ongoing policy reforms, but neither approach led to reduced forest loss in the respective units of analysis during the investigation period.

Conclusions specific to REDD+ include the need to address the region-specific main drivers of forest loss. For the focus area it is important that improvements be made to the spatial planning and land use classification processes and that the non-forestry sector is better engaged in land use management. Successful pilot stage activities need to be upscaled and the necessary resources for implementation secured.

Conclusions specific to FLEGT-VPA's comprise implications of their sole focus on legality. In order to ensure that timber concessions also comply with sustainability measures requires considering and questioning the national legislation of the VPA partner country in terms of SFM which would ultimately influence its national sovereignty.

German summary

Die globale Politikgestaltung im Forstsektor ist von zahlreichen Instrumenten und Initiativen geprägt. Diese Ansätze, im Folgenden als forstbasierte Ansätze (FbAs) bezeichnet, verfolgen das Ziel, das holistische Konzept einer nachhaltigen Waldbewirtschaftung (SFM) zu fördern. Trotz ihres gemeinsamen Ziels unterscheiden sich FbAs in Abhängigkeit ihres jeweiligen Ansatzes, in Umfang, Schwerpunkt und angewandten Strategien. Entsprechend variiert ihre Bedeutung für SFM. Zwei aktuelle FbAs sind REDD+ (Minderung von Emissionen aus Entwaldung und Schädigung von Wäldern, sowie die Rolle des Schutzes, der nachhaltigen Waldbewirtschaftung und der Verbesserung der Kohlenstoffvorräte der Wälder in Entwicklungsländern) und FLEGT (Rechtsdurchsetzung, Politikgestaltung und Handel im Forstsektor).

Die Grundidee von REDD+ ist, Entwicklungsländer für die entgangenen Kosten im Zusammenhang mit der Vermeidung von Entwaldung und Walddegradation finanziell zu entschädigen. FLEGT verfolgt das Ziel, durch die Realisierung rechtsverbindlicher Handelsabkommen zwischen der EU und einem Holzproduktionsland außerhalb der EU, so genannter Voluntary Partnership Agreements (VPAs), die Einfuhr von illegal produziertem Holz in die EU zu verhindern und so den illegalen Holzeinschlags im Produktionsland zu bekämpfen.

Ziel der vorliegenden Studie ist es, zu untersuchen inwiefern REDD+ und FLEGT-VPA zum holistischen Konzept von SFM auf subnationaler Ebene beitragen, wobei fünf spezifische Forschungsfragen im Mittelpunkt stehen:

1. Was sind aktuelle SFM relevante Errungenschaften und Grenzen von REDD+ auf subnationaler Ebene?
 - 1.1 Tragen subnationale REDD+ -Aktivitäten zur Verringerung des Waldverlustes auf der Ebene der Gerichtsbarkeit bei?
2. Was sind aktuelle SFM relevante Errungenschaften und Grenzen von FLEGT-VPA, die für die subnationaler Ebene von Bedeutung sind?
 - 2.1 Tragen nationale Waldzertifizierungssysteme im Rahmen eines FLEGT-VPAs zur Reduzierung des Waldverlustes auf Konzessionsebene bei?
3. Was sind die aktuellen Treiber und Hindernisse der subnationale REDD+ Implementierung?

Die Untersuchungen wurden in der indonesischen Provinz Ost-Kalimantan und dem Bezirk Berau durchgeführt, wo beide FbAs implementiert werden. Um die Forschungsfragen 2 und 2.1 zu beantworten, wurden die folgenden FLEGT-VPA-relevanten indonesischen Zertifizierungssysteme untersucht: das Legalitätssicherungssystem für Holz, das sogenannte Sistem Verifikasi Legalitas Kayu (SVLK), das im Zentrum des indonesischen VPAs steht, und die SFM-Zertifizierung, die sogenannte Pengelolaan Hutan Produksi Lestari (PHPL), die gesetzlich an das SVLK angegliedert ist.

SFM relevante REDD+-Errungenschaften und Grenzen auf subnationaler Ebene

Subnationale REDD+ (und FLEGT-VPA) -Errungenschaften im Untersuchungsgebiet wurden anhand von Interviews und der Analyse von Politik-, Implementierungs- und Evaluierungsberichten ermittelt. Die sieben SFM Kriterien² der International Tropical Timber Organization (ITTO) wurden als Bewertungsrahmen verwendet.

Die vorliegende Studie zeigt, dass REDD+ das Potenzial hat, zum holistischen Konzept von SFM beizutragen. Es wurden keine Widersprüche gefunden. REDD+-Errungenschaften (wie auch jene von FLEGT-VPA) werden meist als Output (das heißt als unmittelbares Ergebnis einer Intervention) eingestuft, während nur wenige 'Outcomes' (das heißt Verhaltens-, institutionelle oder soziale Veränderungen, die über einen Zeitraum von 3 bis 10 Jahren nach Realisierung des Outputs stattfinden) beobachtet wurden. Zu den Haupterrungenschaften zählen insbesondere solche, die zur Schaffung der Rahmenbedingungen für SFM (Kriterium 1) beitragen, sowie die Verbesserung der Landnutzungsdatengrundlage (Kriterium 3 and 2).

² Criterion 1: Enabling conditions for SFM (Rahmenbedingungen für SFM), criterion 2: Extent and condition of forests (Umfang und Zustand der Wälder), criterion 3: Forest ecosystem health and resilience (Gesundheit und Resilienz des Waldökosystems), criterion 4: Forest production (Forstproduktion), criterion 5: Forest biological diversity (biologische Vielfalt des Waldes), criterion 6: Soil and water protection (Boden und Wasserschutz), criterion 7: Economic, social and cultural aspects (wirtschaftliche, soziale und kulturelle Aspekte).

Die Ergebnisse zeigen außerdem, dass REDD+ (laufende) Reformen der Regierungsführung auf subnationaler Ebene fördern kann, dieser Prozess jedoch langwierig ist. Errungenschaften in Zusammenhang mit den SFM Kriterien „Gesundheit und Widerstandsfähigkeit des Waldökosystems“, „Forstproduktion“, „biologische Vielfalt des Waldes“ und „wirtschaftliche, soziale und kulturelle Aspekte“ befanden sich zum Zeitpunkt der Studie in der Pilotphase, und zeigten deshalb keine eindeutigen Auswirkungen auf Provinz- oder Distriktebene. Die Errungenschaften auf der Distriktebene blieben im Allgemeinen hinter derer der Provinzebene zurück.

Beitrag von subnationalen REDD+ Aktivitäten zur Reduzierung des Waldverlustes

Die Analyse von Satellitendaten lässt keinen Schluss darauf zu, dass der REDD+ Prozess in der Untersuchungsregion den Waldverlust zwischen 2009/10 – dem Zeitpunkt der REDD+-Einführung – und 2016 reduzieren konnte. Die Triangulation von Studienergebnisse zeigt, dass die Hauptursachen für die Waldverluste auf Distrikt und Provinzebene durch die dortigen REDD+-Programme nicht bekämpft werden konnten. Über 60% des gesamten Waldverlustes zwischen 2001 und 2016 in den beiden administrativen Einheiten wurde in der Landklasse „Nicht-Wald“ beobachtet (das indonesische Landklassifizierungssystem stimmt nicht zwangsläufig mit der tatsächlichen Waldbedeckung überein). Mehr als die Hälfte des Waldverlustes in Berau fand innerhalb industrieller Landnutzungsgenehmigungen für Naturwald, Holzplantagen, Bergbau oder Ölpalmenplantagen statt.

SFM relevante FLEGT-VPA Errungenschaften und Grenzen auf subnationaler Ebene

Die Ergebnisse zeigen, dass das VPA zwischen der EU und Indonesien einen positiven Beitrag zu vielen Kriterien des holistischen SFM-Konzeptes leisten kann, dass einzelne Elemente des VPAs jedoch im Widerspruch zur Nachhaltigkeit stehen. Die wichtigsten Errungenschaften wurden im Zusammenhang mit der Schaffung von Rahmenbedingungen für SFM (Kriterium 1) und dem Kriterium „Forstproduktion“ beobachtet. Die im Rahmen der Interviews befragten Personen gaben darüber hinaus an, als Folge der SVLK Implementierung einen abnehmenden Trend illegal eingeschlagenen und für den Exportmarkt bestimmten Holzes zu beobachten (Kriterium 2). Aufgrund der allgemein schlechten Datengrundlage ließ sich dies nicht faktisch belegen. Aspekte im Zusammenhang mit den SFM Kriterien „biologische Vielfalt des Waldes“, „Boden- und Wasserschutz“ und „wirtschaftliche, soziale und kulturelle Aspekte“ wurden im Rahmen des Indonesischen Legalitätszertifizierungssystems nicht adressiert.

Defizite wurden darüber hinaus im Zusammenhang mit der Land- und Waldzuteilung festgestellt, deren Klarheit für die Umsetzung des indonesischen TLAS von entscheidender Bedeutung sein sollte. In diesem Zusammenhang konnte gezeigt werden, dass trotz eng damit zusammenhängender Ziele zur Verbesserung der Regierungsführung im Forstsektor, keine entsprechenden Maßnahmen zur Beeinflussung der subnationalen Regierungsführung und zur Verbesserung der Raumplanung im Rahmen des VPA vorgesehen sind.

Die Studie zeigt außerdem, dass das untersuchte FLEGT-VPA traditionelle, nicht nachhaltige Praktiken, die im indonesischen Recht verankert sind, verstärkt. Beispiele hierfür sind die Anwendung eines veralteten Erntesystems und die großflächige legale Umwandlung von Wäldern in andere Landnutzungsformen. Die Ergebnisse zeigen, dass unter VPA gehandeltes ‚legales‘ Holz, nicht zwangsläufig aus nachhaltiger Waldwirtschaft stammen muss.

Beitrag von VPA-Zertifizierungssystemen zur Reduzierung des Waldverlustes

Die Analyse von Fernerkundungsdaten liefert keinen Hinweis darauf, dass die VPA-Zertifizierungssysteme zu einer Verringerung der Entwaldung auf Konzessionsebene beigetragen haben. Es wurde weder eine Reduzierung im Zusammenhang mit forstwirtschaftlichen Aktivitäten noch mit großflächiger Umwandlung von Waldfläche in andere Landnutzungsformen festgestellt. Der größte Teil der Waldverluste in den untersuchten Konzessionen wurde auf Bergbau oder die dauerhafte Umwandlung natürlicher Wälder in Ölpalmpflanzungen zurückgeführt. Basierend auf den Ergebnissen, fanden großflächige Waldverluste darüber hinaus in PHPL-zertifizierten Konzessionen statt.

Treiber und Hindernisse für die REDD+ Implementierung

Dieser Teil der Studie basiert auf der Analyse von REDD+-Experteninterviews und Politik-, Implementierungs- und Evaluierungsberichten. Die Ergebnisse zeigen, dass internationale Organisationen und Akteure aus Wissenschaft und ziviler Gesellschaft die Haupttreiber des REDD+-

Prozesses in der Untersuchungsregion sind. Eine entscheidende Bedeutung kam dabei den Forstfakultäten zu. Darüber hinaus begünstigte das langjährige Vorhandensein von Naturschutzprogrammen, das vorhandene technische Know-how, sowie die finanziellen und personellen Ressourcen in der Untersuchungsregion den dortigen REDD+-Prozess.

Zu den Gründen für die Nichterreichung beabsichtigter Ziele der REDD+ Programme im Untersuchungsgebiet zählten unter anderem die mangelnde Unterstützung seitens der Regierung und die späte Integration von mit REDD+ zusammenhängenden Strategien in regionale Entwicklungspläne. Das geringe Engagement der subnationalen Regierungen in REDD+ lässt sich aus einem Zusammenspiel mehrerer Faktoren erklären, darunter die mangelnde Autonomie von anderen Sektoren, die maßgeblich zum Waldverlust beitragen, die begrenzte Einbindung des subnationalen Parlamentes, das mangelnde Verständnis und Interesse an REDD+-Themen politischer Entscheidungsträger, nicht mit REDD+ in Einklang stehende nationale Interessen und die mangelnde Übersetzung nationaler Ziele auf lokaler Ebene.

Schlussfolgerung und Implikationen

Basierend auf den Studienergebnissen werden Schlussfolgerungen zu den SFM relevanten Errungenschaften und damit verbundener Grenzen von REDD+ und FLEGT-VPA auf subnationaler Ebene gezogen. REDD+ und FLEGT weisen unterschiedliche Stärken und Schwächen in Bezug auf SFM auf. Beide Ansätze unterstützen laufende politische Reformen, aber keiner der beiden Ansätze führte während des Untersuchungszeitraums zu einem geringeren Waldverlust in den jeweiligen Analyseeinheiten.

Schlussfolgerungen spezifisch für REDD+ beinhalten die Notwendigkeit die regionalen Haupttreiber des Waldverlustes zu adressieren. Für die Untersuchungsregion bedeutet dies, dass die Raumplanung und Landnutzungsklassifizierung verbessert werden und der nicht-forstwirtschaftliche Sektor in ein verantwortungsvolleres Landnutzungsmanagement einbezogen werden muss. Erfolgreiche Aktivitäten in der Pilotphase müssen großflächig anwendbar gemacht und die für die Implementierung erforderlichen Ressourcen gesichert werden.

Schlussfolgerungen und Implikationen spezifisch für FLEGT-VPA beziehen sich unter anderen auf die Defizite des alleinigen Legalitätsziels. Um sicherzustellen, dass Forstkonzessionen nicht nur dem Legalitätsaspekt gerecht werden, sondern darüber hinaus auch Nachhaltigkeitsstandards erfüllen, ist es notwendig, die vorherrschenden nationalen Rechtsvorschriften des nicht Europäischen VPA-Partnerlandes in Bezug auf SFM zu Berücksichtigen und gegebenenfalls in Frage zu stellen. Dies würde letztendlich heißen, die nationale Souveränität zu beeinflussen.

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Abbreviations

APL	Non-forest area
BAU	Business as Usual
BFCP	Berau Forest Carbon Program
CAB	Conformity Assessment Bodies
CBD	Convention on Biological Diversity
CIFOR	The Center for International Forestry Research
CITES	Convention on International Trade in Endangered Species
COP	Conference of the Parties
CSO	Civil Society Organisation
DDPI	Dewan Daerah Perubahan Iklim (Regional Council on Climate Change)
DFID	Department for International Development of the UK
DGCC	Directorate General of Climate Change Oversight
EIA	Environmental Impact Assessment
ER-PIN	FCPF Carbon Fund Emissions Reduction Program Idea Note
EU	European Union
EUTR	EU Timber Regulation
FAO	Food and Agriculture Organisation
FbA	Forest-based Approaches
FCPF	Forest Carbon Partnership Facility
FLEGT	Forest Law Enforcement, Governance and Trade
FMU	Forest Management Unit
FSC	Forest Stewards Council
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIZ	Gesellschaft für Internationale Zusammenarbeit
HA	Natural Forest Concession
HCV	High Conservation Value
HK	Conservation Forest
HL	Protection Forest
HP	Permanent Production Forest
HPK	Convertible Production Forest
HPT	Limited Production Forest
HTI	Timber Plantation Concession
IPK	Izin Pemanfaatan Kayu (Timber Utilization Permit)
ITTO	International Tropical Timber Organization
JPIK	Jaringan Pemantau Independen Kehutanan (Independent Forest Monitoring Network)
LK	Legalitas Kayu (Timber Legality)
LoI	Letter of Intent
MCAI	Millennium Challenge Account Indonesia
MFP	Multi-stakeholder Forestry Program

MoEF	Ministry of Environment and Forestry
MoF	Ministry of Forestry
MRV	Measurement, Reporting and Verification
NGO	Non-Governmental Organisation
NLBI	Non-legally binding Instrument on all types of forests
OMI	One Map Initiative
PHPL	Pengelolaan Hutan Produksi Lestari (Sustainable Production Forest Management)
RAD-GRK	Regional Action Plan for GHG emission Reduction
REDD+	Reducing Emissions from Deforestation and Forest Degradation and the Role of Conservation, Sustainable Management of Forests and Enhancement of Forest Carbon Stocks in Developing Countries
RIL	Reduced Impact Logging
RIL-C	Reduced Impact Logging-Carbon
RPJMD	Provincial Mid-term Development Plan
SEA	Strategic Environmental Assessment
SFM	Sustainable Forest Management
SIGAP-REDD+	Communities Inspiring Action for Change in REDD+
SIS	Safeguard Information System
SME	Small and Medium Enterprise
SRAP	Provincial Strategy and Action Plan
SVLK	Sistem Verifikasi Legalitas Kayu (Timber Legality Assurance System)
TBI	The Borneo Initiative
TFCA	Tropical Forest Conservation Act
TLAS	Timber Legality Assurance System
TNC	The Nature Conservancy
TPTI	Tebang Pilih Tanam Indonesia (Indonesian Selective Cutting with Replanting System)
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
UNMUL	University Mulawarman Samarinda
VLK	Verification of Timber Legality
VPA	Voluntary Partnership Agreement
WWF	The World Wide Fund for Nature

1 Introduction

For decades, the international forestry arena has seen numerous instruments and initiatives seeking to halt deforestation and forest degradation and currently shaping global forest governance (McDermott, 2014; Secco et al., 2014). A common element of these approaches – hereafter referred to as forest-based approaches (FbA) – is the promotion of sustainable forest management (SFM). Despite their ultimate goal to foster SFM, it remains unclear how these approaches actually contribute to SFM, especially on the subnational level.

This study investigates the contribution to SFM on the subnational level of two recent FbAs, namely REDD+ (Reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries) and FLEGT-VPA (Forest Law Enforcement, Governance and Trade-Voluntary Partnership Agreements). Specifically, this study identifies REDD+ and FLEGT-VPA related achievements and their limitations relevant for SFM in East Kalimantan, Indonesia. As a key requirement to sustaining forests, special attention is given to achievements in relation to reducing forest loss. Factors that drive and hinder the subnational REDD+ implementation are, moreover, identified. These factors ultimately influence the success of FbAs in a specific region and therewith their ability to contribute to SFM.

The following briefly introduces the concepts of ‘forest governance’ and ‘sustainable forest management’. The global approaches of ‘REDD+’ and ‘FLEGT’ are then subsequently introduced. The subsequent chapters outline the motivation and scope of the research, the study’s objectives and the structure of the thesis.

1.1 Forest governance

Various definitions exist for the concept of forest governance. Following Cowling et al. (2014), forest governance “*comprises all the social and economic systems that affect how people interact with forests, including bureaucracies, laws, policies, traditional norms and culture, patterns of land tenure, and markets*” (p. 13). An alternative and more comprehensive definition that represents both private actors and institutions, and governments is proposed by Giessen and Buttoud (2014):

“forest governance comprises a) all formal and informal, public and private regulatory structures, i.e. institutions consisting of rules, norms, principles, decision procedures, concerning forests, their utilisation and their conservation, b) the interactions between public and private actors therein and c) the effects of either on forests” (p. 1).

Global forest governance is shaped by several global initiatives – or as referred to in this study as FbAs – legally or non-legally binding in nature and directly or indirectly relating to forests. Among those are norms such as the Forest Principles or the Non-Legally Binding Instrument on all Types of Forests that directly apply to forests but are not legally binding. Agreements such as the three United Nations Rio Conventions (UNFCCC³, UNCBD⁴ and UNCCD⁵) are legally-binding but relate only indirectly to forests as they focus on different regulatory subjects (e.g. on the conservation of biodiversity).

Other recent examples of such FbAs are REDD+ and FLEGT.

The issues of forests are thus distributed among numerous treaties and mechanisms. Rodríguez Fernández-Blanco et al. (2019) found that global forest governance in 2014 was composed of 41 forest-focused and forest-related institutional elements, among them the aforementioned UN conventions and REDD+. Global forest governance is, therefore, often referred to as being ‘fragmented’, ‘incomplete’, and ‘ineffective’ (Faggini & Behagel, 2017; Giessen, 2013; Singer & Giessen, 2017).

³ United Nations Framework Convention on Climate Change (UNFCCC)

⁴ Convention on Biological Diversity (CBD)

⁵ United Nations Convention to Combat Desertification (UNCCD)

Those characteristics are closely related to the inherent complexity of forest governance in the absence of a legally binding forest instrument (forest convention).

No approach has so far succeeded in halting forest loss – which is a key requirement for SFM. The fragmentation of global forest governance itself has partly been blamed for its ineffectiveness as each approach lacks the comprehensiveness and forest-specific detail of a forest convention (Eikermann, 2015; Giessen, 2013; Singer & Giessen, 2017).

1.1.1 REDD+ and FLEGT

In the absence of a legally binding forest instrument (or forest convention), the international governance and protection of forests is regulated and promoted by different forest-related initiatives (Roessing Neto, 2015). Such FbAs are typically multi-actor, multi-sectors and multi-level (Lemos and Agrawal, 2006; Rametsteiner, 2009 in Secco et al. (2014)). They are designed on an international or global level and influence national forest policies that in turn influence subnational policies and programs (*ibid.*). General goals that are formulated in international agreements have to be translated into more concrete objectives and activities on the local level. Depending on the national circumstances, this can be realized in many different ways.

While a common element of these FbAs is the concept of SFM to reverse global forest cover loss, their scope and focus on forests as well as their applied strategies and measures vary depending on the purpose and actual priority of each instrument and therewith their interlinkage with the concept of SFM (Eikermann, 2015).

Two such relatively new FbAs are REDD+ and FLEGT-VPA. While REDD+ originally focuses on the reduction of greenhouse gas (GHG) emissions from the forestry sector and the increase of GHG removals, FLEGT-VPAs aim to tackle the trade of illegal logging. Both require the establishment of a country-specific national framework that regulates implementation on the ground.

REDD+

REDD+ was proposed in 2005 at the 11th Conference of the Parties (COP) to the UNFCCC and enshrined into the Paris Agreement concluded at the COP21 in 2015. The underlying idea of is to compensate countries or individuals for foregone costs related to avoiding deforestation and forest degradation, conservation and enhancement of forest carbon stocks and sustainable forest management. Result-based payments thereby provide positive incentives to developing countries to reduce emissions and increase removals in the forestry sector.

Since 2007, the UNFCCC COP have published guidances on REDD+, the most relevant being the seven Warsaw Framework for REDD+ adopted at COP 19 in 2013. Through COP decision 1/CP. 16 countries are requested to have the following REDD+ elements in place to receive result-based payment under the UNFCCC⁶:

- A National strategy or Action Plan
- A National Forestry Monitoring System including Measurement, Reporting and Verification (MRV)
- A Safeguard Information System (SIS) and
- A Forest Reference Emission Level and/or Forest Reference Level

REDD+ implementation can be achieved in three phases: Readiness phase, implementation phase and result-based actions phase. In practice, the single phases overlap in their implementation. Figure 1 provides more detail on each phase.

There are currently more than 60 countries participating in REDD+⁷. One of these is Indonesia.

⁶ For more information on the single elements see <https://redd.unfccc.int/>.

⁷ <https://redd.unfccc.int>

Following the promotion of the REDD+ mechanism through the UNFCCC COP decisions, a plethora of subnational pilot activities have revealed in nearly all of the participating REDD+ countries. Activities aim to test the different REDD+ elements and generate important lessons for the development of the national REDD+ framework.

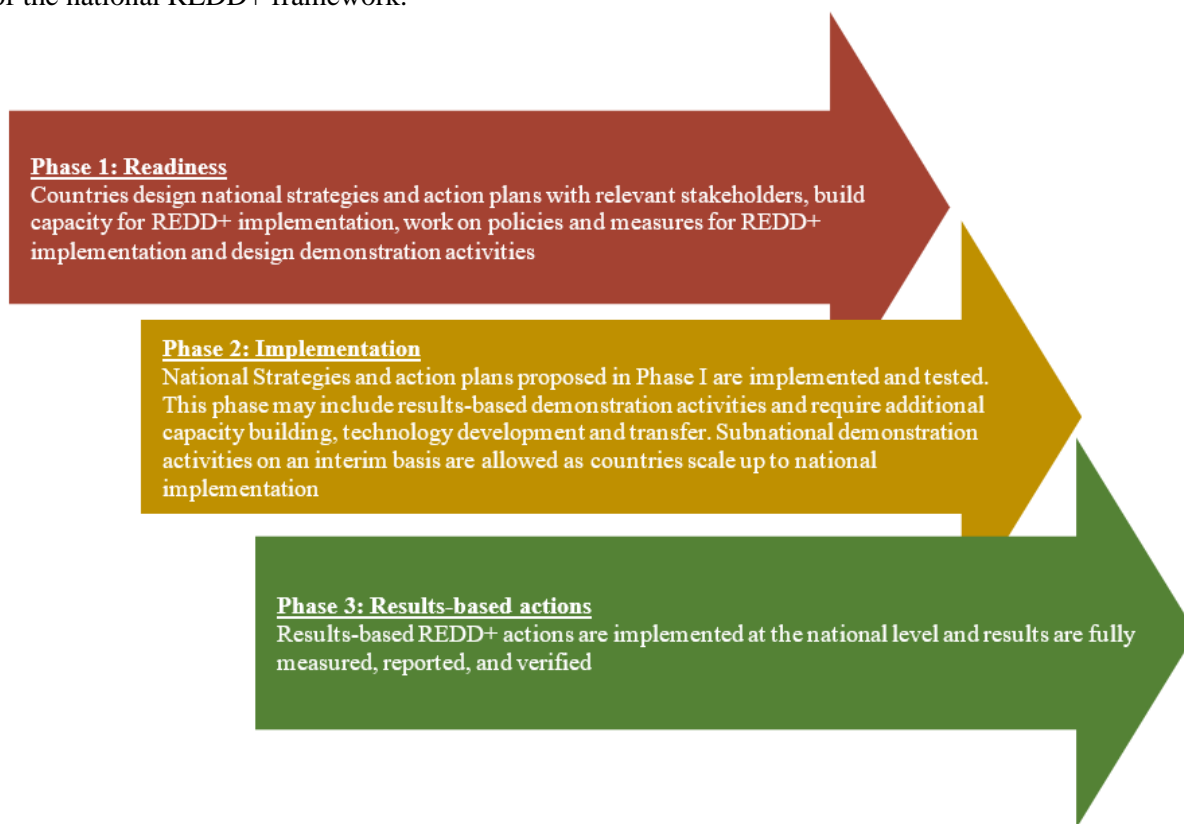


Figure 1: Description of the three phases of REDD+ implementation based on COP decision 1/CP.16. Source: United Nations Environment Programme (2017).

FLEGT

In 2003, the European Commission presented an Action Plan on Forest Law Enforcement, Governance and Trade (FLEGT EU Action Plan) to address the growing problem of illegal logging and related trade (European Commission [EC], 2003). The FLEGT EU Action Plan sets out demand and supply side measures. It thereby recognizes the shared responsibilities between consumer and producer countries (Jonsson et al., 2015). The following seven measures are set out in the FLEGT EU Action Plan (EC, 2003):

- Support to timber-producing countries: for example, support of timber producing countries to set up verification systems to identify legally harvested timber destined for the EU market, encourage greater transparency of information within the forest sector, support to build capacity to implement broad governance reforms, support policy reforms
- Promoting trade in legal timber: for example, through building bilateral or regional FLEGT partnership agreements and developing a multilateral framework and international collaboration by engaging other major timber consumers to restrict illegally harvested timber
- Promoting public procurement policies: for environmental aspects through the use of the Handbook on Green Procurement that will present clear guidance on the utilization of environmental considerations in public procurement procedures
- Supporting private sector initiatives: for example, encouraging the private sector in the EU to work with the private sector in timber-producing countries according to voluntary codes of practice for timber harvesting and procurement

- Financing and investment safeguards: for example, by encouraging banks and financial institutions to take environmental and social factors into account when conducting due diligence
- Supporting the Action Plan with existing legislative instruments: for example, through encouraging Member States to designate illegal logging as a crime under money laundering, promoting research on endangered timber species to justify their inclusion in Appendices I and II to CITES
- Addressing the problem of conflict timber, that is, timber traded by armed groups to fund armed conflicts: for example, through initiate discussion with Member State, other donors and forested countries on the role of forests during conflicts

The core of the FLEGT EU Action Plan are legally binding bilateral trade-agreements, so called Voluntary Partnership Agreements (VPAs), between the EU and a timber producing country outside the EU. The main purpose is to ensure that only legal timber and timber products are imported to the EU. VPAs build on national state authority through better law enforcement. A core element of a VPA is a Timber Legality Assurance System (TLAS). VPAs, moreover, contain frameworks for monitoring and evaluating implementation and commitments to improve transparency and other aspects of forest governance⁸.

Countries entering a VPA, design and develop their own TLAS that is commonly based on existing control mechanisms and on the country-specific legislative context⁹. TLAS resemble forest management certification schemes and verify that timber products conform to national laws. The following elements are common to all TLAS (European Forest Institute 2019¹⁰):

- A legality definition
- Supply chain control
- Verification of compliance
- FLEGT licensing
- Independent Audit

The single elements are exemplarily defined for Indonesia in Table 5.

After the ratification of the VPA and the development and implementation of a TLAS, partner countries can issue FLEGT licenses for timber products destined for the EU market. FLEGT licenses are documents that confirm that timber products comply with the law of the exporting country. Those licenses are also recognized to comply with the requirements of the EU Timber Regulation (EUTR).

There are currently 15 tropical countries negotiating or implementing VPAs¹¹. Indonesia is one of the early VPA partner countries of the EU and was the first – and by the time of study conduction – only country to issue FLEGT licenses¹².

A second key element of the FLEGT EU Action Plan is the EUTR that came into force on March 3, 2013. It aims to ensure that no illegal timber enters the EU market. It stipulates three requirements for European operators (European Parliament & The Council of the European Union, 2010; Jonsson et al., 2015):

- The placing on the market of illegally harvested timber or timber products derived from such timber is prohibited

⁸ For more information see <http://www.vpaunpacked.org/en/web/vpa-unpacked-multilang/vpa-elements>.

⁹ <http://www.euflegt.efi.int/en/web/guest/vpa-elements>

¹⁰ <http://www.vpaunpacked.org/en/web/vpa-unpacked-multilang/timber-legality-assurance-system>

¹¹ <http://www.flegtlicence.org/vpa-countries>

¹² See under 3.7 for the VPA between the EU and Indonesia as an example of how a VPA might be translated to the national context.

- Operators shall exercise due diligence when placing timber or timber products on the market. To that end they need to provide access to information on the timber product, implement risk assessment and mitigation measures and procedures to minimize the likelihood of illegality
- Traders placing timber on the EU market have to keep record of the operators who have supplied the timber and the traders to whom they have supplied the timber

As REDD+, the FLEGT EU Action Plan ultimately aims to encourage SFM (EC, 2003).

1.2 Background on sustainable forest management

In the following a brief background on the concept of SFM and its development is given.

The holistic concept of SFM

In global forest governance SFM is a key concept (Faggin & Behagel, 2017).

A cornerstone in the development of the SFM concept were the non-legally binding agreements reached at the UN Conference on Environment and Sustainable Development, also called Rio or Earth Summit in 1992. Two guiding documents for the management of forests were adopted there: The Forest Principles and the Agenda 21 with chapter 11 ‘combating deforestation’. They provided the basis on which to build a common understanding of SFM (Food and Agriculture Organization [FAO], 2005).

In the Forest Principles (United Nations [UN], 1992) it is stated that “*Forest resources and forest lands should be sustainably managed to meet the social, economic, ecological, cultural and spiritual needs of present and future generations.*” This definition stretches the multiple values and functions of forests. Accordingly, the guiding objective of the Forest Principles is to contribute to the management, conservation and sustainable development of all types of forests and to provide for the multiple and complementary functions and uses (UN, 1992).

Since 1992 the concept of SFM continued to evolve through the Intergovernmental Panel on Forests, Intergovernmental Forum on Forests, United Nations Forum on Forests and several international and regional initiatives that aimed to translate the concept of SFM into practice and monitor its progress (Wilkie et al., 2003). This involved the development of criteria and indicators of SFM as supported by the Food and Agriculture Organisation (FAO) and the International Tropical Timber Organization (ITTO) (Wilkie et al., 2003).

In 2007, the concept of SFM was further sharpened through the Non-legally binding Instrument on all types of forests (NLBIs). There, SFM is broadly defined as a “*dynamic and evolving concept, [is] intended to maintain and enhance the economic, social and environmental value of all types of forests, for the benefit of present and future generations*” (UN, 2007, p. 2). Drawing from the criteria identified by existing criteria and indicator processes, seven thematic elements were considered as a common reference framework for SFM in the NLBIs (UN, 2007), these are:

1. Extent of forest resources
2. Forest biological diversity
3. Forest health and vitality
4. Productive function of forest resources
5. Protective function of forest resources
6. Socio-economic functions of forests
7. Legal, policy and institutional framework

Criterion 1 refers to the quantity of forests, or forest area and its changes, and to the aim of monitoring the extent and characteristics of forests. Criteria 2 to 6 relate to the quality of forests and ecosystem services that forests provide (Tegegne et al., 2018). Closely related to those five criteria is the aim to assess, monitor and report on biological diversity (criterion 2), disturbances of forest ecosystems (criterion 3), timber and non-timber forest products (criterion 4), the role of forests in water and soil protection (criterion 5) and the economic and social benefits of forest management (criterion 6).

The last criterion, criterion 7, refers to the enabling condition of implementing SFM. It provides the basis for the implementation of SFM and addresses the effective development and implementation of forest policy and the related institutional capacity of national and subnational forest agencies (FAO, 2010).

Those seven thematic elements capture the environmental, social, economic and governance dimensions of forests and embody the holistic concept of SFM (Tegegne et al., 2018).

In this study, SFM is understood as such a holistic approach that aims to balance environmental, economic, social and governmental functions of forests.

The scale of SFM

Another important dimension of SFM is the scale at which it is applied.

The FAO¹³ and ITTO¹⁴ have introduced different geographical scales to the application of SFM. Their classifications differ slightly.

One of these scales is the national level where goals and strategies, the legislative framework for the sustainable management of forests and its monitoring is laid down and enabling conditions for the subnational implementation are provided and prepared. Those national policies and objectives are influenced by international and global processes on SFM.

The level below this is the subnational – or landscape – level that may stretch over a water catchment area or an entire administrative unit, for example, a province or a district. On this level, the national legislative framework is translated to the subnational context, for example, through the release of governor decrees, the implementation of regional moratoriums, the formulation of regional land use plans or the establishment and operationalization of subnational forest agencies. At these scales, a means of considering multiple land use systems (forestry, forest plantations, agriculture or livestock areas) is afforded and trade-offs will usually have to be made in the mix of services forests offer (International Tropical Timber Organization [ITTO], 2016). Regional planning processes will decide over the quantity and type of forests in a geographical or administrative unit and over their management.

The local level is referred to as the forest management unit level. It is guided through the subnational level requirements and strategies and comprises individual forest stands that should be managed sustainably according to their local conditions and purpose in the landscape.

The use of forests is planned on all levels (ITTO, 2016). The goals, strategies, policies, instruments and institutional arrangements to implement SFM may vary considerably depending on the scale, but the overall aim is to maintain and balance the various services of forests at all scales.

SFM today is implemented through various initiatives focusing on different aspects of forests and their related problems. Examples are voluntary global or (mandatory) national certification schemes like the Forest Stewards Council (FSC), the Programme for the Endorsement of Forest Certification Schemes (PEFC) or the Indonesian Lembaga Ekolabel Indonesia (LEI). The latter is a voluntary SFM certification scheme in Indonesia. Approaches like REDD+ and FLEGT are other examples of recent forest approaches that aim to promote SFM through individual foci, strategies and instruments. While FLEGT aims to foster SFM through addressing the problem of illegal logging and its related trade (EC, 2003), REDD+ applies SFM as a strategy to reduce emissions from deforestation and forest degradation.

¹³ <http://www.fao.org/forestry/sfm/85084/en/>

¹⁴ International Tropical Timber Organization (ITTO) (2016): Criteria and indicators for the sustainable management of tropical forests.

1.3 Motivation and scope of the research

Forest-based approaches like REDD+ and FLEGT aim to foster the implementation of SFM. Despite their objective to do so, latest data on global forest cover shows that deforestation and forest degradation continue at an alarming rate (FAO, 2020). No global approach was successful in sustaining forest resources and lead towards a broader change of SFM.

Against this background, it is relevant to ask how FbAs like REDD+ and FLEGT actually interlink with the concept and promote the implementation of SFM (Cosslett, 2013; Eikermann, 2015; Neupane et al., 2019; Tegegne et al., 2018; TEREA et al., 2016).

The interlinkage between the holistic concept of SFM and REDD+/FLEGT has only rarely been investigated so far. The few studies that exist (e.g. Cosslett (2013) and Tegegne et al. (2018)), focused mainly on the theoretical level, exploring potential overlaps based on policy documents. Key questions remain on the impacts of FbAs on the ground. Such gaps can be explained by the few assessments of related local initiatives (Angelsen et al., 2018; Arts et al., 2019; TEREA et al., 2016; Youn et al., 2017). A logical consequence of the lack of local studies is the poor understanding of aspects that drive and hinder the local implementation of FbAs. A better understanding of such aspects can help to explain discrepancies between stipulated policy objectives of FbAs and missing outcomes on the ground and help to overcome local barriers that FbAs face thereby fostering their contribution towards SFM. While there have been a number of global comparative and national studies carried out that aimed to identify such factors in the REDD+ policy arena (Brockhaus et al., 2016; Korhonen-Kurki et al., 2014; Korhonen-Kurki et al., 2017; Korhonen-Kurki et al., 2018), studies for the subnational level were largely neglected.

The present study seeks to close these research gaps.

1.4 Study goals

The overarching objective of the present study is to analyze the subnational implementation of the concept of SFM through recent FbAs that shape forest governance. REDD+ and FLEGT-VPA are chosen as two examples of such recent approaches.

To meet the overall objective, five research questions are formulated:

1. What are the current REDD+ achievements and limitations relevant to SFM on the subnational level?
 - 1.1 Do subnational REDD+ activities contribute to forest loss reduction on the jurisdictional level?
2. What are the current FLEGT-VPA-related achievements and limitations relevant to SFM on the subnational level?
 - 2.1 Do national forest certification schemes under a FLEGT-VPA contribute to forest loss reduction on the concession level?
3. What are the current driving forces of and hindrances to subnational REDD+ implementation?

Figure 2 introduces these research questions. The research framework is in more detailed described in chapter 4.3.

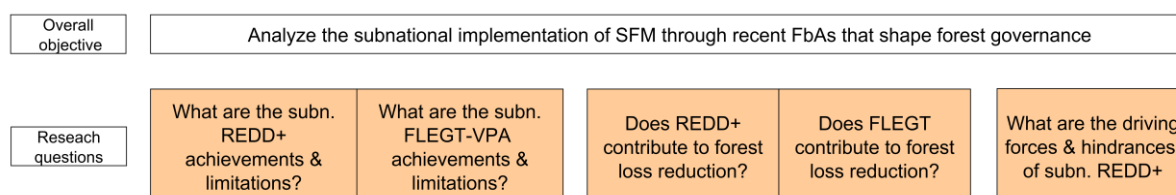


Figure 2: Research questions.

Figure 3 shows how the five research questions are linked. The contribution of REDD+/FLEGT-VPA towards SFM is influenced by various factors. It is influenced by the interlinkages between their global policy designs and the holistic concept of SFM. REDD+ and FLEGT-VPA will, due to their different scopes, objectives, measures and applied instruments, not influence and contribute to SFM equally. They may show overlaps with some of the SFM elements but likely not evenly with all of them.

This interlinkage with SFM is anchored in REDD+/FLEGT policy documents and hereafter referred to as the ‘thematic overlap’. Within this thematic overlap, the actual achievements (outputs, outcomes and impacts) in terms of SFM will be realized on the ground. The reduction of tree loss as a key component of SFM and requirement for the conservation of global forests is one of the most important outcomes required.

Considering the past challenges of reversing the ongoing global deforestation trend, not all of the stipulated objectives of REDD+ and FLEGT-VPAs relevant for SFM will likely be observed on the ground. Reasons for this can be manifold. Understanding those aspects that drive and hinder the implementation of FbAs can help explain why certain envisaged objectives in terms of SFM are not achieved while others have been.

Findings under each respective research question are – where meaningful – combined and triangulated to answer the overall objective.

The focus of the present study lies on the subnational level that comprises the Province of East Kalimantan in Indonesia and there especially the Berau District and – in the case of FLEGT-VPA – the forest management level (concessions). While *national* REDD+ policy arenas and institutional settings are explicitly not dealt with, the national legal policy framework of FLEGT-VPA is considered as it mainly determines the implementation on the local level.

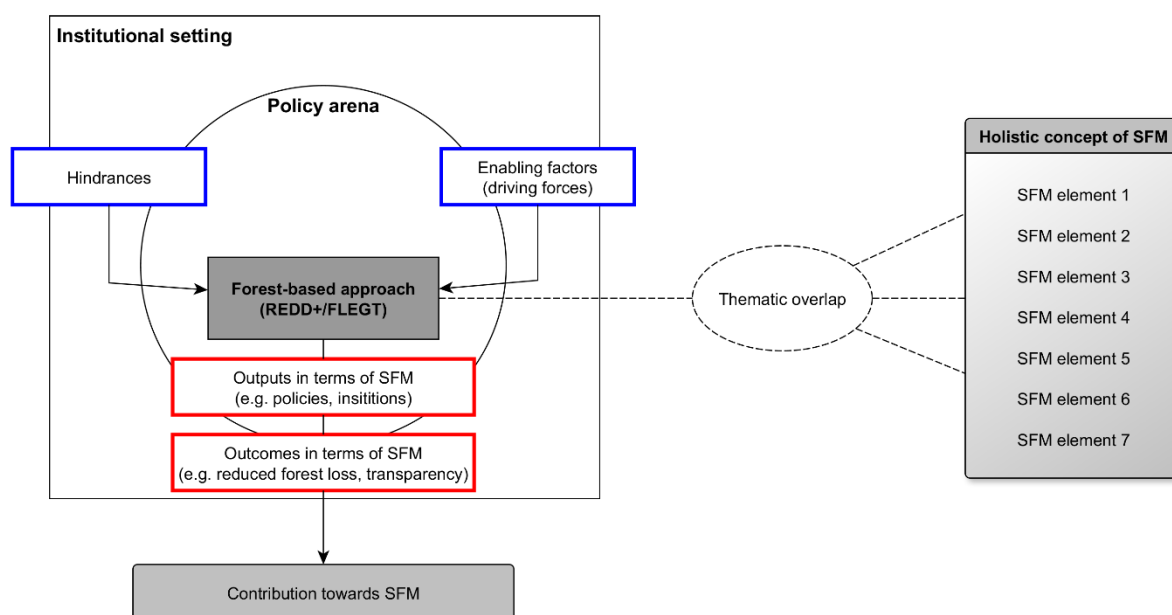


Figure 3: Linking the different components of the study. Blue frame = research question 3; red frame = research question 1 and 2; the linkages between the holistic concept of SFM and REDD+ and FLEGT are exemplarily indicated.

1.5 Structure of the work

This work contains seven chapters. Chapter one introduces the thematic background of the study and informs on the concepts of ‘forest governance’, ‘SFM’ and the global approaches ‘REDD+’ and ‘FLEGT-VPA’. It, moreover, outlines the motivation, study goal and research questions of this study.

Chapter two provides existing knowledge on the linkages between REDD+/FLEGT-VPA and the concept of SFM. It comprises a summary of existing lessons on the (potential) achievements relevant for SFM of both approaches and on factors that hinder and drive the REDD+ process. The chapter ends with positioning this study against the existing research.

In chapter three, relevant background information on the study-country Indonesia is given. This comprises basic features of Indonesia’s forestry sector, its legal framework and its threats. The chapter also contains a description of the Indonesian-EU FLEGT-VPA and the Indonesian REDD+ process.

The materials-and-method chapter, chapter four, outlines the research design, data collection and analysis methods. It further comprises a description of the study area and provides for the research framework.

Chapter five presents the results of the study. They are presented along the five research questions.

In chapter six the results of the study are discussed. The chapter starts with a summary of the key findings. In the following five chapters results of each research question are discussed in terms of their meaning, expectancy and position vis-à-vis existing research. The last subchapter of chapter six critically discusses the chosen methodological approach and limitations to the research.

The final chapter, chapter seven, draws conclusions on the overall objective of the study, and discusses implications for politicians, practitioners, and future research.

2 State-of-the art

This chapter outlines current knowledge on the linkages between the concept of SFM and REDD+ and FLEGT-VPA.

The chapter starts with a general overview of existing research and then specifically outlines knowledge on the topics of the five research questions of this study, namely:

- REDD+ achievements and limitations relevant to SFM (on the subnational level)
 - o Contribution of subnational REDD+ activities to forest loss reduction on the jurisdictional level
- FLEGT-VPA-related achievements and limitations relevant SFM to (on the subnational level)
 - o Contribution of national forest certification schemes under a FLEGT-VPA to forest loss reduction on the concession level
- Driving forces of and hindrances to the (subnational) REDD+ implementation

Under 2.4 of this chapter, existing patterns, contradictions and gaps of current research are concluded and summarized and the present study positioned in this context.

In the past decades numerous initiatives aiming to halt deforestation have emerged in the international arena. Although they commonly support the implementation of SFM, their linkages with the underlying concept of SFM remains poorly understood (Tegegne et al., 2018). A reason for this is that research has only very recently begun to focus on such linkages. Evaluation reports of FbA – like that of the FLEGT EU Action Plan – accordingly stated that “*FLEGT’s contribution to the higher objective of Sustainable Forest Management is unclear and needs to be made more explicit*” (TEREA et al., 2016, p. 3).

Cosslett (2013), Neupane et al. (2019) and Tegegne et al. (2018) are the few authors that have yet focused specifically on the links between REDD+ and/or FLEGT and SFM.

Cosslett (2013) analyzed the impact of REDD+ on the financing, implementation and achievements of each of the seven thematic elements of SFM as listed in the NLBIs (UN, 2007). Neupane et al. (2019) based their analysis on specialist interviews and applied the ITTO Criteria and Indicator framework to explore specialists viewpoint on FLEGT-VPAs and REDD+s contribution towards SFM in Indonesia. Tegegne et al. (2018) based their analysis on a content analysis of global REDD+ and FLEGT policy documents. They employed the seven thematic elements of SFM as listed in the NLBIs and self-developed so called ‘sub-topics’ for each of those elements. Despite their different approaches, all frameworks are based on the seven thematic elements of SFM.

Authors like Bastos Lima et al. (2017) and Tegegne et al. (2018) showed that one possibility to analyze the linkages between different approaches and concepts is to analysis related policy documents for stipulated objectives relevant for SFM. While this may reveal common overlaps in stipulated objectives, it does not address the actual thematic overlaps on the implementation level. Of the three mentioned authors, only Neupane et al. (2019) based their research on real-life experiences. The remaining authors used policy documents as the basis for their analysis and, therefore, remained on a theoretical level.

Few other authors, for example, C. P. Hansen et al. (2018) and Lesniewska and McDermott (2014) picked out single aspects of SFM and critically discussed selected approaches – here FLEGT – in regards of those.

One expects that research would (at least) cover the main objectives of FbAs (that could ultimately be related to single SFM elements). For REDD+ and FLEGT, this is the reduction of emissions from deforestation and forest degradation and the reduction of illegal logging and related trade. However, existing research is poor, mainly because of constraints of reliable data and a lack of assessments of local initiatives (Angelsen et al., 2018; Arts et al., 2019). Underlying reasons are financial, methodological, data and political challenges of implementing impact evaluations.

While there are thus generally more lessons required for the thematic overlaps between FbAs and the concept of SFM, there are particularly more empirical lessons needed, especially from the implementation level.

2.1 Achievements and limitations of REDD+ relevant to SFM

The following summarizes and analyzes current knowledge on REDD+ and SFM based on existing research and REDD+ policy documents relevant for Indonesia.

Since SFM is an activity under REDD+, it can be assumed that it aims to implement SFM in its entirety and as such overlaps with it to 100%. Considering that a clear hierarchy between carbon and non-carbon objectives and benefits in REDD+ can be observed (Bastos Lima et al., 2017), REDD+ will likely not equally overlap with every of these functions. Existing literature consequently points towards a different extent of REDD+ achievements for the single thematic SFM elements.

Cosslett (2013) and Tegegne et al. (2018) concluded that REDD+ overlapped closely with the first **SFM element “extent of forest resources”**. That is, because the ultimate goal of REDD+, reducing emissions from deforestation and forest degradation and enhancing carbon stocks, directly complies to conserving forest resources.

In Indonesia, this linkage of REDD+ and forest conservation is anchored in national law, namely in regulation No.: P. 30/Menhut-II/2009 on Procedures for Reducing Emissions from Deforestation and Forest Degradation. There it says that the purpose of REDD is to reduce deforestation and forest degradation in order to achieve SFM and improve community welfare (Chapter II Article 2.2).

Despite those overlaps of REDD+ objectives and SFM element one, real life has shown that deforestation continues and that the transformational change away from Business as Usual (BAU) forest loss has globally not taken place under REDD+ (Arts et al., 2019). Duchelle, Simonet et al. (2018), that reviewed scientific literature to understand the outcomes of REDD+ on the ground, found a moderately encouraging picture, especially at the local level of REDD+ interventions in terms of carbon outcomes.

For Indonesia, Neupane et al. (2019) showed that the ITTO indicator ‘change in forest area’ was not estimated as a major issue that REDD+ (nor FLEGT) contributed to from a specialists point of view. In line with this perception, data on forest loss in Borneo, where the focus area of this study is located, revealed that annual forest loss generally showed an increasing trend between 2001 and 2016, with a maximum of 0.61 Mha in Indonesian Borneo in 2016, and a sharp decline in 2017 (0.25 Mha) (Gaveau et al., 2018).

Scientists, however, also acknowledged that there have been too few evaluations in the context of carbon outcomes (Duchelle, Simonet et al., 2018).

These examples suggest that there is a discrepancy between lessons drawn from empirical and theoretical scholarship in relation to SFM element one.

Cosslett (2013) and Tegegne et al. (2018) also assumed that REDD+ could generate important biodiversity (**SFM element two**) and forest health and vitality (**SFM element three**) co-benefits through reduced deforestation and forest degradation, enhanced connectivity among forest areas and forest fire management.

A positive contribution to SFM element two and three should also be assured through a functioning and operational REDD+ Safeguard Information System (SIS), especially in relation to safeguard 5¹⁵ (decision 1/CP.16).

Through Safeguard 5, REDD+ also has the potential to contribute towards the fifth **SFM element “protective function of forest resources”**.

¹⁵ That actions are consistent with the conservation of natural forests and biological diversity, ensuring that the actions referred to in paragraph 70 of this decision are not used for the conversion of natural forests, but are instead used to incentivize the protection and conservation of natural forests and their ecosystem services, and to enhance other social and environmental benefits, taking into account the need for sustainable livelihoods of indigenous peoples and local communities and their interdependence on forests in most countries, reflected in the United Nations Declaration on the Rights of Indigenous Peoples, as well as the International Mother Earth Day.

In Indonesia, nationally planned activities under REDD+ address SFM elements two, three and five. Among those are activities such as the rehabilitation and restoration of degraded areas (Indonesian REDD+ Task Force, 2012). These activities could also enhance soil productivity and water retention capacity. It remains, however, unclear how much and what areas should be rehabilitated under a REDD+ program as does the current process on the realisation of these activities.

A REDD+ related achievement in relation to SFM element two, three and five in Indonesia was the enactment of a national forest moratorium on the suspension of new conversion permits in primary forest and peatland in 2011. Based on Murdiyarso et al. (2011), of the total forest moratorium area (66.4 Mha) about 22.5 Mha were newly covered, that is, had not been protected before the enactment of the moratorium. The remaining area had already been legally protected. The moratorium suspends new conversion licenses in *all* types of peatlands. Before, the suspension was limited to peatlands with a depth of > 3 m (Murdiyarso et al., 2011).

Despite these positive outputs, Groom et al. 2018 as cited in Angelsen et al. (2018) found only marginal impacts associated with the moratorium.

These examples show that despite the development of REDD+ outputs – here the enactment of the forest moratorium – actual changes (outcomes) are yet to be observed. This suggests that there remain limitations in terms of the translation to and/or operationalization of achieved outputs on the ground.

Drawing conclusions on the contribution of REDD+ towards forest biodiversity was, moreover, hampered by a scarcity of studies on biodiversity outcomes (Duchelle, Simonet et al., 2018). Most of their reviewed studies claimed biodiversity benefits based on reforestation and conserved forest area, taking tree cover loss as a proxy for biodiversity.

In practice, the contribution of REDD+ towards SFM elements two and three on the ground, therefore, remains widely unclear.

Cosslett (2013) stretched both benefits and trade-offs in relation to the **fourth SFM element “productive function of forest resources”** induced by REDD+. They argued that REDD+ may on the one hand lead to a reduction in timber production by placing certain forests under conservation which would be a trade-off and contrary to the objectives of SFM element four. On the other hand, they argued that REDD+ may lead to improved forest management practices through the implementation of Reduced Impact Logging (RIL) or FSC certifications standards. Cosslett (2013), moreover, suggested a reduction in timber supply from ‘conversion wood’.

In the Indonesian study by Neupane et al. (2019), specialists ranked ‘Reduced impact harvesting and silvicultural operations’, as one of the key contributions of REDD. Apart from this study, there was a lack of information on REDD+ achievements on the ground in relation to these aspects of SFM.

Cosslett (2013) and Tegegne et al. (2018) both came to the conclusion that REDD+ also had the potential to have important socio-economic impacts (**SFM element six “socio-economic function of forests”**). Through the Cancun safeguards 3, 4 and 5 REDD+ could contribute to local benefit and well-being, resource rights, public participation and traditional knowledge and use.

In Indonesia, those thematic issues are addressed through the REDD+ national strategy framework (Indonesian REDD+ Task Force, 2012), namely through pillar five ‘the inclusion/involvement of stakeholders’. There, the facilitation of the interaction between stakeholders, the development of social and environmental safeguards and the assurance of benefit sharing is envisaged. Each of these objectives is followed up by several strategies (*ibid.*).

Cosslett (2013), however, also named some potential challenges. Concerns relate to the opportunity costs to other non-sustainable land use activities that REDD+ must adequately compensate and the stability of benefit flows from REDD+.

Duchelle, Simonet et al. (2018) concluded from their review of REDD+ studies that effects on welfare were small and with mixed signs. Land tenure and its clarity have been considered a major challenge for REDD+ throughout those case studies.

Cosslett (2013) and Tegegne et al. (2018) further suggested a major direct contribution of REDD+ towards the seventh **SFM element “legal, policy and institutional framework”**, especially through its readiness phase.

In line with this perception, nearly half of the respondents in the study of Neupane et al. (2019) ranked ‘forest governance’ in Indonesia on rank one (level of contribution of REDD+ towards ITTO SFM criteria and indicator). Other indicators with particular high response under this ITTO criterion were ‘Policies, laws and regulations for governing forests’, ‘Institutions responsible for, and supportive of, forest management’ and ‘Integration of forests in national and subnational land-use planning’ (*ibid.*). Overall, respondents in Neupane et al. (2019) indicated that REDD+ in Indonesia had positively contributed towards the enabling conditions for SFM, especially in relation to institutional strengthening, reinforcing policies and regulations, appropriate governance and attracting additional funding.

Several other authors (Astuti & McGregor, 2015b; Austin et al., 2014; Korhonen-Kurki et al., 2017; Mulyani & Jepson, 2017; Wells & Paoli, 2011) had assessed and analysed the impacts of REDD+ outputs on forest governance in Indonesia, among those were studies on the One Map Initiative¹⁶ (OMI), the former national REDD+ Agency and the national forest moratorium.

Findings of those studies uniformly suggested that REDD+ contributed towards national forest governance reform in Indonesia because REDD+ was able to raise the need for and/or support long-needed policy reforms on land use assessment, inter-ministerial communication and coordination, public participation and transparency.

Studies for example suggested that the development of the OMI, prompted through REDD+ as a measure to harmonize existing data and overlapping land claims, provoked better coordination amongst government ministries, greater transparency and increased public participation on the national level (Mulyani and Jepson, 2017).

Despite the rather quick adoption of these policies on the national level, research has indicated that the follow up into lower levels of governance constituted a clear gap. However, the literature review also suggested that much less is currently known about the impacts of REDD+ on forest governance on the subnational level. All consulted studies focused on the national level.

2.2 Achievements and limitations of FLEGT-VPA relevant to SFM

In the following current knowledge on FLEGT-VPA and SFM is summarized and analyzed based on existing research and FLEGT policy documents relevant for Indonesia.

Tegegne et al. (2018) suggested that FLEGT could directly contribute towards the first **SFM element “extent of forest resources”**, particularly in relation to ‘forest inventory and data’ because FLEGT-VPAs intent the development of forest management plans and forest resource inventories at the management level.

This was supported by findings of Neupane et al. (2019). In their study, specialists ranked the contribution of Indonesian FLEGT-VPA towards ITTO indicators ‘Forest area in compliance schemes’ and ‘Multiyear forest management plans in FMUs’ as particular high.

Neither of them, however, suggested a direct contribution to reducing forest loss – the fundamental issue to sustain forests. In theory, improved legality and law enforcement in the timber production could reduce the occurrence of illegal logging, that is, forest degradation, which is often a precursor of wider forest loss (EC, 2003), and thus positively affect the occurrence of deforestation in forest concessions. The FLEGT EU Action Plan, moreover, deems that for countries whose legal forestry framework is based on the principles of SFM, better law enforcement will also lead to more sustainable forest management bearing the potential to reduce tree loss on the forest management level (EC, 2003).

¹⁶ The OMI was introduced as a measure to harmonize existing data and overlapping land claims and aims for one single reference map that is used among all ministries and government levels (Mulyani and Jepson (2017)). On 11th of December 2018, the One Map Policy Geoportals was launched as a reference for land use planning (Jakarta Post 2018).

Even so, Lesniewska and McDermott (2014) argued that VPAs might only have a limited potential to address the major drivers of deforestation in countries like Indonesia and Ghana where the agricultural sector is responsible for a wide share of forest loss. No such study was available by the time of writing.

Through the reduction of illegal logging and forest degradation VPAs have the potential to contribute directly towards the second and third **SFM element “forest biological diversity”** and **“forest health and vitality”**. In line with this, the ITTO indicator ‘threats to forests caused directly by human activities’ was ranked particular high among specialists in the study of Neupane et al. (2019), suggesting a high contribution of Indonesian FLEGT-VPA process on this issue. Apart from this perception-based finding, there remained a clear gap on the actual impacts of FLEGT-VPAs on their main objectives of reducing illegal logging and related trade as well as on aspects of biodiversity and forest conditions in the literature. This suggests that lessons of assessments are either not distributed or that there are no evaluations available.

Tegegne et al. (2018) and consulted stakeholders in Neupane et al. (2019) also assumed a direct contribution of FLEGT to the fourth **SFM element “productive function”** through the enforcement of sustainable logging practices such as RIL and timber harvesting arrangements in natural production forests. Lesniewska and McDermott (2014) and C. P. Hansen et al. (2018) in contrast questioned the sustainability of forest management practices supported by VPAs in Indonesia and Ghana. Their concerns related to the support of state law through VPAs that, for example, accept outdated (unsustainable) harvesting systems, the legal conversion of forests and other unsustainable practices. This was the case in Ghana where a yield formula from the 90s was still being used to estimate extraction values (C. P. Hansen et al., 2018). Related criticism was also raised for the Indonesian VPA by Lesniewska and McDermott (2014). Such criticism was raised before the VPA was fully implemented in 2015 providing the possibility that there have been improvements made in the meantime. Notwithstanding this, reinforcing forest management practices like RIL, and reducing illegal logging through VPA-TLASs – once successful – could indirectly contribute towards other protective functions and services of forests related to soil and water (**SFM element five “protective function of forest resources”**) (Neupane et al., 2019; Tegegne et al., 2018).

Tegegne et al. (2018) also foresaw a number of potential direct contributions of FLEGT towards the sixth **SFM element “socio-economic functions of forests”**, among those contributions in relation to ‘economic development’ and ‘legality in production, processing and trade’ through promoting legal processing and international trade of timber products.

For those countries that obliged themselves to implement the TLAS equally on the domestic market, benefits were also expected for this market segment by Tegegne et al. (2018). In contrast, C. P. Hansen et al. (2018) and Lesniewska and McDermott (2014) stressed concerns in terms of the legalization of timber destined for the domestic market and consequently for the potential impact of VPAs to positively affect this market sector. While literature remained on a theoretical basis on this issue, empirical evidence is needed.

Tegegne et al. (2018), moreover, suggested that FLEGT, through improved governance and law enforcement, could directly contribute towards clarifying and strengthening tenure rights of involved actors. This is in line with the social safeguard article that is an integral part of every VPA. It aims to minimize adverse impacts on communities and actors affected by the VPA implementation. However, in Ghana, C. P. Hansen et al. (2018) considered exactly this *“lack of a realistic discussion of forest and tree tenure”* (p. 97) as the key weakness of the VPA implementation.

These and the above examples suggest that there exist discrepancies between envisaged policy objectives and real-life scenarios on the implementation level also for FLEGT-VPAs. Reasons for this are poorly investigated.

There are other contributions towards the seventh **SFM element “legal, policy and institutional framework”** that could be expected from FLEGT. The FLEGT EU Action Plan states that efforts will, among other things, focus on the promotion of transparency of information, policy reforms and capacity

building for partner countries (EC, 2003). Consequently, each VPA agreement includes commitments to improve transparency and other aspects of forest governance¹⁷ (except of Ghana that misses the transparency annex (Lesniewska & McDermott, 2014)). VPAs, moreover, contain an article on the ‘Stakeholder involvement in implementation’ to assure public participation in the VPA process. Accordingly, Tegegne et al. (2018) concluded a potential direct contribution of FLEGT towards issues of ‘capacity building’, ‘country-level legal, policy, and institutional frameworks’ and ‘public participation’.

The independent evaluation of the FLEGT EU Action Plan by TERE et al. (2016) suggested that “*the EU FLEGT Action Plan is resulting in improved forest governance in all targeted countries*” (p. 3) especially in terms of equitable solutions, transparency, capacity building of civil society and government and engagement of various national stakeholder in the VPA process (TERE et al., 2016). Results from the Indonesian study confirmed this. Specialists in Neupane et al. (2019) ranked the ITTO indicators ‘forest governance’, ‘policies, laws and regulations for governing forests’ and ‘availability of professional and technical personnel to perform and support forest management’ as particularly high (ranked among the first 10), suggesting a strong contribution of the Indonesian FLEGT-VPA process on these issues.

While these sources uniformly point towards a positive contribution of FLEGT-VPAs in terms of national forest governance, none of them has made references to subnational forest governance.

2.3 Driving forces of and hindrances to REDD+ implementation

The literature review on REDD+ and FLEGT achievements relevant for SFM above revealed that many of the envisaged targets of both approaches have not been observed yet. This raises the question of what hampers the processes on the implementation level. In the following, existing knowledge on factors that drive and hinder the REDD+ implementation is summarized.

Authors like Angelsen et al. (2012) and Korhonen-Kurki et al. (2018) suggested a number of factors and conditions that influenced the success of REDD+ in the past. To identify and conceptualize challenges and opportunities across the (national) REDD+ policy arenas, Angelsen et al. (2012) applied a political economic lens that focused on ‘Institutions’ (rules, path dependencies¹⁸ or stickiness), ‘Interests’ (potential material advantages), ‘Ideas’ (policy discourses, underlying ideologies or beliefs) and ‘Information’ (data and knowledge, and their construction and use). Their framework was taken up by Korhonen-Kurki et al. (2017). Korhonen-Kurki et al. (2017) took the former national REDD+ Agency in Indonesia as an example to assess factors that favored and restricted the REDD+ process in Indonesia.

The ‘autonomy of the state from economic interests of actors that drive deforestation’, which includes for example, collusion, corruption and rent seeking, and the ‘political will’ were factors that influenced the success of REDD+ identified by Angelsen et al. (2012). Depending on whether those factors are present or absent, they could enable and foster the REDD+ outcome/process or hamper it. Key challenges specific to REDD+ raised by Angelsen et al. (2012) were its ‘multi-level character’, ‘multiple actors’ and ‘requirement for policy change beyond the forestry sector’. In Korhonen-Kurki et al. (2017) the ‘lack of multilevel and multisectoral governance’ and a ‘lack of information flow’ were among the hindrances that the implementation of the national REDD+ Agency faced. Other such factors included ‘no recognition of REDD+ by other policy sectors’ and ‘limited budget support’.

¹⁷ <http://www.vpaunpacked.org/en/web/vpa-unpacked-multilang/vpa-elements>

¹⁸ “*is characterized by the resistance to change often seen in state organizations responsible for the management of natural resources. Ministries of forestry in forest-rich countries may be afraid of losing parts of their sphere of influence, or ministries of agriculture fear that REDD+ will restrict opportunities for new agricultural land. One way to overcome this institutional stickiness would be to create new institutions and introduce new actors, but this comes with its own trade-offs. Formal power typically rests with the ‘stickiest’ organizations – those with enough influence to resist change – while new institutions and actors are ignored or remain marginalized*” Angelsen et al. (2012, p. 22).

Factors that drove the national REDD+ Agency process were for example, ‘incentives to avoid deforestation and forest degradation’ and ‘novel and alternative governance mechanisms’ (novel institutions like REDD+ working groups).

While a number of challenges towards the REDD+ implementation in Indonesia were also outlined in REDD+ policy documents (e.g. Indonesia’s REDD+ Readiness Self-Assessment that was submitted to the Forest Carbon Partnership Facility (FCPF) in 2017), driving forces were rather – if at all – indirectly reported.

The mentioned studies mainly focused on the national policy arena and national institutional setting while there remained a lack of comprehensive assessments of factors that hinder and drive the REDD+ performance on the subnational level. This is insofar surprising as there exist – especially in Indonesia – several REDD+ pilot projects and demonstration activities. This suggests that lessons are either not sufficiently collected or not distributed beyond the project boundaries.

2.4 Conclusion

Above the current knowledge of the overlaps between REDD+/FLEGT and the holistic concept of SFM was summarized. Existing research on factors that drive and hinder REDD+ achievements relevant for SFM were, moreover, outlined. The following conclusions can be drawn from this for the study approach:

1. Research has only recently started to focus on the direct overlaps between the holistic concept of SFM and REDD+ and FLEGT
2. The holistic concept of SFM has been used as an evaluative framework to analyse the overlaps between both approaches and SFM in recent literature
3. Existing research mainly remained on a theoretical level, exploring *potential* overlaps between REDD+/FLEGT objectives and SFM but there remains a need for further investigations on the subnational level
4. Some studies have identified general achievements of REDD+ and FLEGT that can be translated to the context of SFM but research in this context has focused on national achievements, especially in relation to forest governance, while evaluations fall short on achievements relevant for the subnational level
5. Existing literature has shown that there are overlaps between REDD+/FLEGT objectives in policy documents with each SFM element but that the extent and quality of the overlaps vary by approach and SFM element; overlaps were especially found with SFM element seven
6. Studies suggested that FLEGT could apply mechanism that contradict with the holistic concept of SFM
7. The desk review reveals that there exist discrepancies between REDD+/FLEGT(-VPA) policy objectives and observed impacts on the ground for many SFM elements. Building upon the above summary, this may be explained by the following aspects:
 - Policy documents lack the follow-up of policy objectives, that is, they lack a concrete formulation of policy measures to achieve a stated objective. Without those measures, policy objectives risk to remain ‘blank’ statements
 - The design of policy measures and instruments are not adequate. The related question here is how effective they are and how adequate they were designed (and realized) to achieve the stipulated policy objective
 - There are region-specific factors that drive or hinder the implementation of REDD+/FLEGT-VPA. Depending on their presence or absence, they hamper or drive the achievement of REDD+s/FLEGT-VPA objectives and consequently their contribution towards SFM

8. Literature has acknowledged that too few empirical assessments exist in the context of REDD+'s and FLEGT's main objectives, namely reducing deforestation and forest degradation, illegal logging and related trade as well as on related aspects of forest biodiversity and the implementation of SFM practices; the same was observed for factors that drive and hinder, especially the subnational implementation of REDD+
9. The desk review revealed that identified driving forces and hindrances have not been related to REDD+'s potential to contribute towards SFM on the ground

Behind the above-stated conclusions, this study assesses achievements of REDD+ and FLEGT-VPA relevant for SFM on the subnational level. The seven thematic elements of SFM are used as an evaluative framework. A particular emphasis is given to the contribution of REDD+ and FLEGT-VPA towards reducing forest loss as it is suggested that the prevention of 'forest loss' is fundamental to sustaining forests (Lesniewska & McDermott, 2014).

To better understand where the barriers to achieving the global policy objectives of REDD+ and FLEGT-VPA relevant for SFM lie, an additional focus of this study is on the driving forces of and hindrances to the subnational REDD+ implementation. The understanding about these factors can inform the global design of FbAs to better adapt its measures to local circumstances. Real-life lessons on these aspects can, moreover, raise the likelihood that *potential* overlaps between SFM and FbAs actually turn out as such on the ground. The interlinkages of the single study aspects are shown in Figure 3.

Combining the findings of all analyses will allow conclusions to be drawn on the limitations and potentials to implement SFM through recent forest-based approaches that shape forest governance like REDD+ and FLEGT.

3 The Indonesian forestry context

This chapter introduces the (forestry) background of the Indonesia country relevant for this study. Chapters 3.1 to 3.3 outline basic feature of Indonesia and its forestry sector. Chapters 3.4 and 3.5 summarize relevant aspects of Indonesia's legal forestry framework and chapter 3.6 summarizes major threats to Indonesian forests and strategies adopted to address these. National REDD+ and FLEGT processes in Indonesia are outlined in more detail in the chapter 3.7.

3.1 Country size and population

Indonesia's total land area is 1,811,570 km² (FAOSTAT 2016¹⁹). The total population in 2017 was 263,991,379.00 (The World Bank²⁰), which makes Indonesia the fourth most-populous country in the world. Its population had a density of 145.73 people/km² of land area in 2017 (The World Bank²¹) and an annual growth rate of 1.1% in 2017 (The World Bank²²). The same year, 5.7% of the population lived on less than US\$1.90 (at 2011 international prices) (The World Bank²³). About 48 million people live in and around Indonesia's forests (Ministry of Forestry, 2009).

3.2 Forest industry

Estimated total roundwood production in 2014 was 113 million m³ and industrial roundwood 62 million m³ (FAOSTAT). Plywood production yielded 5.8 million m³ in 2014 (3.3 million m³ exported), making Indonesia the third largest producer and second biggest exporter of plywood behind China and the US. Comprehensive figures of the total timber production and consumption, especially those of the domestic timber market in Indonesia, are scarce and very difficult to obtain. This is mainly due to the existence of many unregistered or illegal small producers which do not report to the Ministry of Environment and Forestry (MoEF).

3.3 Forest cover in Indonesia

Indonesia harbours the eighth largest forest cover in the world. Based on the FAO Forest Resource Assessment of 2015 (FAO, 2015), forest cover was 91.01 million ha or 53% of Indonesia's land area in 2015. Of this, 46.02 million ha was primary forest (50.6% of Indonesia's forest area) and 40.04 million ha, or 44% of Indonesia's forest area, was other naturally regenerated forest. Four point ninety-four million ha or 5.4% of Indonesia's forest cover was planted (*idb.*). Fifty-seven million point sixty-six million ha was production forest in 2015 (*idb.*). Carbon stocks in above-ground biomass were estimated to be 9,391 million t and 3,098 million t in below ground biomass (*ibd.*).

3.4 Indonesian forest land use classes and their functions

Indonesia's land area is divided into two classes: 'forest area' and 'non-forest area' (APL land). This classification is anchored in the Indonesian forestry law of 1967 and 1999 and was based on the administrative responsibilities of the forest ministry at that time.

Under Indonesian law, the area legally designated as 'forest area' is 120.6 million ha or 63% of its total land area. The area legally designated as 'non-forest area' is 67.4 million ha, see Table 1.

'Non-forest area', or APL land, can be used for agriculture, settlements and other uses except forestry, for example, for oil palm. The MoEF is responsible to manage the 'forest area'.

¹⁹ <http://www.fao.org/countryprofiles/index/en/?iso3=idn> (accessed 19.03.2019)

²⁰ <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=ID> (accessed 19.03.2019)

²¹ <https://data.worldbank.org/indicator/EN.POP.DNST?locations=ID> (accessed 19.03.2019)

²² <https://databank.worldbank.org/data/source/health-nutrition-and-population-statistics> (accessed 19.03.2019)

²³ https://data.worldbank.org/indicator/SI.POV.DDAY?locations=ID&year_high_desc=true (accessed 19.03.2019)

It is important to consider that the ‘forest area’ class does not necessarily harbour trees and that the ‘non-forest area’ class can actually harbour trees. Table 1 presents and compares the areas legally designated as ‘forest area’ and ‘non-forest area’ and their actual forest cover as reported in the Global Forest Resource Assessment (FAO, 2015) and the State of Indonesia’s Forests 2018 (Ministry of Environment and Forestry [MoEF] & Republic of Indonesia [RoI], 2018).

In the following, the term ‘forest cover’ is used to refer to land area that is still forested. The separation between the ‘forest area’ class as defined by Indonesian law and ‘forest cover’ as estimated based on satellite images, is an important issue throughout the present work, especially in the context of the forest loss per land use class.

Table 1: Forest cover of legally designated ‘forest’ and ‘non-forest area’ based on Indonesian law and FAO (2015). ⁱ MoEF and RoI (2018) define forests as a land area of more than 6.25 ha with trees higher than 5 m at maturity and a canopy cover of more than 30%. ⁱⁱ FAO (2015) defines forest as an area of land of more than 0.5 ha with tree canopy cover of more than 10% and trees higher than 5 m at maturity.

In million ha	Forest cover	Without forest cover	Total area
‘Forest area’ ⁱ	85.8	34.7	120.6
‘Non-forest area’ ⁱ	8.1	59.3	67.4
Forest cover (FAO) ⁱⁱ	94.4		94.4

The ‘forest area’ is further classified based on its function into three classes, see Figure 4: 1) conservation forest (HK), for the preservation of biodiversity and their ecosystems, including national parks and nature reserves, 2) protection forest (HL), for the protection of environmental services such as erosion control, protection of watersheds, prevention of floods, and 3) production forest with the main function of producing forest products.

Production forest is divided into limited production forest (HPT), permanent production forest (HP) and convertible production forest (HPK). Limited production forest is designated for the prevention of soil erosion and shows stricter regulations in terms of timber harvest, it is managed through selective cutting. Decisive for the classification into this forest class is the slope, type of soil and rainfall intensity of the area (Government of Indonesia [GoI], 2010). Permanent production forest shows lower harvest rules and allows clear cutting for the establishment of timber plantations (which are in Indonesia classified as forest).

Based on Forestry Law 41/1999, Article 38, the utilization of production and protection forest area is, moreover, allowed for non-forestry activities such as mining. Mining companies must obtain a lease-use license from the MoEF for these activities.

Convertible production forest is reserved for activities other than forestry, for example, oil palm, and can be released to ‘non-forest area’. Associated deforestation is categorized as ‘planned deforestation’. Table 2 characterizes the different land use classes and provides for the land area under each forest class.

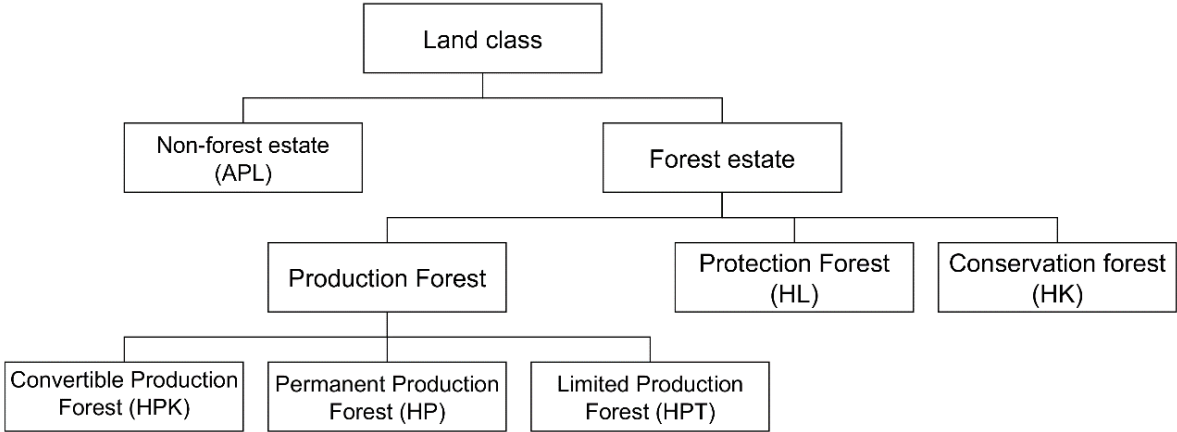


Figure 4: Land use classes in Indonesia.

In 2017, 78.5% of Indonesia's conservation, 80.6% of its protection forest area, 79.4% of its limited production forest area, 58.3% of its permanent production forest area and 49.1% of its convertible production forest area was covered by natural forest (consisting of primary and secondary forests) (MoEF & RoI, 2018).

Legal changes to land use classes

Under Indonesian law, Government Regulation 10/2010, the function of forests can be altered within the 'forest area' class (forest area remaining forest area). The change in the function of forest is theoretical possible for all three forest classes: protection forest, conservation forest and production forest either based on a partial basis or for provincial territory.

Changes from conservation and protection forest into production forest (or vice versa) and from protection into conservation forest (or vice versa) based on a partial basis or provincial basis can only be made where the criteria of each forest class are no longer fulfilled but meet the criteria of another class. The most relevant change is the change in function *within* the class production forest. Those changes can be made "*to meet the need for the optimum area of production forest to support the stable supply of raw materials to the wood processing industry*" (GoI, 2010, Article 42(2)a). Here, the following changes are possible (GoI, 2010, Article 42):

- Limited production forest to permanent production forest and/or convertible production forest
- Permanent production forest to limited production forest and/or convertible forest
- Convertible production forest to limited production forest and/or permanent production forest

Table 2: Land use classes potentially harbouring forest by function in Indonesia. Adapted and modified from Margono et al. (2012); NTFP = Non-timber forest products.

Forest area by function	Code	Million ha ¹ (%)	Purpose & function	Possible management practices	Meaning for SFM
Conservation forest	HK	22.1	Preservation of flora and fauna diversity and ecosystems	Forest preservation	No deforestation and forest degradation
Protection forest	HL	29.7	Protecting the water system to prevent flooding, control erosion, protect sea water intrusion and maintain soil fertility	Forest protection, community use of NTFP	No deforestation and very low intensity degradation
Production forest:		68.8			
- Limited production forest	HPT	26.8	Low intensity logging	Selective logging, post-logging silviculture treatments	Forest degradation
- Permanent production forest	HP	29.2	Logging, industrial timber plantations	Selective logging, post-logging silvicultural treatments, clear cutting	Temporary deforestation, forest degradation
- Convertible production forest	HPK	12.8	Logging	Clear cutting	Permanent and temporary deforestation, forest degradation

¹MoEF and RoI (2018)

Based on the same regulation, ‘forest area’ can also be released to ‘non-forest area’ (forest area not remaining forest area) either on a partial or provincial basis (GoI, 2010, Chapter II, Part 1, Article 6). A total of 30% of the forest cover of a province or a watershed must, however, be maintained. ‘Forest area’ can be released by (GoI, 2010):

- **Swap of forest area:** a change in permanent production forest and/or limited production forest into non-forest area accompanied by incorporating substitute land from non-forest area into forest area
- **Release of forest area:** a change in the appropriation of convertible production forest area into non-forest area

Under certain requirements, ‘forest area’, can also be released to ‘non-forest area’ for provincial territory as part of the spatial planning process (Article 30).

Through the potential of changing the forest area function and transforming ‘forest area’ to ‘non-forest area’, basically each of the forest classes have the potential to be transformed to all other land use classes. For example, by law, oil palm plantations can only be established in ‘non-forest area’ land but because convertible production forest can be released to ‘non-forest area’ and forested area in the limited and permanent production forest class be transformed to the convertible production forest class, forested ‘forest area’ can be in a two-step process released to the ‘non-forest area’ class and then be converted to oil palm.

3.5 Forest management in Indonesia

In the following, the Indonesian forest management framework relevant for the study context is outlined. It comprises the Indonesian SFM certification scheme that is integrated into the Indonesian TLAS, the national harvesting system and the forest management unit (FMU) system.

The Indonesian SFM certification – the PHPL

SFM in all forest concessions in Indonesia became mandatory in 2002 with Government Regulation No. 34/2002 ‘Concerning the forest structuring and making of forest management plans, utilization of forest and use of forest areas’. The same year, the state-driven Pengelolaan Hutan Produksi Lestari (PHPL), the Sustainable Production Forest Management certification scheme, was introduced through decree no. 4795/Kpts-II/2002 and 4769/Kpts-II/2002 on ‘Criteria and Indicators of Sustainable Management of Natural Tropical Forests at the Management Unit’ and their assessment procedures.

The PHPL certification is mandatory for all forest companies with a concession permit in state production forest including natural forest concessions and forest plantations (Maryudi et al., 2017). The PHPL certification scheme consists of four criteria: 1) main preconditions, 2) production aspects, 3) ecological aspects and 4) social aspects. They are further described by various indicators, see Table 3, and their respective verifiers. Depending on the relevance of each verifier, they are distinguished between dominant (with score 2) and co-dominant (score 1) verifiers. Depending on its performance, each verifier is categorized into the classes “good”, “intermediate” or “poor”. The values of all verifiers are aggregated based on their weight to achieve the final score. Concession holders fail to pass the certification when their final score is “poor”, that is, “< 60% of the total possible score and/or not meeting the legality verification, or with at least one dominant verifier graded as poor” (Maryudi et al., 2017, p. 172).

In 2009, the mandatory SFM certification became part of the Indonesian TLAS, the Sistem Verifikasi Legalitas Kayu (SVLK)²⁴.

²⁴ See chapter 3.7 for more information.

Table 3: PHPL criteria and indicators. Source: Maryudi et al. (2017).

Main preconditions	Social aspects
1.1 Tenurial clarity and security of the forests	4.1 Clear delineation and marking of the forest area from indigenous people or community lands
1.2 Commitments to manage forest sustainably	4.2 Corporate social responsibility programs
1.3 Adequacy of professional and trained workers	4.3 Mechanisms and implementation of fair and equitable benefit distribution
1.4 Periodic monitoring and evaluation, and feedback mechanisms to ensure forest improvement	4.4 Reliable conflict resolution mechanisms and their implementation
1.5 Free prior informed consent	4.5 Labour rights, their protection, and the improvement of workers' prosperity
Production aspects	Ecological aspects
2.1 Long-term forest gazettement and delineation for supporting sustainable management of forest	3.1 Protected zones in each forest type
2.2 Annual allowable harvest rates for timber and nontimber	3.2 Forest protection and security
2.3 Silviculture system ensuring forest regeneration	3.3 Soil and water protection and impact monitoring
2.4 Implementation of reduced-impact logging	3.4 Identification and protection of endangered, rare, threatened and endemic species
2.5 Logging only in the assigned compartments	3.5 Allocation of production forest as undisturbed area; management and protection of endangered, rare, threatened and endemic tree species
2.6 The financial health of the company and the level of investment and reinvestment are adequate and meet the needs of forest management	3.6 Allocation of production forest as undisturbed area; management and protection of endangered, rare, threatened and endemic wildlife

The Indonesian Harvesting System

Based on the Director General of Forestry decree No. 35/1972 of 1972, Indonesia's forests should be managed on a sustainable basis by applying the Indonesian Selective Cutting System (TPI). In 1989, the TPI was replaced by the Indonesian Selective Cutting with Replanting System, the Tebang Pilih Tanam Indonesia (TPTI). In addition to the TPI, the TPTI includes aspects of regeneration and maintenance of the residual stand such as enrichment plantings in the second year after harvesting. In 2005 and in 2009, the TPTI was revised through the Director General of Forest Production Management No. 226/VI-BPHA/2005 and P.9/VI/BPHA/2009 and the *silvikultur Intensif*, referred to as SILIN, was introduced. Under this approach, the minimum cutting diameter was set from 50 cm to 40 cm for lowland production forests and from 60 cm to 50 cm for hill forest and limited production forest. The cutting cycle was reduced from 35 to 30 years. The TPTI assumes an annual diameter increment of commercial trees of 1 cm (Romero et al., 2015; Yasman, 1998). The system aims to ensure a sustainable timber supply derived from natural forests (Rimbawanto, 2006).

Forest Management Units (FMUs)

To strengthen Indonesia's forest governance and management at the site level, the implementation of 629 FMUs all over Indonesia had been envisaged until 2019. As a decentralized unit, FMUs are responsible for developing, implementing and overseeing forest governance and management on the site level while the forest service is responsible for forest administrative issues such as the issuing of permits (Kawai et al., 2017; P3SEKPI, 2017). As such, FMUs will be responsible for the development of management plans, overseeing license holders and monitoring land use activities. Approximately 120 FMUs had been established by the time of writing. As the main intervention unit for REDD+ locally, pilot FMUs have been highly supported by the REDD+ readiness process.

3.6 Threats to Indonesian forests

Indonesia is considered a High Forest cover High Deforestation (HFHD) country.

In 2017, Indonesia showed the third highest global tree cover loss of 1.3 million ha or 0.81%, ranking right after Brazil and the Democratic Republic of the Congo²⁵. Deforestation dropped in comparison to 2016, where it was 2.42 million ha or 1.5%²⁶. Corresponding emissions were 557 Mt in 2016 and 213 Mt in 2017. Over the period 1990 to 2014, the land use change and forestry sector contributed to 68% to Indonesia's total GHG emissions⁸. The drop in primary forest loss in 2017 was among other things associated with the national peat drainage moratorium in effect since 2016 and the El Nino year of 2016²⁷.

Drivers of deforestation and forest degradation

The Indonesian government has divided deforestation into planned and unplanned deforestation (Government of Indonesia, 2014). Planned deforestation refers to the loss of forest in the 'non-forest area' and convertible production forest class caused, for example, by approved legal conversion of forests based on regional spatial plans. Planned forest degradation refers to the approval of timber utilization permits in natural forests and of timber industrial plantations in natural forests (Republic of Indonesia, 2014). Table 4 lists direct drivers of deforestation and forest degradation as outlined in the FCPF Carbon Fund Emissions Reduction Program Idea Note (ER-PIN) for Indonesia:

Table 4: Planned and unplanned drivers of deforestation and forest degradation. Adapted from Government of Indonesia (2014).

Type of forest loss	Un/planned	Examples
Deforestation and forest loss	Planned	<ul style="list-style-type: none"> - Expansion of local administrative/governance regions for infrastructure and other uses - Approved legal forest conversion (based on spatial plans/RTRW) - Forest conversion on lands reserved for other purposes (APL) - Forest conversion for mining concessions (e.g. coal) - Forest conversion for estate crop plantations (e.g., oil palm)
	Unplanned	<ul style="list-style-type: none"> - Unplanned forest conversion for estate crop plantations (e.g., oil palm) - Encroachment for timber, fuel wood, agriculture and small-scale mining - Uncontrolled forest fires - Land claims leading to conversion of forest areas
Forest degradation	Planned	<ul style="list-style-type: none"> - Approval of timber utilization permits (concessions) in natural forests - Approval of industrial plantations in natural forests
	Unplanned	<ul style="list-style-type: none"> - Timber harvesting outside the annual allowable cut - Illegal logging - Forest fires due to natural factors - Small human-induced forest fires for land clearing

²⁵ World Resource Institute: <https://www.wri.org/blog/2018/06/2017-was-second-worst-year-record-tropical-tree-cover-loss>, June 26, 2018 (accessed on 22.03.2019)

²⁶ Global Forest Watch (accessed on 22.03.2019)

²⁷ World Resource Institute: <https://www.wri.org/blog/2018/08/indonesias-deforestation-dropped-60-percent-2017-theres-more-do>, August 14, 2018 (accessed on 22.03.2019)

Poor spatial planning, weak and unclear tenurial rights, ineffective forest management, poor governance and weak law enforcement have been identified as underlying causes of deforestation and forest degradation (Government of Indonesia, 2014).

The decentralization policy that had been in effect since 2000 had substantially affected deforestation in Indonesia. As part of this policy, governors and district heads were given the authority to issue small-scale timber concession licenses (Suwarno & Hein, 2015). The decentralization policy resulted in overlapping authorities, power struggles between different governmental levels and the uncontrolled exploitation of Indonesia's forests (Mulyani & Jepson, 2017; Myers et al., 2016).

As a response to the weak and often corrupt land use governance on the local level, the national government of Indonesia issued decree no. 23/2014. With this decree, district authority of various areas, including the forestry sector, was taken back from the district to the provincial level. The decree entered into force in October 2016. With this, the district forestry offices were shut down. It remains to be seen how this change will affect the current forestry set up.

3.7 National FLEGT-VPA and REDD+ processes in Indonesia

To cope with the threats to its forest, Indonesia has engaged early on in the REDD+ and FLEGT-VPA processes.

REDD+

In 2009, Indonesia had committed to reduce its GHG emission by 26% to BAU by 2020 without international help and by 41% with international support through the “National Action Plan to Reduce GHG Emissions” (RAN GRK). During the COP 21 in Paris in 2015, this target was updated to 29% by 2030.

A substantial contribution to this target should originate from the reduction of emissions from deforestation and forest degradation since land use change and forestry activities accounted for 84% of Indonesia's total emissions (Republic of Indonesia, 2014). To achieve this, Indonesia has actively engaged in REDD+ related activities since 2007.

Indonesia has developed all relevant REDD+ elements required by the COP decision 1/CP.16. (i.e. a National Strategy, a National Forest Monitoring System, a Safeguard Information System and a Forest Reference Emission Level). Indonesia, moreover, declared 11 provinces as pilot provinces and had registered 35 REDD+ demonstration activities, including sub-national and project level initiatives (Kawai et al. 2017). By 2012, 11 provinces had completed their REDD+ strategies, among them East Kalimantan (Republic of Indonesia, 2018). Several other steps have been undertaken since (see Figure 5 for the REDD+ landscape in Indonesia). A REDD+ Task Force was established in 2010. It was replaced by the national REDD+ Agency in 2013 that, together with the former Ministry of Forestry (MoF), led the REDD+ Readiness process until early 2015.

When the MoF and the Ministry of Environment were merged into the MoEF in 2014, the REDD+ Agency was dissolved, and its tasks and functions integrated into the MoEF. A new division in the MoEF, called the Directorate General of Climate Change Oversight (DGCC), took over the functions of the REDD+ Agency. All REDD+ related matters were managed under the DGCC by the time of writing.

During the last years, Indonesia was among others supported by UN-REDD²⁸, the FCPF and the Forest Investment Program of the World Bank. In 2010 it signed a Letter of Intent (LoI) with Norway on the development of a REDD+ policy. In the LoI over 1 billion USD, Indonesia agreed to complete a National REDD+ Strategy, establish a special agency to coordinate REDD+ related issues, a MRV system, design a funding instrument and implement a 2-year suspension on all new concessions for conversion of peat and natural forest (Government of the Kingdom of Norway & RoI, 2010).

²⁸ The UN-REDD is the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries. It supports nationally led REDD+ processes.

Other funds included those from Australia, Germany, the KfW Development Bank, the Gesellschaft für Internationale Zusammenarbeit (GIZ) and the United States Agency for International Development (USAID).

Indonesia has, moreover, enacted several regulations or policies related to REDD+. Among those for example Minister Regulation No. 68/2008 on the implementation of REDD+ demonstration activities and MoF Regulation P.30/Menhut-II/2009 on Procedures for Reducing Emissions from Deforestation and Forest Degradation.

Within the last decade, the national REDD+ readiness process in Indonesia has initiated, catalysed and/or supported several efforts to improve forest governance. Among those are ongoing policy reforms such as the One Map Initiative¹⁶, the Forest Moratorium on new conversion permits, a land tenure reform, the recognition of customary rights, a FMU reform, social forestry initiatives and recentralization efforts (Korhonen-Kurki et al., 2017; P3SEKPI, 2017).

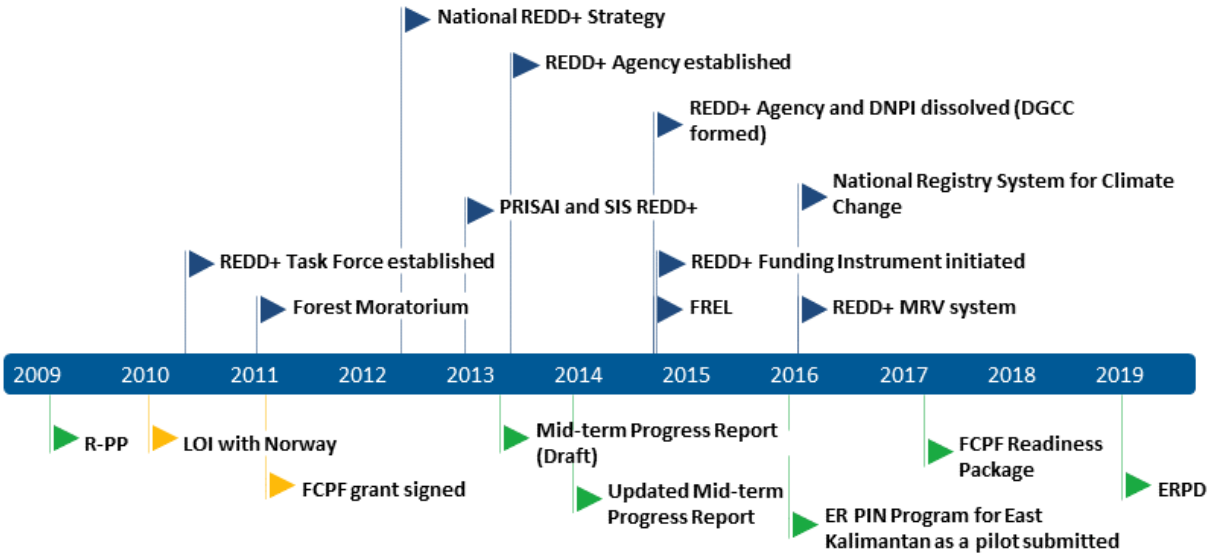


Figure 5: National REDD+ landscape in Indonesia. JIC = Joint Implementation committee; green flags = FCPF related milestones; blue flags = REDD+ institutional landscape; yellow flags = grants.

FLEGT-VPA

By the end of the 1990s, the rising recognition of problems related to illegal logging and unsustainable forest management led to first measures to tackle the unsustainable use of timber in Indonesia. Measures included signing Memorandums of Understandings (MoUs) with timber-importing countries and a Presidential Instruction (No. 4 of 2005) that directed the leaders of 18 government bodies to co-operate and co-ordinate to eradicate illegal logging and to seek to intensify forest certifications. In 2001, Indonesia hosted the East Asia Ministerial Conference on Forest Law Enforcement and Governance (FLEG) in Bali. It resulted in the Declaration on Forest Law Enforcement and Governance’ (Bali Declaration).

Figure 6 provides for an overview of the national FLEGT landscape in Indonesia. The negotiations for a VPA between Indonesia and the EU officially started in 2007 and concluded in 2011. In 2014, the VPA entered into force.

The core of the VPA became the Indonesian TLAS, the Sistem Verifikasi Legalitas Kayu (SVLK), that was first launched in 2009. Apart from the SVLK, the VPA further includes the following elements:

- Commitments to improve transparency, involve stakeholders in implementation, social safeguards and public information
- A joint implementation committee to oversee the VPA implementation; consisting of representatives from the EU, government, private sector and civil society
- Market monitoring: to “collect and analyse information on the acceptance of Indonesian FLEGT-licensed timber in the Union market” (European Union [EU], 2014, Annex VII(1))
- Impact monitoring to monitor the impacts of the VPA on the timber industry and local communities

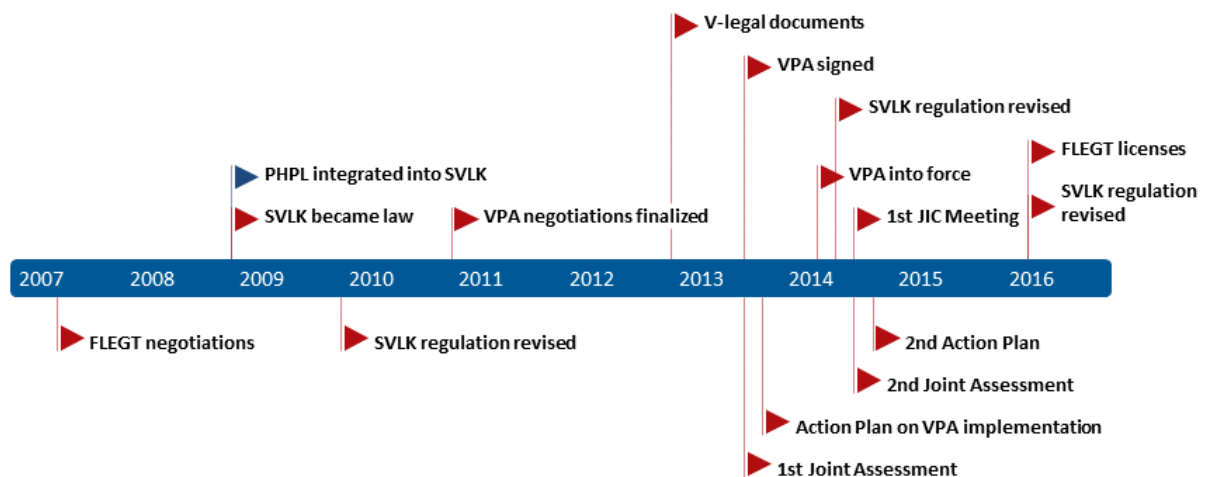


Figure 6: FLEGT landscape in Indonesia. Red flags = FLEGT-VPA related milestones; blue flag = PHPL milestone.

Indonesia’s Timber Legality Assurance System – the SVLK

The TLAS described in the VPA is based on the SVLK (Indonesia & EU, 2015). The SVLK is implemented as an operator-based licensing scheme that resembles forest management certification systems (EU, 2014). It became law in 2009. The SVLK is destined for domestic and international markets. It should thus also apply to timber and timber products exported to non-EU countries and those placed on the domestic market.

The SVLK consists of the following elements: 1) Legality standards, see Table 6 and Table 7, 2) Control of supply chain, 3) Verification procedures, 4) Licensing scheme and 5) Monitoring. Table 5 characterizes each of those elements²⁹. Figure 7 shows the relation between the five elements.

The VPA requires that 1) auditees (timber producers, traders, processors and exporters) comply with the Indonesian legality definition and 2) that permit or landowner and companies (in the case of traders, processors and exporters) demonstrate that “every node of their supply chain is controlled and documented [...]” (EU, 2014, Annex V(3)).

To do so, auditees (concession permit holders) are assessed against a set of standards. Related audit reports are made public through assessment bodies. For the control of the timber supply chain, provincial and district forestry officials are required to undertake field verification and validate the documents of permit holders, landowner, or processors. Related documents include for example, log felling reports, transport documents or log listings.

²⁹ For more information see Indonesia and European Union (EU) (2015) and www.euflegt.efi.

In 2011, the former MoF launched the V-legal logo as part of the SVLK for designated export consignments (Hentschel & Fripp, 2013). A V-legal document is an export license issued through the SVLK system that confirms that the timber product complies with the legality (and/or sustainability) standard of Indonesia. From January 2013 on it became mandatory for all Indonesian exporters to have a V-Legal document.

As already mentioned, the Indonesian TLAS also incorporates the PHPL standard³⁰. The corresponding regulation, the latest being regulation no. P.14/PHPL/SET/4/2016 issued by the General Directorate of Sustainable Management of Production Forests, consists of two standards: 1) standards for the assessment performance of sustainable production forest management (PHPL), that is, standards for SFM and 2) standards for verification of timber legality (VLK).

Both certification schemes are further related as forest concessions that apply the PHPL scheme are also required to comply with the legality standards. PHPL-certified concessions thus also have a legality certificate that eventually is used as a FLEGT license (Maryudi et al., 2017). Forest concession holders can decide whether they immediately apply for the PHPL certification or for the legality certification first. However, they must comply with the PHPL certification standards, no later than the expiry of the first legality certificate, that is after 3 years. Table 7 outlines the legality standards that forest concessionaires in production forest need to comply with.

The SVLK was fully implemented in April 2016. With this, Indonesia became the first country to issue FLEGT licenses for timber exports to the EU.

Table 5: Elements of the Indonesian TLAS. Source: EU (2014) and EU FLEGT Facility³¹.

Elements	Description
Legality standard	A definition of what constitutes legal timber; it provides criteria and indicators to be used to check compliance with relevant laws. Five legality standards have been defined, see Table 6. They are closer described by several principles and criteria that forest actors need to comply with, see Table 7 for those in the production forest class.
Control of supply chain	A procedure for verifying control of the supply chain to ensure that timber comes from legal sources. Forest actors (forest concession permit holders, landowner or companies) must demonstrate that every node of their supply chain is controlled and documented according to the latest regulation (P.14/PHPL/SET/4/2016).
Verification procedure	Tools to verify that all requirements of the VPA legality definition and supply chain controls are met to ensure that timber products are legal. The Indonesian National Accreditation Body, the Komite Akreditasi Nasional or KAN, accredits Conformity Assessment Bodies (CABs). CABs are independent private companies (audits) that audit the performance of forest actors (auditees) based on the principles set out in the legality and SFM (PHPL) standards. They issue legality and PHPL certificates in the case of full compliance with all requirements. The legality certificate is valid for 3 years. See Figure 7 for the relation between the different institutions involved.
Licensing Scheme	Licensing authorities issue export licenses for international markets: for non-EU markets those are V-Legal Documents and for EU Markets those are FLEGT licenses.
Monitoring	Independent entities monitor the implementation of the TLAS. They assess the compliance of the auditees and CABs with the Indonesian TLAS. Civil society has been appointed as the Independent Monitor. In addition, a periodic evaluation assesses the functioning of the SVLK annually.

Following the annual report on the VPA implementation (Indonesia & EU, 2017), by the end of 2016, 23.3 million ha of production forests had been audited for SVLK (total production forest area in 2011: 53,32 million ha (No.: P.49/Menhut-II/2011)) and 3.197 timber industries.

It was, moreover, estimated that all large primary timber processing industries (processing capacity > 6000 m³/year) had been SVLK certified by mid of 2017 (Sucofindo, 2018).

³⁰ See chapter 3.5.

³¹ <http://www.euflegt.efi.int/vpa-elements>

The Multi-stakeholder Forestry Program (MFP) has financially and technically supported the development and implementation of the Indonesian TLAS. The MFP is a bilateral program between the government of Indonesia and the Department for International Development (DFID) of the United Kingdom (UK). The MFP concluded its third phase in 2017 in which it focused on the acceleration of the VPA, especially the SVLK, implementation. It also aimed to address other factors relevant for the VPA implementation, among those to provide assistance to the government to implement policies that address tenure to forest land and to allocate resources to community-based forest enterprises (Multi-Stakeholder Forestry Program [MFP], 2014a).

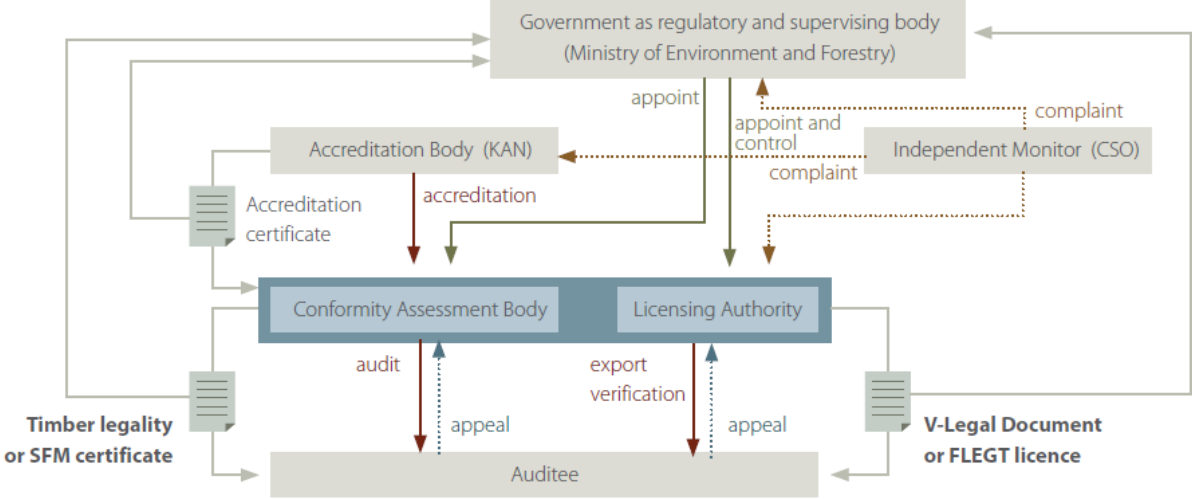


Figure 7: Institutional set-up of SVLK. Source: Indonesia and EU (2015).

Table 6: Indonesian legality standards. Source: EC (2015).

Legality Standard	
1	The standard for concessions within production forest zones on state-owned lands: Natural Forest, Plantation Forest, Ecosystem Restoration, Forest Management Right (see Table 7)
2	The standard for community plantation forest and community forest within production forest zones on state-owned lands
3	The standard for privately-owned forests
4	The standard for timber utilization rights within non-forest zones or from convertible production forest on state-owned lands
5	The standard for primary and downstream forest-based industries and traders

Table 7: Principles and criteria of legality standard in production forest zone. Source: EC (2015).

Legal status of area and right to utilize
K1.1. Forest management unit (concession) is located within the production forest zone
Comply with the system and procedures for harvesting
K2.1. Permit holder possesses a harvest plan for the cutting area that has been approved by the competent administrative authorities
K2.2. Work plan is valid
The legality of the transport or the change of ownership of round logs
K3.1. Permit holders ensure that all the logs transported from a log yard in the forest to a primary forest products industry, or registered log trader, including via an intermediate log yard, is physically identified and accompanied by valid documents
K3.2. Permit holder has settled the payment of applicable fees and levies for the commercial extraction of timber
K3.3. Inter-island transportation and trade
K3.4. Compliance of V-Legal marking
Compliance with environmental and social aspects related to timber harvesting
K4.1. Permit holder has an approved applicable Environmental Impact Assessment (EIA) document and has implemented measures identified in it
Compliance with labor laws and regulations
K5.1. Fulfilment of occupational safety and health (OSH) requirements
K5.2. Fulfilment of workers' rights

4 Materials and methods

The following outlines the methods used in this study. Chapters 4.1 to 4.3 present the research design, consisting of the study scale, the description of the study area and the research framework. This is followed by a discussion of each method of data collection in chapter 4.4. Subsequently, chapter 4.5 describes the method of analysis including its analytical background.

4.1 Research design

Scale of research

Following Gibson et al. (2000) as cited in Secco et al. (2014), a ‘scale’ can be described as “*the spatial, temporal, quantitative, or analytical dimensions used to measure and study any phenomenon*” (p.218).

The spatial and analytical dimensions for analysing the five research questions of this study were determined by the global design of FLEGT and REDD+. Due to their different characteristics, research on the subnational FLEGT-VPA and REDD+ implementation was carried out on distinct levels (spatial scales), through distinct approaches and with a focus on different elements.

While REDD+ is regulated on the national level, its implementation affords the translation of national policies to subnational levels. In decentralized countries like Indonesia, this renders the development of subnational institutional arrangements, region-specific strategies and measures and the participation of various stakeholder groups on all subnational governmental levels necessary. Depending on the local conditions, the subnational REDD+ implementation in a given jurisdictional area can thus be developed in various ways.

Research on REDD+, therefore, focused on the jurisdictional scale, specifically on:

- a) the provincial level in East Kalimantan, see Figure 8, and
- b) the district level – more specifically – the jurisdictional REDD+ pilot project in the Berau District

Focusing on the provincial and district level can be regarded as a “nested approach”. There are several advantages to working at these different spatial scales:

- a) Choosing a province as one focus area for the research on REDD+, had the advantage of integrating the administrative unit with the greatest responsibility for the subnational REDD+ implementation and the institutional linkages between local needs and REDD+ plans (Indonesian REDD+ Task Force, 2012). This responsibility of provinces was notably enforced by law 23/2014³², which came into force in 2016. Through this law, provinces were equipped with major authority over district resources including forests.
- a) The provincial level is also the administrative unit with the greatest importance for (non-) governmental organisations working on the subnational level. As such, many of the organizations working at the district level had their subnational base on the provincial level where they were actively engaged in the provincial REDD+ process.
- b) Research on the district level (as on the concession level in the case of FLEGT), permitted to take into account site-specific conditions, for example, terrestrial information and specific activities, for example, of concessionaires. It, moreover, allowed for the analysis of forest loss changes and their linkages to particular drivers.
- c) Advantages to the “nested approach” included the potential to determine the relative importance of and to compare the drivers and hindrances of the subnational REDD+ and SFM implementation that operate at different spatial scales (Gardner et al., 2013).

³² See chapter 3.6 for more details.

It, moreover, allowed connections to be made between the individual REDD+ pilot project and the larger provincial-scale conservation and climate objectives.

- d) Due to the interdependence of the district and province, processes in the district could, moreover, hardly be separated from the development on the provincial level while the real impacts of provincial strategies and processes could only be seen on the local, that is, district level.

In contrast, the implementation of the core element of the FLEGT-VPA, the timber legality and related PHPL certifications, are clearly regulated through regulation P.14/PHPL/SET/4/2016. This regulation obliges forest concession holders to comply with the legality and sustainability standards related to the management and processing of forests and their products³³. Here, the private sector is responsible for the implementation of these certification schemes.

Research on FLEGT, therefore, focused on:

- a) the FLEGT-VPA regulatory framework relevant for the subnational level and
- b) the concession level within the Berau District, see Figure 8

Choosing the VPA regulatory framework and natural forest concessions, permitted to make connections between results of individual forest concession units and the higher objectives of the FLEGT-VPA.

4.2 The study area

Research on the subnational level was conducted in East Kalimantan Province, see Figure 8. East Kalimantan is Indonesia's third largest province. It consists of seven districts and three cities, the capital is Samarinda. The population of East Kalimantan was about 3.5 million ha in 2016 with a density of 27.13 people/km² (RoI, 2019). Population growth was significant and increased by 15% between 2010 and 2016.

About half (6.8 million ha) of East Kalimantan is forested with approximately 2.1 million ha covered of primary dryland forest and 4.3 million ha of secondary dryland forest (RoI, 2019).

East Kalimantan's forest estate is divided into 20 FMUs. Eight of these are currently operational (*ibid.*).

Annual forest loss between 2006 and 2016 was estimated to be 114,054 ha (RoI, 2019). Degradation of primary forest to secondary forest was 83,192 ha over the same period (*ibid.*). Main drivers of deforestation and degradation since 2006 were oil palm, mining, timber plantation and poor concession management (RoI, 2019).

REDD+ in East Kalimantan

One of the first steps of the REDD+ process in East Kalimantan was the set-up in 2008 of a REDD+ working group through the government of East Kalimantan representing members from the provincial forestry service, organization like The Nature Conservancy (TNC) and the GIZ, the private sector, the University Mulawarman (UNMUL) in Samarinda and communities. Its task comprised collecting and analysing data and information related to REDD+, building a common understanding on REDD+ among related stakeholders, coordinating the REDD+ process in East Kalimantan and handling the vertical and horizontal communication between the REDD+ working group and other institutions and governmental levels (Governor's Decree No. 522/K.215/2010).

Following its establishment, a number of actions have been carried out to prepare for REDD+: In 2010, a "Green East Kalimantan Program" (Kaltim Hijau) was launched with the vision to reduce GHG emissions in East Kalimantan by 19% by 2020 (Hovani et al., 2018). In 2012, through Governor Regulation No. 54/2012, another target to reduce provincial carbon emissions from deforestation and land degradation to 15.6% by 2020 was formulated (Anderson et al., 2016; DNPI & Government of East Kalimantan, 2010).

³³ See chapter 3.5 and 3.7.

Strategy and action plans to achieve these emission reduction targets were subsequently developed, among those the “East Kalimantan Environmentally Sustainable Development Strategy” (DNPI & Government of East Kalimantan, 2010), the “Strategy and Action Plan (SRAP) on REDD+” (Government of East Kalimantan, 2012) and the “Regional Action Plan for GHG Emission Reduction” (RAD-GRK).

East Kalimantan has, moreover, developed a forest reference emission level and implemented several REDD+ pilot projects.

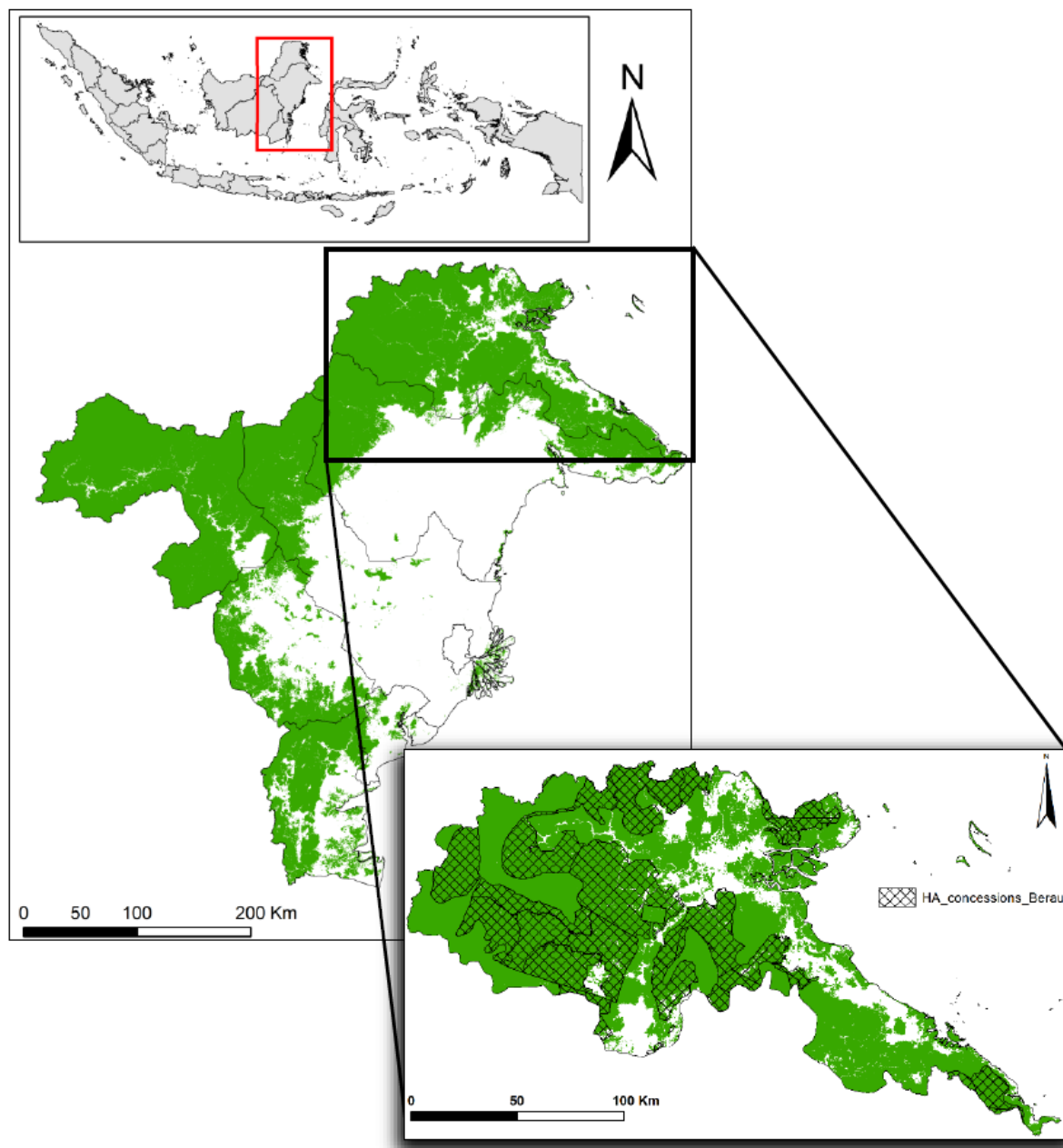


Figure 8: Forest cover in East Kalimantan Province (above) and Berau District (below) in 2000. HA = natural forest concession boundaries.

In 2011, as the first province of Indonesia, a Regional Council on Climate Change, the Dewan Daerah Perubahan Iklim (DDPI), was established. It is chaired by the governor of East Kalimantan and represents members from 13 provincial governmental agencies among those the heads of the Environmental Agency, the Mining and Energy Office, the Forestry Service, the Plantation Service, and experts from the university. While there are formally no members of civil society, the DDPI cooperates

with local non-governmental organisations (NGOs) and organisations such as the GIZ, TNC and WWF, CIFOR and the private sector.

The DDPI was established as an ad-hoc organization to coordinate REDD+ related activities and provide advice to the governor on issues related to climate change. Other tasks included to formulate policies and strategies related to climate change and to monitor and evaluate the policy implementation (Government of East Kalimantan, 2012).

There are currently three working groups under the DDPI: the working group on REDD+/Land use, land use change, and forestry, the working group on MRV system and the working group on Green Growth. All working groups are chaired by initial members of the REDD+ Working Group.

In 2014, East Kalimantan was chosen as the pilot province of the FCPF Carbon Fund program of Indonesia. The DDPI became the focal point and coordinator of the FCPF Carbon Fund (RoI, 2016).

The importance of East Kalimantan

East Kalimantan was chosen as a focus area for multiple reasons:

As a REDD+ pilot province East Kalimantan plays an important role in the national REDD+ context. The province engaged early on in the REDD+ process and has, therefore, a fare record of REDD+ history and related institutions – among those the DDPI.

East Kalimantan, moreover, harbors several REDD+ pilot projects, among those jurisdictional district-wide projects, one of those being the Berau Forest Carbon Program (BFCP) in the Berau District.

East Kalimantan is, moreover, the centre of timber production and forest cover in Indonesia (Inoue et al., 2013). This also made it a suitable area for research related to FLEGT-VPA. About 2.6 million ha, or 38% of forest, were found within natural forest management concessions.

In comparison to other provinces like Central Kalimantan that has already been widely deforested, the province of East Kalimantan, moreover, still harbours a remaining forest area that was relatively high. However, the province' forest area has recently been affected by forest conversion to other land uses and forest degradation, reflecting the drivers that have caused wide-scale deforestation in other areas.

The Institute of World Forestry of the University of Hamburg, moreover, maintains strong working relationships in the area of East Kalimantan. Members of the Institute of World Forestry that are at the same time working for the GIZ in East Kalimantan have been involved in the REDD+ process in East Kalimantan since the very beginning and significantly supported the present research.

The Berau District

Special focus in East Kalimantan was given to the Berau District, see Figure 8, and there especially to the district-wide REDD+ Demonstration Activity “The Berau Forest Carbon Program” (BFCP) and the natural forest concession (HA) area.

Berau is divided into 13 sub-districts and 107 villages. The capital is Tanjung Redeb. Berau has a population of 210,135. Its land area is approximately 2.2 million ha.

Berau's economy is dominated by the mining (40% of GDP) and forestry sector (30% of GDP) (SEA Taskforce of Berau District, 2016).

Berau is among the districts with the largest area of remaining low land rain forest in Indonesia (Berau REDD+ Working Group, 2011). About 75% of its area is covered with primary (~580.000 ha) and secondary forest (1.16 million ha) (Casson et al., 2015).

Most of Berau's land area has been allocated to land use concessions (logging, oil palm, mining). In 2016, there were 21 companies whose forest concessions stretched over Berau District boundaries, see Figure 8.

Deforestation in Berau is particularly driven by palm oil, timber, pulp, and mining production/extraction (SEA Taskforce of Berau District, 2016). With an estimated annual deforestation of more than 24,000 ha per year, the forestry sector was responsible for more than 10 MtCO_{2e} per year (Berau REDD+ Working Group, 2011).

Berau's forest area is divided into four FMUs. One of those, the FMU Berau Barat, was operational by the time of writing.

REDD+ in Berau – the Berau Forest Carbon Program (BFCP)

In 2009, the district-wide REDD+ pilot program, the BFCP, was initiated with the establishment of a district REDD+ working group. By decree no. 716/2009 (Bupati Berau, 2009) the working group comprises 22 members. It is led by the regent, vice regent, chairman of the parliament and the regional secretary of the Berau District. Other members comprise representatives from local governmental agencies such as the forestry service and the land agency of Berau, TNC, members from the “Community Empowerment Agency and Village Government” (Badan Pemberdayaan Masyarakat dan Pemerintah Kampung) and the private sector represented through forest concessionaires.

The district-wide working group was initially established as an ad-hoc institution to prepare the establishment of a steering committee. Other tasks comprised among other things, the collection of baseline data on natural resource management, the development and mainstreaming of REDD+ action plans, the development of strategies for marketing distribution and financing and the provision of advice to the local government in policy formulation.

The BFCP is a partnership program between the government of Berau, the East Kalimantan Province, the MoEF, NGOs and other government and funding institutions. By the time of study conduction, the BFCP was mainly supported by TNC, FORCLIME (GIZ) and local NGOs. Financially, the BFCP was supported by the Tropical Forest Conservation Act (TFCA) Kalimantan³⁴, and the Millennium Challenge Account Indonesia³⁵ (MCAI). In 2010 the BFCP became one of the national REDD+ Demonstration Activities of Indonesia.

The BFCP incorporates different activities that are implemented by various organizations under one common strategy. The strategic program for the first five years (Berau REDD+ Working Group, 2011) was published in 2011 with the goal to improve and refine land-use planning, reduce forest carbon emissions of at least 10% to BAU, improve forest management and public welfare, protect valuable ecosystems, biodiversity and watershed functions and build capacity for stakeholders. This should be achieved through (Berau REDD+ Working Group, 2011):

1. an enabling condition reinforcement strategy that seeks to address the underlying drivers of deforestation and forest degradation, among which were the issues of spatial and land-use planning and forest governance, and
2. a site-based investment strategy that aims to develop carbon emission reduction and sequestration models for different types of land in Berau

A program steering committee was established in March 2011. It was the highest level of authority and consisted of the head of the district (Bupati), the vice Bupati and national government officers from the National Planning Agency and the former Ministry of Forestry (Berau REDD+ Working Group, 2011). Its tasks were to ensure the integration of the BFCP strategic plan into the regional development plan and into provincial and national policies; to coordinate between different governmental levels, to develop policy guidelines, to provide guidance and supervision and evaluate the BFCP implementation (*idb.*)

In 2010, the FMU Berau Barat was established and became the main intervention site of the BFCP. In 2014, the district became one of the focus districts of the Indonesian FCPF Emission Reduction (ER) Program. No funding has been generated through the sale of carbon credits (Sills et al., 2014).

³⁴ The TFCA Kalimantan is a partnership between the Government of Indonesia and the Government of the USA. It supports the BFCP and the Heart of Borneo (HOB) initiative in 4 districts: Kapuas Hulu, Berau, Kutai Barat and Mahakam Ulu with a total intervention area of 966,299 ha through a debt-for nature swap (TFCA Kalimantan (2017)). In total, until 2017 almost US\$ 5 million had been committed to the BFCP under the TFCA Kalimantan of which 63% had been distributed (TFCA Kalimantan (2018)).

³⁵ Under the MCAI, a total of US\$ 332.5 million had been dedicated to the Green Prosperity Project, a funding facility that supports achievements of climate change targets including sustainable management of natural resources and renewable energy in Berau district.

The importance of the Berau District and the BFCP

The large area of remaining forest area makes Berau a suitable location for the present research. Other favorable conditions for choosing Berau as a focus area for the subnational REDD+ and FLEGT-VPA research at the time the study was conducted include:

- The Berau District engaged early on in REDD+ and, therefore, showed a relatively long history of REDD+ readiness activities and institutions
- Being a district-wide national demonstration activity and a focus area of the FCPF ER program, the BFCP played an important role in the development of the national REDD+ framework
- Berau's natural resources had increasingly been exploited during the last decade, placing its intact forest and biodiversity under threat. As a consequence, the district contributed greatly to the province's emission profile: in 2009, it was estimated that Berau was the fifth largest emitter of GHG emissions in the industrial sectors in East Kalimantan and to contribute to 8.5% (21 MtCO₂e) to the total emissions of the East Kalimantan Province (Berau REDD+ Working Group, 2011). By this time, the major contributor was the forestry sector
- The forestry sector in Berau and, therefore, also the subnational REDD+ implementation faced challenges and threats that other districts and regions in Indonesia could not cope with in the past
- The Berau district, moreover, harbored several active natural forest concessions that were in the process of getting certified or that had already complied with the TLAS and PHPL certification standards

Given this interplay of factors, the district provided ideal conditions for analyzing the driving factors and challenges to the subnational REDD+ implementation and REDD+ and FLEGT-VPA-related achievements relevant for SFM on the subnational level.

4.3 Research framework

To derive broader lessons of how recent FbAs implement SFM, this study assessed the subnational implementation of the REDD+ and FLEGT-VPA processes in Indonesia.

The study applied a mixed-method approach combining qualitative and quantitative data and analysis techniques with the aim of triangulating results. Triangulation is usually applied to cancel out the weakness of each respective single method.

Figure 9 shows the research framework of this study. The interlinkages of the single research questions and their main topics are described in chapter 1.4.

Research on subnational REDD+ focused on the East Kalimantan province and the BFCP in the Berau District. Research on FLEGT-VPA focused on the SVLK and PHPL legal framework relevant for the subnational implementation and the concession level in Berau.

Empirical material for the assessment of research question 1 and 2: 'What are the current REDD+ and FLEGT-VPA achievements and limitations relevant to SFM on the subnational level?', was drawn from a) REDD+ and FLEGT policy, implementation and evaluation reports and b) transcripts from REDD+ and FLEGT interviews.

Interview transcripts and policy, implementation and evaluation reports were analysed in terms of reported achievements by means of content analysis. The ITTO criteria were used as an evaluation framework. Data was separately collected and analysed for REDD+ and FLEGT.

Empirical material for their sub-questions 1.1 'Do subnational REDD+ activities contribute to forest loss reduction on the jurisdictional level?' and 2.1 'Do national forest certification schemes under a FLEGT-VPA contribute to forest loss reduction on the concession level?' was drawn from the analysis of remote sensing data on the provincial, district and concession level.

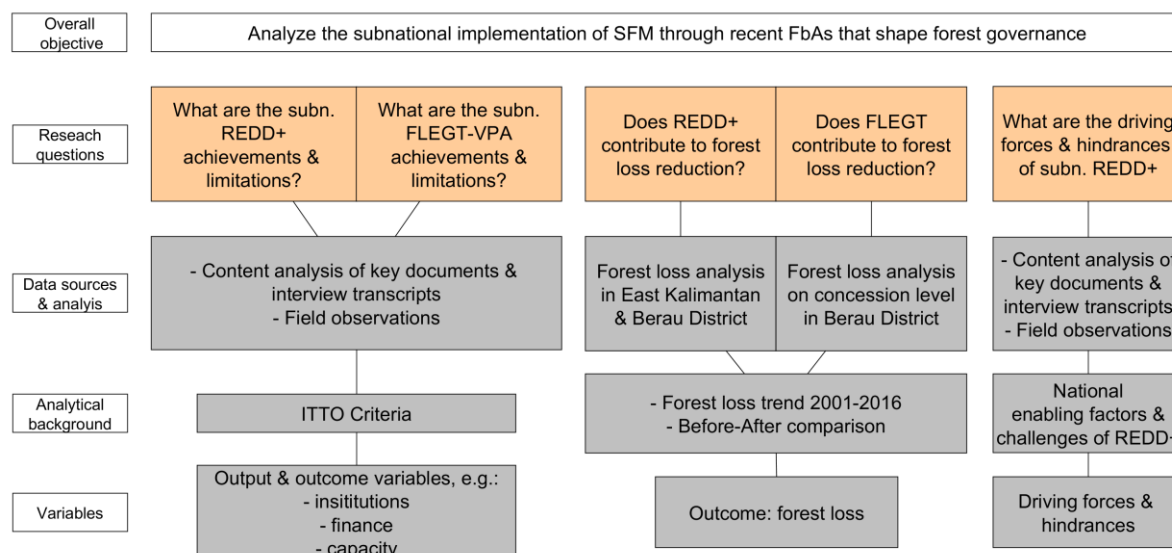


Figure 9: Research framework. FbA = forest-based approaches.

The forest loss analysis on the provincial and district level was carried out to estimate the impact of the bundle of provincial and district-wide REDD+ activities on reducing forest loss. The analysis involved mapping forest loss from 2001 to 2016 in East Kalimantan Province and Berau District and comparing the forest loss dynamics of the reference (‘non-REDD+ period’) with the ‘REDD+ period’.

The forest loss analysis on the concession level in Berau was carried out to estimate the potential impact of VPA-related certification schemes on a reduction in forest loss. Annual forest loss was compared in forest concessions that had obtained a VPA-related certification with concessions that had not obtained a certification (yet). During this analysis, small-scale forest loss, associated with harvesting activities, was isolated from large-scale forest loss, associated with forest conversion.

Empirical material for the assessment of research question 3 ‘What are current driving forces of and hindrances to the subnational REDD+ implementation?’ was drawn from a) REDD+ documents and b) transcripts of REDD+ interviews. The analysis was based on and inspired by the studies and findings from Angelsen et al. (2012), Korhonen-Kurki et al. (2014), Korhonen-Kurki et al. (2017) and Korhonen-Kurki et al. (2018) (chapter 4.5.1.3). Building upon their approaches and lessons, factors that enabled and hampered the REDD+ process in East Kalimantan and the Berau District were identified by means of content analysis.

Field observations from two field trips complemented the research on all themes and objectives.

All data sources and analysis had the same weight and were used to verify the respective other data source.

4.4 Data collection

In the following each method of data collection is outlined. Data collection was carried out between 2016 to early 2018. The following data sources were used for this study:

- An expert interview survey of REDD+ and FLEGT stakeholders (chapter 4.4.1.2)
- Field observations (chapter 4.4.1.1) of two field stays, involving informal discussions with stakeholders and key informants, natural forest concession and FMU visits and a plywood company guided tour
- REDD+ and FLEGT related policy, evaluation and implementation documents (chapter 4.4.2)
- Remote sensing data on land use and land use change (chapter 4.4.3)

4.4.1 Interviews and field observation

Interviews and field observations provided data to answer research question 1 ‘What are the current REDD+ achievements and limitations relevant to SFM on the subnational level?’, research question 2 ‘What are the current FLEGT-VPA-related achievements and limitations relevant to SFM on the subnational level?’ and research question 3 ‘What are the current driving forces of and hindrances to the subnational REDD+ implementation?’.

4.4.1.1 Field observations

Two field stays in East Kalimantan were conducted by the author of this study in 2016 from June to July and in 2017 from March to April.

The first field stay in 2016 aimed to provide for a sound fundament to decide for the scale and design of the study and to learn about the REDD+ and FLEGT-VPA processes in Indonesia. Informal discussions with REDD+ and FLEGT-VPA stakeholders on various levels were conducted, new contacts established, existing ones deepened, and first unstructured explorative interviews held.

The second field stay in 2017 served to carry out semi-structured, in-depth interviews with REDD+ and FLEGT stakeholders.

During the two field stays, the Model FMU Berau Barat in the Berau District and one of the REDD+ model villages of TNC under the BFCP were visited. The latter included informal discussions with the village head. A guided tour through and discussions with the Deputy Head of Logging Division of a plywood processing company in Samarinda that applies SVLK and visits of three natural forest concessions in Berau District were, moreover, conducted.

4.4.1.2 Interviews

In total, 48 stakeholders either related to FLEGT-VPA, REDD+ or general forestry aspects were consulted during the two field stays. With 30 of those, semi-structured, in-depth interviews were carried out and 22 of those were approached for unstructured interviews, see Table 8.

Table 9 provides an overview of these stakeholders by approach and stakeholder group. Annex I provides a list of all consulted stakeholders during both field trips.

Table 8: Number of consulted stakeholders in 2016 & 2017. *Includes four stakeholders that were also consulted for semi-structured interviews.

	Semi-structured interviews (2017)	Unstructured interviews (2016 & 2017)
Total	30	22*
REDD+	16	
FLEGT-VPA	11	
Concessionaires	3	

Table 9: List of consulted people by approach and stakeholder group during first and second field stay. Three stakeholders were consulted for both REDD+ and FLEGT and are, therefore, listed under both regimes.

Stakeholder groups	N total	N REDD+	N FLEGT
Government institution	10	7	4
Private sector	10	1	9
International organization	10	10	2
NGO	8	5	3
Academic/researcher	8	4	4
Others	2	2	
Total	48	29	22

The selection of interviewees aimed to consider the diverse set of stakeholder groups. A pre-selection of interviewees had been identified prior to the interview survey with the help of key informants working for over decades in the study area. The snowball sampling techniques was then used, that is, interviewees identified additional informants.

REDD+ stakeholders were either entrusted with the implementation of REDD+ activities in the Berau District, with the coordination and/or development of REDD+ related activities in East Kalimantan and/or the Berau District. They involved employees of local NGOs, national and international organization, representatives of government institutions (e.g. REDD+ Working Groups, DDPI, FMU) and stakeholders from the research/academia on the provincial and district level.

FLEGT-VPA/SVLK respondents represented the private sector, for example, audit companies, forest concessionaires, national certification institutions; and local NGOs, among them members of the independent monitoring network and representatives from the academia/research.

Most REDD+ and FLEGT-VPA stakeholders were approached in Samarinda, the Berau District and Jakarta.

Unstructured interviews

Twenty-two stakeholders were consulted for only selected issues of the semi-structured, in-depth interviews, and to deepen the understanding on specific issues (e.g. on the district REDD+ Working group and the DDPI). Some of the stakeholders were approached multiple times over the study duration.

Recurring themes during these unstructured REDD+ interviews were:

- challenges to reduce emissions in the forestry sector in East Kalimantan/Berau
- achievements of REDD+ in East Kalimantan/Berau
- the coordination of REDD+ activities on the subnational level
- the establishment and progress of the REDD+ working groups and DDPI in East Kalimantan/Berau

Recurring aspects in relation to the FLEGT-VPA were:

- achievements of the SVLK, including its impact in terms of illegal logging
- the major sources of illegal logging and
- the issue of domestic timber under the SVLK

General aspects discussed in the unstructured interviews related among other things to the issue of tenure conflicts, the management system of Indonesian forests and the FMU system.

Notes were taken during the unstructured interviews. They were transcribed and analyzed by means of content analysis.

Semi-structured in-depth interviews

One source of data for this study was the conduction of in-depth interviews. In-depth interviews are used to gather detailed information on new issues and can provide outcome data (Boyce & Neale, 2006).

In total, 30 semi-structured, in-depth interviews were carried out from March to April 2017. Sixteen of those were mainly related to REDD+ and 14 mainly to FLEGT-VPA including three forest concessionaires with whom separate semi-structured interviews were conducted. The focus here was on the SVLK/PHPL scheme.

Interview guidelines were prepared prior to the conduction of the interviews. Different guidelines were prepared for REDD+ and FLEGT stakeholders³⁶.

All questions used in this study were open-ended questions. Questions were kept broad, instead of narrowing the questions down to one specific aspect, which is good practice applied in qualitative research to provide for the full and detailed perception of interviewee. Questions were specified where

³⁶ See Annex II: Interview guidelines.

necessary. This approach made it possible to focus on the individual knowledge and experience of each interviewee.

Interviews were mainly conducted in English. On the district level, some interviews needed to be conducted in Bahasa.

With both, REDD+ and FLEGT stakeholders

- the perceived threats to SFM
- the potential contribution of REDD+/FLEGT-VPA to SFM in this context
- their overall strength and weakness and
- opportunities and threats to them

were discussed.

REDD+ interviews further focused on:

- REDD+-related activities in the focus area and their challenges
- the coordination and monitoring of REDD+ activities
- the development of the district REDD+ working group and the DDPI as examples of REDD+
- outputs on the subnational level

FLEGT-VPA interviews further focused on:

- the SVLK achievements in terms of reducing illegal logging
- the issue of conversion timber under the SVLK
- the implementation of the SVLK and
- the role and work of the Independent Monitoring

All interviews were prepared, conducted and analyzed by the author of this study. Each interview was recorded and lasted about 1 to 2 hours. Interview trials had been conducted prior to the interview survey and resulted in several adjustments to assure that the initial research objectives were met.

Depending on the time availability of the interviewee, his/her background, knowledge and willingness to share his/her views, not all questions could be discussed with every interviewee. Results of the interviews were triangulated with results of the document and forest analysis.

4.4.2 Key documents

Together with the interviews and field observations, REDD+ and FLEGT related policy, evaluation, and implementation documents provided data to answer research question 1 ‘What are the current REDD+ achievements and limitations relevant to SFM on the subnational level?’, research question 2 ‘What are the current FLEGT-VPA-related achievements and limitations relevant to SFM on the subnational level?’ and research question 3 ‘What are the current driving forces of and hindrances to the subnational REDD+ implementation?’. They were analyzed by means of content analysis.

As common with pilot projects (such as REDD+ pilot projects) and instruments under development (such as the SVLK), there are only few scientific published studies available. For the assessment of REDD+ progress on the subnational level, it was, therefore, not straightforward to find evaluation reports that would assess the progress of the BFCP and REDD+ development in East Kalimantan. By the time of study conduction, only one rapid evaluation of the BFCP had been conducted. It was undertaken in 2016. The author gained access to the summarized results. No evaluation of the provincial REDD+ process had been carried out by the time of study.

For those reasons, the study primarily needed to rely on grey literature. The combination of using those reports, the expert interviews and the forest loss analysis offered sufficient different data sources to draw reliable lessons learnt.

Key policy documents used for the analysis of factors that have enabled and hindered the subnational REDD+ process (driving factors and hindrances) and for the assessment of subnational achievements of REDD+ on the provincial level were (predominantly but not exclusively) the:

- Revised ER Program Idea Note Draft (RoI, 2016)
- Provincial Strategy and Action Plan (SRAP) of East Kalimantan (Government of East Kalimantan, 2012)³⁷
- East Kalimantan Environmentally Sustainable Development Strategy (DNPI & Government of East Kalimantan, 2010)³⁷
- REDD+ Readiness Self-Assessment for Indonesia submitted to the FCPF (P3SEKPI, 2017)

Key documents on the district level for the BFCP in Berau were the:

- BFCP Strategic Program 2011-2015 (Berau REDD+ Working Group, 2011)
- Rapid District Assessment of the Millennium Challenge Account-Indonesia (CDM International Inc [CDM Smith] & Hatfield Consultants Partnership, 2014)
- Update Reports of the Berau REDD+ Working Group (Pokja REDD Berau, 2009a, 2009b)
- Internal evaluation report of the BFCP of 2016 (Noor, 2016)

The following key documents were additionally assessed for subnational achievements of the REDD+ process in the focus area:

- Annual reports of TFCA Kalimantan from 2015-2017 (TFCA Kalimantan, 2016, 2017, 2018)
- Internal project reports, NGO directories and presentations related to the BFCP in Berau (e.g. Marquardt (2015))
- Provincial REDD+ regulations and policy documents (e.g. related to DDPI; Local Action Plan for GHG Emission Reduction (RAD-GRK))

Hovani et al. (2018) that described major milestones, results and lessons learnt of the jurisdictional approaches in Berau and East Kalimantan, and the FCPF ER Program Document were not available by the time data was collected. These documents were used for fact checking and the discussion.

Key policy documents for the analysis of VPA achievements, included (primarily but not exclusively) the:

- VPA text between the EU and Indonesia and its latest amendment (EC, 2015; EU, 2014)
- The umbrella regulation of the SVLK and PHPL schemes (Director General of Sustainable Production Forest Management, 2016)
- Annual progress reports on the FLEGT-VPA implementation in Indonesia of 2014-2015 and 2015- 2016 (Indonesia & EU, 2015, 2017)
- The final report of the evaluation of the FLEGT Action Plan 2004-2014 (TEREA et al., 2016)
- The periodic evaluation report of the FLEGT-VPA of Indonesia and the EU (Sucofindo, 2018)
- Reports of the Indonesian Independent Monitoring of 2014 and 2018 (Meridian et al., 2014; Meridian et al., 2018)
- Multistakeholder Forestry Program reports (MFP, 2014b, 2017; Suparno & Nurbaiti, 2018)
- An analysis of audit reports (Maryudi et al., 2017)

Some issues that were identified through the analysis of key documents and raised by interviewees required the review and analysis of additional literature or databases to verify and improve the understanding of those aspects. References are given in the result section.

All mentioned documents were reviewed and analysed by means of content analysis³⁸.

³⁷ See 'REDD+ in East Kalimantan' in 4.2 for a brief description of these documents.

³⁸ See chapter 4.5.2.

4.4.3 Land use change and forestry data

Remote sensing and forestry data were collected and analyzed to answer research question 1.1 ‘Do subnational REDD+ activities contribute to forest loss reduction on the jurisdictional level?’ and 2.1 ‘Do national forest certification schemes under a FLEGT-VPA contribute to forest loss reduction on the concession level?’.

Table 10 provides for the land use change data that was used for the forest loss analysis on the provincial, district and concession level. Most of the data was freely available while some data was shared by GIZ East Kalimantan.

Table 10: (Spatial) data and its sources used for analysis on the provincial, district and concession level.

Data	Source
Province & district boundaries	Latest spatial plan of East Kalimantan SK 718/2014 (Provided by GIZ East Kalimantan)
Land use classes	s. above
Forest loss data 2001 to 2016	M. C. Hansen et al. (2013)
Deforestation data Indonesian Borneo	Gaveau et al. (2016)
Forest concession boundaries (HA & HTI) East Kalimantan	BPKH wilayah IV Samarinda ³⁹ 2016 provided by GIZ East Kalimantan
Oil palm concessions boundaries East Kalimantan	Greenpeace 2015
Mining concessions boundaries East Kalimantan in FMU Berau Barat	Provided by GIZ East Kalimantan
Information about date of forest concession permit issuance in Berau concessions	BPKH wilayah IV Samarinda ³⁹ 2016 provided by GIZ East Kalimantan; cross-checked with forest concession lists of June 2014 of BP2HP Wilayah XIII Samarinda ⁴⁰ and ISDHP ⁴¹
Certification status and date of forest concessions in Berau	www.jpik.or.id; Anti Forest-Mafia Coalition (2014); Audit companies websites; SILK database

4.5 Data analysis

The different thematic elements of this study and the different types of data sources required the application of different analytical methods. Interview and document data of research question 1 and 2 ‘What are the current REDD+ and FLEGT achievements and limitations relevant to SFM on the subnational level’, was analysed by means of content analysis. The ITTO criteria were chosen as an evaluative framework.

Interview and document data for research question 3 ‘What are the current driving forces of and hindrances to the subnational REDD+ implementation’, was also analysed by means of content analysis. The analysis was carried out in the context of lessons made from Angelsen et al. (2012), Korhonen-Kurki et al. (2014), Korhonen-Kurki et al. (2017) and Korhonen-Kurki et al. (2018).

The analysis of the remote sensing data related to research question 1.1 ‘Do subnational REDD+ activities contribute to forest loss reduction on the jurisdictional level?’, and 1.2 ‘Do national forest certification schemes under a FLEGT-VPA contribute to forest loss reduction on the concession level?’, required quantitative analytical techniques. A Before-After comparison was chosen to compare forest loss during the ‘REDD+/FLEGT period’ with forest loss during the ‘reference period’ (‘non-REDD+/FLEGT period’).

³⁹ Regional forest planning unit of the Ministry of Forestry (MoF) located in Samarinda

⁴⁰ Regional office of forest monitoring and forest utilization of MoEF located in Samarinda

⁴¹ Directorate of forest inventory and forest resource utilization

The chapter is organized as follows:

- First, the analytical background towards each research question is outlined, comprising
 - o the ITTO criteria framework (research questions 1 and 2)
 - o the Before-After comparison of forest loss in East Kalimantan and Berau (research questions 1.1 and 1.2)
 - o the national enabling conditions and challenges framework (research question 3)
- Then, each analysis method is described, comprising:
 - o The content analysis of interview transcripts and key documents (research questions 1, 2 and 3)
 - o The analysis of remote sensing data (research questions 1.1 and 1.2)

4.5.1 Analytical background of specific study elements

In the following, the different analytical backgrounds of each research question are outlined.

4.5.1.1 Assessing the achievements of REDD+ and FLEGT-VPA

Identifying and assessing the achievements of REDD+ and FLEGT-VPA in terms of SFM (research question 1 and 2) was one of the approaches to analyze how FbAs implement SFM on the subnational level.

The introduction and state-of-the-art chapter already outlined how both REDD+ and FLEGT-VPA aim to foster the implementation of SFM and have by its global design several overlaps with it ('thematic overlap system'). This assumption stipulates the entry point of the following analysis.

The seven elements of SFM⁴² have been employed by several studies as a conceptual framework to assess the contribution of different forest-related instruments towards SFM (Cosslett, 2013; Tegegne et al., 2018). In this study, the SFM criteria and indicator framework by ITTO (ITTO, 2016) is proposed as an evaluative framework. A similar approach was applied by Milbank et al. (2018) that assessed the extent to which REDD+ project objectives align with the Sustainable Development Goals (SDGs) taking the SDGs as an evaluative framework.

ITTO proposes seven criteria that are based on the seven SFM elements proposed by the NLBIs. These criteria are organized under four objectives. They are more closely defined in Table 11 that, moreover, shows the interrelation between the four ITTO objectives (column 1 & 2), the seven ITTO criteria (column 3) and the NLBI SFM elements (column 4). In the following, each of the seven ITTO criteria is briefly introduced.

ITTO criterion 1: Enabling conditions for sustainable forest management, deals with issues of policies, laws, and regulations for governing forests, forest tenure and ownership, forest governance, the institutional framework and the planning, monitoring, and economic framework.

ITTO criterion 2: Extent and condition of forests, relates to the stability and performance of forest area and *inter alia* addresses issues of total area under comprehensive land-use plans, multiyear forest management plans in FMUs, forest area under compliance schemes, change in forest area and forest carbon stocks.

ITTO criterion 3: Forest ecosystem health and resilience, addresses threats to, and vulnerabilities of, forests and the restoration of degraded forests and lands. The former comprises issues such as threats caused by human activities, vulnerability of forests to natural disturbances and forest resilience and climate change adaptation.

⁴² See chapter 1.2.

ITTO criterion 4: Forest production, relates to issues of resource assessment, harvesting planning and control procedures and silviculture in natural and planted forests. This comprises issues of forest inventories and carbon stocks, timber harvesting arrangements, timber log tracking systems and reduced impact harvesting as well as the monitoring of these operations.

ITTO criterion 5: Forest biological diversity, addresses issues of ecosystem, species and genetic diversity and the biodiversity conservation in production forests. Specifically, this refers to the forest extent in protected areas, buffer zone management, threatened forest-dependent species and biodiversity conservation measures in natural production forests *inter alia*.

ITTO criterion 6: Soil and water protection, primarily relates to the forest extent designated to the protection of soil and water and protection of downstream catchment areas as well as to the protective function in natural production forests.

ITTO criterion 7: addresses economic, social and cultural aspects and relates to community and indigenous peoples' rights and participation in forest management. Related aspects are the contribution of the forest sector to the gross domestic product, wood and non-wood forest product processing capacities and efficiency, capacity building of forest workers in forest management and industry, procedures to ensure the health and safety of forest workers, mechanisms for resolving disputes between forest stakeholders, local livelihoods, forest tenure and user rights of indigenous people and local communities and their involvement in forest management *inter alia*.

Each criterion is further described by indicator groups and/or several indicators. In total the ITTO criteria and indicator framework comprises 18 indicators groups and 58 indicators⁴³.

No matter the evaluative framework, literature has acknowledged that certain challenges exist when measuring or identifying achievements of an intervention, including the following:

Aiming to identify achievements, renders the question about the attribution of an intervention to a specific result necessary. Attributing a specific result (output, outcome, impact) to an intervention (causality) is especially challenging when the outcome can be a result of various variables (Angelsen et al., 2012). For example, donor agencies or organisations are usually one of several actors working on the same objective in a region so that it can be difficult to identify the share of an actor on achieving the particular result (Organisation for Economic Cooperation and Development [OECD], 2014). This was also the case in the focus areas in East Kalimantan and the Berau District where several organisations work on joint objectives like reducing emissions and forest loss, conserving biodiversity and managing forests sustainably.

Another challenge is the timing of an assessment (Angelsen et al., 2012). The full impact which REDD+ and FLEGT-VPA aim to achieve can only be assessed at a later stage.

Another challenge refers to achievements that are related to issues such as 'capacity building', 'policy reforms' and 'governance'. Those issues are not as easily measurable and quantifiable as technical issues. In the case of REDD+, among the potential achievements are not only reduced emissions and deforestation but also changes in governance. Likewise, FLEGT-VPA does not merely aim to reduce illegal logging, but also to strengthen forest governance and overall SFM.

For the sake of these challenges, Angelsen et al. (2012) suggest that it may be useful to include expert judgment in the overall assessment. Tools such as surveys and feedback loops that provide qualitative data have, moreover, been explored as new methods for measuring results of development interventions (OECD, 2014). Generating an in-depth understanding of the environment surrounding an intervention for example, by consulting local organisations or using innovative approaches such as the use of third-party monitoring data are ways to circumvent some of these challenges.

⁴³ See ITTO (2016) for more information.

Table 11: Evaluative framework: ITTO objectives and criteria for the sustainable management of tropical forests and the corresponding NLBI SFM element. Source: ITTO (2016).

ITTO objective	Characterization of objective	ITTO criteria	Corresponding SFM element
Providing the enabling conditions for SFM	Political commitment, supportive national policies, strong institutions, laws and regulations, appropriate governance, security of forest tenure and clearly defined access and use rights, including customary and traditional rights, are necessary conditions for SFM	ITTO 1: Enabling conditions for sustainable forest management	Element 7: Legal, policy and institutional framework
	Managing tropical forests sustainably requires that land allocation and spatial planning within and outside forests maintain or enhance the economic, social and environmental values of forests at a landscape scale. This requires the adoption of a forest planning framework at the national, subnational or landscape scale	ITTO 2: Extent and condition of forests	Element 1: Extent of forest resources
Ensuring forest ecosystem health and vitality	Resilience is a key tenet of SFM in natural tropical forests; it is essential to maintain or enhance it to reduce risks to sustainability. Climate change is likely to affect tropical forests and the people who depend on them. It is essential to identify, prevent, monitor and manage threats to forests and to protect them from destructive agents and stresses	ITTO 3: Forest ecosystem health and resilience	Element 3: Forest health and vitality
Maintaining the multiple functions of forests to deliver products and environmental services	The role of natural tropical forests as providers of multiple goods and environmental services should be safeguarded by the application of sound planning and management practices that maintain ecosystem functions and the potential of the forest to yield the full range of benefits to society. In timber production forests, it is essential to have an approved management plan with clearly stated objectives and the silvicultural measures to help meet those objectives	ITTO 4: Forest production	Element 4: Productive function of forest resources
		ITTO 5: Forest biological diversity	Element 2: Forest biological diversity
		ITTO 6: Soil and water protection	Element 5: Protective function of forest resources
Integrating social, cultural and economic aspects to implement SFM	SFM needs to accommodate forest-based production (particularly of timber), environmental protection and local development concerns. Natural tropical forests perform a wide range of socioeconomic and cultural functions, which must be recognized and maintained	ITTO 7: Economic, social and cultural aspects	Element 6: Socio-economic functions of forests

Study approach

Against this background, the following framework was drawn for the identification of REDD+ and FLEGT-VPA-related achievements and limitations in terms of SFM:

1. REDD+ and FLEGT-VPA policy, implementation and evaluation reports and REDD+ and FLEGT-VPA interview transcripts were screened for reported achievements and limitations in relation to the seven ITTO criteria by means of content analysis. The ITTO indicator groups and indicators helped to further subdivide findings under each criterion.
2. ‘Achievements’ throughout this study refer to outputs, outcomes or impacts (intended or unintended) of the bundle of REDD+ and FLEGT-VPA interventions that are characterized based on their location on the result chain⁴⁴. The following definitions were used (Angelsen et al., 2012; OECD, 2014):
 - Output: immediate results of the intervention such as products, capital goods and services, for example, policy adopted and enforced
 - Outcome: the likely or achieved short-term and medium-term effects of an intervention’s outputs; observable behavioural, institutional and societal changes that take place over 3 to 10 years of an intervention’s output, for example, quantified reductions in deforestation
 - Impact: broader and longer-term effects (10 years or more) produced by an intervention (directly or indirectly, intentionally or unintentionally), for example, quantified changes in carbon emissions

The output-outcome-impact model has frequently been used to measure project performance against a set of initial project targets. While this study did not aim to do so in the first place (and, therefore, did not apply an entire result chain), the idea and proposed terminology of the model was used to classify and characterize SFM related ‘achievements’ into outputs, outcomes and impacts.

3. Because impacts are not yet expected to be observed for the majority of activities outputs, the study focused on outputs and outcomes (rather than impacts) of the REDD+ and FLEGT-VPA processes.
4. Certain achievements under REDD+ or FLEGT-VPA may not have been in line with all of the elements of SFM or may not have had an effect on an SFM element yet, in the following referred to as ‘limitations’.
5. The study focused on achievements attributed to the REDD+ and VPA processes in Indonesia. This means that the basis for the outputs have been outlined in related REDD+ or VPA policy documents and/or their attribution has been demonstrated by already conducted research.
6. The joint outcomes of all related REDD+/FLEGT interventions and not the outcome of every single intervention were regarded. In this context, it is recognized that the observed outcomes might not be attributed to REDD+ or FLEGT-VPA alone, but may be the result from a collective action with other conservation or development interventions that are not closer regarded within this study (the UK Department for International Development results framework as reported in OECD (2014)).
7. To identify outcomes, triangulation of results was applied. For example, the perception of interviewees was not further questioned when the same outcome was also reported by other interviewees and/or reported in the analyzed key documents. To minimize potential perception bias of REDD+ and FLEGT interviewees some validation steps were nevertheless applied⁴⁵.

⁴⁴ The result chain is “*the causal sequence for a development intervention that stipulates the necessary sequence to achieve desired objectives beginning with inputs, moving through activities and outputs, and culminating in outcomes, impacts, and feedback*”(Organisation for Economic Cooperation and Development (OECD) (2014, p. 14)).

⁴⁵ See chapter 4.5.2.

8. The validity of REDD+ project implementation reports and FLEGT-VPA evaluations was not questioned. They were used to explore the relevance and efficacy of REDD+ and FLEGT-VPA for SFM on the subnational level.
9. As the prevention of forest loss is fundamental to sustaining forests (Bartley, 2014), special emphasis was given to the potential of REDD+/FLEGT to contribute towards a reduction in forest loss. Because such an analysis is better based on remote sensing data, the document analysis was complemented by a forest loss analysis. Results of this analysis relate to ITTO criterion 2: Extent and condition of forests.

4.5.1.2 Before-After comparison of forest loss

The aim of this analysis was to assess the ability of REDD+ activities and FLEGT-VPA-related certification schemes to contribute to forest loss reduction. Forest loss was taken as a single outcome indicator for SFM in these analyses. For REDD+, the analysis was applied on the provincial and district, for FLEGT-VPA-related certification schemes on the concession level.

Forest loss on the provincial and district level (REDD+)

The analysis on the provincial and district level in this study was carried out in the context of concrete targets and strategies of reducing emissions through deforestation and forest degradation, see also 4.2, among those:

- Indonesia's national CO₂e ER target of 29% by 2030 (DNPI & Government of East Kalimantan, 2010; Government of East Kalimantan, 2012)
- East Kalimantan's target to reduce GHG emissions from the land-use sector by 15.6% by 2020
- Reduction of forest carbon emissions of at least 10% to BAU until 2015 through the BFCP in Berau

To achieve these targets, REDD+ was chosen as a key strategy.

The units of analysis were the Province of East Kalimantan and the District of Berau. Within those units, forest loss was mapped and calculated between 2001 and 2016. To differentiate the potential contribution in different land use classes, the analysis took into account the land use classification on the provincial and district level. Additionally, on the district level in Berau, forest loss in different forest and non-forest land use permit boundaries were regarded. Forest land use permits were those of 1) selective logging concessions in natural forests (HA) and 2) timber plantation concessions (HTI). Non-forest land use permits were those of oil palm and mining concessions.

The basic approach was to compare forest loss during the time of REDD+ activities ('REDD+ period') in each jurisdictional division, their land use classes and – in the case of Berau – its land use permits, with the forest loss that occurred before REDD+, specifically from 2001 until the REDD+ activities had commenced ('reference period'). The establishment of the provincial REDD+ working group in 2008 was taken as the starting point of REDD+ activities in East Kalimantan. The year 2008, therefore, marked the breaking point in the analysis in East Kalimantan.

On the district level, the initiation of the BFCP in 2009 with the establishment of the district REDD+ working group marked the start of the 'REDD+ period' for the present analysis. Table 12 shows the analysis periods.

Table 12: Analytical time frame.

Division	Non-REDD+ period	REDD+ period
East Kalimantan Province	2001-2008	2009-2016
Berau District	2001-2009	2010-2016

Mapping forest loss in the different land-use classes and non-forest permit boundaries was expected to improve the understanding on the drivers of deforestation in the focus area. This allowed to critically assess the effectiveness of REDD+ (and FLEGT-VPA) in addressing the sources of forest loss in East Kalimantan and Berau. Table 10 summarizes the data and its sources used.

Forest loss on the concession level (FLEGT)

This analysis dealt with the two mandatory Indonesian forest certification schemes of forest concessions: the timber legality (Legalitas Kayu, LK) and SFM certification (Pengelolaan Hutan Produksi Lestari, PHPL).

The PHPL certification became mandatory in 2002, the legality certification in 2009. By the time of study preparation, it was, therefore, assumed that all active forest concessions in Berau were already certified with at least one of those two certification systems. The application of control sites was hence not logical for which reason a temporal comparison was chosen.

The period under review was from 2001 to 2016. This time frame covered a sufficiently long period when concessions had not obtained any certification (reference period) and, on the downside, a sufficiently long certification period when concessions were certified. The chosen time frame, moreover, coincided with the forest loss data of M. C. Hansen et al. (2013) and Gaveau et al. (2016) that was used as primary data sources.

A simple Before-After comparison was applied to analyze the potential impacts of current certification schemes on forest loss in Indonesia. The Before-After method is on the one hand a relatively simple and objective approach to implement but on the other hand susceptible to external factors of influence (Bos et al., 2017). A subsequent analysis step was, therefore, applied that aimed to differentiate small- from large-scale deforestation. The basic idea behind this was that tree cover loss may be the result of different activities. It could be due to 1) forest management activities such as the establishment of logging roads or harvesting operations, or 2) permanent conversion of forest to other land uses, for example, to palm oil plantations.

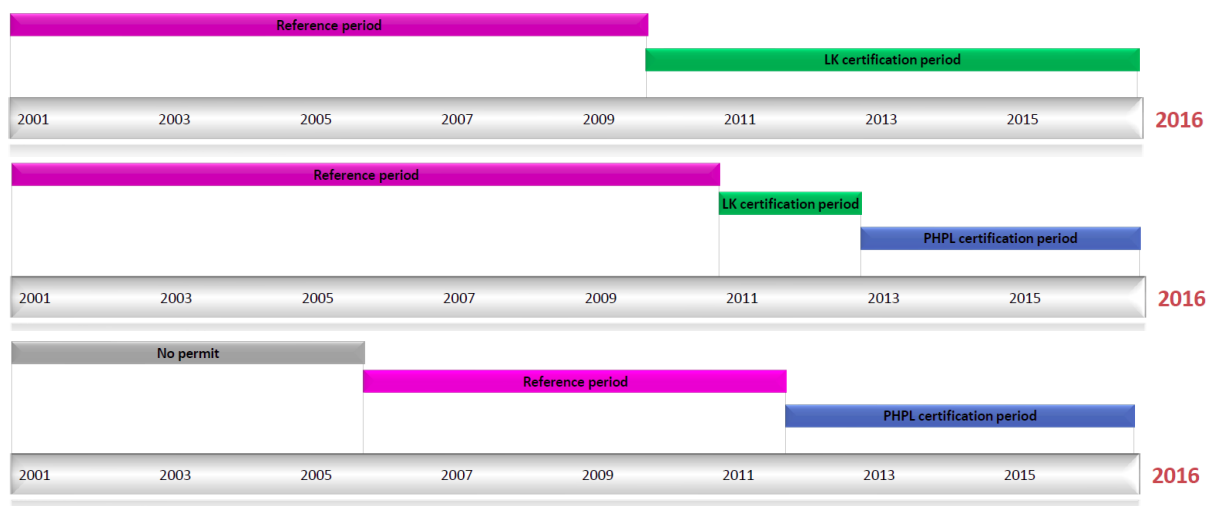


Figure 10: Examples of reference and certification periods of concessions. No permit = concession obtained their concession permit later than 2001.

The implementation of the legality and/or PHPL certification schemes primarily aims to improve forest management by requiring harvest and management plans, implementing RIL or for the commitment to implement SFM among other things. It was, therefore, assumed that certifications would rather be able to reduce small-scale forest loss. As large-scale forest loss was associated with activities other than selective logging it could thus be assumed that those activities were rather not affected through neither of the two forest certification schemes. In separating small from large-scale deforestation, it was thus avoided that deforestation and forest degradation stemming from other drivers than forest management superimposed the effects of forest management within forest concessions.

Because concessions in Berau obtained the certifications in different years, the length of reference and certification periods differed between concessions. Some concessions moreover immediately applied for the PHPL certification and thus never showed a ‘LK certification period’. Each concession, therefore, showed individual reference and certification periods as exemplarily illustrated in Figure 10.

4.5.1.3 Driving forces and challenges to the REDD+ implementation

Identifying driving forces and challenges of the subnational REDD+ implementation (research question 3) was one of the objectives of this study.

The underlying idea behind this is that the success of a FbAs – and with this its actual contribution towards SFM – is influenced by the local circumstances and regional setting in which the approach is implemented. This setting is shaped through factors that drive and hamper the implementation.

In the state-of-the-art chapter, current knowledge of those driving forces and challenges have already been exemplarily introduced for the REDD+ implementation.

To analyze enabling conditions and challenges to the REDD+ implementation, the studies from Angelsen et al. (2012), Brockhaus et al. (2016), Korhonen-Kurki et al. (2017), Korhonen-Kurki et al. (2014) and Korhonen-Kurki et al. (2018) have distinguished the ‘institutional setting’ in which REDD+ is embedded and the REDD+ ‘policy arena’.

Korhonen-Kurki et al. (2014) defined the institutional setting as: “*the formal and informal regulations, rules and norms that are established over time and that are not easily changed or transformed*” (p. 169). REDD+ policy processes take place in this context of pre-existing institutions (Brockhaus et al., 2016).

The ‘policy arena’ is defined as: “*being framed by institutions but shaped by the actions of the actors, whether individuals, communities, organizations or networks, and characterized by more or less hierarchical or inclusive processes, involving a range of powerful actors, which can foster or prevent certain policies and influence policy formulation*” (Korhonen-Kurki et al., 2014, p. 169).

In the context of the ‘institutional setting’, Korhonen-Kurki et al. (2018) hypothesized that countries with a ‘scarcity of forest resources’ and an ‘absence of effective forestry framework and policy’, face a stronger need to engage in REDD+. Key features of effective forestry framework for example, comprised the existence of a legal framework that defines tenure, use and management rights (Korhonen-Kurki et al., 2014).

Among the identified factors that explain success or failure in the policy arena were for example, the ‘inclusion of stakeholders’, the ‘national ownership’ to drive the REDD+ policy process (in contrast to international actors driving it) and the ‘presence of powerful transformational coalitions’ that lead the policy away from BAU and have access to the decision-making level. The ‘promise of performance-based funding’ was further seen as a likely driving factor in the national REDD+ process.

For each of their identified enabling factors, Korhonen-Kurki et al. (2014) and Korhonen-Kurki et al. (2018) outline several characteristics for the absence or presence of those aspects, see also Table 13.

Study approach

The following framework was drawn from the above studies:

1. Challenges and driving forces on the subnational level in the focus area were drawn from key documents and interview transcripts by means of content analysis
2. Through the preparatory literature review and first informal discussions and meetings with colleagues working in the study area, it was assumed that many of the identified factors on the national level were equally existing on the subnational level
3. The driving forces and challenges on the national level were, therefore, used to identify, assess and categorize the driving forces and challenges
4. Identified driving forces and challenges were classified into the ‘institutional setting’ and ‘policy arena’

5. Lessons in terms of REDD+'s multi-level character proposed by Angelsen et al. (2012) and those made by Korhonen-Kurki et al. (2017) for the national REDD+ Agency were taken into account
6. To summarize the subnational findings, the framework in Table 13 was taken as a basis

REDD+ was chosen as an example because of its subnational implementation that involves provincial and district governments, civil society and private actors. The FLEGT-VPA, or its core element the TLAS, follows a different approach: as a national legal requirement, the key element of the TLAS, the legality certification scheme, is implemented through the private sector. Analyzing driving factors and challenges was thus not regarded appropriate as it does not represent broader challenges of approaches that shape forest governance on the subnational level.

Table 13: Evaluative framework: Operationalization of enabling conditions to achieve a REDD+ environment. Adapted and modified (to subnational context) from Korhonen-Kurki et al. (2014), Brockhaus et al. (2016) and Korhonen-Kurki et al. (2018), and building on Angelsen et al. (2012).

Condition in institutional setting		
Factors	Presence	Absence
Pressure from shortage of forest resources	Forests are under pressure from high deforestation rate.	Abundant or recovering forest resources with a low to medium or negative (reforestation) deforestation rate.
Key features of effective forest legislation, policy and governance	A sound and clear legal framework with clearly assigned rights and management regulations is in place. Laws and policies are at least partly effectively implemented by national and local administrations, which have at their disposal a minimum of enforcement mechanisms and implementation capacity.	Tenure and rights are in many respects unclear and contested. There are unresolved contradictions between formal and customary law. There are no adequate laws and policies, or they exist but are ineffective because of lack of implementation mechanisms and enforcement capacity and/or elite capture and corruption.
Already initiated policy change	The government has already formulated and is implementing policy strategies on climate change and deforestation, or a low-carbon development strategies or/and PES schemes are already established independently from REDD policies.	The government has not yet formulated advanced policy strategies on climate change and deforestation or a low-carbon development strategy, or existing policies are highly insufficient or not implemented at all. No PES schemes have been established.
Conditions in policy arena		
National ownership	Pro-REDD+ media statements by government (national and subnational). National research and NGO actors dominate policy discourse. Engagement of national political institutions in REDD+ policy formulation. Donor agendas do not dominate process. Budget allocation to REDD+.	Anti-REDD+ media statements by national state actors and/or pro-REDD+ statements by international actors dominate policy discourse. Policy formulation is mainly by foreign actors. Financial incentives from donors are main reason for REDD+ implementation. No budget allocation to REDD+.
Inclusiveness of the policy process	Key stakeholders, including civil society, private sector, and indigenous people (if applicable) participate or are at least consulted during the REDD+ process. There are formal participation or consultation mechanisms and the views expressed by stakeholders are considered in REDD+ policy documents.	There are no formal mechanisms for the participation of or consultation with key stakeholders, civil society, indigenous people, and the private sector, or any mechanisms are not applied. Stakeholders' views are not represented in REDD+ policy documents.
Transformational coalitions	Existence of coalitions of drivers of change with room to maneuver in the political structures and impact on the discourse. Policy actors and coalitions calling for transformational change are more prominent in the media than those supporting the status quo.	No observable coalitions of drivers of change, or any present are too marginal to influence policy making and are not visible in the political discourse on REDD+. Media and policy circles are dominated by coalitions supporting the status quo and business as usual.
Promise of results-based funding for REDD+	REDD+ funding on a payment-for-performance basis is available through a transfer of funds from an international donor.	REDD+ funding on a payment-for-performance basis is not available.
Autonomy from other sector and sectors	State actors have a high autonomy vis-à-vis powerful economic interests that contribute to the main drivers of deforestation and forest degradation.	Low autonomy of state actors from business interests that drive deforestation and degradation limit state actor's choices to change current practices (e.g. existence of rent seeking, fraud, collusion or corruption).

4.5.2 Content analysis of interview transcripts and key documents

The interview transcripts and policy, evaluation and implementation reports conducted or gathered to address research question 1, 2 and 3 were analyzed by means of content analysis.

Qualitative content analysis is a (text) interpretation method for qualitative interviews or other data materials (Kohlbacher, 2016). The study followed the proposed steps to analyze interviews of Sutton and Austin (2015), see Figure 11.

After the conduction and recording of the interviews (data collection), all interviews were transcribed by student assistants. The transcription was verified by the study author, which comprised to correct errors and anonymize the transcribed interviews.

The actual analysis of the interview transcripts (and the key documents) was carried out in MaxQDA Plus 12 (VERBI Software, 2019).

The analysis comprised the selection, coding and theming of relevant text paragraphs.

“Coding refers to the identification of topics, issues, similarities, and differences that are revealed through the participants’ narratives and interpreted by the researcher” (Sutton & Austin, 2015, p. 228). Here, codes that summarize a paragraph by content or the concept mentioned, were assigned.

Theming then draw together the codes of different transcripts “to present the findings of qualitative research in a coherent and meaningful way” (Sutton & Austin, 2015, p. 229). Themes for the purpose of research question 3 were inspired by the enabling factors and challenges that had been identified by authors on the national level⁴⁷ and included for example, ‘funding partnerships’ and ‘political will/commitment’. Themes related to research questions 1 and 2, that means to REDD+/FLEGT-VPA related achievements in terms of SFM, were pre-defined by the seven ITTO criteria.

Quotations of interviews given in the result sections exclusively resulted from the 30 semi-structured in-depth interviews.

Validation of findings

To minimize bias related to the subjectivity of the study author during the analysis, a number of validity steps were carried out.

The validation of the findings was applied as inspired by Creswell (2007). Creswell (2007) provided eight strategies for verifying qualitative research findings. Among the strategies is the triangulation of methods and data sources, negative case analysis, peer debriefing and member-checking. Creswell (2007) recommends applying at least two of those strategies. The negative case analysis involves the identification and discussion of data that contradict identified analysis pattern. Peer debriefing should act as an external check of the research process. Here, an external person not involved in the data collection or analysis critically discusses methods, meanings and interpretations of the data with the researcher in regular sessions. In member checking, preliminary analysis and findings are taken back to participants to let them judge validity and accuracy. Following those recommendations, the findings of the interview survey were triangulated with findings of the key document and forest loss analysis

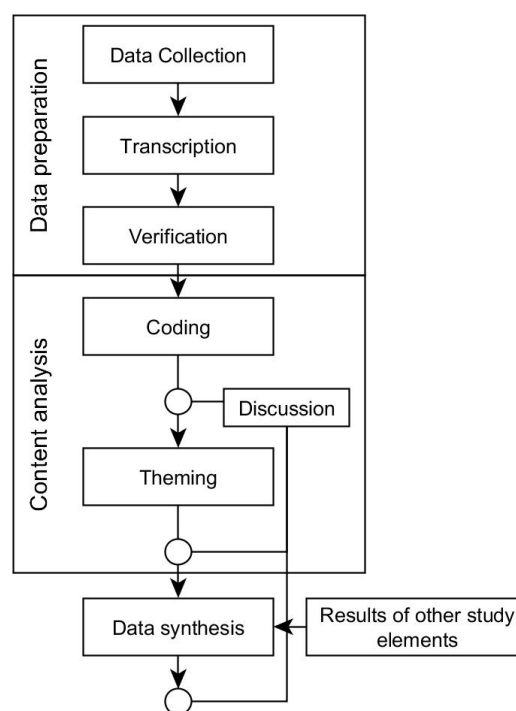


Figure 11: Steps of preparation and analysis of interviews and their synthesis with other study elements. Discussion is part of validation⁴⁶.

⁴⁶ See chapter 6.7.

⁴⁷ See chapter 4.5.1.3.

(and vice versa). Results of the interviews were further discussed among researchers of the Institute of World Forestry at several stages.

4.5.3 Analysis of remote sensing data (forest loss analysis)

The analysis of remote sensing data was carried out to answer research question 1.1 and 2.1. It was based on best available data. Data was assessed in ArcGIS 10.4.1. (ESRI, 2019). All calculations were undertaken in RStudio 1.0.153 (RStudio Team, 2019).

The following steps were undertaken as part of the analysis:

1. Calculating area per land use class in East Kalimantan and Berau District boundaries
2. Generating forest cover base maps of 2000
3. Calculating forest cover in 2000 in provincial and district boundaries and their land use classes
4. Calculating forest loss in provincial and district boundaries and their land use classes from 2001 to 2016
5. Calculating forest loss in forest and non-forest land use permit boundaries in the Berau District from 2001 to 2016

For the analysis on the concession level in Berau, additionally the following steps were undertaken:

6. Calculating forest loss in natural forest concession (HA) boundaries of reference and certification periods
7. Focal statistics (separating small- from large-scale forest loss in HA boundaries)
8. Calculating small- and large-scale forest loss in HA boundaries of reference and certification periods

The analysis on the concession level used data sets that had been generated during the forest loss analysis on the district level. In the following, each step is outlined in more detail.

Area per land use class

Provincial and district and land use class boundaries (RTRWP Kalimantan Timur 2019-2036) were obtained from the latest spatial plan SK 718/2014. Figure 12 shows the data processing for generating the area of each land use class.

Generating forest cover base maps

The forest product of Gaveau et al. (2016) was used to create forest cover base maps for the year 2000 for East Kalimantan and the Berau District. Figure 13 shows the single steps involved.

Deforestation that occurred between 2001 and 2016 and remaining forest cover in 2016 (intact and logged forest) in the Gaveau et al. (2016)⁴⁸ data set were (re)classified as 'forest'. All other values contained in the data set, such as water, deforestation before 2000, non-forest areas in 1973, regrowth 1973-2016 were reclassified as 'NoData'. The generated forest cover base map product of 2000 excluded plantation forests, agriculture land, scrublands and other non-forest areas.

'Forest' by Gaveau et al. (2016) was defined as⁴⁹:

Areas that are mainly composed of closed-canopy (>90% cover) evergreen Dipterocarps. In some highland regions, 'Forest' may also include Kerangas and in coastal areas, mangroves. 'Intact forest' includes pristine old-growth forests, i.e. forests that have never been disturbed by humans, or for which disturbances were too localized to be detected by satellites. 'Logged forest' are areas of old-growth forest that have been impacted by

⁴⁸ <https://www.arcgis.com/home/item.html?id=e4cfa6b98203475d906e7de88dba41ac>

⁴⁹ <https://www.arcgis.com/home/item.html?id=e034a603cd834ec8a0048b5bf7ff97ac>

industrial-scale mechanized selective logging at some point since 1973. They have lost their original structure but have remained in good condition and regenerate quickly. 'Regrowth forest' are areas of forest that were likely young regrowth in 1973 and resemble old-growth forest in 2015. In 1973, before extractive industries began, forests were mainly Intact (old growth). 'Forest' excludes young forest regrowth, scrublands, tree plantations, agricultural land, and non-vegetated areas. The latter are clumped into 'Non-Forest'.

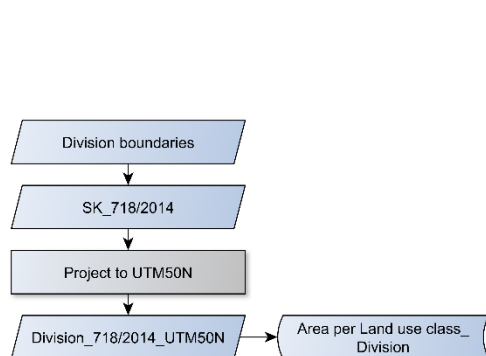


Figure 12: Process of generating the area per land use class. Division = province or district; SK 718/2014 = Spatial plan of 2014; projected from degrees into m².

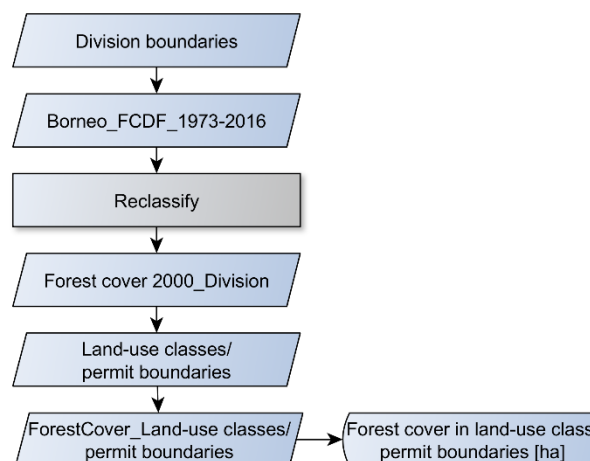


Figure 13: Process of generating forest cover base maps of 2000 ('Forest cover 2000_Division') and of calculating forest cover in land use class and permit boundaries; Borneo_FCDF_1973-2016 = data set of Gaveau et al. (2016).

Calculating forest cover in 2000 and 2016

The generated forest cover base maps of East Kalimantan and Berau were overlaid with the land use classes as obtained by the spatial plan SK 718/2014 to calculate the forest cover in 2000 for each land use class, see Figure 13.

Calculating forest loss in East Kalimantan and Berau boundaries and their land use classes

The forest cover base maps of 2000 were, moreover, combined with the tree cover loss product from M. C. Hansen et al. (2013) to calculate (mean) annual and total forest loss from 2001 to 2016 inside forest areas identified by Gaveau et al. (2016) in the East Kalimantan Province and Berau District boundaries. In doing so, the study accounted for the non-forest or deforested land in 2000 by Gaveau et al. (2016) that was handled as forest by M. C. Hansen et al. (2013) following his forest definition of "any vegetation above 5m" which hence also included timber and oil palm plantations (Margono et al., 2014; Tropek et al., 2014). This annual forest/non-forest map at 30 m resolution was subsequently combined with the spatial plan of East Kalimantan and Berau to calculate forest loss within each land use class between 2001 and 2016, see Figure 14 for single steps involved.

Calculating forest loss in forest and non-forest land use permit boundaries

The annual forest/non-forest map was, moreover, combined with forest (HA and HTI) and non-forest (oil palm and mining) land use permit boundaries in the Berau District to calculate total and annual forest loss within permits between 2001 and 2016.

Data on oil palm permits was obtained from Greenpeace 2015⁵⁰. Permits in the data set were either 'location permits', 'plantation business licences' (IUP) or 'long-term business-use permits' (HGU)⁵¹.

⁵⁰ <https://www.greenpeace.org/archive-indonesia/Global/seasia/Indonesia/Code/Forest-Map/en/data.html>

⁵¹ Companies first must file an application for a location permit to the district governor for an area that is reflected in the local spatial plan as suitable for oil palm plantations (Handayani (2010)). The next step involves applying for an 'plantation business license' in the district governor. When having obtained the 'plantation business licence', companies are permitted

As there was no comprehensive data set on mining concessions available, an internal data set from GIZ Samarinda was used. The data set contained mining permits inside the FMU Berau Barat but did not differentiate between exploration licenses (for general surveys, exploration and feasibility studies etc.) and production operation licenses (for activities of construction, mining, processing etc.).

For the analysis on the concession level, for each HA concession the following information were additionally gathered or calculated, see also Table 14 for an overview:

- 1) the date the concession permit was first issued,
- 2) the baseline year of each concession,
- 3) number of permit years concession held its concession permit during the period 2001 to 2016,
- 4) the concession size based on the current permit,
- 5) the concessions' forest cover in 2000 [ha],
- 6) the certification status as of 2016,
- 7) the year the legality and/or PHPL certification was obtained and
- 8) the length of reference and certification period.

For all concessions that obtained their concession permit before 2001 the baseline was 2001. For all others the actual date of permit issuance was used as the baseline year that was first obtained from the BPKH wilayah IV Samarinda³⁹ data set. The BPKH wilayah IV Samarinda data set, however, only provided information about the current permit while in many cases this recent permit was only a renewal from a former permit. To account for this likelihood, all concessions in Berau with permits after 2001 were cross-checked with – by the time of analysis – still publicly available concession lists of 2014 and 2010 by BP2HP Wilayah XIII Samarinda⁴⁰ and ISDHP⁴¹. This cross-checking linked six concessions to earlier concession permits issued before 2001.

The actual concession size was taken from the BPKH wilayah IV Samarinda concession data set.

The forest cover in 2000 in a concession was estimated by overlaying the forest cover base map of Berau of 2000 with the HA concession boundaries of BPKH Wilayah IV Samarinda (2016), see Figure 13.

Because there was not one single database that held comprehensive information on the date concessions in Berau obtained their first certification, information on the certification of each concession was obtained from various sources. The SILK⁵² and JPIK⁵³ databases were first used to get information on the certification status of concessions. This information was cross-checked with lists provided under Anti Forest-Mafia Coalition (2014) and through visiting respective audit company websites. The information on concessions were cross-checked with a forest management supervisor working in Berau. Depending on the year a concession obtained their first legality or PHPL certificate, the length of the certification and reference period varied accordingly among concessions.

Concessions that either had no certification until now based on investigations or that were inactive (information from key informants) were sorted out for the analysis.

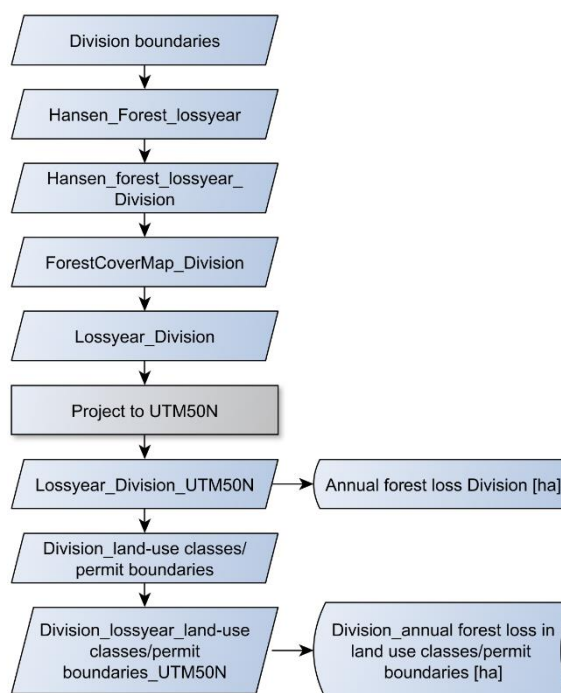


Figure 14: Process of calculating annual forest loss in the divisions East Kalimantan and Berau and in their land use classes and permits.

to initiate the plantation development (Paoli et al. (2013)) that involves obtaining a land clearing permit. The last step in securing long-term plantation tenure rights is that of obtaining the 'long-term business-use permit' that allows to plant and exploit oil palm. 'Long-term business-use permits' are granted for 35 years.

⁵² <http://silk.dephut.go.id> (accessed in late 2017)

⁵³ <https://www.jpik.or.id/database/sertifikasi-lk-hutan/> (accessed in late 2017; does not exist anymore)

Forest loss in HA concessions was estimated for the time period between a concessions baseline year and 2016 and was expressed in hectare and as a percentage of a concessions' 2000 forest cover within the Berau District boundaries.

Calculated statistical estimators included sample mean, range (difference between highest and lowest value) and median. The median and the mean of annual forest loss expressed as a percentage of the concessions' 2000 forest cover were the crucial variables for a comparison among the single concessions.

Table 14: List of variables on the provincial, district and concession level.

Variables	Definition
Provincial and district level	
Land area per land use class	<ul style="list-style-type: none"> - in East Kalimantan and - Berau as of spatial plan 2014 in hectare
Forest cover	<ul style="list-style-type: none"> - in East Kalimantan, - Berau boundaries and - in their land use classes for the years 2000 in hectare
Annual & total forest loss	<ul style="list-style-type: none"> - in East Kalimantan and - Berau boundaries and - in their land use classes, - in HA & HTI concession boundaries and - in oil palm & mining concession boundaries in Berau for years 2000 to 2016 in hectare
Concession level	
Permit date	Date the concession permit was first issued
Baseline year	2001 or year of permit issuance
Concession size	Size in hectare as of latest concession permit
Forest cover	Forest cover in hectare of a concession within its boundaries in Berau in 2000
Certification status	Non, PHPL or legality (as of 2016)
Certification year	Year the certificate was first issued
N years_permit	Number of years concession possessed the concession permit during 2001 to 2016; corresponds to '2017' – 'baseline year'
Length of reference or certification period	Number of years of reference and certification period of a concession between 2001 and 2016

Calculating forest loss in reference and certification periods

To analyse the potential impact of the legality and PHPL certifications on reducing forest loss in HA concessions in Berau, for each concession annual forest loss of its reference and certification period(s) was estimated.

The 'reference period' included the time from the baseline year to the year of certification. The 'certification period' included the time from the year of certification to 2016. For those concessions that obtained both legality and PHPL certifications until 2016, forest loss of the non-certified years (reference period), the legality-certified years (LK certification period) and the PHPL certified years (PHPL certification period) were calculated.

To do so, for each concession and year (observations), the status of certification was indicated, that is, a) without certification, b) with legality certification or c) with PHPL certification.

The different periods were then compared by calculating statistical estimators for each period as already described above.

Focal statistics: separating small-scale from large-scale forest loss

The following analysis aimed to distinguish between small- and large-scale forest loss to account for the different sources of tree loss. This followed the aim of assessing the impact of the legality and PHPL certifications on reducing both forest loss extends.

A neighbourhood analysis was applied in ArcGIS separating small patches or lines of forest loss (associated with skid trails, felling gaps) from deforestation (associated with forest conversion to other land uses). Figure 15 provides an overview of the single steps involved.

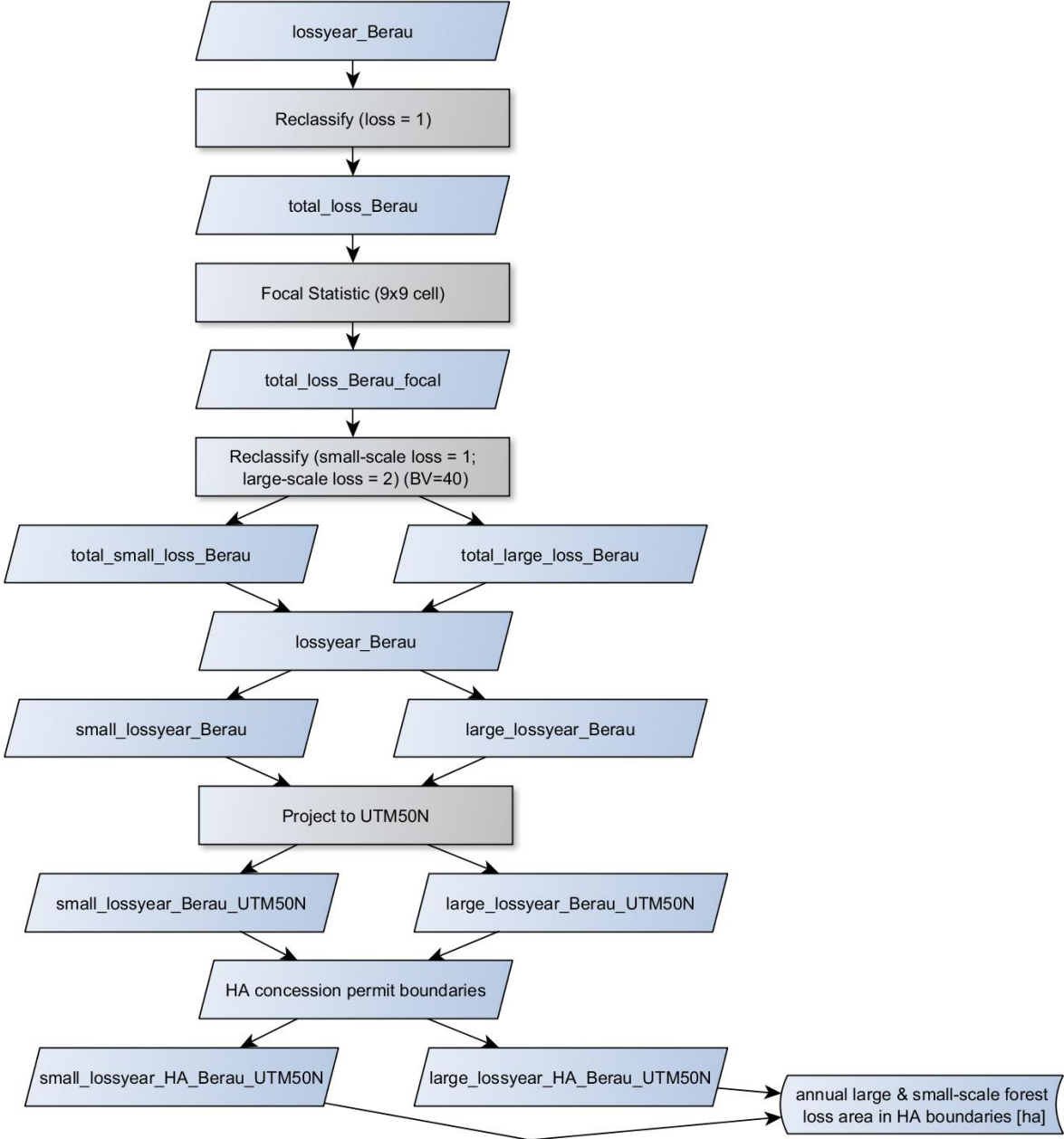


Figure 15: Process of determining annual small- and large-scale forest loss in natural forest concession boundaries.

For the analysis, clusters of tree cover loss pixels were identified using a moving window (focal statistics). The focal statistics tool of ArcGIS calculates a statistic (e.g. sum, mean, majority) of the values in the input raster location (forest loss = 1; no loss = NoData, i.e. ignored) within a specified neighbourhood for each input cell.

In a first step, the neighbourhood settings, that is, the size of the moving window, needed to be determined. For this, a) large-scale deforestation due to forest conversion to other land uses and b) small-scale forest loss due to logging activities of historical pictures of 2016 in Google Earth were exemplary identified in ArcGIS, see Figure 17 to Figure 20.

The moving window size was accordingly varied/tested to fit the visual interpretation of the small- and large-scale forest loss excerpts identified in Google Earth starting with a 3x3 cell-window (9 pixel). The statistic type that was used for the neighbourhood analysis was ‘sum’. Most logging roads and skid trails in the excerpt of the test side in Berau were identified as such small-scale forest loss when choosing a window size of 9x9 (81 pixels) and the threshold of 40 pixels. Figure 16 shows the product of this analysis. With these setting, small- and large-scale forest loss were defined as follows:

- forest loss patches of ≤ 3.6 ha = small-scale loss (associated with skid trails and logging roads)
- forest loss patches of $\geq 3,7$ ha = large-scale loss (associated with forest conversion to other land uses)

Creating annual small- and large-scale forest loss maps

The annual forest loss map of Berau (lossyear_Berau in Figure 15) was reclassified to map total deforestation between 2001 and 2016. In this operation, annual forest loss between 2001 and 2016 was assigned the value = 1. All other values were assigned ‘NoData’. This map did hence not further specify the annual deforestation but only the total deforestation that occurred from 2001 to 2016.

The focal statistic operation was subsequently applied using a rectangular moving window of 9x9 cells with a threshold of 40. Clusters of 41 or more pixels of tree cover loss were interpreted as large-scale forest loss while clusters of 40 or fewer were interpreted as small-scale forest loss associated with logging or selective forest management activities. From this map – through the operation ‘reclassify’ – two separated maps for total large and small-scale forest loss were generated.

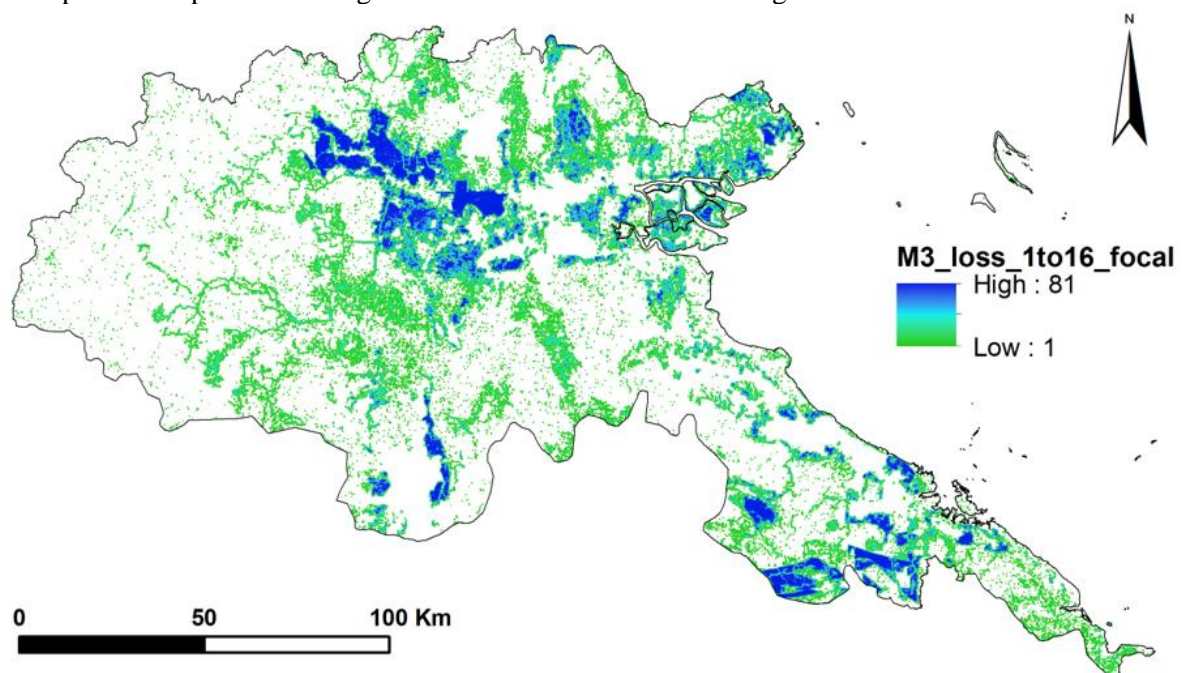


Figure 16: Product of focal statistic. Showing the range of the sum of cells (1-81) in the neighbourhood of each pixel for a 9x9 rectangle moving window with ‘sum’ as a statistic type.

Those two maps were again each overlaid with the annual forest loss map of Berau (lossyear_Berau) to extract the *annual* forest losses within the just identified small-scale (large-scale) forest loss patches. Those two new maps (small_lossyear_Berau and large_lossyear_Berau in Figure 15) then showed the annual small- and the annual large-scale forest losses of each year between 2001 and 2016 in Berau. Both maps were once again projected to UTM50N (linear unit = meters) and overlaid with the natural forest concession (HA) permit boundaries. Small- and large-scale forest loss within the HA boundaries were then processed in R (RStudio Team, 2019)

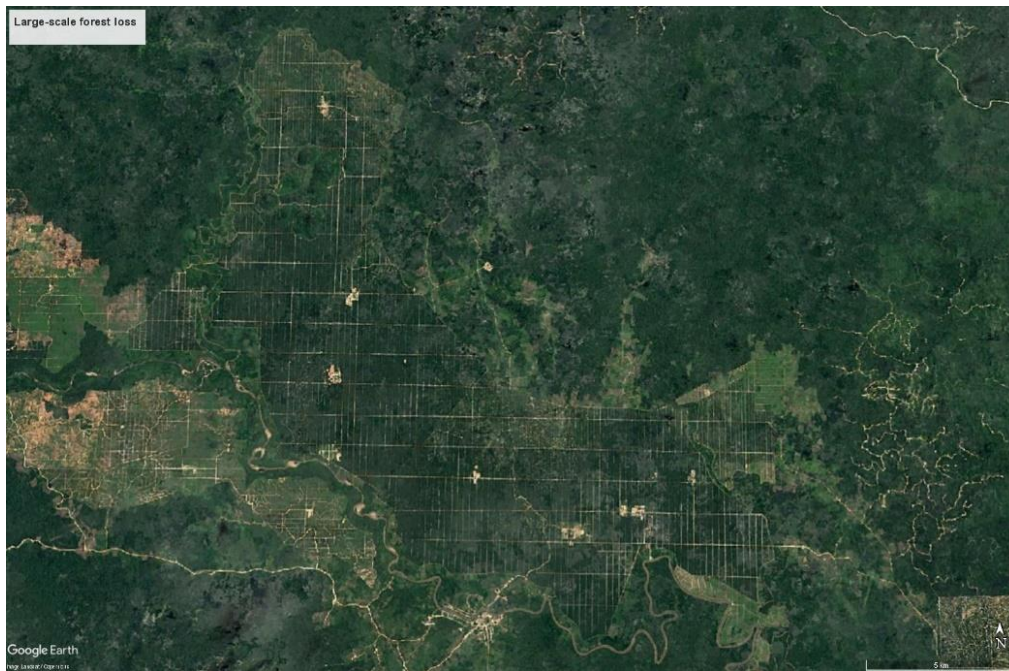


Figure 17: Example of large-scale forest loss in Berau in Google Earth as of 12/2016 (1° 58.413' N 117° 1.321' E).

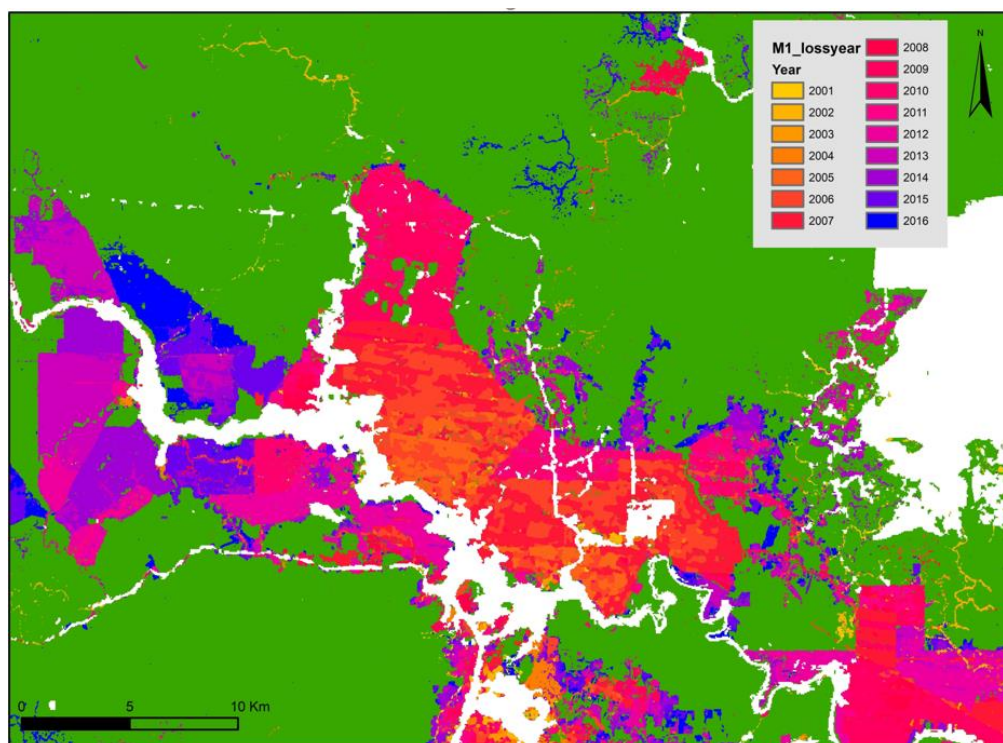


Figure 18: Large-scale forest loss between 2001 and 2016 in ArcGIS of the excerpt in **Figure 17**.

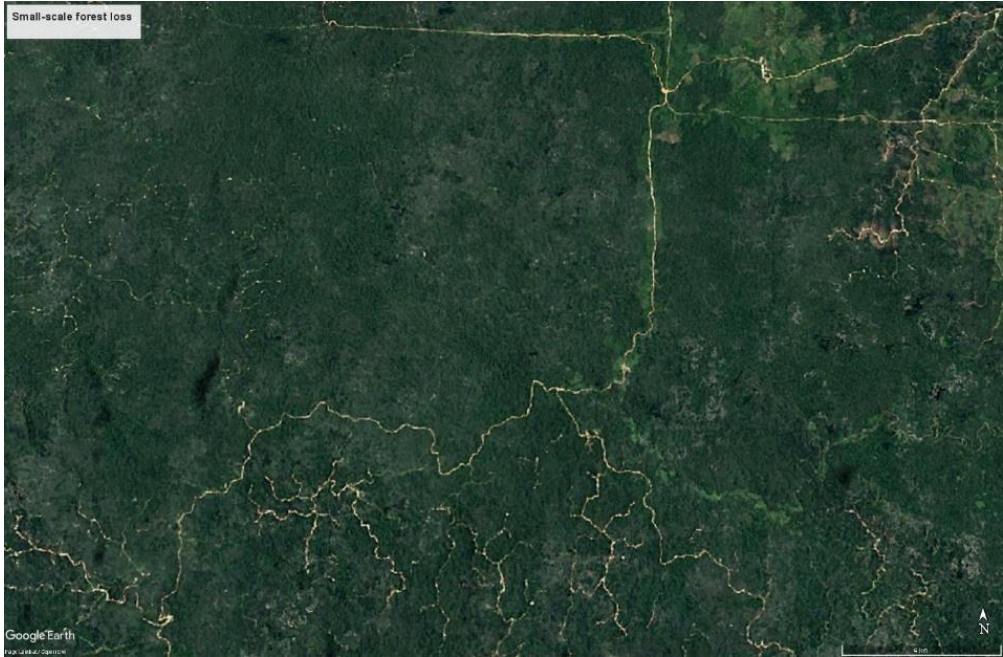


Figure 19: Example of small-scale forest loss in Berau in Google Earth as of 12/2016 (2° 16.204' N 117° 7.588' E).

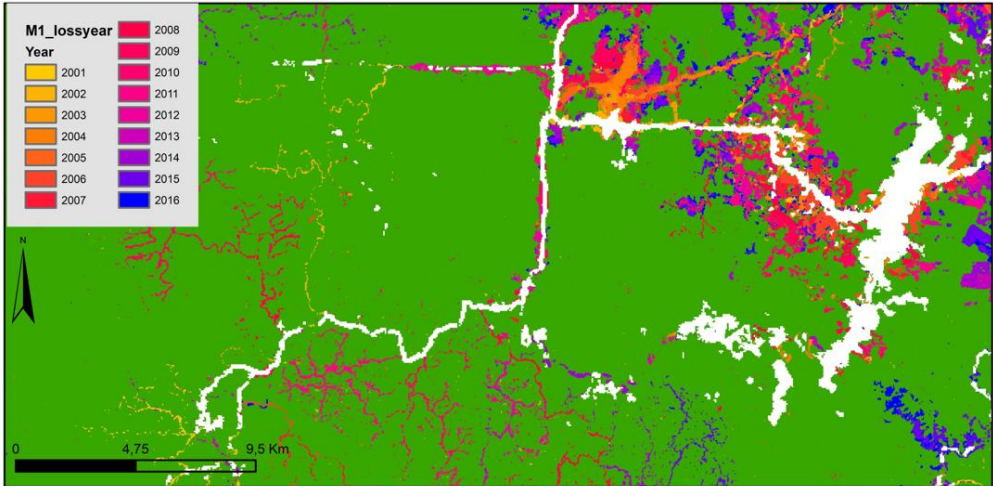


Figure 20: Small-scale forest loss between 2001 and 2016 in ArcGIS of the excerpt in **Figure 19**.

5 Results

Results are presented along the five research questions:

1. What are the current REDD+ achievements and limitations relevant to SFM on the subnational level?
 - 1.1 Do subnational REDD+ activities contribute to forest loss reduction on the jurisdictional level?
2. What are the current FLEGT-VPA-related achievements and limitations relevant to SFM on the subnational level?
 - 2.1 Do national forest certification schemes under a FLEGT-VPA contribute to forest loss reduction on the concession level?
3. What are the current driving forces of and challenges to the subnational REDD+ implementation?

5.1 Achievements and limitations of REDD+ in East Kalimantan and Berau

In the following subnational REDD+ achievements relevant for the seven ITTO criteria in East Kalimantan and the Berau District are outlined. The achievements and limitations presented in this chapter have been derived from the analysis of REDD+ interview transcripts and policy, evaluation and implementation reports.

The REDD+ achievements in terms of a reduction in forest loss that were derived from the analysis of remote sensing data are reported separately in chapter 5.2.

Table 15 summarizes the identified achievements against the seven ITTO criteria.

Table 15: Summary of subnational REDD+ achievements (outputs and outcomes) relevant for SFM in East Kalimantan (incl. Berau). BFCP = Berau Forest Carbon Program; RPJMD = regional development plan; RTRWK = regional spatial plan; ER = Emission Reduction; HCV = High Conservation Value; FPIC = Free, Prior and Informed Consent; NTFP = Non-Timber Forest Products.

ITTO criterion	Outputs related to	Examples of outputs/outcomes	Outcomes related to	Examples of outcomes
Enabling conditions for SFM	Policies & regulations for governing forests	<ul style="list-style-type: none"> - East Kalimantan's Local Action Plan for GHG Emission Reduction developed - East Kalimantan's moratorium on new land use permits enacted 	Forest governance	<ul style="list-style-type: none"> - Stakeholder participation in forest governance increased - Coordination & communication slightly increased
	Institutions supportive to forest management	<ul style="list-style-type: none"> - Provincial and district REDD+ working groups established - Regional Council on Climate Change (DDPI) established 		
	Political commitment & ownership on REDD+	<ul style="list-style-type: none"> - Provincial ER targets formulated - Enactment of provincial policies & regulations 		

Table 15 (continued)

Enabling conditions for SFM	Strategy & action plans for forests	<ul style="list-style-type: none"> - Provincial Environmentally Sustainable Development Strategy developed - Provincial Strategy and Action Plan on REDD+ developed - ER Program Idea Note East Kalimantan developed - BFCP strategic plan for 2001-2015 developed 		
	Institutional capacity & capacity in land use management	<ul style="list-style-type: none"> - Technical support to FMUs in East Kalimantan: development of an FMU forest management plan in Berau - Support to forest concessions in obtaining forest certifications: No. of certified concessions increased (legality, PHPL, FSC certifications) - Village workshops on boundary mapping, FPIC and sustainable agriculture techniques: <i>inter alia</i> village boundaries mapped, rice cultivations established - BFCP stakeholder workshops on remote sensing 	Capacity	<ul style="list-style-type: none"> - Operationalization of FMU in Berau increased - Increased capacity of the community, sub-district and district government in making village regulations
	Forests in land-use planning	<ul style="list-style-type: none"> - Conduction of land use studies and assessments on provincial and district level: new information & data available - Development of land use data base for Berau - Strategic Environmental Assessment of Berau's RPJMD 2016-2021 & RTRWK published - Integration of BFCP strategies into Berau's midterm development plan 2016-2021 		
	Monitoring & planning of SFM related projects	<ul style="list-style-type: none"> - Rapid assessment of the BFCP performance 		
	Funding committed to SFM	<ul style="list-style-type: none"> - Approval of FCPF ER Program in East Kalimantan - Attraction of funding: TFCA Kalimantan, MCAI - Financial support related to REDD+ from TNC and GIZ in East Kalimantan 		
Extent and condition of forests	Forest area & carbon stocks	<ul style="list-style-type: none"> - Availability of information and data on provincial & district forests, carbon stocks and land use cover increased and improved - Provincial & district Forest Reference Level developed - Small-scale preservation of forest area and carbon stocks on the village level in Berau 		

Table 15 (continued)

Extent and condition of forests	Forest area in compliance schemes	<ul style="list-style-type: none"> - Support of forest concessions: all active forest concessions in Berau legality and/or PHPL certified; FSC certifications increased 		
	Multiyear forest management plans	<ul style="list-style-type: none"> - Support to FMUs and forest concessions in developing forest management plans (fmp): FMU fmp developed; all active concessions possess fmps 		
Forest ecosystem health and resilience	Threats to forests & climate change adaptation	<ul style="list-style-type: none"> - Identification and quantification of drivers of deforestation and forest degradation in East Kalimantan - Access and information availability of forest threats increased - Conduction of community awareness campaigns in relation to climate change and SFM on the village level in Berau 	Threats to forests	<ul style="list-style-type: none"> - Understanding of deforestation and forest degradation drivers increased on the provincial and district level - Awareness of climate change and forests on the provincial level increased
	Restoring forest land	<ul style="list-style-type: none"> - Provincial and district strategies on reforestation and the rehabilitation of peatlands formulated - Small-scale land rehabilitation on the village level in Berau 		
Forest production	Silvicultural operations & their monitoring in natural forests	<ul style="list-style-type: none"> - Through support to forest concessions in Berau in complying with FSC standard: FSC certified forest concessions in Berau increasing - Trials of Reduced impact logging- Carbon 		
	Resource assessment	<ul style="list-style-type: none"> - By supporting forest concessionaires in complying with legality, PHPL and FSC standards in Berau: conduction of forest inventories enforced - Support to FMUs: forest management plan of FMU in Berau developed 		
	Forest product tracking system	<ul style="list-style-type: none"> - Technical support to forest concessionaires in complying with legality and PHPL standards in Berau: log tracking systems in all active concessions in Berau implemented 		
Forest biological diversity	Ecosystem diversity	<ul style="list-style-type: none"> - Protected forest areas strengthened - Identification of HCV forest areas in three villages in Berau - Establishment of new small-scale protected areas on the village level 		

Table 15 (continued)

Forest biological diversity	Forest species diversity	<ul style="list-style-type: none"> - Conduction of HCV studies & biodiversity surveys in East Kalimantan: identification of endangered animal and plant species - By supporting forest concessionaires in complying with FSC in Berau: forest species diversity strengthened 		
	Biodiversity conservation in production forests	<ul style="list-style-type: none"> - By supporting forest concessionaires in complying with FSC in Berau: conservation of biodiversity in production forests strengthened - Mapping of HCV forests in several natural production forests and villages in Berau 		
Soil and water protection	Protective function of forests for soil & water	<ul style="list-style-type: none"> - Management decree for Dumaring River Upstream Forest for two village forest management units in Berau - By supporting forest concessionaires in complying with FSC in Berau: protective function in terms of soil and water strengthened 		
Economic, social and cultural aspects	Local livelihoods & forest management	<ul style="list-style-type: none"> - By supporting forest concessionaires in complying with FSC in Berau: various economic, social and cultural functions of forests strengthened (also applies to the following outputs below) - 26 NGOs working in 78 villages in the Berau District - Several communities and villagers in subsistence farming and other village development related activities trained - SIGAP-REDD+ approach in 2 villages piloted and replicated in 24 villages in Berau 		
	Economic aspects of forests	<ul style="list-style-type: none"> - Establishment of NTFP community business groups on the village level - Technical support of farmers in the management of NTFP in Berau 		
	Resolving disputes between forest stakeholders	<ul style="list-style-type: none"> - Conduction of workshops on spatial planning and village boundary mapping in some villages in Berau - Production of indicative maps of village boundaries - Conduction of land tenure assessments and participatory boundary mapping in various villages in Berau 		
	Village forest management rights	<ul style="list-style-type: none"> - Several villages in Berau and the remaining TFCA Kalimantan intervention area received village forest management rights 		

5.1.1 Criterion 1: Enabling conditions for sustainable forest management

5.1.1.1 Outputs related to policies and regulations for governing forests

Since REDD+ was introduced in East Kalimantan a number of regulations and policies that aim to guide its implementation have been developed and formulated. Most of those were a direct response to the threats to climate change and meant to support sustainable development. They outline objectives and strategies related to reducing emissions in the forestry sector and can therefore directly be related to the governance and management of forests.

An example is the East Kalimantan governor's pledged in 2009 to make East Kalimantan a "green province" (Kaltim Hijau) (Anderson et al., 2016) that was followed by the "Kaltim Hijau" (Green Kaltim) declaration in 2010 (Government of East Kalimantan, 2010). The declaration outlines environmental and sustainable goals. In 2011 it was followed up by guidelines for the implementation of the 'Green Kaltim' through Governor Regulation No. 22/2011. They include provisions such as the formulation of policies to improve forest management through SFM.

Another example is the Regional Action Plan for Reducing GHG Emissions (RAD-GRK)⁵⁴ of 2012 that was released through Governor Regulation No. 54/2012. It stipulates objectives and strategies to reduce provincial carbon emissions from deforestation and land degradation in East Kalimantan and covers among other things strategies for the forestry, plantation and mining sector. An outlined strategy for the forestry sector is for example the implementation of SFM and High Conservation Value (HCV) Forest in selective logging and timber concessions (Government of East Kalimantan, 2014) .

In 2013, the Governor of East Kalimantan, moreover, issued Instruction No. 180/1375-HK/2013, a moratorium on the issuance of new mining, plantation and logging permits. The moratorium aimed to allow for a revision of existing land use permits to determine if permits had been issued according to law (Casson et al., 2014).

5.1.1.2 Outputs related to institutions supportive of forest management

A number of ad hoc institutions were developed as part of the REDD+ process on the provincial and district level that are supportive to the management and governance of forests. Especially on the provincial level, their members have frequently been involved in the formulation of REDD+ related strategy and action plans and in promoting the vision of sustainable development. Interviewees frequently stated that REDD+, through those institutions, has triggered discussions on issues related to customary rights and SFM in the focus area.

REDD+ related institutions with a relevance for SFM on the provincial level included the REDD+ working group that was established in 2008 and the Regional Council on Climate Change (DDPI) that was established in 2011.

Institutions that were established as part of the REDD+ process in Berau, and meant to support the implementation of the BFCP, included the district-wide REDD+ working group of 2009 and the Steering Committee of the BFCP of 2011⁵⁵.

The REDD+ working group in Berau was meant to facilitate the communication between different stakeholders and to coordinate the different activities of implementing organizations and stakeholders under the BFCP. Based on the interviews, its success in doing so was, however, limited for various reasons. Interviewed stakeholders from local NGOs were accordingly skeptical about its recent achievements. One of those reasons were funding concerns. Interviews and field visits revealed that by the time of study conduction, the working group had not received any funding for two years, leaving the staff to work voluntarily. By decree no. 716/2009 (Bupati Berau, 2009) all costs that arose from the establishment of the REDD+ working group should have financially been supported by the Berau

⁵⁴ RAD-GRKs are based on the National Action Plan to Reduce Greenhouse Gas Emissions (RAN GRK). The RAN GRK of 2011 that was approved in Presidential Regulation No. 61 in 2011, was a direct follow up of Indonesia's national commitment to reduce GHG emissions by 26/41% and builds substantially on REDD+ Anderson et al. (2016); National Development Planning Agency (2011).

⁵⁵ See chapter 4.2 for more information on these institutions.

government, but interviews revealed that in the past most of the funding for the working group was provided by TNC.

Concerns were also expressed about the BFCP Steering Committee. According to the interviewees, it had met only twice by 2011 and finalized and endorsed the BFCP strategic plan on its last meeting. Interviewees complained about the limited actions of the Steering Committee after the endorsement of the strategy and the lack of follow-up meetings. Apparently, there were no more meetings, activities or products. Based on those statements, the internal evaluation report of the BFCP concluded that the Steering Committee had not provided “*significant results and impacts*” (Noor, 2016).

Meetings with members of the working group and other BFCP stakeholders revealed that seven years after the initiation of the BFCP, there was (still) no organization or institution taking on the role of coordinating the different programs under the BFCP.

5.1.1.3 Outcomes related to forest governance

Coordination & communication

As newly established platforms that unite different stakeholder groups and ministries, on the provincial level, the REDD+ working group and especially the DDPI fostered cross-sectoral communication. Interviews, however, also revealed that REDD+ related communication was still primarily built on personal relationships rather than on legal authority between the DDPI and provincial ministries.

Based on interviews, there was still a need to improve coordination and monitoring tasks in relation to land use and climate change by the government.

On the district level poor communication and coordination in newly established REDD+ institutions were observed. As mentioned before, an operational institution was lacking to take on responsibility for the implementation and coordination of activities to achieve the BFCPs objectives.

Stakeholder participation in forest governance

In East Kalimantan, through platforms such as the REDD+ working group and the DDPI, Civil Society Organisations (CSOs) and academia (universities and research institutes) were frequently involved in the REDD+ process and therewith in aspects concerning the governance of forests.

Land tenure and ownership

See criterion 7.

5.1.1.4 Outcomes related to political commitment and ownership to support REDD+

On the provincial and district level, the REDD+ process has gained political support and commitment from the governmental level that was also important for fostering the implementation of SFM. The commitment was, for example, expressed through the formulation of provincial ER targets⁵⁶.

The governmental support formed the basis for the establishment of new institutions and for the enactment of policies and regulations related to REDD+. However, by the time of study conduction the REDD+ process in East Kalimantan was still largely influenced by non-governmental actors. International organizations and academics were the main drivers of the current REDD+ process.

In Berau there was a lack of ownership from the local government on the jurisdictional REDD+ pilot project observed that resulted in several drawbacks⁵⁷.

5.1.1.5 Outputs related to the development of strategy and action plans for forests

Several assessments and strategies have been conducted and developed during the REDD+ process in East Kalimantan and Berau. They inform on various land use related aspects and outline strategies to achieve the ER targets in the land use sector. In other words, they provide the basis for the sustainable management of East Kalimantan’s natural resources.

⁵⁶ See chapter 5.1.1.1

⁵⁷ See also chapter 5.5.1 on the challenges of the REDD+ implementation in the focus area.

The lack in implementation of such strategies and action plans, however, was raised as a central issue by interviewees and implementation and evaluation reports. Interviewees pointed to a lack of guidance, technical support, capacity on the field level and absence of a REDD+ implementation and monitoring framework at the local level.

Key strategies in East Kalimantan comprised the East Kalimantan Environmentally Sustainable Development Strategy, the 'Provincial Strategy and Action Plan' (SRAP) on REDD+, the FCPF ER Program Idea Note, and a Master Plan on Climate Change.

The East Kalimantan Environmentally Sustainable Development Strategy identified five key initiatives to improve land use efficiency and reduce GHG emissions: 1) Zero burning policy, 2) Reduced Impact Logging, 3) Use of degraded land (for future expansion of oil palm and timber plantations and agriculture), 4) Rehabilitation of opened peatlands and 5) Reforestation (DNPI & Government of East Kalimantan, 2010). The document also specifically identified the need to improve harvesting practices in Indonesia. REDD+ was proposed as an approach to achieve the outlined initiatives.

Measures in the SRAP on REDD+ comprised, among other things, the development of infrastructure in the land-based sector to prevent deforestation and forest degradation at the provincial level (e.g. establishment of REDD+ institutions), improved and accelerated implementation of efforts that aim to prevent or control emissions from deforestation and forest degradation (mostly related to policies and regulations) and improved land use management, for example, through assistance to the planning and implementation of RIL. Several strategies, actions and indicators were formulated for the forestry, agriculture, oil palm plantation and mining sector.

In October 2015, the process of drafting the ER-PIN East Kalimantan began. It was among other things based on the RAD-GRK and SRAP documents (Republic of Indonesia, 2015).

The Master Plan on Climate Change combined the different strategies and followed the idea of having only one single reference document for all districts in East Kalimantan. It was initiated by members of the University Samarinda, REDD+ working group and DDPI.

The issue of climate change had also generally been integrated into East Kalimantan's mid-term development plan (RPJMD) of 2013-2018.

A number of assessments and strategies to improve land use management in the Berau District have also been conducted and developed as part of the REDD+ process there. One of those was the BFCP strategic plan for the period 2011 to 2015. The strategy comprised various elements of SFM on the landscape level, among those for example, (Berau REDD+ Working Group, 2011; Hovani, unknown):

- Planning improvement and refinement particularly in relation to spatial planning, land use planning and spatial permitting processes at the district level
- Bringing at least 800,000 ha of forest land under effective management
- Improvement of public welfare (in income and improved livelihood opportunities) for at least 5,000 people living within or around the forest estate
- Protection of valuable ecosystems, biodiversity and watershed function
- Capacity building within public institutions and for stakeholders, particularly human resources and funding sustainability

Deforestation was mainly planned to be targeted through the spatial planning process and land use activities outside the forest estate, such as oil palm. Forest degradation was mainly planned to be targeted through the improvement of the management of natural forests and timber plantations. For this the BFCP intended to support natural forest concessionaires in obtaining forest certificates (SVLK/PHPL, FSC), support them in low emission forest management, help with the establishment of the FMU Berau Barat and support in directing the establishment of plantation forests to severely degraded forest areas. While some of the envisaged activities had been implemented, interviews and field observations revealed that

there was no clear follow up on the strategic plan⁵⁸ and that the main objectives of reducing emissions through better spatial planning and land use management could not be achieved⁵⁹.

5.1.1.6 Outcomes/outputs related to building institutional capacity and capacity in land use management

The REDD+ process contributed to building (institutional) capacity in the study area. Outputs comprised the training of professional and technical personnel to perform and support forest management⁶⁰.

Technical support was provided to model FMUs and forest concessions in issues related to forest management and planning by organizations actively engaged in the REDD+ process such as GIZ and TNC.

Following the document and interview analysis, FMU support in Berau included developing a forest management plan; supporting FMUs in resolving land use conflicts; facilitation of partnerships between communities and land use permit holders, and assisting FMUs in coordinating NGOs through the establishment of an NGO forum. Interviews and field visits in the subsequent years of 2016 and 2017 showed that the model FMU in Berau increased their operationalisation visibly during those two years.

Nevertheless, the FMU roll-out on the local level still faced several challenges, among those substantial budget and staff restrictions and unclear forest boundaries. In Berau, the limited resources together with the many tasks, the vast area of up to 800,000 ha and the poor infrastructure limited the operationalization of the FMU Berau Barat substantially.

Assisting forest concessionaires comprised to provide technical support to achieve the standards of voluntary and mandatory forest certifications, namely the legality, PHPL and FSC certifications.

Interviews with forest managers revealed that support in complying with the FSC standard included specifically training on spatial forest planning, development of forest harvest planning maps support to implementing RIL, training forest workers on reading established maps and in felling practices in order to reduce damage of other trees.

Under the BFCP, several NGOs, moreover, carried out capacity building measures on the village level. Focus there lied on the assistance to and empowerment of communities and the development of alternative sustainable land use practices. Outputs and outcomes in terms of capacity building on the village level included (Hansen, 2017a), (Marquardt, 2015):

- Trainings related to village mapping and spatial planning and institutional strengthening
- Training on climate change, Free, Prior and Informed Consent (FPIC) and REDD+ related issues, this, for example, included a climate change and REDD+ training for elementary school teachers
- Development of learning materials in the TFCA Kalimantan intervention area on organic honey, rubber agroforestry, traditional conservation practices, and protection of ecosystems in ecotourism objects in the Embaloh watershed and in Malemba
- Training communities in the preparation of a Village Medium-Term Development Plan
- Facilitating social forestry partnerships in communities
- Conducting horticulture field schools and establishing rice cultivation and freshwater fish cultivation
- Computer training, mapping and GPS use, and training for High Conservation Value (HCV) 5 and 6 of community members from various villages
- Increased capacity of the community, sub-district and district government in making village regulations for sustainable natural resource management

⁵⁸ See also 5.5.1 on hindrances to conditions to the subnational REDD+ process.

⁵⁹ See also results of the forest loss analysis in 5.2.

⁶⁰ See also outputs on the village level under chapter 5.1.7.1 and 5.1.7.2.

Some concerns in this context were that trainings and materials were too difficult to understand for local communities.

There were also several activities and measures that aimed to train those stakeholders that were responsible for implementing the BFCP in the study region. During the initiation phase of the BFCP, between 2009 and 2010 several workshops to prepare the BFCP strategic plan for 2011-2015 were conducted. They were mostly attended by representatives from the local, provincial and national government, the private sector, TNC, local NGOs, the academia and members of Berau REDD+ working group. Besides this, several technical trainings on remote sensing and the analysis of spatial data were provided to key stakeholders of the BFCP.

TFCA Kalimantan also aimed to increase the capacity of their partners entrusted with the implementation of their program, particularly in issues related to administration, institutions, finance, project implementation, and reporting. Between 2014 and 2016, the implementing partners received training in the form of (Hansen, 2017a):

- Training, workshops and mentoring in institutional management to optimize institutional mechanisms. Training was related to administration and finance issues, recording and bookkeeping systems, cost standards, procurement procedures, technical financial reporting, and to financial internal control mechanisms
- Financial and institutional guidebooks
- Facilitators that supported the implementing partners in various matters, for example, related to technical and financial issues

However, Hansen (2017a) identified several challenges that grantees (implementing organizations) faced, among those: a lack of capacity of grantees personal staff, a limited understanding of administrative and financial procedures and a lack of report submission.

5.1.1.7 Outputs related to the integration of forests in land-use planning

One achievement of the BFCP was the support of the local government in spatial planning and land use processes through environmental controlling, GIS and development working groups on low emission (internal evaluation report). Support included gathering and providing new information and data through the conduction of land use studies, an assessment of Berau's spatial plan and the development of a freely available land use data base for the district.

The Strategic Environmental Assessment (SEA Taskforce of Berau District, 2016) of Berau's Medium-Term Development Plan (SEA RPJMD) (2016-2021) and the review of Berau's spatial plan were undertaken to strengthen sustainable development principles and environmental aspects in the Berau District. The SEA RPJMD focused among other things on the strategic issues of climate change risks and deforestation and degradation of forest ecosystems. Financial resources for the assessments were among other things derived from the district government budget. TNC and a 'Small Team of Civil Society' that worked under the REDD+ program guidelines of Berau facilitated the assessments (SEA Taskforce of Berau District, 2016).

In 2016, the strategies of the BFCP were integrated into Berau's latest RPJMD 2016-2021.

5.1.1.8 Outputs related to monitoring and planning of SFM related projects

To learn about the BFCPs performance and thus about its achievements in terms of various aspects relevant for SFM – TNC initiated an evaluation of the strategic plan in 2016. Three consultants were hired to conduct a rapid assessment of the BFCP performance. Unfortunately, the study author was not able to find any baseline or evaluation documents. The same challenge was reported from the evaluators.

Generally, the author of this study observed a lack of monitoring of the BFCP which resulted in a gap of information on the current progress. The analysis, moreover, revealed that the BFCP project strategy was not satisfactorily translated into action. Problems were, for example, caused by overly optimistic

and ambitious project objectives and the fact that the non-forestry sector was inadequately involved in the project conceptualization and design phase.

Given this shortcoming and the lack of an exchange forum for organizations supporting the BFCP, there, moreover, existed insufficient information on who was actually involved in what and with which resources.

5.1.1.9 Outputs related to funding committed to SFM – incentives to encourage SFM

Following interview respondents, the attraction of funding was one of the central achievements of the REDD+ program in Berau.

In both East Kalimantan and Berau, REDD+ was able to attract various external funding sources. Under these sources, organisations engaged in the improvement of forests management.

On the district level, a related challenge was that activities under the single funding schemes were scattered and not aligned to reinforce each other.

Among the funding schemes and programs achieved through the REDD+ process in the focus area were the FCPF ER Program, the TFCA Kalimantan³⁴ and the MCAI³⁵.

The ER program, that will be piloted in East Kalimantan, will support ongoing policy reforms such as the implementation of an FMU system to strengthen forest governance (RoI, 2016). The private sector will, moreover, be engaged in obtaining forest certifications and be supported in low-emission management practices, such as RIL. Other ER activities will focus on community empowerment and community forestry, fire control and protection of peat lands. Activities will concentrate on five districts, namely Berau, Kutai Barat, Mahakam Ulu, Kutai Kartanegara and Paser, and their ongoing REDD+ initiatives there.

One of the envisaged measures to build enabling conditions for the implementation of the BFCP strategy in Berau was the development of sustainable funding mechanisms. By the time of study conduction there were two major grant schemes and two organizations financially supporting the BFCP in Berau: TFCA Kalimantan, the MCAI, GIZ and TNC. The MCAI has focused on the promotion of environmentally sustainable, low-carbon economic growth and provided a combination of financial and technical assistance with the aim to reduce the reliance on fossil fuel and improve land management practices. The initial idea of the TFCA Kalimantan was to finance the BFCP activities, but interview respondents raised concerns about the missing connection between the TFCA and the BFCP strategic plan criticising that TFCA was mainly following their own schemes.

Activities of the GIZ and TNC relevant for SFM were, for example, to support forest concessions in getting legality, PHPL and FSC certified.

5.1.2 Criterion 2: Extent and conditions of forests

5.1.2.1 Outputs/outcomes related to the extent of and change in forest area and carbon stocks

The REDD+ process in East Kalimantan and Berau led to the availability of new and improved information and data on the area of forest cover, land use/forest cover change, spatial and temporal forest maps, forest conditions and wood-growing and carbon stocks. Analysis of drivers of deforestation and forest degradation were conducted and response strategies to the drivers identified. Provincial and district forest reference levels were, moreover, established. Information on these aspects related to the extent of forest and carbon stocks formed the basis to successfully implement SFM and monitor and plan progress.

The document and interview analysis for example revealed that local NGOs in Berau assisted in the development of new ecotourism and protected area maps, and in the identification of geographical conditions of important ecosystems (e.g. karst sites).

Outcomes in terms of conserving forests and reducing forest loss identified through the document and interview analysis were, however, modest. Among the achievements in Berau was the prevention of forest conversion of an area of each ~ 4, 900 ha in two villages (TFCA Kalimantan, 2018).

Within the entire TFCA intervention area (966,299 ha in Kalimantan), land use change of 87,486.54 ha was, moreover, prevented, the planting of an area of 776.21 ha undertaken and forest fire prevention for an area of 86,456 ha forest established (TFCA Kalimantan, 2018). Other efforts to conserve forest area for example, through the creation of village forests remained in a preparatory stage by the time of study conduction (TFCA Kalimantan, 2017).

5.1.2.2 Outputs related to forest area in compliance schemes

One common activity of organisations supporting the REDD+ program in Berau was the support of forest concessionaires in better forest management. This was mainly achieved through assisting forest concessionaires in implementing voluntary and mandatory certification standards, namely the PHPL, legality and FSC standard.

By 2016, all active concessions in Berau had been at least certified for legality and thus possessed forest management plans. There were six concessions that were in the process of getting FSC certified or that were already certified. All of those also obtained financial support from The Borneo Initiative⁶¹(TBI) – independent of REDD+.

5.1.2.3 Outputs related to multiyear forest management plans

As part of their support to forest concession holders in complying with the certification standards, these organisations also assisted in the development of forest management plans.

As already mentioned, organizations actively engaged in the REDD+ process in Berau like TNC and the GIZ, moreover, facilitated the FMU development and operationalization, for example, through the development of the FMU's forest management plan.

5.1.3 Criterion 3: Forest ecosystem health and resilience

5.1.3.1 Outputs/outcomes related to addressing threats to forests and climate change adaptation

Through the identification and quantification of drivers of deforestation and forest degradation, in both East Kalimantan and Berau, the REDD+ process contributed substantially to the assessment of threats to forest ecosystems. The access to and availability of this information was significantly improved in the last few years. New information was not restricted to forest ecosystems but covered the entire land use sector.

Various strategy and action plans that outline potential strategies to address these identified threats to forests have subsequently been developed for East Kalimantan and Berau⁶².

In Berau, related activities included the conduction of scoping studies prior to the BFCP start. One of those was the study “Carbon Emissions from Land Use, Land Use Change and Forestry in Berau District East Kalimantan, Indonesia” that tested the feasibility of REDD in the Berau District. It comprised: 1) carbon stock accounting and monitoring, 2) a driver analysis of land use/cover change and 3) a probability and REDD opportunity cost analysis (Ekadinata et al., 2010).

These studies on the provincial and district level and their underlying assessments resulted in a much better understanding of deforestation drivers and their underlying causes in the focus area. Interviewees and documents, moreover, suggested that the awareness on forests was visibly increased.

On the village level, in cooperation with communities, activities to monitor forest fires and illegal logging in protected forests were, moreover, carried out by NGOs working under TFCA Kalimantan (TFCA Kalimantan, 2018).

⁶¹ The TBI is an international initiative for the promotion of SFM in forest concessions in Indonesia. It financially supports the adoption of the mandatory and voluntary certification schemes in the focus area. For more information see <https://theborneoinitiative.org/>.

⁶² See chapter 5.1.1.5.

Many local NGOs supporting the BFCP, moreover, carried out activities to mainstream the idea of REDD+ and climate change adaptation. Activities for example included (Marquardt, 2015; TFCA Kalimantan, 2015):

- Preparation and distribution of awareness materials like posters, leaflets, billboards, shirts, stickers, films
- Development of manuals for forest management practices
- Conduction of community awareness campaigns in relation to climate change, socio-economic and sustainable management issues

Despite those efforts, the document and interview analysis demonstrated that a limited understanding of and interest in SFM related aspects, especially from stakeholders of non-forestry land use sectors, remained in the focus area. Interviewees on the provincial level highlighted the limited understanding and ownership on REDD+ related issues and projects among provincial government officials.

5.1.3.2 Outputs related to restoring forest land

Envisaged REDD+ activities in East Kalimantan included those related to the rehabilitation and restoration of degraded areas. Provincial strategies like the East Kalimantan Environmentally Sustainable Development Strategy of 2010 (DNPI & Government of East Kalimantan, 2010) listed rehabilitation of open peatlands and reforestation as two of five key initiatives to improve land use efficiency and to reduce GHG emissions.

Between 2010 and 2014, in total 20,000 ha of critical land were planned to be rehabilitated in Berau District (Government of East Kalimantan, 2012).

Consequently, REDD+ organizations under the BFCP in Berau worked on the restoration of peatlands and degraded forests. TFCA Kalimantan (2016), TFCA Kalimantan (2017) and TFCA Kalimantan (2018) provided the following achievements for the TFCA Kalimantan intervention area:

- Land rehabilitation with agroforestry and restoration schemes in 328.92 ha village forests with 147,859 seedlings planted
- Mapping of degraded areas and plans for rehabilitation in three villages.

5.1.4 Criterion 4: Forest production

Findings under this criterion were mainly derived from the forest concession level in the Berau District.

5.1.4.1 Outputs/outcomes related to silvicultural operations and their monitoring in natural forests

A central aim of the REDD+ process in East Kalimantan was to improve forest management practices. Accordingly, one activity of REDD+ initiatives in Berau was to support forest concessions in obtaining mandatory and voluntary certifications⁶³.

However, there remain knowledge gaps on the impacts especially of the mandatory certification schemes⁶⁴.

The support of forest concessions in complying with the FSC standard contributed to sustainable silvicultural operations. Instead of relying on the national harvesting system, the TPTI⁶⁵, harvesting levels at or below a level which can be permanently sustained have been estimated and applied.

Another silvicultural activity carried out by organisations supporting the BFCP was the implementation of RIL procedures and their monitoring. The development of a methodology for measuring carbon impacts of RIL practices, referred to as RIL-Carbon (RIL-C), was stated as an important achievement of the REDD+ program in Berau by interviewees.

By the time of study conduction, in two concessions in Berau, RIL-C had been trialed. Internal TNC project reports and discussions of the study author with an RIL-C officer revealed that these practices

⁶³ See chapter 5.1.2.2 for outputs related to forest in compliance schemes.

⁶⁴ See chapter 5.3.4.3.

⁶⁵ See chapter 3.5.

could reduce up to 30 to 40% emissions compared to conventional logging by maintaining timber production.

5.1.4.2 Outputs related to resource assessment

Through the support of forest concessionaires in obtaining mandatory and voluntary certifications under the BFCP in Berau, the conduction of forest inventories was enforced. Another achievement was the finalization of a business plan for the model FMU in Berau.

5.1.4.3 Outputs related to forest product tracking system

The REDD+ process in Berau indirectly contributed to the implementation of log tracking systems by technically supporting concessionaires in obtaining related certifications, namely the legality and FSC certifications.

5.1.5 Criterion 5: Forest biological diversity

The following results were mainly derived from Berau.

5.1.5.1 Outputs related to ecosystem diversity

Various organizations supporting the BFCP in Berau have facilitated or implemented activities related to forest and ecosystem diversity conservation. These activities have strengthened existing protected forest areas, facilitated the creation of new ones and supported the identification of HCV areas. Achievements included (Fishbein & Lee, 2015; Marquardt, 2015; TFCA Kalimantan, 2016, 2017):

- Facilitation of the preparation of management plans in the Lesan River Protected Forest
- Studies on the forest quality of the Lesan River Protected Forest containing information on biodiversity potential, carbon stocks, hydrological conditions, soil fertility, microclimate
- Facilitation of gazetment of Sungai Lesan Protected Forest
- Construction of a forest health monitoring plot
- Establishment of several new small protected areas
- Identification of HCV Forest areas in three villages

5.1.5.2 Outputs related to forest species diversity

The issue of species diversity was indirectly addressed through the support of forest concessionaires in obtaining FSC certifications, specifically through the Principle 9: HCV, and 6: Environmental Values and Impacts (e.g. through criteria 6.4), by organisations actively engaged in the REDD+ process in Berau.

Organizations working under the TFCA Kalimantan carried out various biodiversity surveys, developed related information material and protected important habitats. Key achievements in the entire TFCA Kalimantan intervention area – that covers various districts in Kalimantan including the Berau District – were as follows (TFCA Kalimantan, 2016, 2017, 2018):

- HCV studies on ‘Increasing the role and contribution of local conservation areas in biodiversity conservation and management of natural resources’ in various districts: Various plants, mammal, bird, amphibian and reptile species were identified, among those mammal species with a critically endangered status (IUCN) or that are listed in CITES appendix 1, various plant species with an endangered status on the red list of IUCN and endemic bird, amphibians and reptile species
- Conduction of surveys in mangrove ecosystems in Tanjung Batu village; of proboscis monkeys in the Berau River delta; of Sumatran Rhino in Kalimantan; of wild cattle species (*Bos javanicus*) in ecosystem Hulu
- Compilation of guidelines for an orangutan survey and settlement of conflicts between orangutans and humans
- Training in surveying orangutan populations in the Lesan River Protected Forest area

- Protection of mangrove ecosystems for Proboscis monkey habitat
- Protection and identification of Irrawaddy dolphin (*Orcaella brevirostris*) habitat in Kubu Raya Regency, West Kalimantan

5.1.5.3 Outputs related to biodiversity conservation in production forests

Through the support of forest concessionaires in obtaining FSC certifications, REDD+ related activities in Berau indirectly addressed several issues related to the conservation of biodiversity in production forests, especially through Principle 9: HCV and Principle 6: Environmental Values and Impacts (Forest Stewardship Council [FSC], 2015).

Organisations like TNC facilitated the mapping of HCV forest in several natural production forests and villages. TFCA Kalimantan, moreover, supported the sustainable management of 233,568.17 ha of forest area and conducted a biodiversity protection campaign for 10,988 people (TFCA Kalimantan, 2018).

5.1.6 Criterion 6: Soil and water protection

5.1.6.1 Outputs related to the protective function of (production) forests for soil and water

On the local level in Berau, some organizations supporting the BFCP have carried out activities in relation to the protective function of forests with the following outputs:

- Installation of hydrological observation stations in eight locations (Nyadeng River in Merabu Village, Petiwar River Kampung Suaran, Hulu Hewan, Sungai Mud, Gua Peringgi, Hulu Batu Lepoq, Mensa River, Marang River)
- Support of communities in several villages in watershed areas with the result that the Dumaring River Upstream Forest received a management decree from MoEF for two village forest management units in through funding support from TFCA Kalimantan

Organisations supporting the BFCP provided support to FMUs in East Kalimantan in preparing their periodic forest management plans and thus indirectly strengthened the protective function of forests. The reason for this is that forest management plans recognize sensitive areas (high slope) and buffer strips (e.g. along water course), areas where harvesting is not allowed for purposes of soil protection.

By supporting forest concessionaires in obtaining FSC certification, specifically through the implementation of indicator 6.7 on protection or restoration of natural water courses, water bodies, riparian zones and their connectivity (FSC, 2015), the BFCP supporting organisations also indirectly contributed towards the protective function of forests as related to soil and water.

5.1.7 Criterion 7: Economic, social and cultural aspects

The following findings were mainly derived from the village level in Berau.

Supporting forest concessionaires in complying with the FSC standard, especially with Principle 3: Indigenous Peoples' Rights, and Principle 4: Community Relations, indirectly strengthened various economic, social and cultural functions of the forests.

5.1.7.1 Outputs related to local livelihoods and forest management

There were 26 NGOs working in 78 villages in the Berau District by the time of study conduction (internal presentation & interviews). Many of these NGOs received their funding from the above-mentioned REDD+ related granting schemes and focused on the empowerment of local communities, training of villagers in subsistence farming and other village development related activities. Reported outputs included (Fishbein & Lee, 2015; TFCA Kalimantan, 2016, 2017)⁶⁶:

⁶⁶ For more outputs related to the capacity building in forest management see chapter 5.1.1.6.

- Training in forest health monitoring for Lesan River Protected Forest
- Training in nursery techniques
- Planting of seasonal plants (e.g. peanuts, eggplant, sweet corn) grown by 18 farmer groups and various fruit trees in different villages in Berau
- Training in participatory mapping for communities in Merabu in order to make arrangements for village forest utilization permits
- Training in participatory mapping in order to map the utilization of mangrove forest ecosystem areas
- Conduction of livelihood assessment studies in various villages covering human, natural, infrastructure and economic resources
- Training in sustainable livelihoods in four villages
- Development of sustainable livelihood demonstration plots

Another output related to ITTO criterion seven, was the piloting of the community empowerment approach ‘SIGAP-REDD+’ (Communities Inspiring Action for Change in REDD+) by TNC in initially two villages from 2012 to 2014. Through this approach communities were assisted in formulating a village development plan and in determining low emission intervention activities to prevent the increase of forest clearing. The approach was just being replicated by local NGOs in additional 24 villages by the time of study conduction. Some interviewees were, however, ambivalent about the suitability of the approach and complained about the limited possibility to adapt the approach to their ideas.

5.1.7.2 Outputs related to the economic aspects of forests

Organisations working under the REDD+ program funding schemes in East Kalimantan, contributed towards the production of non-timber forest products. Within the entire TFCA Kalimantan intervention area (966,299 ha in Kalimantan) organisations supported the management of non-timber forest products like honey, coffee, traditional medicinal plant and handicraft (TFCA Kalimantan, 2017, 2018).

On the subnational level in Berau, organizations working under the BFCP have supported or enabled various economy-related activities in several villages. Outputs included (TFCA Kalimantan, 2017):

- Integration of development and management plans for mangrove and proboscis ecotourism in Village Regional Long-Term Development Plan for 2016-2022
- Establishment of six community business groups of alternative economic strategies, for example, banana chips
- Establishment of fresh fish and vegetable cultivation demonstration plots
- Conduction of ecotourism development activities in three villages

5.1.7.3 Outputs related to resolving disputes between forest stakeholders

One focus of REDD+ related projects in East Kalimantan was the assistance and empowerment of communities in resolving land use conflicts. Measures in Berau included participatory boundary mapping and the facilitation of land use conflict resolutions. International organizations such as the GIZ and TNC supported the resolution of conflicts with industry businesses (community and business; business and business) while local NGOs mainly assisted communities. Examples of specific outputs in this context in Berau were (Marquardt, 2015; TFCA Kalimantan, 2016):

- Conduction of workshops on spatial planning and village boundaries in four villages to explore the potential of the natural resources owned by the village and to identify and design the village boundaries
- Production of indicative maps of village boundaries
- Training in mapping and introduction of FPIC in various villages
- Land tenure assessment and participatory mapping in communities in five villages that are within a forest concession

Following the study authors observations and interviews, outcomes of these activities were mixed, and land use conflicts frequently remained to persist even when there had been measures to resolve them undertaken.

5.1.7.4 Outputs related to village forest management rights

With the support of NGOs working under the TFCA Kalimantan, several villages have received village forest management rights. By 2016, community-based forest management was implemented in 23 villages comprising an area of 194,887 ha within the entire TFCA Kalimantan intervention area (966,299 ha in Kalimantan). Specific outputs in Berau included (Fauna & Flora International [FFI], 2017; TFCA Kalimantan, 2017):

- Preparation of village forest in two villages covering an area of 8,988 ha in Berau
- Development of a Village Forest Management Institute (LPHK) in Tebih Daludun for the management of village forests in the Dumaring River Upper Protection Forest area with a working area of 3,877.319 ha in Berau
- Agreement over village boundaries and village forest in Hulu Sungai Dumaring protection forest
- Preparation of village forest in communities in three watersheds

5.2 Forest loss in East Kalimantan and Berau

In this chapter the results of the remote sensing data are presented to answer research question 1.1 ‘Do subnational REDD+ activities contribute to forest loss reduction on the jurisdictional level?’ Results can be translated to the achievements of REDD+ in terms of ITTO criterion two ‘Extent and conditions of forests’.

In a first step, results of the forest cover estimations in East Kalimantan and Berau are presented as the basis for the estimation of forest loss between 2001 and 2016. This is followed by the presentation of the results of the forest loss analysis within East Kalimantan and Berau boundaries from 2001 to 2016, their land use classes and – in the case of Berau – within forest and non-forest land use permits.

5.2.1 Forest cover in East Kalimantan and Berau

Figure 21 and Figure 22 illustrates the land use classes in East Kalimantan and Berau following the spatial plan of 2014 (SK 718/2014). The land area of each class according to the official land classification (and its respective true forest cover in 2000) is shown in Table 16 for East Kalimantan and in Table 17 for Berau. ‘Forest area’ is classified into protection forest (HL), permanent production forest (HP), limited production forest (HPT), convertible production forest (HPK) and conservation area (KSA/KPA).

Figure 8 shows the forest cover in 2000 in East Kalimantan and the Berau District. Based on the Gaveau et al. (2016) data set, forest cover in 2000 was 6,416,396 ha in East Kalimantan and 1,767,654 ha in Berau, that is, 28% of East Kalimantan’s forest cover in 2000.

Most of the forest in East Kalimantan and Berau District was found within the limited production forest class. About 16% of the total forest cover in East Kalimantan and 22% in Berau was found within the ‘non-forest area’ (APL) in 2000.

The total forest cover in all land use classes – that is, 1,766,396 ha in Berau and 6,413,703 ha in East Kalimantan – differs slightly to the total forest cover of East Kalimantan and Berau just mentioned, which is explained by the different water area estimated by Gaveau et al. (2016) and the spatial plan.

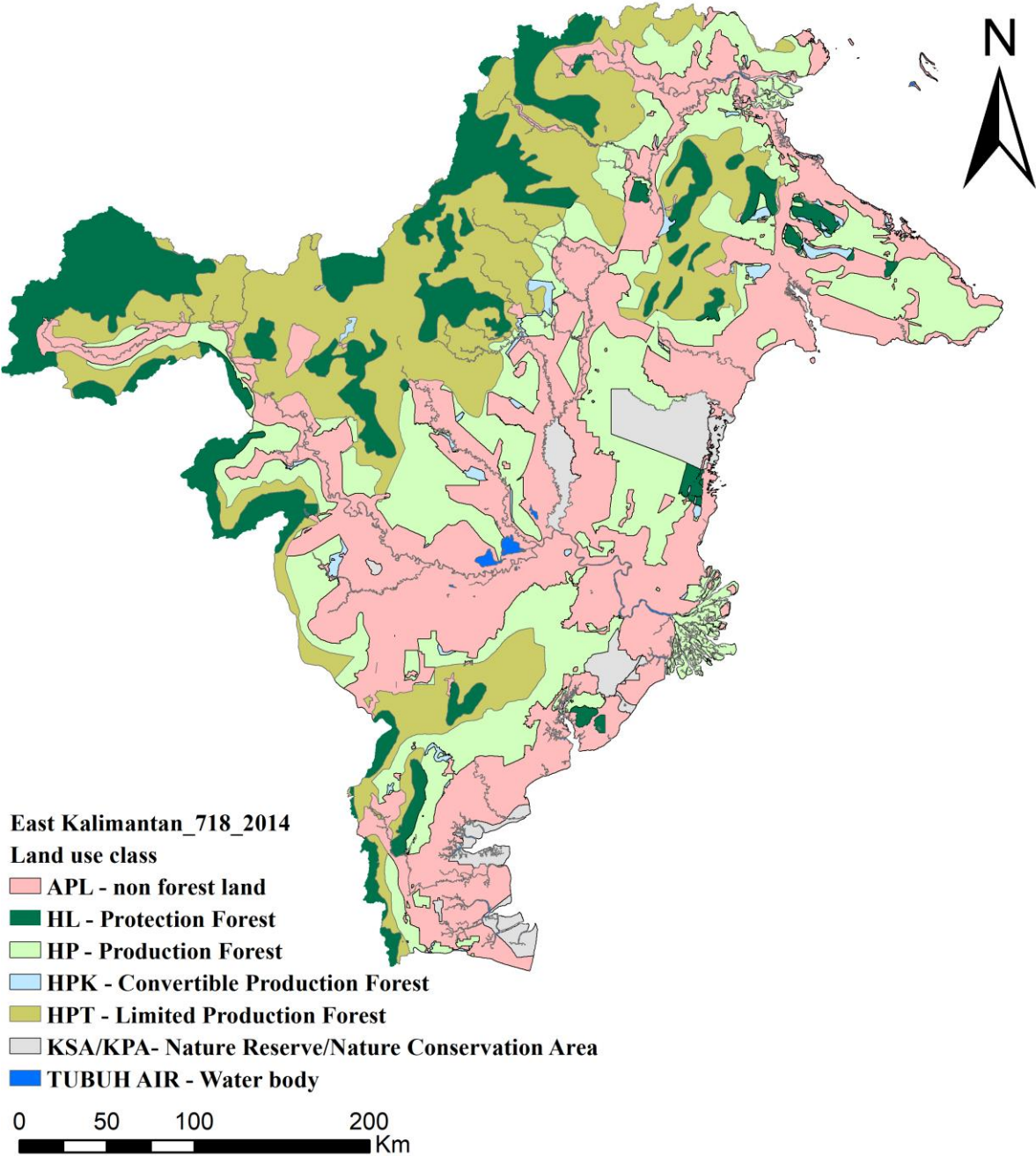


Figure 21: Land use classes of East Kalimantan as of spatial plan SK 718/2014.

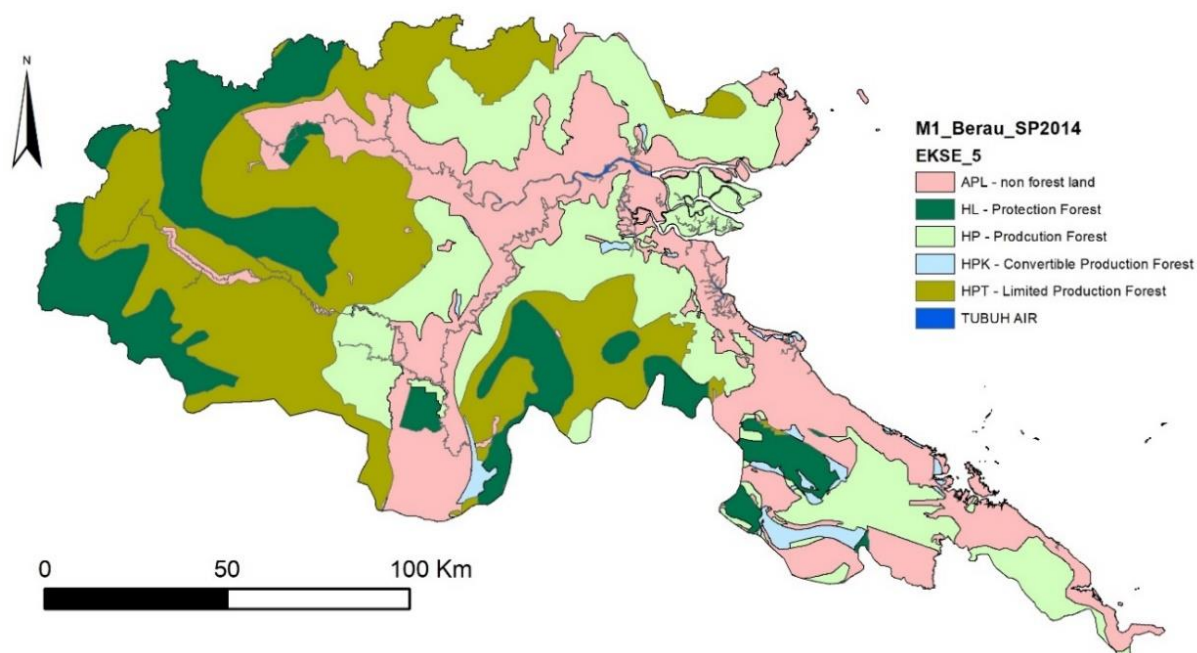


Figure 22: Land use classes of Berau as of spatial plan SK 718/2014.

Table 16: Land use class area (calculated based on SK 718/2014) and their forest cover in 2000 (based on Gaveau et al. (2016)) in East Kalimantan.

Land use class	Land area according to land use classification [ha]	True forest cover 2000 [ha]
State forest	8,242,732	5,400,666
Protection Forest (HL)	1,785,807	1,663,311
Conservation Area (KSA/KPA)	437,055	35,052
Limited Production Forest (HPT)	2,876,521	2,383,870
Production Forest (HP)	3,022,828	1,273,696
Convertible Production Forest (HPK)	120,521	44,738
Non-forest Area (APL)	4,301,274	1,013,036
Total land area	12,544,006	6,413,703

Table 17: Land use class area (calculated based on SK 718/2014) and their forest cover in 2000 (based on Gaveau et al. (2016)) in Berau.

Land use class	Land area according to land use classification [ha]	True forest cover 2000 [ha]
State forest	1,557,879	1,382,377
Protection Forest (HL)	362,818	350,894
Limited Production Forest (HPT)	624,349	606,397
Production Forest (HP)	536,792	398,207
Convertible Production Forest (HPK)	33,921	26,880
Non-forest Area (APL)	600,292	384,018
Total land area	2,158,171	1,766,396

5.2.2 Forest loss in East Kalimantan and Berau boundaries

Due to mentioned differences in defining water areas between the data sets of Gaveau et al. (2016) and the spatial plan, total forest loss values, that means the sum of annual forest loss values of all land use classes (based on the spatial plan), slightly differed to those values calculated for the entire division where only Gaveau et al. (2016) was used.

5.2.2.1 Total and annual forest loss in East Kalimantan

Figure 23 and Figure 24 show the occurrence of forest loss between 2001 and 2016 within East Kalimantan and Berau boundaries. Annual and total forest loss values for both divisions are provided in Table 18.

Total forest loss between 2001 and 2016 in East Kalimantan was 564,897 ha. On average 35,306 ha were lost annually. Forest loss was highest in 2012 (71,448 ha), followed by 2015 (68,284 ha) and 2016 (66,480 ha).

Thirty-five percent of East Kalimantan's total forest loss during that time occurred within the Berau District, see also Figure 25 that illustrates the share of each district on East Kalimantan's annual forest loss. With this, Berau showed the highest share on forest loss among the districts in East Kalimantan. Forest loss in Berau was followed by the forest loss in the districts Paser and Kutai Barat, with a respective share of 25% and 18% on East Kalimantan's total forest loss between 2001 to 2016.

Forest loss in land use classes

Total and annual forest loss between 2001 and 2016 in East Kalimantan was highest within the 'non-forest' land use class (total loss = 346,658 ha) followed by the production (total loss = 147,110 ha) and limited production forest class (total loss = 51,443 ha), see Figure 26 and Figure 27. Those three classes accounted for 95.5% of the total forest loss in East Kalimantan from 2001 to 2016. Forest loss within the non-forest class accounted for 61.4%, the production forest class for 26% and the limited production forest class for 9.1%. Forest loss in the protection (total loss = 7,508 ha), convertible (total loss = 3,994 ha) and conservation forest (total loss = 8,055 ha) land use classes was small and in total accounted for only 3.4% of East Kalimantan's total forest loss from 2001 to 2016.

Figure 27 shows the annual forest loss in each land use class from 2001 to 2016. Forest loss in the 'non-forest' area class (APL) showed an increasing trend over the years of investigation with peaks in 2009, 2012 and 2014.

Forest loss in the production forest class (HP) increased steadily from 2009 on with the exception of 2013 where forest loss dropped until it increased in 2014 over the level from the previous years. Forest loss in the HP class peaked from 2014 to 2016.

Forest loss within the limited production forest class (HPT), where selective logging takes place, was relatively stable until 2009. Highest loss occurred in the years 2012 and 2014 to 2016.

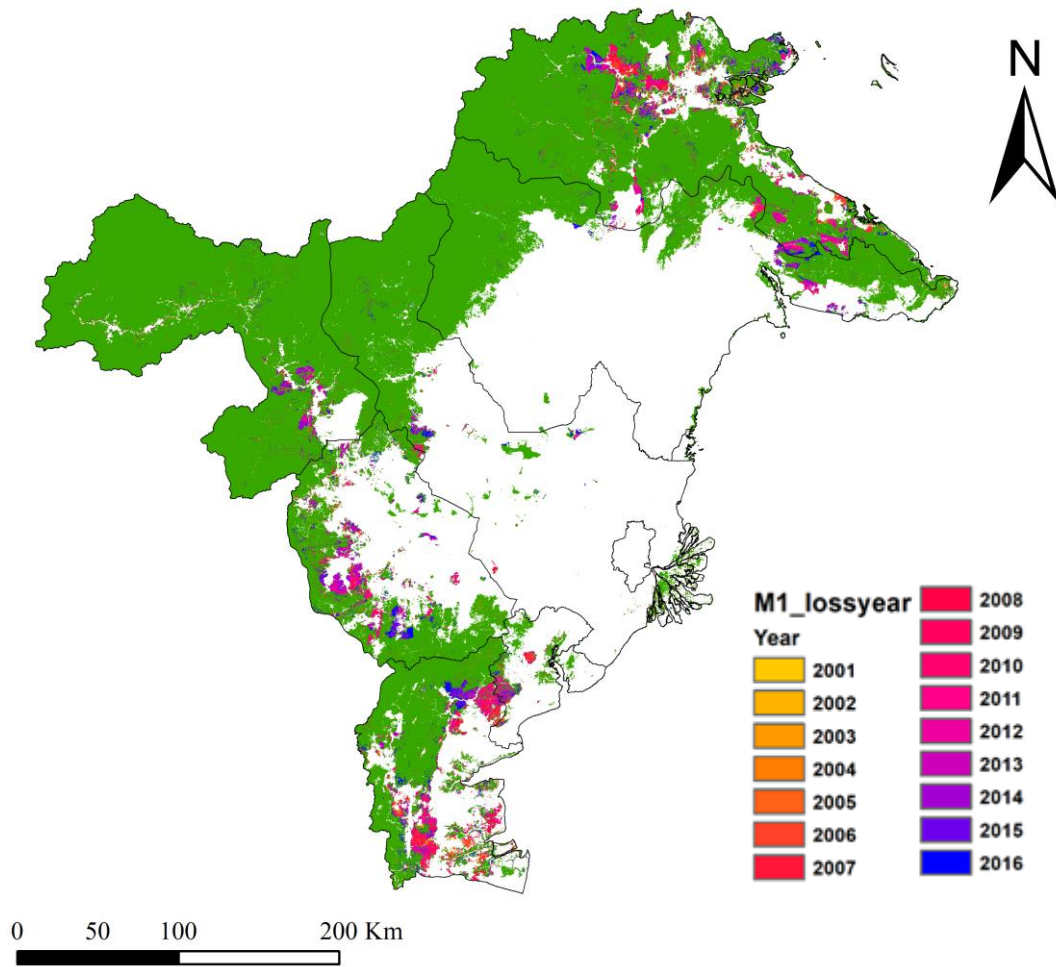


Figure 23: Forest loss in East Kalimantan from 2001 to 2016 based on Gaveau et al. (2016) and M. C. Hansen et al. (2013).

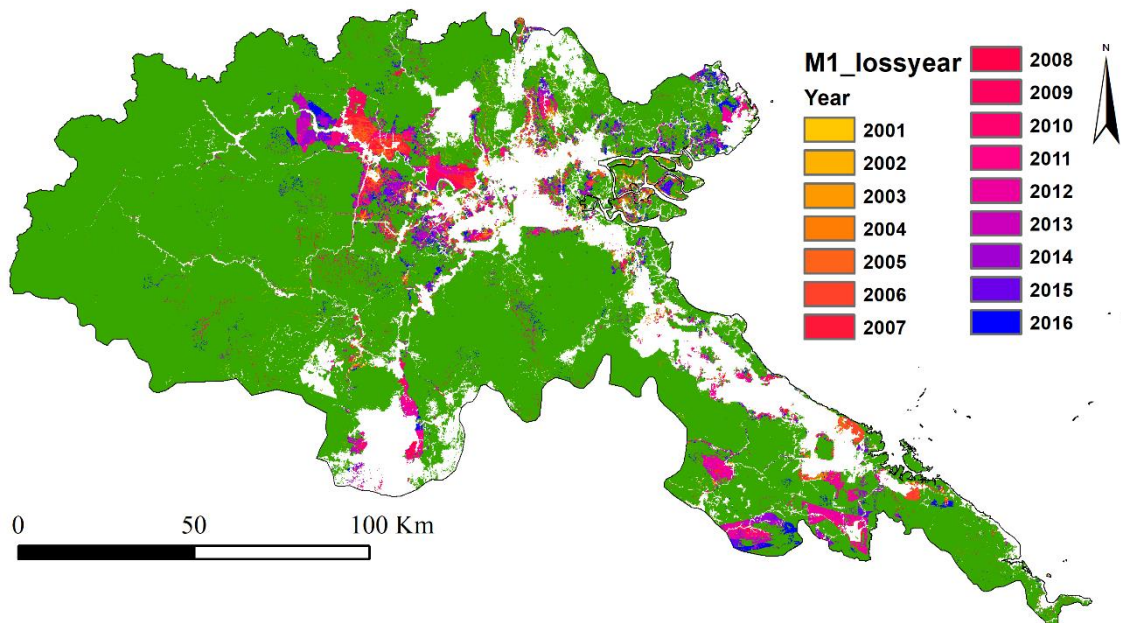


Figure 24: Forest loss in Berau from 2001 to 2016 based on Gaveau et al. (2016) and M. C. Hansen et al. (2013).

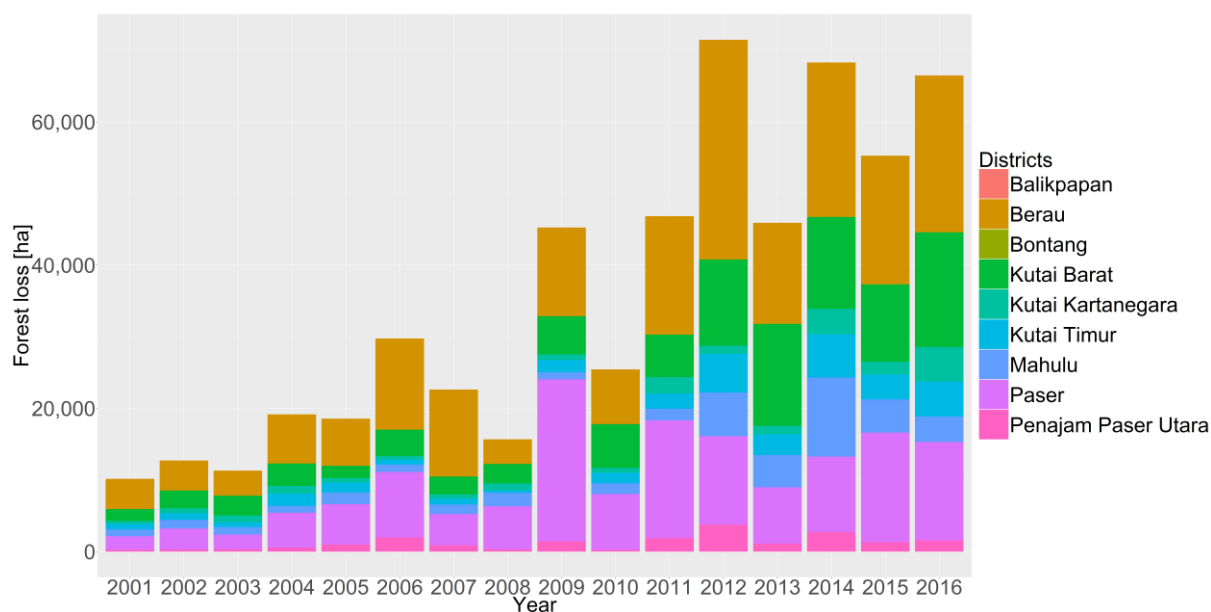


Figure 25: Share of annual forest loss of each district from 2001 to 2016 in East Kalimantan.

Table 18: Annual forest loss in East Kalimantan and Berau.

Year	East Kalimantan [ha]	Berau [ha]
2001	10,158	4,200
2002	12,728	4,170
2003	11,305	3,482
2004	19,168	6,834
2005	18,569	6,610
2006	29,756	12,667
2007	22,627	12,152
2008	15,674	3,469
2009	45,249	12,356
2010	25,436	7,656
2011	46,831	16,530
2012	71,448	30,618
2013	45,905	14,117
2014	68,284	21,573
2015	55,279	17,931
2016	66,480	21,845
Total	564,897	196,210
Mean	35,306	12,263

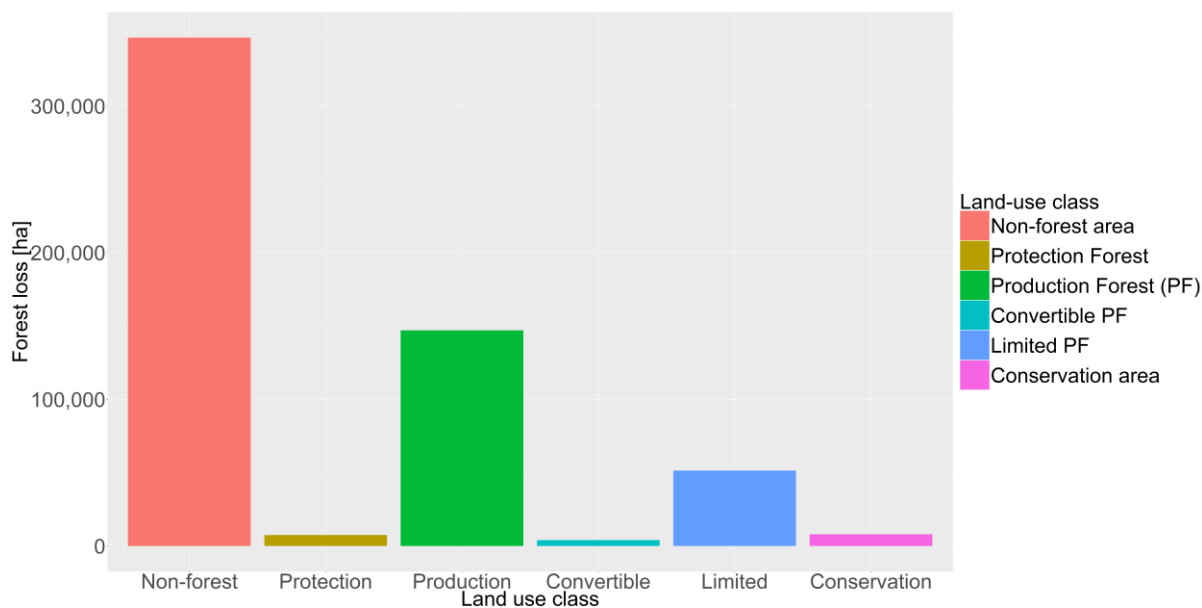


Figure 26: Total forest loss per land use class from 2001 to 2016 in East Kalimantan.

Forest loss in the convertible production forest class (HPK) peaked in 2006, 2012 and 2016. Forest loss in the protection forest class (HL) was relatively stable over the years, except for year 2016 where forest loss was five times as high as the mean annual forest loss from 2001 to 2016 in the HL class. Forest loss in the conservation area (KSA) peaked in 2009 and 2014 to 2016.

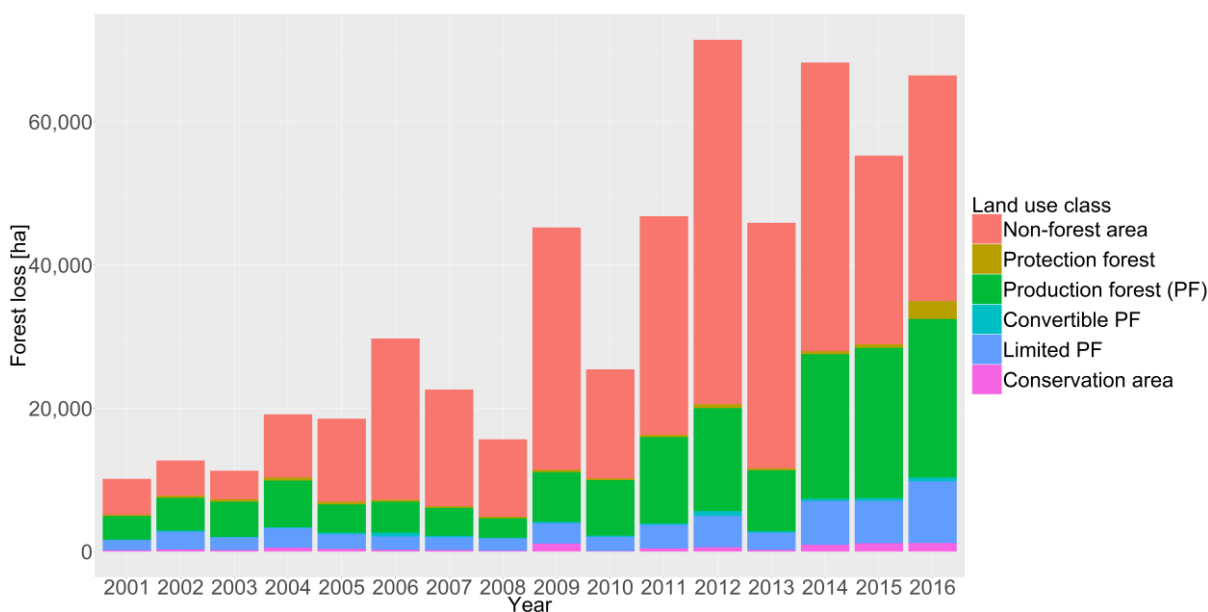


Figure 27: Annual forest loss in each land use class from 2001 to 2016 in East Kalimantan.

5.2.2.2 Comparing forest loss of ‘non-REDD+’ and ‘REDD+-period’ in East Kalimantan

Annual forest loss in East Kalimantan showed an increasing trend from 2001 to 2016. Forest loss in the REDD+-period, from 2009-2016, was clearly elevated in comparison to the first half from 2001 to 2008 where no REDD+ activities had taken place. Table 19 compares the annual and total forest loss of the time when no REDD+ activities had taken place with the ‘REDD+ period’ in East Kalimantan.

From 2001 to 2008 in total 139,985 ha forest were lost. This corresponds to an annual forest loss of 17,498 ha. Annual forest loss during that time ranged between 10,158 and 29,756 ha. Total loss in the

‘REDD+ period’ (2009 - 2016) was in comparison 424,912 ha, which corresponds to an annual loss of 53,114 ha. Annual forest loss here ranged between 25,436 and 71,448 ha. This means that the mean annual forest loss tripled within the ‘REDD+ period’.

As Figure 27 and Table 19 demonstrate, this trend was also observable for the forest loss within the single land use classes. Total and annual forest loss in each land use class was higher within the ‘REDD+ period’ than in the period from 2001 to 2008. Accordingly, and as already stated above, most of the land use classes showed peaks in their forest loss during the ‘REDD+ period’, that is, between 2009 to 2016.

Table 19: Annual and total forest loss in each land use class in East Kalimantan from 2001 to 2016; range = minimum and maximum annual forest loss values; *with data from Gaveau et al. (2016) and M. C. Hansen et al. (2013); ¹with data from spatial plan SK78/2014.

Land use class	Total loss [ha]			Annual mean forest loss and range [ha]		
	2001-2016	No REDD+ 2001 - 2008	REDD+ 2009 - 2016	2001-2016	No REDD+ 2001 - 2008	REDD+ 2009 - 2016
East Kalimantan*	564,897	139,985	424,912	35,306 (10,158-71,448)	17,498 (10,158-29,756)	53,114 (25,436-71,448)
Non-forest area ^{*1}	346,659	83,887	262,772	21,666 (3,990-50,841)	10,486 (3,990-22,523)	32,846 (15,211-50,841)
Protection forest ^{*1}	7,508	2,342	5,167	469 (166-2,503)	293 (166-465)	646 (244-2,503)
Production forest (PF) ¹	147,110	34,211	112,899	9,194 (2,728-22,130)	4,276 (2,728-6,519)	14,112 (6,944-22,130)
Convertible PF ^{*1}	3,994	1,403	2,591	250 (66-650)	175 (66-521)	324 (170-650)
Limited PF ^{*1}	51,443	15,831	35,612	3,215 (1,433-8,615)	1,979 (1,233-2,756)	4,452 (1,986-8,615)
Conservation area ^{*1}	8,055	2,259	5,795	503 (72-1,208)	282 (125-546)	724 (72-1,208)

5.2.2.3 Total and annual forest loss in Berau

In total 196,210 ha forest was lost between 2001 and 2016 in Berau. This corresponds to a mean annual loss of 12,263 ha with an annual minimum loss of 3,469 and a maximum of 30,618 ha. As shown in Figure 28, annual forest loss showed an increasing trend in the period of investigation. Annual forest loss from 2011 on exceeded those of the previous year.

Figure 29 shows the total forest loss from 2001 to 2016 per land use class in Berau. Based on the land classification of the spatial plan of East Kalimantan from 2014 (SK718/2014), most of the forest loss in Berau during this time period, that is, 126,634 ha or 65%, occurred within the ‘non-forest area’ (APL). It was followed by the production forest class (HP) and the limited production forest class (HPT) where 49,050 ha or 25% of Berau’s total forest loss and 17,455 ha or 9% were lost, respectively. Forest loss in the protection forest (HL) and convertible production forest (HPK) accounted for both 1% or 1,093 ha and 1,919 ha, respectively. With this, the APL, HP and HPT classes accounted for 98.5% of Berau’s total forest loss between 2001 and 2016.

Annual forest loss between 2011 and 2016 was on average 7,915 ha in the APL, 3,066 ha in the HP, 1,091 ha in the HPT, 68 ha in the HL and 120 ha in the HPK class, see Table 20.

Forest loss in the APL class was relatively low from 2001 to 2003 and in 2008, see Figure 28. From 2006 on it increased with a peak in 2012. Forest loss in the production forest class increased from 2011 on with the exception of the year 2013 where it dropped from the peak in 2012 after it peaked again in 2014 and the following two years. Forest loss in the limited production forest class showed an increasing

trend from 2009 on. Highest forest loss was observed in 2014 and 2016. Forest loss in the protection forest class peaked in 2012 and 2016, forest loss in the convertible production forest class in 2012.

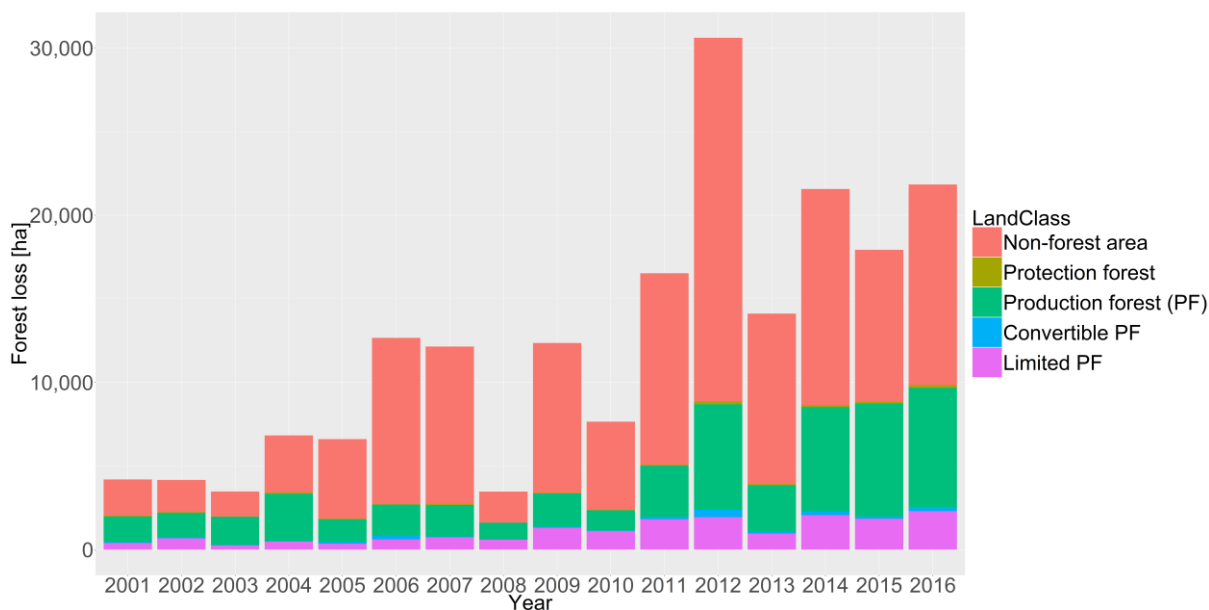


Figure 28: Annual forest loss in each land use class from 2001 to 2016 in Berau District.

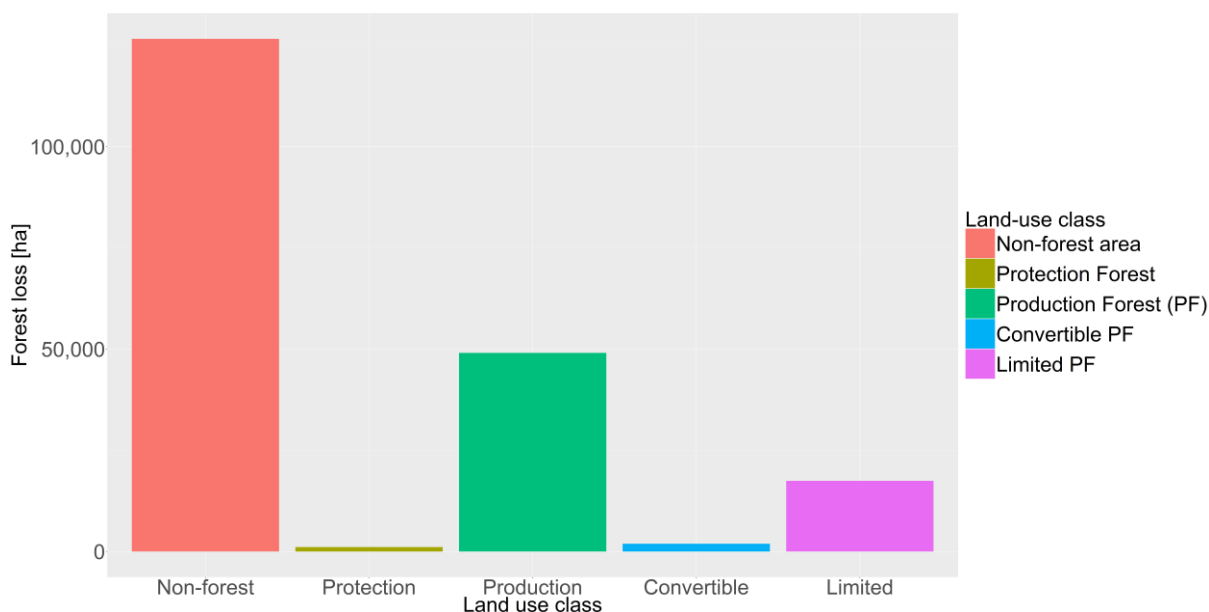


Figure 29: Total forest loss per land use class from 2001 to 2016 in Berau.

5.2.2.4 Comparing forest loss of ‘non-REDD+’ and ‘REDD+- period’ in Berau

Table 20 compares the total and mean annual forest loss of the time before REDD+ activities were carried out, that is, from 2001-2009, with the time after the REDD+ initiation from 2010 to 2016 in Berau. Total forest loss almost, and mean annual forest loss more than doubled between the two time periods with a total forest loss of 65,940 ha from 2001 to 2009 and 130,269 ha from 2010 to 2016 and a mean annual forest loss of 7,326.6 ha from 2001 to 2009 and 18,609.7 ha from 2010 to 2016. A similar trend was observable in the single land use classes where total forest loss roughly and mean annual forest loss more than doubled.

Table 20: Annual and total forest loss in each land use class in Berau from 2001 to 2016; range = minimum and maximum annual forest loss values; *with data from Gaveau et al. (2016) and M. C. Hansen et al. (2013); ¹with data from spatial plan SK78/2014.

Land use class	Total loss [ha]			Mean annual forest loss and range [ha]		
	2001-2016	No REDD+ 2001-2009	REDD+ 2010 - 2016	2001-2016	No REDD+ 2001 - 2009	REDD+ 2010 - 2016
Berau*	196,209	65,940	130,269	12,263 (3,469-30,618)	7,327 (3,469-12,667)	18,610 (7,656-30,618)
Non-forest area ^{*1}	126,634	43,924	82,710	7,915 (1,490-21,749)	4,880 (1,490-9,945)	11,816 (5,278-21,749)
Protection forest ^{*1}	1,093	388	705	68 (9-172)	43 (9-81)	101 (25-172)
Production forest (PF) ^{*1}	49,050	15,574	33,476	3,066 (1,006-7,136)	1,730 (1,006-2,820)	4,782 (1,214-7,136)
Convertible PF ^{*1}	1,919	610	1,309	120 (8-447)	68 (8-226)	187 (16-447)
Limited PF ^{*1}	17,455	5,416	12,039	1,091 (251-2,299)	602 (251-1,307)	1,720 (964-2,299)

5.2.3 Forest loss in forest land use permits in Berau

Figure 30 illustrates the occurrence of forest loss from 2001 to 2016 in natural forest (HA) and industrial timber plantation concession (HTI) boundaries. Twenty-two-point two percent of the total forest loss from 2001 to 2016 in Berau, or 43,558 ha, occurred within HA-boundaries. Ten-point eight percent, or 21,115 ha, occurred within HTI boundaries when using the land use permit data from BPKH Wilayah IV Samarinda of 2016. This corresponds to an annual forest loss of 2,722 ha (ranging from 741 to 6,528 ha) and of 1,320 ha (ranging from 280 to 4,179 ha) that were lost annually within the entire HA and HTI boundaries in Berau from 2001 to 2016, respectively.

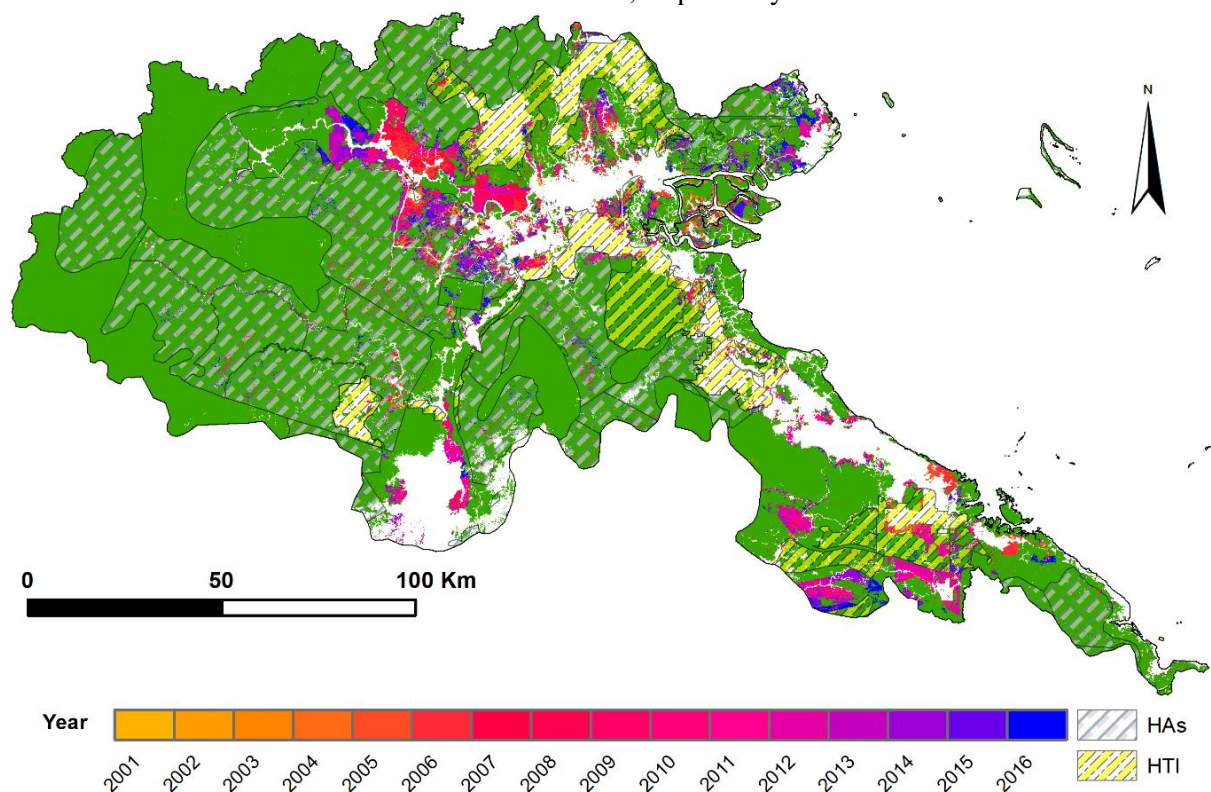


Figure 30: Forest loss in natural forest concession permit (HA) and industrial timber plantation permit (HTI) boundaries from 2001 to 2016 in Berau.

Annual forest loss of the entire area in Berau of both concession types is also shown in Figure 31 and Figure 32. Annual forest loss in the HA boundaries showed an increasing trend between 2001 and 2016 with a peak in 2014. Forest loss within the HTI boundaries peaked in 2012 and remained relatively stable above the level of the years 2001 to 2011 from 2014 on.

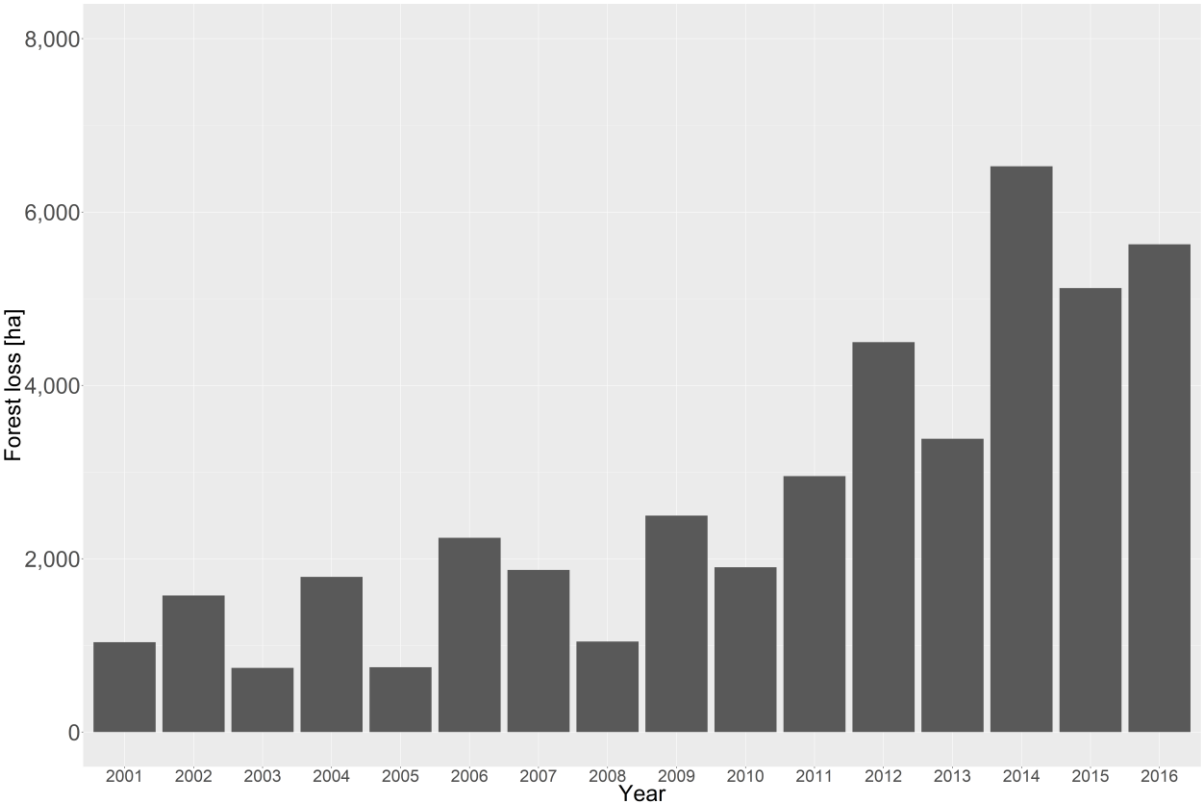


Figure 31: Annual forest loss in natural forest concession permit boundaries from 2001 to 2016 in Berau (Number of concessions = 21).

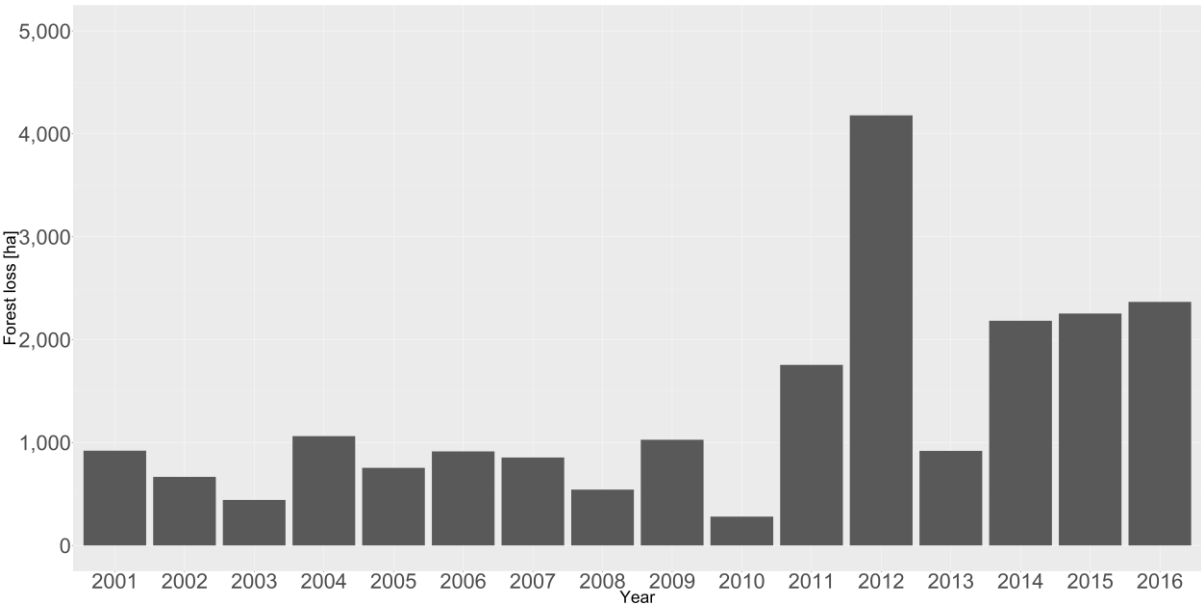


Figure 32: Annual forest loss in industrial timber plantation permit boundaries from 2001 to 2016 in Berau.

5.2.3.1 Comparing forest loss of ‘non-REDD+’ and ‘REDD+-period’

Table 21 compares the total and annual forest loss within different land use permit boundaries between the time when no REDD+ activities had taken place and that of REDD+.

In both forest permit boundaries in Berau, total forest loss roughly doubled from the ‘non-REDD+’ to the ‘REDD+ period’ while annual forest loss was more than twice as high in the REDD+ than in the ‘non-REDD+ period’.

Table 21: Annual and total forest loss in forest and non-forest land use permit boundaries in Berau from 2001 to 2016; range = minimum and maximum annual forest loss values.

Land use permit	Total loss [ha]			Mean annual forest loss and range [ha]		
	2001-2016	No REDD+ 2001-2009	REDD+ 2010-2016	2001-2016	No REDD+ 2001-2009	REDD+ 2010-2016
Natural forest	43,558	13,544	30,014	2,722 (741-6,528)	1,505 (741-2,497)	4,288 (1,902-6,528)
Plantation forest	21,115	7,180	13,936	1,320 (280-4,179)	798 (442-1,062)	1,991 (280-4,179)
Oil palm	101,291	34,466	66,825	6,331 (980-19,306)	3,830 (980-8,526)	9,546 (4,446-19,306)
Mining	34,803	10,827	23,976	2,175 (534-5,153)	1,203 (534-1,814)	3,425 (1,409-5,153)

5.2.4 Forest loss in non-forest land use permits in Berau

Figure 33 shows the product of overlaying the forest loss of Berau between 2001 and 2016 with oil palm and mining permit boundaries. Most large-scale forest loss between 2001 and 2016 in Berau occurred within those land use permits. This corresponds to the results of the share of the single land use classes on the total forest loss in Berau with most of the forest loss observed within the ‘non-forest’ area class (APL) where oil palm permits can legally be granted, see also Figure 29. No statement can be made whether the forest loss attached to the permit boundaries was legal or illegal.

Figure 33, moreover, reveals that a lot of the large-scale forest loss in the central part of Berau occurred under mining and oil palm permits.

Total forest loss from 2001 to 2016 within the oil palm permit boundaries in Berau was 101,291 ha or 51.6% of Berau’s total loss in the same period. This corresponds to an annual forest loss of 6,331 ha (ranging from 980 to 19,306 ha) within the area covered by the oil palm permit boundaries. Annual forest loss, as shown in Figure 34, peaked in 2012 and 2014.

Total forest loss from 2001 to 2016 within mining permit boundaries was 34,803 ha or 17.7% of Berau’s total forest loss in the same period. As Figure 35 reveals, from 2011 on, annual forest loss was above the level of the years 2001 to 2010 and peaked in 2014 and 2015. Mean annual forest loss within the mining permit boundaries of 2001 to 2016 was 2,175 ha ranging from 534 to 5,153 ha annually.

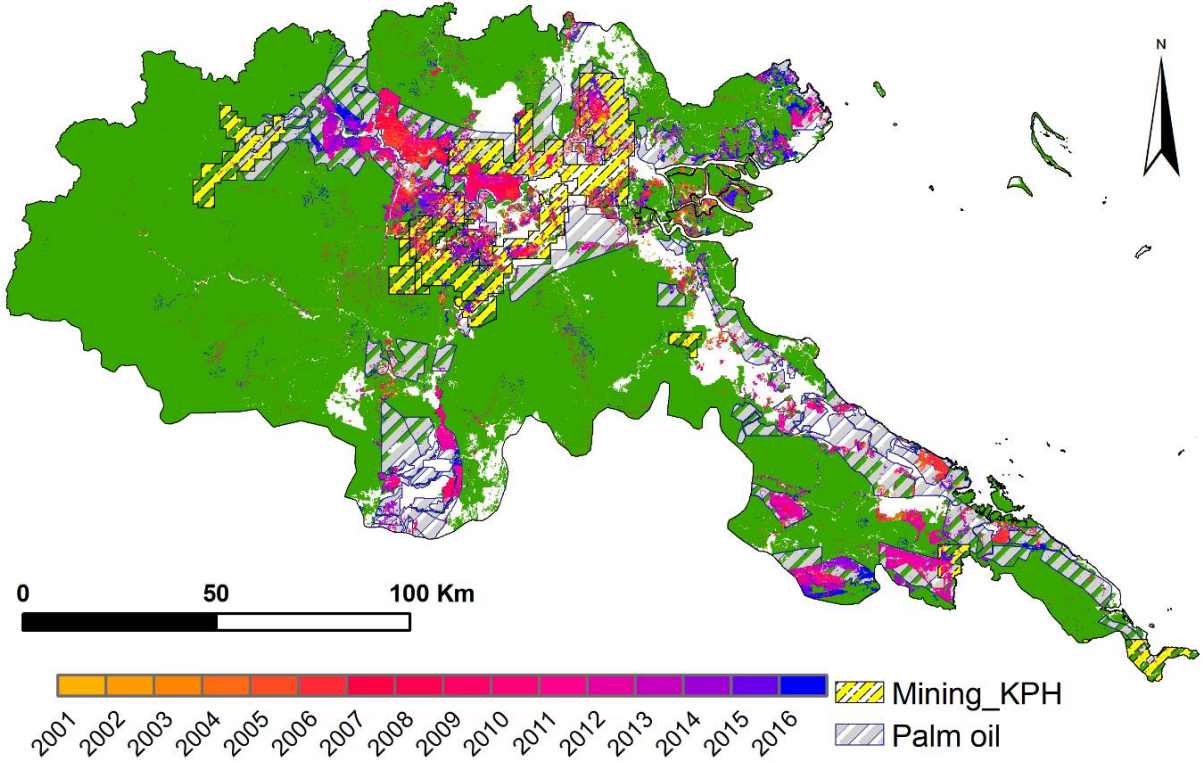


Figure 33: Forest loss in oil palm and mining permit boundaries from 2001 to 2016 in Berau.

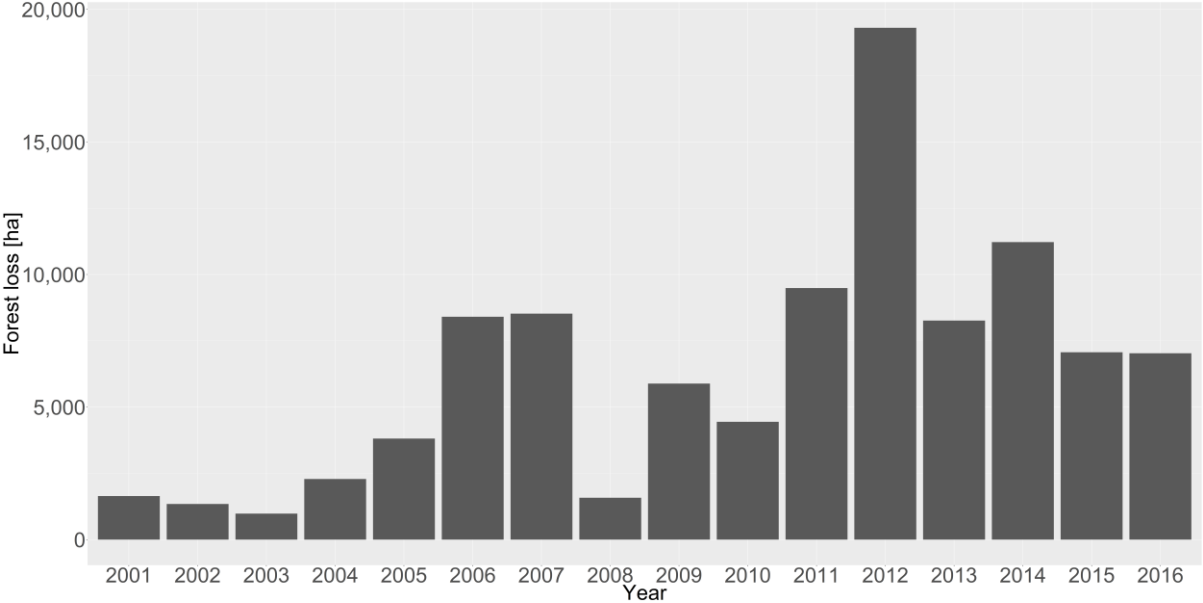


Figure 34: Annual forest loss in oil palm permit boundaries from 2001 to 2016 in Berau.

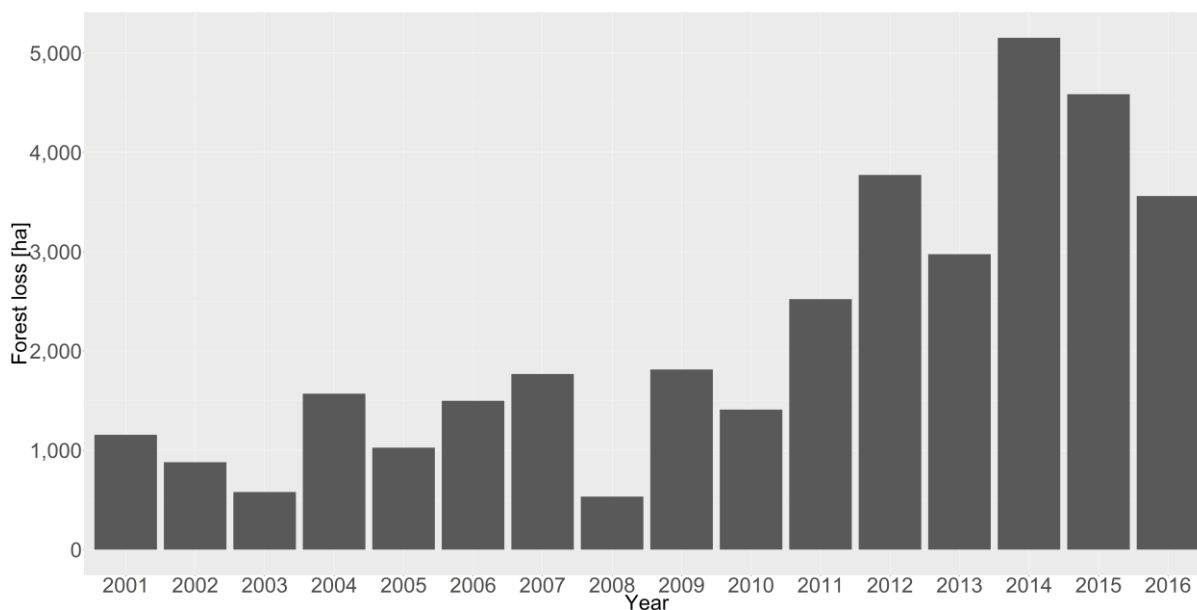


Figure 35: Annual forest loss in mining permit boundaries from 2001 to 2016 in FMU Berau Barat.

5.2.4.1 Comparing forest loss of ‘non-REDD+’ with ‘REDD+ period’

Total forest loss within the area covered by the oil palm and mining permit boundaries roughly doubled from the ‘non-REDD+ period’ to the time of REDD+, see Table 21. Mean annual forest loss in both permit boundary types was more than twice as high in the REDD+ period than in the period without any REDD+ activities.

5.3 Achievements and limitations of FLEGT-VPA in East Kalimantan and Berau

This chapter presents the achievements and limitations of the FLEGT-VPA process relevant for SFM for the focus area. The achievements and limitations were derived from the analysis of FLEGT-VPA policy, evaluation and implementation reports and interview transcripts.

Achievements in terms of a forest loss reduction on the concession level that were derived from the analysis of remote sensing data are reported separately in chapter 5.4.

Table 22 summarizes the identified achievements against the seven ITTO criteria.

Table 22: Summary of FLEGT-VPA achievements (outcomes and outputs) with a relevance for the focus area; MFP = Multi-stakeholders Forestry Programme; JIC= Joint Implementation Committee; FPIC = Free, Prior, and Informed Consent; SME = small and medium enterprise.

ITTO criterion	Outputs related to	Examples of outputs	Outcomes related to	Examples of outcomes
Enabling conditions for SFM	Policies & regulations for governing forests	<ul style="list-style-type: none"> - Improvement of SVLK regulations - Technical support to social forestry reform 		
	Institutions supportive to forest management	<ul style="list-style-type: none"> - Provincial focal point established 		
	Institutional capacity & capacity in forest management & monitoring	<ul style="list-style-type: none"> - Provision of technical and financial support to Independent Monitoring (incl. provincial focal points) - Training on SVLK for government, civil society and SMEs - Collaboration with Universities - Training of SVLK & PHPL audits 	Capacity	<ul style="list-style-type: none"> - Increased capacity to audit certification processes
	Forest management planning & monitoring	<ul style="list-style-type: none"> - SVLK audits strengthened - Independent Monitoring established and strengthened - Independent Monitoring carried out by civil society: publication of two reports 		
	Forest governance	<ul style="list-style-type: none"> - Establishment of forest data bases - Platform for stakeholder participation in forest governance established, for example, Independent Monitoring 	Forest governance	<ul style="list-style-type: none"> - Transparency in forest production increased
	Funding committed to SFM	<ul style="list-style-type: none"> - Attraction of funding to implement VPA on all levels: contributions from EU, Government of Indonesia, private sector and civil society - Financial support from MFP 		
Extent and condition of forests	Illegal logging	<ul style="list-style-type: none"> - Enforcement of legality certification requirement for exporting companies 	Illegal logging	<ul style="list-style-type: none"> - Decreasing trend of illegal logging associated with timber exports suggested
	Forest area in compliance schemes	<ul style="list-style-type: none"> - Enforcement of SVLK and PHPL schemes: all active forest concessions in Berau were certified for legality and/or PHPL 		
	Multiyear forest management plans	<ul style="list-style-type: none"> - The need for forest concessionaires to possess harvest and working plans enforced through SVLK scheme - All active concessions in Berau legality certified (with harvest and work plans) 		

Table 22 (continued)

Forest ecosystem health and resilience	Threats to forests	<ul style="list-style-type: none"> - Enforcement of SVLK on all levels to fight illegal logging - Promotion of SVLK and related issues of illegal logging through civil society campaigns 	Threats to forests	<ul style="list-style-type: none"> - Awareness of illegal logging on all levels increased - Decreasing trend of illegal logging associated with timber exports suggested
Forest production	Silvicultural operations & their monitoring in natural forests	<ul style="list-style-type: none"> - Through adoption of PHPL scheme into SVLK legal framework, enforcement of forest regeneration on the management level 		
	Resource assessment	<ul style="list-style-type: none"> - The need to assess and report on forest resources on the management level enforced through SVLK scheme 	Resource assessment	<ul style="list-style-type: none"> - Transparency on forest resources increased
	Forest product tracking system	<ul style="list-style-type: none"> - VPA implementation strengthened timber product tracking through enforcement of SVLK scheme, particularly the timber supply chain 		
Forest biological diversity	Biodiversity conservation in production forests	<ul style="list-style-type: none"> - Through adoption of PHPL scheme into SVLK legal framework, enforcement of ecological indicators on the management level 		
Soil and water protection	Protective function of forests for soil & water	<ul style="list-style-type: none"> - Through adoption of PHPL scheme into SVLK legal framework, enforcement of ecological indicators (incl. the requirement to monitor forest management impacts on soil and water) on the management level 		
Economic, social and cultural aspects	Labour rights & equitable benefit distribution	<ul style="list-style-type: none"> - The health and safety of forest workers strengthened through adoption of related criteria in SVLK scheme - Through adoption of PHPL scheme into SVLK legal framework, standards for equitable sharing of benefits, conflict resolution mechanisms and labour rights enacted - Social inclusion strategy developed by MFP 		
	Economic aspects of forests	<ul style="list-style-type: none"> - Financial and technical support to small-scale businesses in legality certification matters by MFP 		
	Resolving disputes between forest stakeholders	<ul style="list-style-type: none"> - Indicators related to tenurial and boundary clarity and FPIC adopted in PHPL regulations 		
	Village forest management rights	<ul style="list-style-type: none"> - Public awareness campaigns on social forestry schemes on the community level by MFP 		

5.3.1 Criterion 1: Enabling conditions for sustainable forest management

The following achievements (outputs and outcomes) of the FLEGT-VPA process have been identified in terms of enabling conditions for SFM for the focus area.

5.3.1.1 Outputs related to policies and regulations for governing forests

The FLEGT-VPA process, especially the development and implementation of the Indonesian TLAS, has contributed to ongoing forest policy reform in Indonesia.

One achievement in this context, identified through the document analysis, was the strengthening and improvement of SVLK related regulations (MFP, 2014b, 2017). As ‘legality’ is one aspect of SFM, these improvements have a particular relevance for SFM on the subnational level.

The MFP, moreover, technically supported the social forestry reform through the revision of existing and drafting of new regulations (MFP, 2017; Suparno & Nurbaiti, 2018). The social forestry reform aims to allocate 12,7 million ha of forest to communities under social forestry schemes, that is, community forest, community plantation forest, village forest, partnership and customary forest (MFP, 2017). However, interviews revealed that this area should be allocated on lands that do not carry a land use license yet and as such avoid existing land use conflicts.

5.3.1.2 Outputs related to institutions supportive to forest management

A number of working groups and meeting forums have been developed on the national level to oversee, monitor and/or implement the VPA and with this the implementation of the SVLK, among those Joint Expert Meetings and the Joint Implementation Committee. Through its standards laid out in regulation P.14/PHPL/SET/4/2016, the SVLK obliges forest concessionaires to implement various issues related to the management of forest, timber production and processing. Therefore, established institutions have also far-reaching responsibilities over the forest management level.

Despite its scope to oversee the implementation of the VPA/SVLK – that mainly takes place on the local level – there was only little evidence of related subnational institutional structures in East Kalimantan. By the time of study conduction, one provincial focal point had been established with the aim to support the Independent Monitoring. However, field visits revealed that their operationalization was still poor.

5.3.1.3 Outcomes/outputs related to building institutional capacity

A number of capacity building measures have been carried out on the subnational level as part of the FLEGT-VPA process to accelerate the implementation of the SVLK. Many of these measures were carried out or supported by MFP. Among other things, the MFP strengthened capacities of FLEGT-related institutions and actors engaged in the SVLK implementation and, therefore, in the management of forests. Following their implementation reports, subnational support focused on Java and Sumatra which were not focus areas of this study. Consequently, this information was not dealt with.

Capacity building measures with a relevance for the subnational level in East Kalimantan comprised (Indonesia & EU, 2015; MFP, 2014a, 2017):

- Capacity building with a focus on the role of CSO in performing Independent Monitoring tasks and its role in the JIC
- Support to national and local government agencies including activities to strengthen capacity of forestry education centres by MPF3 and the MoEF
- Financial support of Independent Monitoring Organization Network (JPIK) to support their work in monitoring compliance with SVLK
- Training and technical assistance for government officials, civil society representatives and small and medium enterprises (SMEs) in terms of SVLK provided by MFP3
- Training for focal points to assist SVLK process for community-based forest institutions supported by MFP3
- Collaboration of MPF3 with four universities, among those the University of Mulawarman in Samarinda, to pilot the introduction of the SVLK subject into the undergraduate level

Following the study authors findings and observations, by the time of study conduction there were no capacity measures carried out for the private forest sector in East Kalimantan.

5.3.1.4 Outputs/outcomes and limitations related to forest management planning and monitoring

Two approaches to monitor the subnational implementation of the SVLK and its impacts have been introduced and strengthened through the VPA-TLAS process: independent auditors and the Independent Monitoring⁶⁷. Both institutions act on the field level to assure compliance with the SVLK standards and are, therefore, directly entrusted with observing the management of forests.

Interviewees raised concern over the quality of the auditors. Interviewed auditors stated that there was a risk that concession holders would look for those auditors that were “known” for making the certification process “easier” or to look for a new auditor once their current auditor “made the process difficult”.

The document and interview analysis, moreover, revealed that the assessment of the legality and PHPL standards mainly included verifying the existence of documents to verify the single indicators and that auditors used environmental impact assessment documents and environmental management plans to verify FPIC (indicator 1.5).

5.3.1.5 Outputs and limitations related to stakeholder participation in forest management monitoring

One of the five elements of the Indonesian TLAS is the ‘Monitoring’. It comprises the Independent Monitoring. The Independent Monitoring of the Indonesian TLAS is carried out by civil society and assesses the compliance of PHPL and SVLK auditors and auditees with the requirements of the related certification standards. Through the Independent Monitoring, civil society was provided with a platform to actively engage in the monitoring of forest management operations.

By the time of study conduction seven networks existed that monitor compliance all over Indonesia. One of those is the Jaringan Pemantau Independen Kehutanan (JPIK - Independent Forest Monitoring Network). The JPIK had published two monitoring reports on the Indonesian TLAS by the time of study conduction. The first one was published in 2014 and was based on the monitoring between 2011 and 2013. The second report for the term between 2014-2017 was published in 2018. Violations of the SVLK standards mainly related to tenure conflicts and conflicts over boundaries with communities which corresponded to what was mentioned in interviews with SVLK/PHPL audits.

Although the Independent Monitoring was strengthened through the latest revision of the SVLK regulation (Indonesia & EU, 2017), interviews and field observations in East Kalimantan showed that there were still substantial capacity and resource gaps. Interviewed stakeholders working for NGOs that were part of the JPIK, reported that they had never received any funding for the monitoring and training. The Independent Monitoring focal point on the provincial level in East Kalimantan in this context pointed towards the national JPIK focal point holding them partly responsible for the limited resources and information they received. Stakeholders from the national JPIK focal point, themselves pointed towards the JPIK on the subnational level accusing them of not fully taking advantage of their opportunities to apply for financial support.

In summary, consulted stakeholders and key documents revealed that the conduction of the monitoring tasks was nearly impossible given the vastness of the country and the limited capacity of the Independent Monitoring.

⁶⁷ See Table 5 for more information on both elements.

5.3.1.6 Outputs related to building capacity in forest management planning and monitoring

As part of the VPA process, several auditors were trained to assure compliance of forest permit holders with the SVLK standards. Indonesia and EU (2017) for example stated that there were 396 SVLK auditors working for 24 Conformity Assessment Bodies in Indonesia.

The MFP has facilitated the training of auditors in several universities in Indonesia. In line with this, all interviewed auditors hold a university degree in forestry.

5.3.1.7 Outcomes related to forest governance

The VPA process has resulted in a number of achievements that are relevant for forest governance on the subnational level in the focus area. Examples are given in the following.

As part of the FLEGT-VPA process, a variety of forest information from the field level has been made accessible to the public which improved data transparency. Examples are assessments and reports from the independent monitoring, documents related to the SVLK and FLEGT licenses, and SVLK related databases. The following are examples of databases that provide data and information on timber production that have been established or strengthened through the SVLK:

- Forest Products Administration Information System⁶⁸ (SIPUHH): stores information on timber production planning, logging, marking, transportation and processing
- Timber Legality Information System⁶⁹ (SILK): serves as a registry for legality and PHPL certifications, V-legal documents and FLEGT licenses
- Information System of Industrial Raw Material Receipt⁷⁰ (SIRPBBI): contains data on timber flows from and within primary industry
- Integrated Timber Data Management Information System⁷¹ (SIPHPL): integrates the existing information systems and the Non-Tax State Revenue System (SIPNBP)

However, there were some limitations observed in terms of the transparency of those databases. While the SIPUHH database provided only data on the total (planned) annual production and transported volume of each province and annual total timber production per land use type throughout Indonesia, additional or more detailed information was not made public.

Through various platforms, for example the Joint Implementation Committee, technical working groups and the Independent Monitoring, CSOs were, moreover, given the opportunity to engage in the national VPA implementation process and thus influence national forest governance. In those forums, CSOs – many of them acting on the field level – took over the role of constantly reviewing and monitoring the implementation of the VPA process and pointing out deficits, for example, through publishing monitoring reports (Meridian et al., 2014; Meridian et al., 2018).

In East Kalimantan, provincial Independent Monitoring focal points certainly did involve CSO, however, field observations of the study author revealed that both, the focal point itself and NGOs under the JPIK, were still far from being operational and lacked sources to conduct their monitoring tasks.

Land tenure and ownership

See criteria 7, chapter 5.3.7.

⁶⁸ <http://sipuhh.net>

⁶⁹ <http://silk.dephut.go.id/>

⁷⁰ <http://rpbbi.dephut.go.id/>

⁷¹ <https://si-phpl.menlhk.go.id/>

5.3.1.8 Outputs related to funding committed to SFM

The FLEGT-VPA process in Indonesia has attracted a substantial amount of funding to implement the VPA and, therefore, for measures that follow the EUs wider objective to foster the implementation of SFM (EC, 2003).

The desk review revealed that the total investment in FLEGT from the EU and member states was €56.1 million (TEREA et al., 2016). Additionally, the government of Indonesia contributed approximately €20 million, the private sector at least €10 million for mandatory certification costs and civil society approximately €5 million obtained from other sources (*idb.*). The MFP that was since 2000 funded by the DFID's Forest Governance, Markets and Climate framework programme, attracted another 11.7 million pounds (~US\$ 15.45 million) which was widely used to implement the SVLK (Suparno & Nurbaiti, 2018, p. 41). The study author did not identify any other funds specifically provided for the VPA implementation in East Kalimantan by the time of study conduction.

5.3.1.9 Outputs and limitations related to incentives to encourage SFM

It was frequently promoted that “*The SVLK provides incentives for legality and sustainability by promoting market access for verified legal products and blocking market access for illegal products*” (Indonesia & EU, 2015, p. 8; Suparno & Nurbaiti, 2018, p. 41) and that “*The SVLK utilizes market forces to fight illegal logging by providing incentives to timber-based industry players to conduct their businesses in a sustainable manner*” (Suparno & Nurbaiti, 2018, p. 41).

The analysis of interview transcripts and key documents suggested that the certification schemes in their current forms did not act as an incentive to implementing SFM (nor legality). This is for the following reasons: First, it is important to differentiate that sustainability is not equal to legality, but that legality is only one part of SFM. While the quotes read as if the SVLK would automatically promote sustainability through the implementation of the TLAS, assuring legality under the SVLK can also support the use of unsustainable practices (such as the legal conversion of forests)⁷².

A former worker of an independent domestic organization that promotes sustainable natural resource management through certification and that was involved in the initial legality definition of the SVLK shared his view as follows:

“I think that [the issue of SVLK] is a very good progress. But I think it will not automatically develop to the practice of SFM. I think the government [...] will have to make some effort to make that the ultimate goal [of the VPA: SFM] is come to reality. [...] what I see, the government still has the perception that the SVLK is not only the legality certification. They said it is as well the sustainability certification. But the market response [is] different with the present perception of the government. [...] the [international] market still thinks that the SVLK is only for legality. Not yet for the sustainability.”

Second, on the management level, concession holders interviewed uniformly stated that they were hoping for premium prices through the legality certification but that they have not yet received them. Certification was perceived an extra cost burden.

Third, the national government does not recognize other voluntary but widely recognized certification schemes such as the FSC although they include all the relevant requirements of the SVLK. This means, that concessionaires were obliged to obtain the SVLK and/or PHPL certificate, regardless of whether they complied with FSC. These different and not-yet compatible legality and SFM certification schemes placed a high burden on concessionaires, especially as the prospect of premium prices for the concessionaires have not been realized under the SVLK.

⁷² See also chapter 5.3.4.3.

5.3.2 Criterion 2: Extent and conditions of forests

5.3.2.1 Outputs/outcomes and limitations related to the extent of and change in forest area

The document analysis and expert interviews showed that there currently remained a knowledge gap on the impacts of the VPA, namely of the PHPL and SVLK certification schemes in terms of reducing forest loss and degradation and illegal logging and trade which was explained by a lack of reliable data.

The only estimations found in this context, were those of the evaluation of the FLEGT EU Action Plan that suggested that achievements related to illegal logging (and trade) of FLEGT in Indonesia “*have been modest*” (TEREA et al., 2016). Their estimations indicated that between 2000 and 2013, about half of the illegal industrial roundwood produced in Indonesia was destined for local end-use (not exported). While this roundwood production appeared to have been stable over the entire time period of 2000-2013 (~20 million m³/year), estimations indicated a decrease in illegally exported wood between the time period 2000 and 2007 from which on estimations were more or less stable (varying between 15 to 20 million m³/year).

Many of the interviewees perceived a positive impact of the SVLK towards illegal logging, especially towards illegal logging that resulted from exporting companies. However, consulted stakeholders also emphasized the different sources of illegal logging and the limitations of the SVLK in this context. Undocumented logging from communities, as generally harvesting for the domestic market, was perceived as not being influenced by the current SVLK process, nor was large-scale deforestation associated with other land use activities than forest management.

Results of the forest loss analysis on the concession level of this study are presented in chapter 5.4.

5.3.2.2 Outputs related to forest area in compliance schemes

As repeatedly mentioned, there are currently two mandatory forest management certification schemes in Indonesia: the SVLK and the PHPL. The SVLK became the core element of the FLEGT-VPA. The PHPL is stipulated within the SVLK regulation and as such part of its legal framework. Forest concessionaires are obliged to obtain the PHPL certification before the first legality certificate expires. The VPA process has improved both systems and accelerated its implementation on the ground.

In Berau, all active forest concessions were certified for at least legality by 2016⁷³.

In the VPA, Indonesia obliged itself to equally apply the SVLK to the domestic market. Interviewees, among them forest concessionaires and plywood company officers, uniformly stated that for the domestic market, there was no SVLK certification needed. While larger industries, for example, plywood companies, mainly exported their produced and certified timber, small enterprises that feed the local market as well as rejects from forest industries sold to the domestic markets, did not need a certificate. The SVLK thus did not cover the domestic market. Interviewees framed that as the following:

“I think the weakness is – at least in the Indonesian context – it [the SVLK] does not really cover the domestic market which is probably as big as the European one.”

5.3.2.3 Outputs related to multiyear forest management plans in concessions

One of the requirements of the legality certification is that permit holders must possess a valid harvest plan for the cutting area and a valid work plan. The SVLK thus strengthened forest management planning in forest concessions and its periodic monitoring. As all active concessions in Berau had been at least certified for legality by the time of study conduction, they all possessed forest management plans.

⁷³ See chapter 5.4.3.

5.3.3 Criterion 3: Forest ecosystem health and resilience

5.3.3.1 Outputs/outcomes and limitations related to addressing threats to, and vulnerabilities to forests

Illegal harvesting is one essential threat to natural tropical forests. To combat illegal logging, Indonesia has implemented the VPA and strengthened Indonesia's TLAS. As mentioned before, data on the actual impacts of the FLEGT-VPA in terms of reducing illegal logging and related trade was poor in reviewed key documents. TERE et al. (2016), that evaluated the FLEGT Action Plan from 2004 to 2014, recognized in this context that the evaluation of FLEGT's main objectives, namely the reduction in illegal logging and related trade, was hindered by a lack of reliable data. They stated that neither production nor trade in illegal wood-based products was being monitored.

Nevertheless, following interviewees and key documents, the VPA process has resulted in an increased awareness on the issues of illegal logging on all levels in Indonesia. As part of the VPA process, a number of campaign materials were for example produced and distributed to promote the SVLK and related issues of 'illegal logging'. Campaigns of civil society played a major role in raising this awareness on issues of illegal logging and poor forest governance.

5.3.4 Criterion 4: Forest production

5.3.4.1 Outputs and limitations related to resource assessment

The VPA, through the implementation of the SVLK, contributed to the assessment and reporting of forest resources. Through associated criteria, for example, through criterion 2.1⁷⁴ of the legality standard in production forests, the SVLK reinforces the need for forest inventories and harvest plans which specify annual allowable harvest in forest concessions. The standard for concessions within production forest zones in the VPA further requires that "*all the large diameter logs harvested or commercially extracted have been reported in a Timber Production Report*" (EU, 2014).

There was, however, a lack of information available on timber stemming from conversion areas and being exported under the FLEGT licensing scheme to the public.

5.3.4.2 Outputs related forest product tracking systems

The VPA strengthened timber product tracking in Indonesia which is one requirement under ITTO criterion 4.

The control of the supply chain is a key element of the SVLK. It requires that permit holders, landowners and companies demonstrate that "*every node of their supply chain is controlled and documented [...]*" (EU, 2014, p. 297). This is achieved through related criteria, for example, through criterion 2.1 of the legality standard for primary and downstream forest-based industry⁷⁵ or criterion 3.1 of the legality standard for concessions within production forest zones⁷⁶.

Interviews revealed in this context, that it was (still) common practice for government officials to demand "under-the-table costs" from the operators for those checks.

5.3.4.3 Outputs and limitations related to silvicultural operations and their monitoring in natural and planted forests

Through integrating the PHPL system into the SVLK legal framework, FLEGT-VPA indirectly contributed towards silvicultural treatments that ensure forest regeneration. A 'silviculture system ensuring forest regeneration' is one of the required indicators. Maryudi et al. (2017) found that most of the audited concessions scored the best grade on those production indicators (including the above one).

⁷⁴ 'Permit holder possesses a harvest plan for the cutting area that has been approved by the competent administrative authorities'

⁷⁵ 'Existence and application of a system which traces timber in the forest products'

⁷⁶ 'Permit holders ensure that all the logs transported from a log yard in the forest to a primary forest products industry [...] is physically identified and accompanied by valid documents'

However, the content analysis of interview transcripts and key documents also revealed that there existed gaps in terms of the sustainability of those TLAS and PHPL standards related to silvicultural operations.

Some interviewees raised general concerns about the sustainability of the Indonesian mandatory SFM certification, the PHPL, as the following statement of an officer of an international organization revealed:

“If you look at PHPL, this is a very low standard. And I don’t believe that this is sustainable at all.”

Concerns referred to the national Indonesian Selective Cutting with Replanting System⁷⁷ (TPTI) adopted by the PHPL. Reviewed key documents in this context indicated that the set harvesting diameter was too low for many species, the current harvesting system, therefore, unlikely sustainable, and that silvicultural systems based on diameter limit alone, as in the case of the TPTI, could not be compatible with sustainability (Ruslandi et al., 2014; Sist et al., 1998).

By integrating the PHPL into the legal framework of the SVLK, the VPA also indirectly addressed the issue of RIL. However, the verifiers under the PHPL focused on administrative requirements and technical and silvicultural procedures rather than on ecological indicators (Maryudi et al., 2017; Ruslandi et al., 2014).

Another concern related to the establishment of timber plantations that are addressed through a special standard under the PHPL scheme. In Indonesia, timber plantation permits should only be issued on degraded forest land. However, it has been acknowledged that the establishment of forest plantations may involve the conversion of forests (RoI, 2016). Once a timber plantation permit is issued, there is no need to demonstrate that the timber plantation was not established following the conversion of natural forests under the PHPL. Voluntary certifications such as FSC in that case require that *“Plantations established in areas converted from natural forests after November 1994 shall not qualify for certification”* (FSC, 2015, p. 15) to avoid that the purpose of the plantation establishment involves clear-cut deforestation.

Under the SVLK, the fourth legality standard, moreover, defines the standards for the ‘timber utilization rights within non-forest zones on state-owned lands’. They apply to the so called ‘Izin Pemanfaatan Kayu (IPK) permit’. IPK permits are required when clearing forested land and are required for the conversion of forests to other land uses, for example, for oil palm plantations or mining. In other words, timber that originates from clear cut areas can legally be supported to the EU market under the FLEGT licensing scheme.

How much wood of this conversion timber is exported to the European market is unknown. This is due to the fact that there is currently only limited information available on IPK timber and no information on the amount of timber that originates from conversion areas and is exported.

5.3.5 Criterion 5: Forest biological diversity

5.3.5.1 Outputs/limitations related to biodiversity conservation in production forests

Under the SVLK regulations there are no explicit criteria that require biodiversity conservation at the concession level. Social and environmental issues are, however, indirectly referred to through SVLK criterion 4 of the legality standard for concessions within production forest zone: *“Compliance with environmental and social aspects related to timber harvesting”* (EC, 2015, p. 44). The criterion requires permit holders to possess an approved applicable EIA document and to implement measures identified in it.

⁷⁷ See chapter 3.5.

The PHPL scheme includes an ecological criterion that comprises set-asides for protected areas, forest protection to disturbances like forest fires, monitoring the forest management impact on soil and water, and biodiversity (flora and fauna) assessment and management which includes *inter alia* to identify protected, rare, endangered and endemic species.

The document analysis revealed that there is almost no information available about field level impacts of those indicators. The only analysed source that reported on these aspects was Maryudi et al. (2017), that reviewed PHPL certificates and found that related indicator 3.5: specific protection areas for endangered, rare, threatened and endemic tree species, and indicator 3.6 for wildlife, appeared to be problematic for concessionaires to implement. Maryudi et al. (2017) argued that this may indicate that “*activities in the production zones rarely take ecological aspects into consideration*” (p.175).

5.3.6 Criterion 6: Soil and water protection

The interview transcript and document analysis did not suggest any direct contributions to this criterion⁷⁸.

5.3.7 Criterion 7: Economic, social and cultural aspects

5.3.7.1 Outputs/limitations related to the economic aspects of forests

The MFP carried out a number of activities to support small-scale timber businesses outside the focus area in Java (not included in the following) and some others that were not closer specified, among those (MFP, 2017):

- Financial and technical support to SMEs with the result that 525 SMEs were certified during the MFP3 period
- MFP3 assisted community-based forestry enterprises in developing business proposals for the ‘Environmental Fund Management Agency’

Interviews with forest concessionaires and forest management trainers indicated that local forest management enterprises did not profit from any increasing market. They all stated that they had not received any premium prices through the certifications.

5.3.7.2 Outputs/limitations related to resolving disputes between forest stakeholders

The standards of the SVLK and PHPL certifications that apply to forest permit holders comprise a number of aspects that are relevant for ITTO criterion 7 but also hold important limitations.

For example, there is no direct reference to land use conflicts or customary rights in the legality standards under the Indonesian TLAS. For concessions within production forest zones on state-owned land, social aspects, as well as environmental aspects, are dealt with through EIAs.

For areas covered through legality standard four, that is, ‘the standard for timber utilization rights within non-forest zones or from convertible production forest on state-owned lands’ (relates to timber from conversion areas, see Table 6) the following principles are required (EC, 2015):

- Legal status of area and right to utilize
- Compliance with legal systems and procedures for tree harvesting and for the transportation of logs
- Compliance with labor laws and regulations

No other social requirements exist to obtain a legality certificate in those areas.

Under the PHPL scheme there are a number of indicators that relate to tenure and user rights of indigenous people and local communities. Related indicators comprise Indicator 1.1 on tenurial clarity and security of the forests, Indicator 1.5 on FPIC and Indicator 4.1 on clear delineation and marking of

⁷⁸ See 5.3.5.1 for indirect contributions and limitations in terms of environmental impacts of the PHPL implementation.

the forest area from indigenous people or community lands. Given their adequate implementation, the Indonesian VPA could indirectly contribute to these aspects of sustainability but neither reviewed documents nor interviews suggested a substantial impact on those issues. Rather, the review of the PHPL regulation by the study author revealed that the verifier that relates to tenurial clarity (verifier 1.1.3.) is a co-dominant verifier⁷⁹. Apart from that, field observations and interviews suggested that it was very unlikely that all of the concessions that had obtained a PHPL certificate, and consequently passed those indicators or verifiers, were actually free from tenurial conflicts (relates to indicators 1.1 and 4.1) and had implemented FPIC (relates to 1.5). One of the FMU staffs working in Berau accordingly stated that there were many ongoing conflicts over land in the Berau District despite the fact that all active HA concessions were certified by the time of interview conduction.

This was also supported by the second monitoring report of the Independent Monitoring published in 2018, where the majority of the 17 monitored natural forest and timber concessions that had obtained PHPL certifications, showed non-compliance with verifiers related to the clarity over land tenure with communities (indicator 1.1: Tenurial clarity and security of the forests, and here specifically verifier 1.1.3: stakeholders' recognition of IUPHHK in forest area (BATB)). Frequent shortcomings were also found in the 'dominant verifier' 4.1.2: Mechanism for participatory boundary delineation/reconstruction and boundary conflict resolution is available.

Maryudi et al. (2017) showed from their reviewed audit protocols that a high proportion of concessions scored the best grades on the 'pre-condition indicator' 1.1 and 'social indicators' 4.1 and 4.3. However, they were "*cautious in drawing a conclusion on the PHPL's audit results*" (p. 173) against the background of the high occurrence of overlapping land uses in Indonesia. They argued that those results were likely explained by the audit procedure that was solely based on the availability of licenses and documents (Maryudi et al., 2017). Maryudi et al. (2017)'s analysis, moreover, revealed that auditors used EIA documents and environmental management plans to verify FPIC (indicator 1.5).

5.3.7.3 Outputs related to labor rights and equitable benefit resolution

Through other criteria and indicators, the FLEGT-VPA strengthened procedures related to the health and safety of forest workers. Relevant indicators under the SVLK criterion 5: Compliance with labor laws and regulations, of the legality standard in production forests are:

- Availability of occupational safety and health procedures and their implementation
- 5.1.2 Freedom of association for workers
- 5.1.3 Existence of collective labor agreements
- 5.1.4 Company does not employ minors/underage workers

Indicators 5.1.2 and 5.1.3 refer, however, to company policies and policy documents rather than their implementation.

The PHPL system in production forests stipulates wider standards in relation to the equitable sharing of benefits of forest management, conflict resolution mechanisms and labor rights that are thus indirectly strengthened through the VPA implementation, they include:

- 4.2 Corporate social responsibility programs
- 4.3 Mechanisms and implementation of fair and equitable benefit distribution
- 4.4 Reliable conflict resolution mechanisms and their implementation
- 4.5 Labour rights, their protection and the improvement of workers' prosperity

5.3.7.4 Outputs related to village forest management rights

As part of the VPA process in Indonesia, the MFP supported activities related to village forest management rights on the subnational level, among them the process of obtaining social forestry licenses through public awareness campaigns on the community level and the issuance of social forestry permits. In total, during MFP phase 3, social forestry permits covering a total area of 328,145.19 ha have been issued by the MoEF in Indonesia (MFP, 2017). There was no information available on the location of these permits in analysed documents.

⁷⁹ See chapter 3.5 on issue of dominant and co-dominant verifiers in PHPL scheme.

5.4 Forest loss on the concession level in Berau

This chapter provides the results of the analysis of remote sensing data on forest loss to answer research question 2.1 ‘Do national forest certification schemes under a FLEGT-VPA contribute towards a reduction in forest loss on the concession level?’

First, forest loss results for the entire forest concession area spanned by the 18 concessions under investigation, hereafter referred to as the ‘HA-area under investigation’, for the time 2001 to 2016 are presented. This is followed by the forest loss results of the single concessions. Subsequently, forest loss between 2001 to 2016 is related to the certification status of the concessions under investigation.

Overview of concessions

Of the 21 concessions in Berau, 18 concessions were integrated into the analysis. The remaining three were sorted out because they were inactive or lacked information on their certification history by the time of data collection.

Most of the concessions obtained their concession permit in 2001 or earlier. Only four concessions obtained their permit later than 2001. Those four concessions consequently showed a different baseline year. Table 23 outlines basic information about each of these 18 concessions. The ‘concession size’ correspond to those outlined in the current concession permit decree given in the spatial data set. Because not the entire concession necessarily lied within the Berau District but stretched over more than one district, the actual concession size within the Berau District differed from the size outlined in the permit decree in respective cases. The concessions’ forest cover within Berau boundaries was calculated based on the forest cover base map of 2000 and ranked between 6,730 ha and 129,199 ha for a single concession. Total forest cover in 2000 within the HA-area under investigation was 723,205 ha.

Table 23: Basic information of incorporated concessions in Berau District. Baseline = 2001 for all concessions that obtained their permit before 2001, or year of concession permit issuance; concession size as of permit decree; forest cover within concession boundaries in Berau calculated based on forest cover base map of 2000; LK = timber legality certificate; PHPL = PHPL certificate.

Concession no	Permit date	Concession size [ha]	Forest cover [ha]	PHPL issued	LK issued	Base-line
1	1999	42,700	37,845	2017	2013	2001
2	1999	43,680	45,647		2015	2001
3	2000	35,886/30,170	24,340		2016	2001
4	1997	79,899/74,980	6,730	2010		2001
5	2006	138,210	129,199	2010		2006
6	1993	70,700	64,801	2011		2001
7	1993	10,6020	67,787	2013		2001
8	1993	55,604	23,465	2013		2001
9	1999	49,123	46,733	2014		2001
10	1988	66,554/50,400	8,571	2013		2001
11	1999	46,080	53,537	2013		2001
12	2008	25,630	22,120	2013	2011	2008
13	2009	55,150	24,468	2016	2011	2009
14	1999	85,725	11,927	2013		2001
15	1990	63,550	64,513	2013	2013	2001
16	2005	49,250	39,718	2014		2005
17	1999	44,402	42,768	2017	2013	2001
18	2001	14,800	9,036		2015	2001
Total			723,205			

5.4.1 Forest loss in the entire natural forest concession (HA) area

In total 43,558 ha of forest – representing 22% of Berau’s total forest loss – were lost within the concession boundaries from 2001 to 2016 in the Berau District when considering all 21 concessions, no matter if concessions were inactive or not. Figure 36 shows this forest loss within the concession boundaries in Berau.

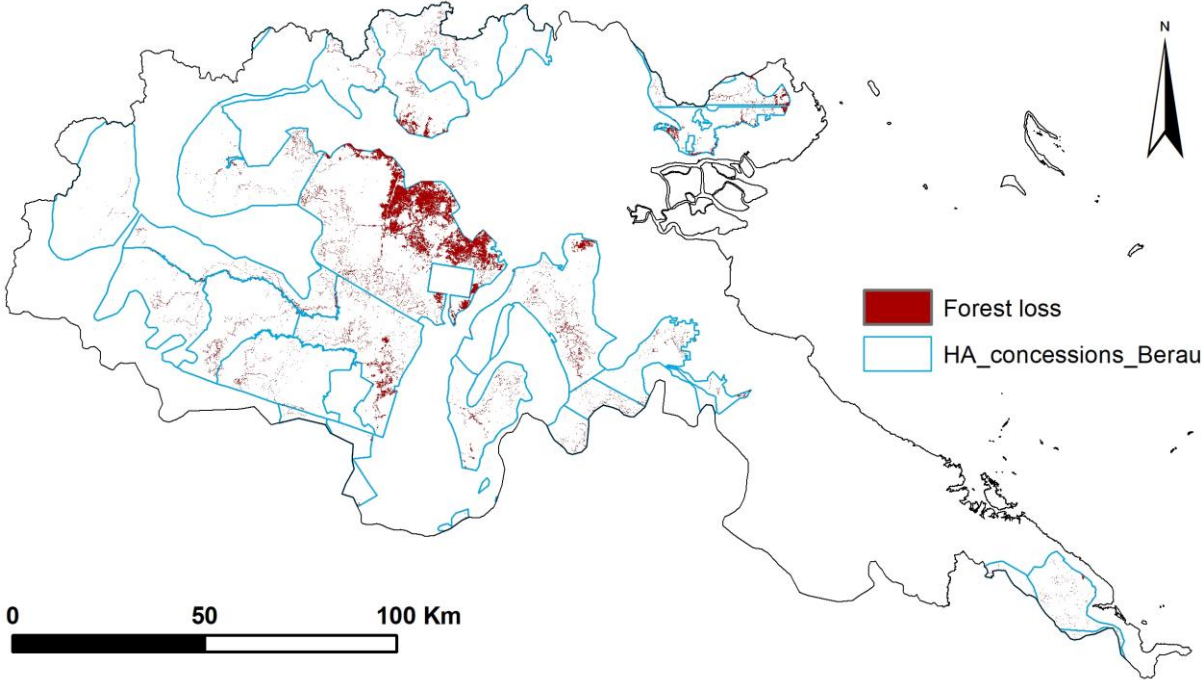


Figure 36: Forest loss in natural forest concession boundaries (HA) from 2001 to 2016 in Berau.

The area covered by the 18 concessions included in this analysis, see Table 23, showed a forest loss of 42,402 ha in the same period.

When taking into account that four concessions obtained their permits after 2001, total forest loss resulted in 39,160 ha, see Table 24, that represent 20% of Berau’s total forest loss from 2001 to 2016. This corresponds to 5.42% of the 2000 forest cover of the entire HA-area under investigation. This calculation only included the total annual forest loss in those concessions that already had a permit in the given year.

Table 24: Total forest loss within the concession area within Berau between 2001 and 2016. Regarding only those losses that occurred under a concession permit. ¹expressed as a percentage of the 2000 forest cover of the area covered by the 18 concessions within the Berau district.

Type of loss	Forest cover 2000 [ha]	Total loss [ha]	Total loss [% ¹]
Total	723,205	39,160	5.42
Of which			
Large-scale	/	22,600	3.13
Small-scale	/	16,560	2.29

On average 2,448 ha were annually lost in the HA-area under investigation when regarding only those losses between 2001 and 2016 under a valid concession permit in each given year, see Table 25. Annual losses ranged between 370 and 6,408 ha/year.

Table 25: Averages of annual forest loss of the concession area within Berau from 2001 to 2016. Regarding only those losses that occurred under a concession permit. ¹ expressed as a percentage of total forest cover in 2000 of the area covered by the 18 concessions within the Berau district.

Type of loss	Mean annual forest loss & range [ha]	Mean annual forest loss & range [% ¹]	Median annual forest loss [ha]	Median annual forest loss [% ¹]
Total	2,448 (370-6,408)	0.34 (0.05-0.89)	2,039	0.29
Of which				
Large-scale	1,413 (26-4,356)	0.2 (0-0.6)	1,218	0.17
Small-scale	1,034 (321-2,886)	0.14 (0.04-0.4)	741	0.1

Table 31 in Annex III, shows the forest loss in each of those 18 concessions expressed in hectare and as a percentage of a concessions' 2000 forest cover within Berau boundaries from their baseline year until 2016⁸⁰.

5.4.1.1 Separating small- from large-scale forest loss

In the analysis, small-scale forest loss (defined as loss ≤ 3.6 ha) was differentiated from large-scale loss (defined as ≥ 3.7 ha). The former was associated with harvesting activities like skid trails and felling gaps, and logging roads, the latter with forest conversion to other land uses.

Figure 37 and Figure 38 show the distribution of the small- and large-scale forest loss within the HA boundaries in Berau (21 concessions). Of the 43,558 ha that were in total lost in the 21 HA concessions in Berau, 18,072 ha were identified as small-scale loss and 25,486 ha as large-scale forest loss, respectively.

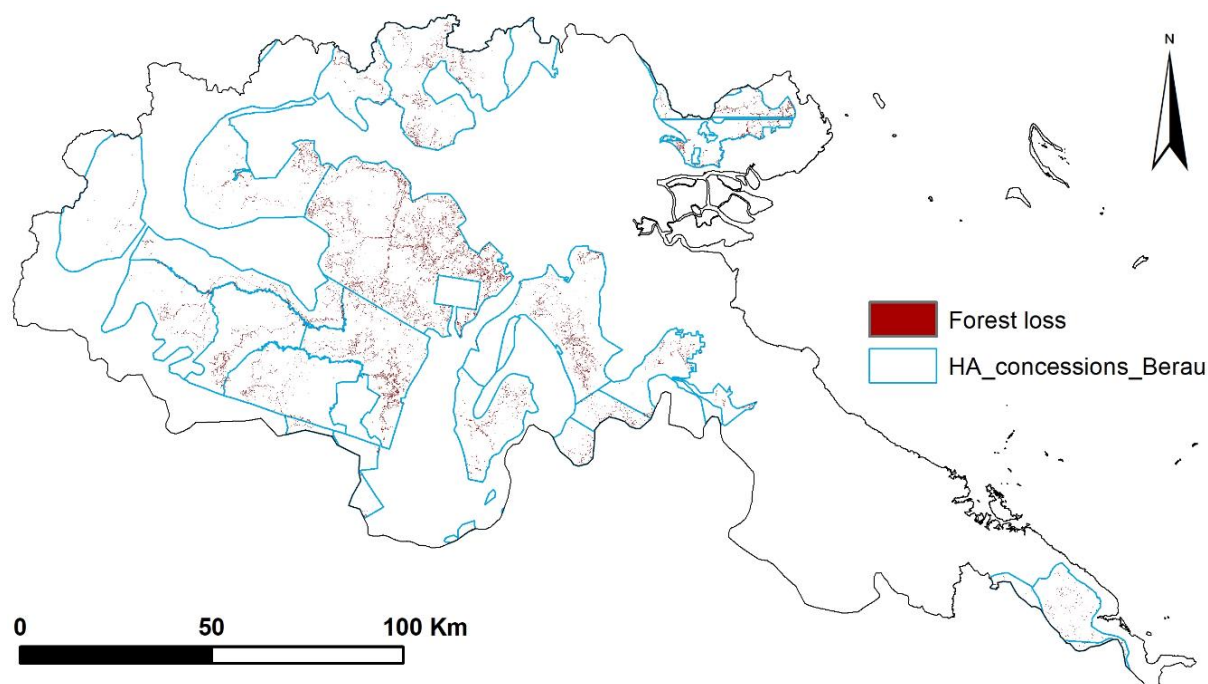


Figure 37: Small-scale forest loss in natural forest concession boundaries (HA) from 2001 to 2016 in Berau.

Small- and large-scale forest loss within the HA area covered by the 18 in the analysis integrated concessions – the HA area under investigation – resulted in 16,560 ha and 22,600 ha, respectively, see Table 24. These represent 2.29% and 3.13% of the total forest cover of the HA-area in 2000 that were lost between 2001 and 2016, respectively.

On average in the HA-area under investigation, 0.14% forest was lost annually due to forest management activities (small-scale forest loss) and 0.2% due to forest conversion (large-scale forest loss), see Table 25.

⁸⁰ See also chapter 5.4.2.

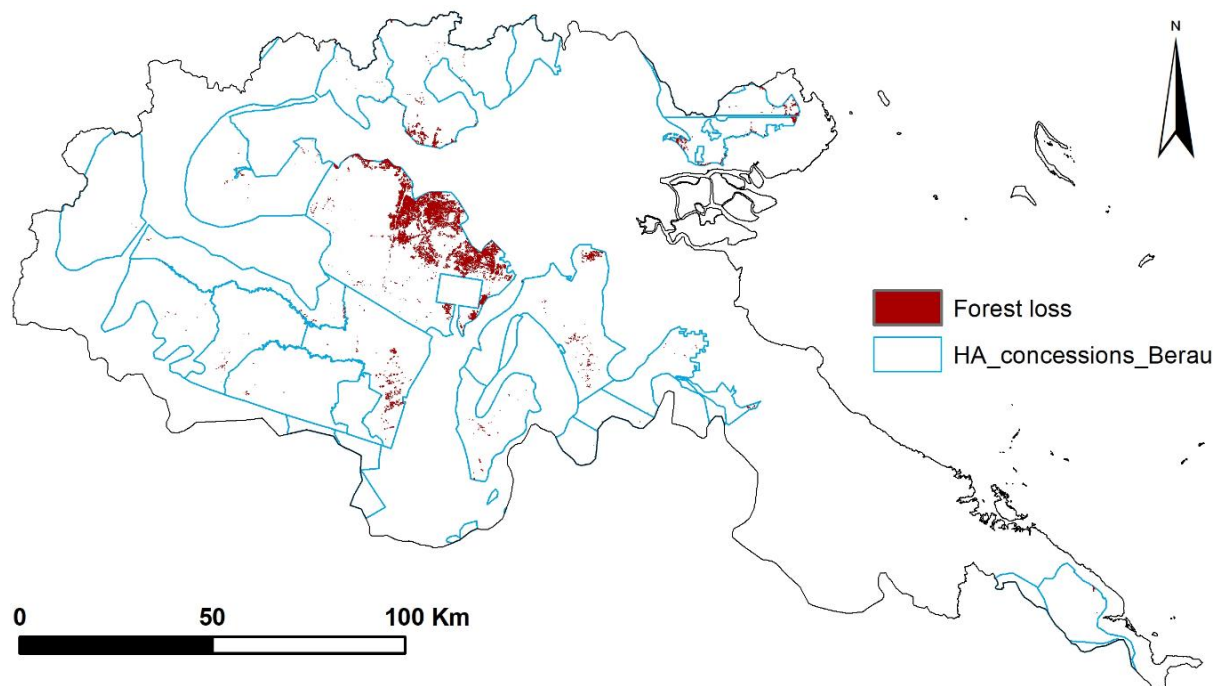


Figure 38: Large-scale forest loss in natural forest concession boundaries (HA) from 2001 to 2016 in Berau.

5.4.2 Forest loss in single HA concessions

This chapter presents the forest loss dynamics from 2001 (or their baseline year) to 2016 of the single HA concessions, independent of their certification status.

The single forest loss values for each of the 18 concessions are presented in Table 31 in Annex III. Highest total forest loss between the baseline year and 2016 was 23,749 ha (within 11 years). The lowest total forest loss observed was 84 ha (within 16 years).

It has to be noted that the total forest loss-values of the single concessions in refer to unique concession sizes. The calculation periods might have, moreover, varied depending on the baseline year. The last column indicates this, that is, how many years entered the analysis (baseline year to 2016). More informative is, therefore, the percentage that was lost annually of a concessions' 2000 forest cover.

On average a concession within the Berau District boundaries lost 0.22% per year, ranging from 0 to 3.49%, of its 2000 forest cover between its baseline year and 2016.

Figure 39 shows the distribution of annual forest losses of the 18 concessions [expressed as a percentage of a concessions' 2000 forest cover] from 2001 to 2016. Annual forest losses tended to increase.

Figure 40 shows the individual forest losses per year and concession expressed as a percentage of the concessions' 2000 forest cover from 2001 and 2016 also indicating when each concession obtained its certification(s).

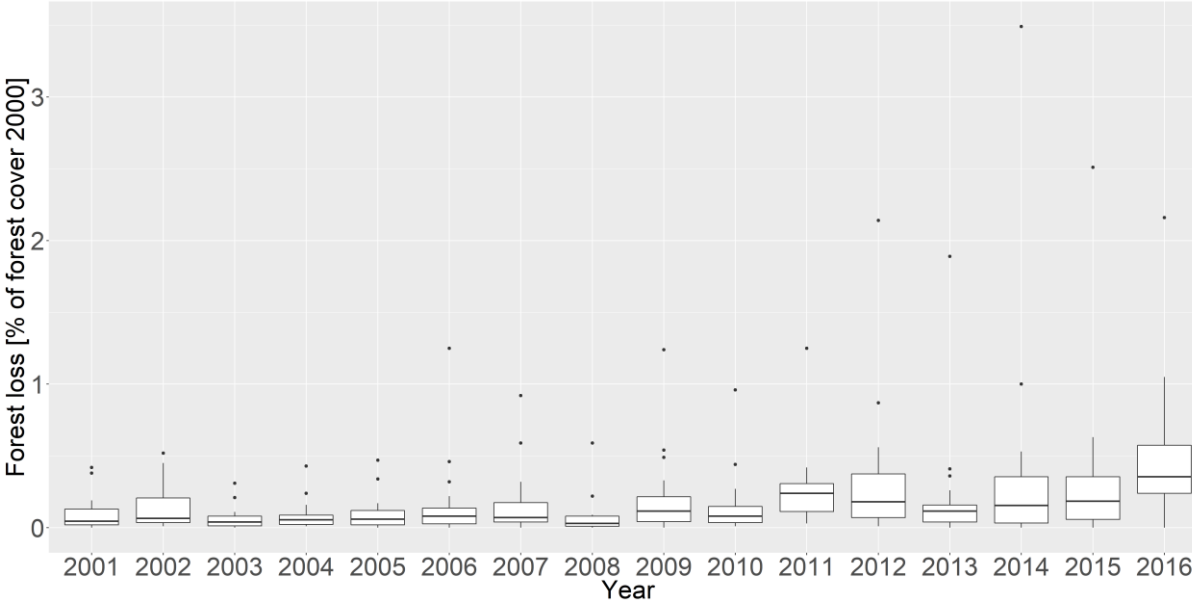


Figure 39: Distribution of annual forest loss expressed as a percentage of a concessions’ 2000 forest cover of the 18 concessions under investigation.

5.4.2.1 Separating small- from large-scale forest loss

Table 32 and Table 33 show the results of the 18 concessions when separating forest loss into small- and large-scale losses.

On average a concession within the Berau District boundaries lost yearly 0.13%, ranging from 0 to 0.72%, forest associated with forest management activities of its 2000 forest cover (small-scale losses) and 0.09%, ranging from 0 to 2.9%, associated with forest conversion (large-scale losses) between its baseline year and 2016.

Figure 41 shows the range of yearly losses of the 18 concessions associated with small- and large-scale loss [expressed a percentage of a concessions’ 2000 forest cover]. Annual small-scale loss (associated with forest management activities) was generally higher than annual large-scale forest loss (associated with forest conversion). From 2011 to 2016 large-scale losses in individual concessions were highest.

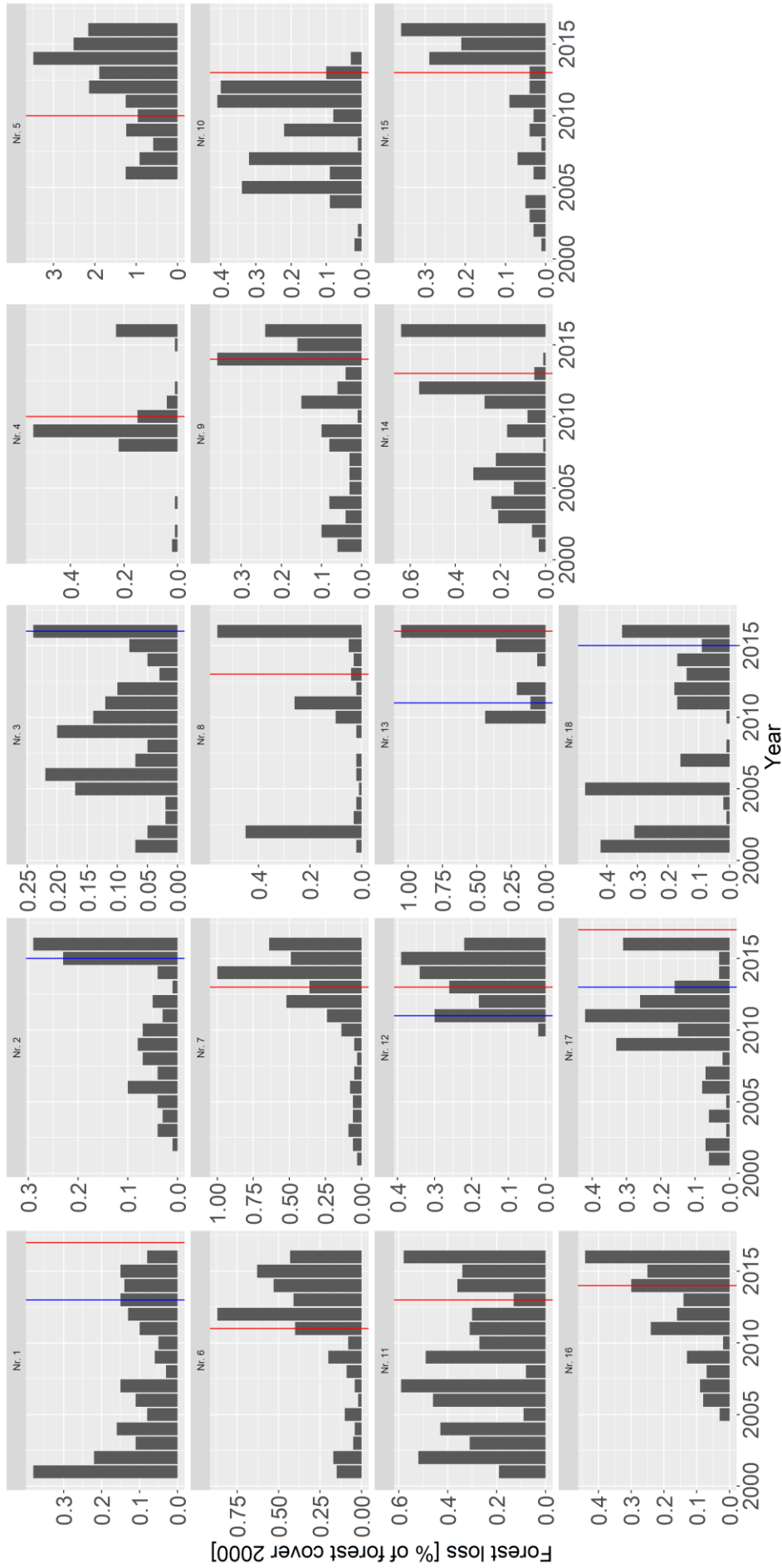


Figure 40: Annual forest loss expressed as a percentage of a concessions' 2000 forest cover from 2001 and 2016 of the 18 concessions under investigation. Blue intercept = year of legality certification; red intercept = year of PHPL certification; y-scales vary; concession no. 5, 12, 13 and 16 obtained their permission after 2001, annual forest loss in those years was not calculated.

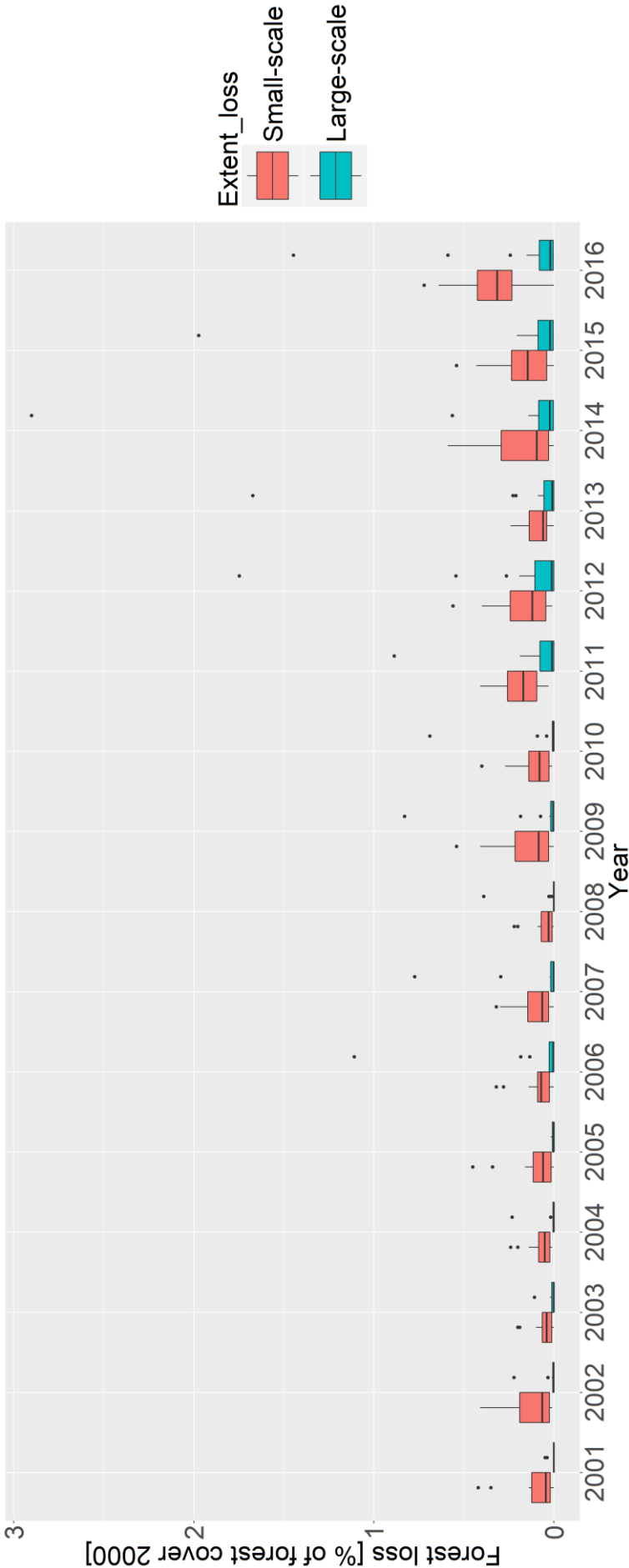


Figure 41: Annual small- and large-scale forest loss expressed as a percentage of a concessions' 2000 forest cover of the 18 concessions under investigation.

5.4.3 Forest management certifications in Berau

To see the effects of the legality and PHPL certification schemes on a reduction in forest loss, forest loss from 2001 to 2016 within the HA-area in Berau was analysed in consideration of the certification states of single concessions.

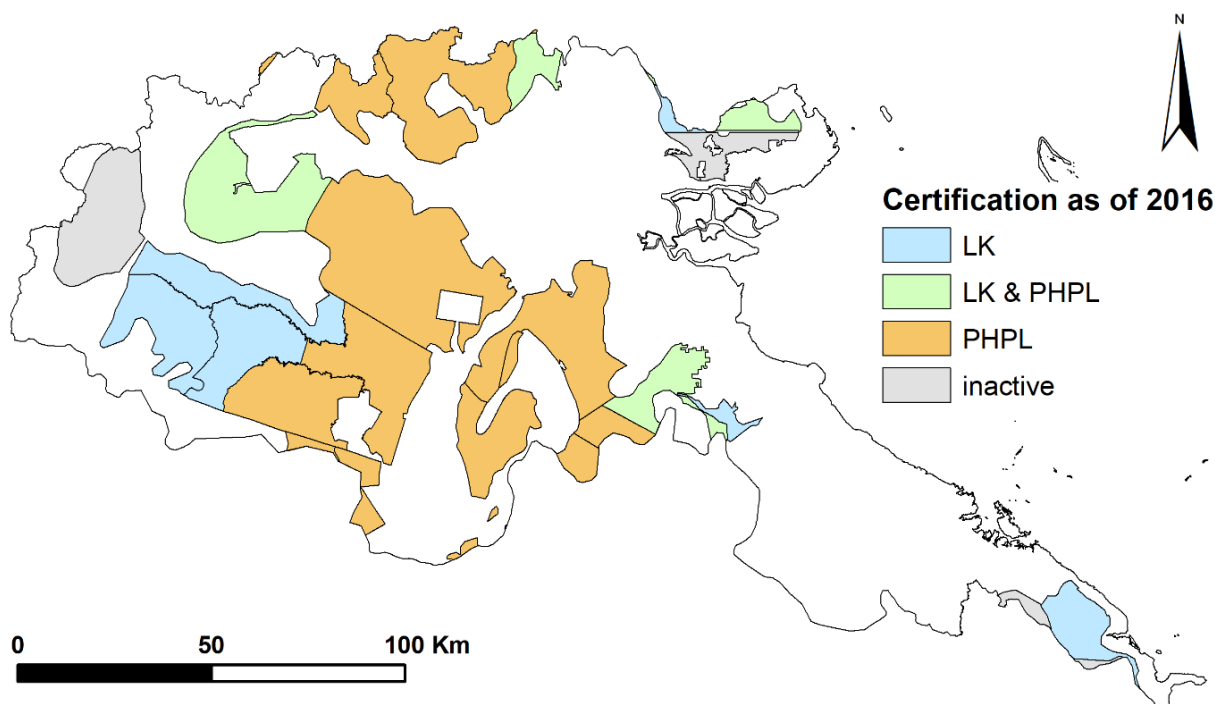


Figure 42: Natural forest concessions and their certification status as of 2016 in Berau. Concessions had obtained only PHPL or legality (LK) certifications or had first obtained a LK and later a PHPL certification (LK & PHPL); inactive = inactive concession or unknown certification status.

Most of the 18 concessions obtained their first certification in 2013 or later, see column four and five in Table 23. In 2016, 13 concessions were PHPL certified while five concessions hold a legality certificate. Eight of the 18 concessions first obtained a legality before they obtained a PHPL certificate. The concession 15 obtained both certifications in 2013. The time after 2013, was consequently regarded as a ‘PHPL period’. Figure 42 shows the certification status as of 2016 of the single concessions.

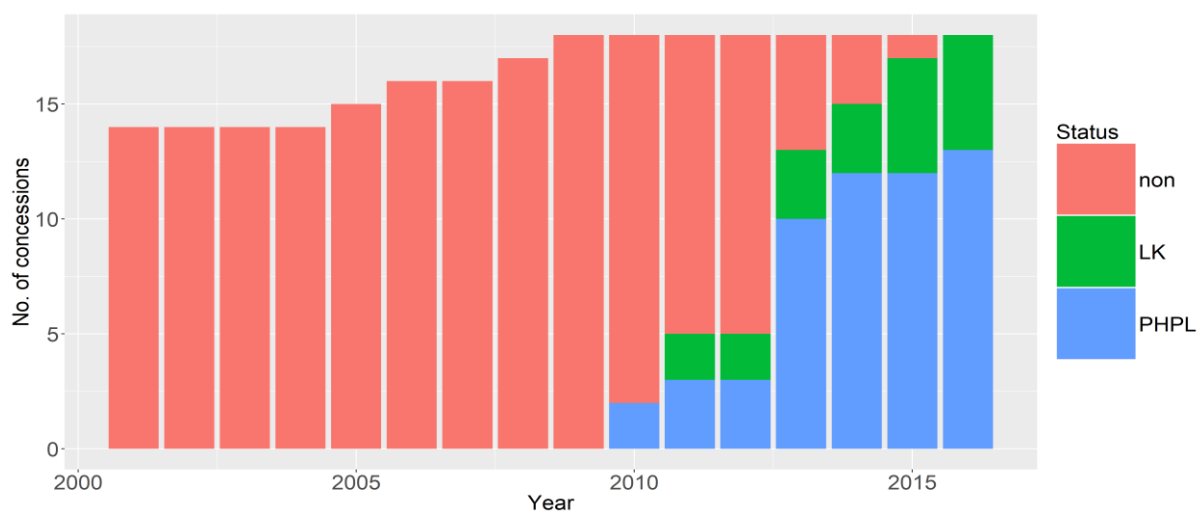


Figure 43: Number of concessions for each certification status between 2000 and 2016. Non = without forest certification; LK = with legality certification; PHPL = with PHPL certification.

Figure 43 shows the number of concessions that hold PHPL and legality certificates in each year and those that had not obtained any certification and were consequently classified into the ‘reference period’. As a consequence, the respective sizes of the total HA-area of the certification and reference periods varied each year depending on the concessions that “newly” entered the certification period, that “dropped” out of the reference period or changed from the ‘legality’ to the ‘PHPL status’.

In total, during the reference period (those years and concessions without a certification), 12,814 ha were lost. During the legality and PHPL certification period in total 1,051 ha and 25,296 ha were lost, see Table 26. It has to be noted that these hectare values cannot be compared between the different certification states because of their different number of observations.

Table 26: Total forest loss of the reference (period without certification), legality (LK) and PHPL certification period between 2001 and 2016. Regarding only those losses that occurred under a concession permit.

Type of loss	Certification status	Total loss [ha]	N observations
Total	Reference	12,814	189
	LK	1,051	20
	PHPL	25,296	55
Of wich			
Large-scale	Reference	5,566	189
	LK	174	20
	PHPL	16,860	55
Small-scale	Reference	7,247	189
	LK	877	20
	PHPL	8,436	55

5.4.4 Forest loss by certification status

Table 34 and Table 35 in Annex III summarize the total and average annual forest loss of all 18 concessions by certification state. Annual forest loss values expressed as a percentage of a concessions’ forest cover of 2000 can be compared between the different certification states of a single concession and among the 18 concessions.

Table 27: Averages of annual forest loss of a concession by certification status between 2001 and 2016 in Berau. Non = period without certification (reference period); LK = legality certification period; PHPL = PHPL certification period. Regarding only those losses that occurred under a concession permit.

Certification status	Mean annual forest loss and range [%]	Median annual forest loss [%]	N observations
Non	0.14 (0-1.25)	0.07	189
LK	0.17 (0-0.36)	0.16	20
PHPL	0.52 (0-3.49)	0.34	55

On average a concession lost 0.14% of its 2000 forest cover during the reference period annually. This corresponds to a median of 0.07%, see Table 27. Annual forest loss values of the concessions ranged from 0 to 1.25% of its 2000 forest cover.

In the legality and PHPL periods, annual forest loss of a concession was on average 0.17% (median = 0.16%), ranging from 0 to 0.36%, and 0.52% (median = 0.34%), ranging from 0 to 3.49, of its 2000 forest cover, respectively. Figure 44 shows the distribution of annual forest losses among the non-certified and certified concessions expressed as a percentage of its 2000 forest cover.

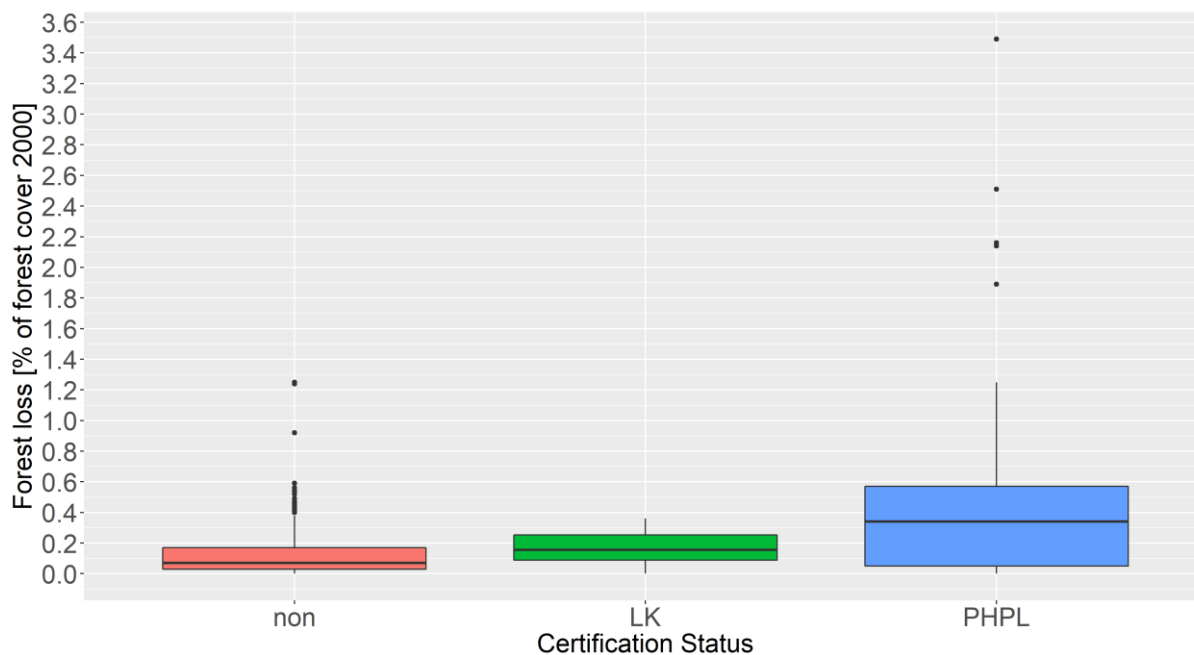


Figure 44: Annual forest loss expressed as percentage of a concessions' 2000 forest cover by certification status from 2001 to 2016 of the 18 concessions under investigation; non = without certification LK = with legality certification; PHPL = with PHPL certification.

Average annual forest loss appeared to be highest during the PHPL period and slightly higher in the legality certification than during the reference period. Yearly losses, moreover, varied more during the PHPL period than during those of the reference and legality certification period. Figure 40, that presents the individual forest losses per year and concession expressed as a percentage of the concessions' 2000 forest cover from 2001 and 2016, reveals that about half of the concessions showed an increasing forest loss trend during the last years under investigation which roughly coincided with the date of certification obtainment.

Figure 45 shows the range of forest losses of all concessions in each year between 2001 and 2016 by certification status. For example, the red boxplot in 2002 shows the distribution of the forest loss in the year 2002 of all concessions that had not obtained any certification by that time. As can be seen, annual forest loss among the concessions varied markedly from 2010 coinciding with the certification periods. Concessions without a certification, moreover, showed a relatively stable forest loss distribution from 2010 onwards while annual forest loss appears to be higher in the legality and PHPL periods. No causality between the forest losses and certification states are made.

Figure 46 illustrates the difference in the annual forest loss of each single concession from their certification period(s) to their reference period, that is, it shows how much smaller or larger the annual forest loss in the certification period was in comparison to the reference period.

Of the seven concessions that had obtained a legality certificate at some point, five concessions showed a higher mean annual forest loss in the certification period than in the reference period. Of the 13 PHPL certified concessions, 10 concessions showed a higher, partly very pronounced, mean annual forest loss in the certification period.

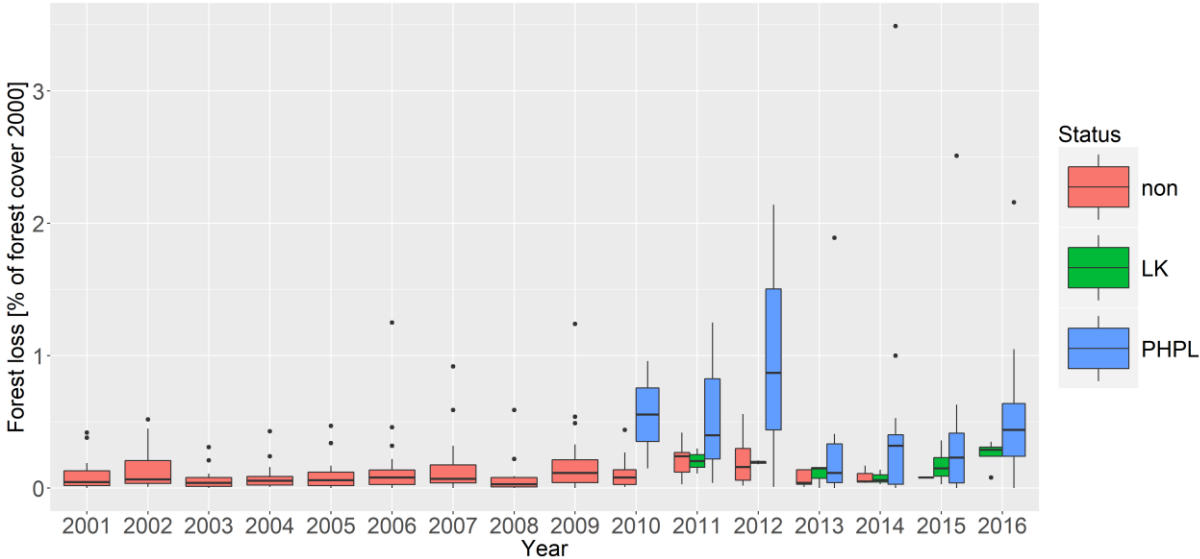


Figure 45: Distribution of annual forest loss expressed as a percentage of a concessions’ 2000 forest cover among the 18 concessions by certification status. Non = without certification; LK = with legality certification; PHPL = with PHPL certification.

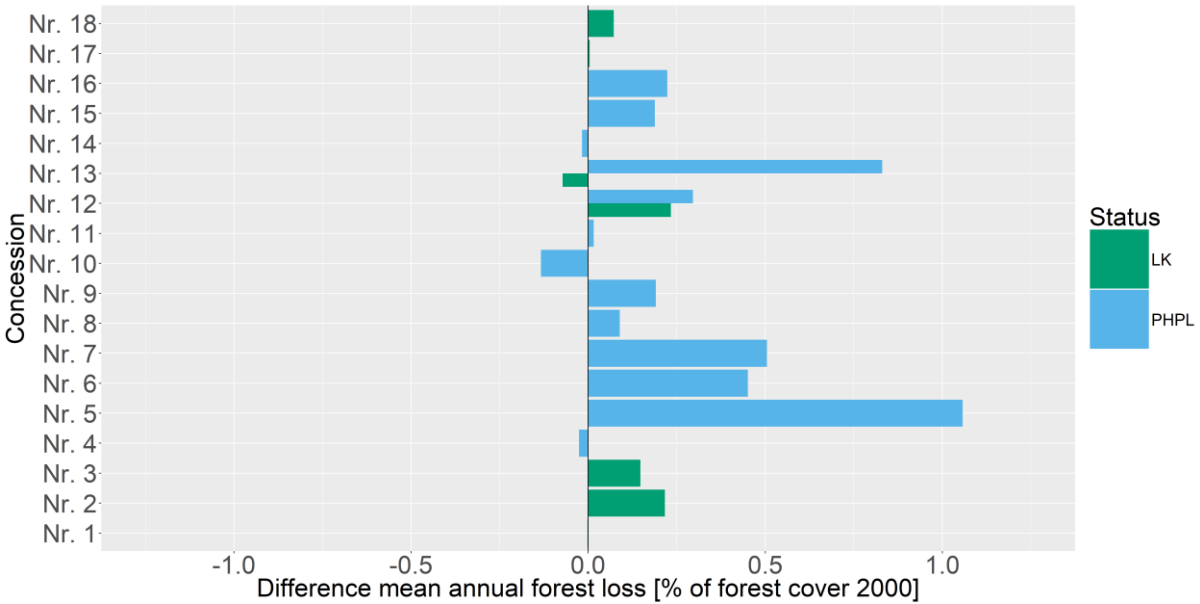


Figure 46: Difference in the mean annual forest loss (expressed as a percentage of a concessions’ 2000 forest cover) between the certification period(s) and the reference period of the 18 concessions under investigation; LK = with legality certification; PHPL = with PHPL certification.

5.4.4.1 Small- and large-scale forest loss by certification status

To take into account that the certification schemes under investigation would rather contribute towards a reduction in forest loss associated with forest management activities (small-scale loss) than with losses associated with forest conversion (large-scale loss), in the following, results of the separation into small- and large-scale forest loss are presented.

In total, in the reference period, 7,247 ha associated with small-scale forest activities and 5,566 ha associated with large-scale activities were lost (Table 26). Within the legality certification

period, in total 877 ha classified as small-scale and 174 ha classified as large-scale forest loss were lost. In the PHPL period, in total 8,436 ha small-scale and 16,860 ha large-scale forest loss occurred.

Table 28: Averages of annual small- and large-scale forest loss of a concession by certification status between 2001 and 2016 in Berau. Non = period without certification (reference period); LK = legality certification period; PHPL = PHPL certification period.

Type of forest loss	Certification status	Mean annual forest loss and range [%]	Median annual forest loss [%]	N observations
Large-scale	Non	0.035 (0-1.11)	0.0008	189
	LK	0.034 (0-0.21)	0.0061	20
	PHPL	0.28 (0-2.9)	0.026	55
Small-scale	Non	0.1 (0-0.56)	0.06	189
	LK	0.14 (0-0.31)	0.12	20
	PHPL	0.24 (0-0.72)	0.23	55

On average a concession lost annually 0.1% (median = 0.06%) of its 2000 forest cover due to forest management activities, ranging from 0 to 0.56% in the single concessions (Table 28), and 0.035% (median = 0.0008%) due to forest conversion, ranging from 0 to 1.11%, in the reference period (Figure 47). In the legality certification period, this was 0.14% (median = 0.12%) and 0.034% (median = 0.0061 %), respectively. In the PHPL certification period, a concession lost annually 0.24 % (median = 0.23%) of its 2000-forest cover defined as small-scale forest and 0.28% (median = 0.026%) defined as large-scale loss. Based on the median, annual small-scale losses in a concession were, thus, greater than annual large-scale losses.

Relating the losses to the certification status (Figure 47) reveals that annual small- and large-scale losses in a concession tended to be both largest during the PHPL certification period.

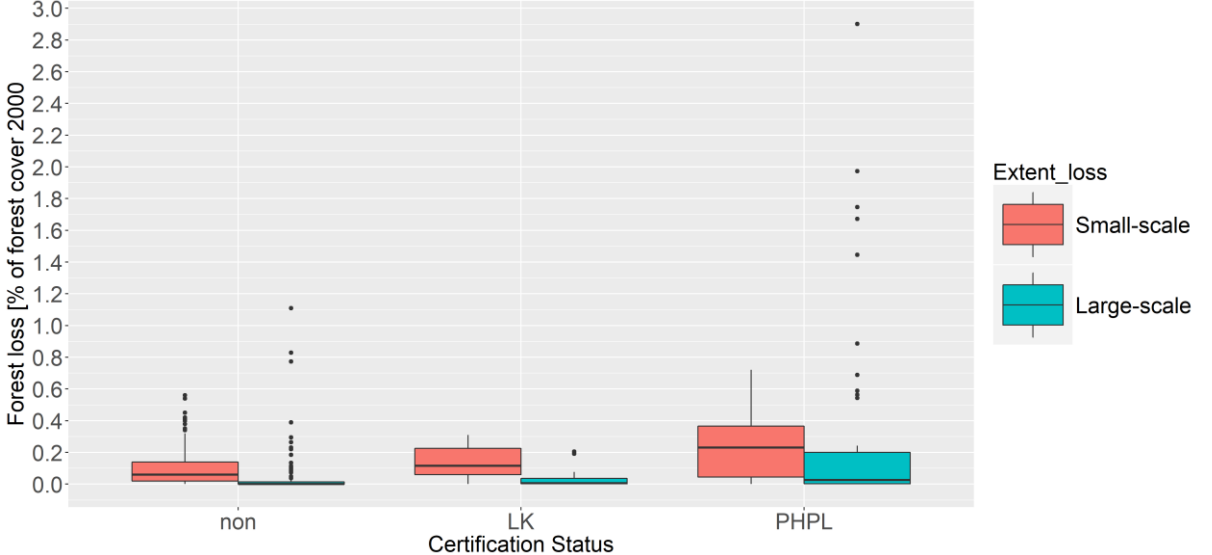


Figure 47: Annual forest loss expressed as a percentage of a concessions’ 2000 forest cover of the 18 concessions under investigation by certification status from 2001 to 2016; non = without certification LK = with legality certification; PHPL = with PHPL certification.

Figure 48 shows this annual small- and large-scale forest loss of all 18 concessions for each year between 2001 and 2016 by certification status. Again, annual small-scale forest losses during the certification periods tended to be higher than those of the reference period. Annual small-scale forest loss in the PHPL certification period showed a larger range of annual losses than both other periods.

The distribution of annual large-scale forest losses reveals that these annual losses were also lower in the reference period than in the certification periods. Annual large-scale loss was clearly highest in the PHPL certification period.

Small- and large-scale forest losses of each concession are summarized in **Figure 49** and Table 36 to Table 39 in Annex III. For a comparison between the different certification states of a single concession and among the 18 concessions, the annual forest loss values expressed as a percentage of a concessions' 2000 forest cover are to be used. Not all concessions showed large-scale forest loss.

Of the seven concessions that obtained a legality certificate, five concessions showed a higher mean annual small-scale forest loss in the certification period than in the reference period (**Figure 49**). Of the 13 concessions with PHPL certificates, 10 concessions showed a higher mean annual small-scale forest loss in the certification than in the reference period.

Of the seven concessions that obtained a legality certificate, five concessions showed a higher large-scale forest loss than in the reference period.

Of the 13 concessions that had a PHPL certificate, 11 concessions showed, although partly only very slightly, a higher mean annual large-scale forest loss than in the reference period.

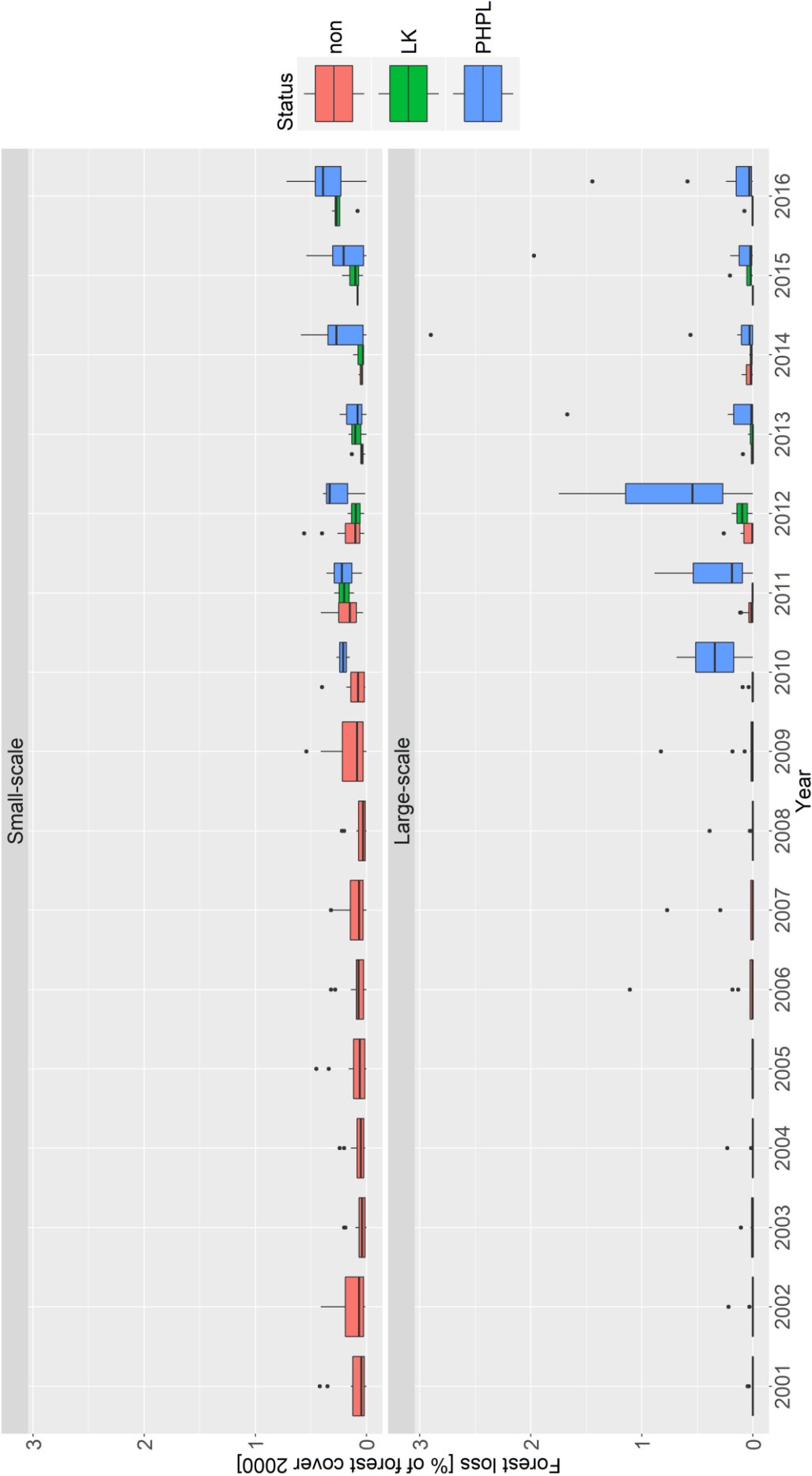


Figure 48: Distribution of small- and large-scale annual forest loss expressed as a percentage of a concessions' 2000 forest cover of the 18 concessions under investigation by certification status; non = without certification ; LK = with legality certification; PHPL = with PHPL certification.

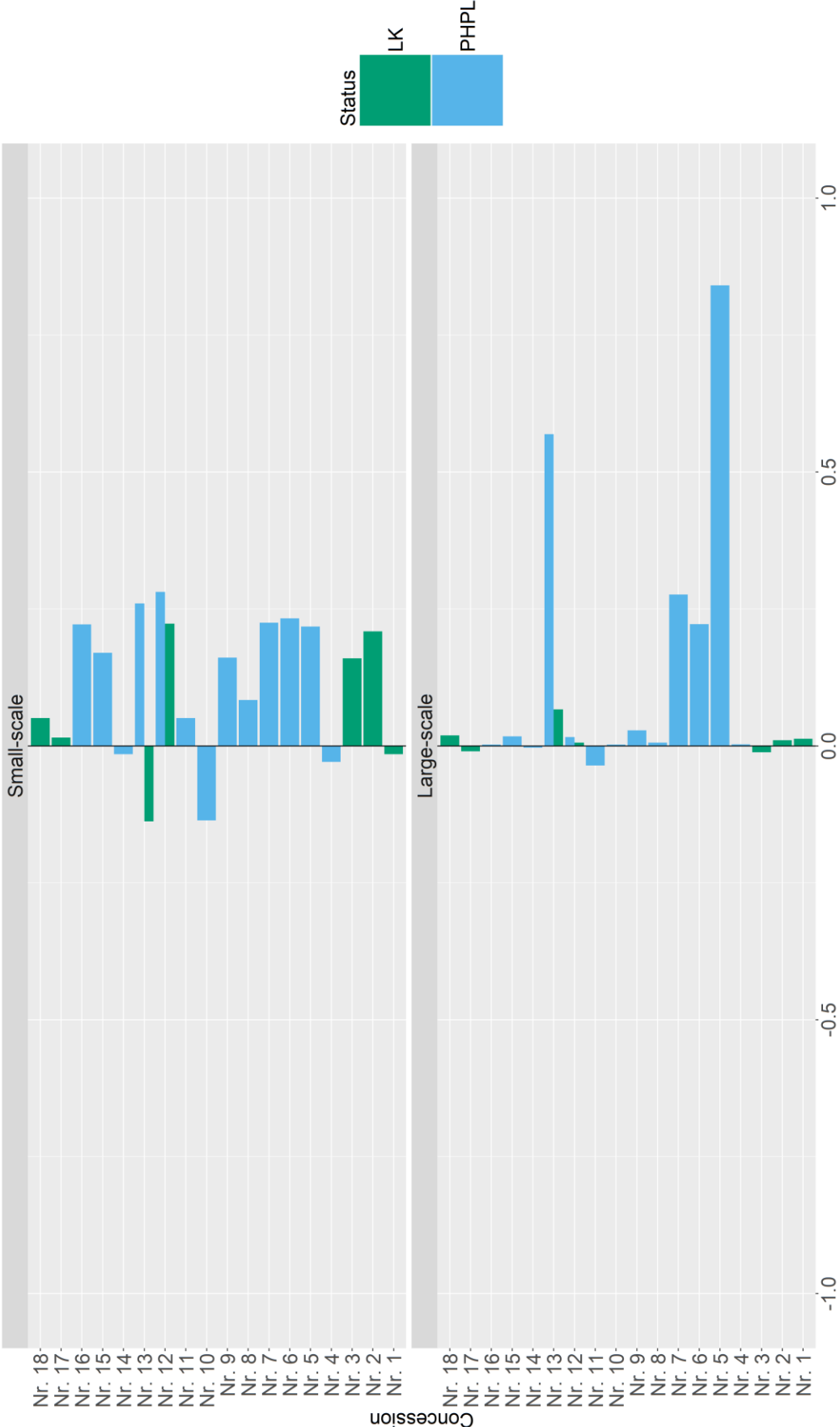


Figure 49: Difference in the mean annual small- and large-scale forest loss (expressed as a percentage of a concessions' 20000 forest cover) between the certification period(s) and the reference period of the 18 concessions under investigation; LK = with legality certification; PHPL = with PHPL certification.

5.5 Driving forces of and hindrances to the subnational REDD+ process

In the following driving forces of and hindrances to the subnational REDD+ process in East Kalimantan and the Berau District are presented to answer research question ‘What are the current driving forces of and hindrances to the subnational REDD+ implementation?’.

Each of the identified factor was related to the ‘institutional setting’ or the ‘REDD+ policy arena’⁸¹. Findings are summarized in Table 29 using a modified framework of Korhonen-Kurki et al. (2014).

Many of the identified driving forces and hindrances were interlinked. By choosing the presented structure, the speciality of each aspect could be highlighted.

In a first step the hindrances, meaning factors or conditions that hampered the subnational REDD+ process in the focus area, are outlined. Subsequently, those factors that drove the REDD+ process, meaning factors or conditions that enabled and fostered the process, are presented.

5.5.1 Hindrances to the subnational REDD+ process

5.5.1.1 Hindrances related to the institutional setting

Three main hindrances that relate to the institutional setting in which the REDD+ process in the focus area was placed were identified through the content analysis of REDD+ interview transcripts and key documents. These were: ‘national contradicting policies and strategies’, a ‘lack of a land use assessment’ and a ‘lack of capacity’. The first two factors specifically originated on the national level. The following describes the factors in more detail.

National contradicting policies and strategies

One of the challenges to achieving REDD+ objectives were the competing national land use strategies that support and foster the exploitation of East Kalimantan’s natural resources. An example is the economic development strategy that is laid down in the “Masterplan for Acceleration and Expansion of Indonesia Economic Development” (MP3EI) (Coordinating Ministry for Economic Affairs, Republic of Indonesia [RoI], 2011). Following this masterplan, Indonesia’s development is concentrated on six ‘economic corridors’. One of those is Kalimantan. The Kalimantan economic corridor is based on industries such as steel, bauxite, palm oil, coal, oil and gas, and timber. East Kalimantan plays an important role within this economic corridor as it harbours one of the highest coal reserves in Indonesia. To foster the development of these land-based industries, the national government plans the creation of appropriate incentives. An example are declarations to reduce spatial conflicts between coal mining and forestry.

Plans like this run contrary to those national policies and strategies that support a sustainable and low-emission development.

Lack of a land use assessment

A lack of clear information on land use rights was another aspect that hampered the achievement of REDD+ objectives in the focus area. The analysis of interview transcripts and key documents revealed that weak tenure, specifically the uncertainty over forest boundaries, contradicting cadastral maps and overlapping land claims, were aspects that drove deforestation in the focus area. In the Berau District, there consequently prevailed unresolved conflicts between formal and customary law and many overlapping industrial land use permits existed.

Another related problem was that regulations that stipulate who could theoretically take part under REDD+ (e.g. MoF Regulation No. P.36/Menhut-II/2009 or MoF Regulation No. P.36/Menhut-II/2009) could hardly be implemented due to a missing clarity over land and carbon rights.

⁸¹ See chapter 4.5.1.3 for definitions.

Lack of capacity

The analysis, moreover, revealed that there existed capacity gaps related to financial, human and time resources that hampered the effective implementation of national and subnational REDD+ policies in the focus area. Although East Kalimantan can be regarded as relatively well equipped, capacity constraints could still be observed on the provincial governmental, district, village and field level as described in the following.

Funding

The underfinancing of the forestry sector was one recurring aspect during the interviews and respondents uniformly complained about the limited available budget. For example, available state funding was perceived as so low by respondents that FMUs were hardly able to work in the field.

The REDD+ process has also suffered from limited state budget. In the focus area most of the available funding for REDD+ related issues came from international donors. They took over the role of filling financial gaps that the government was not able to fill. Limited financial support to REDD+ from the state budget was mainly explained by the absence of climate change issues in regional development plans that provide the legal basis for funding. Other explanations were the limited support from the parliament and from other sectors, and different economic priorities of those.

A REDD+ output that represented this challenge was the district REDD+ working group that suffered from the absence of funding for two years by the time of interview conduction in 2017. Formally, it should have been funded by the state.

Despite the financial gaps, respondents also pointed to a poor allocation of financial resources and saw the distribution and allocation of money and corruption as a closely related problem.

Human resources

A lack of human resources for local governmental officers, FMU staff, and staff to operate SIS REDD+, together with poor human capacities in the newly established REDD+ institutions, for example, expressed through a limited ability among REDD+ stakeholders to negotiate with the local government, were other restrictions mentioned on the working level in East Kalimantan and there especially in the Berau District.

A national leader of an international organization explained that situation as follows:

“[...] we [the organization] have been working now for 15 years in the Ministry, so basically training or some sort of support has been now such a density, that we would say the capacities on the management level in the Ministry [on the national level] are quite good, they are professional. The problem is then, you go on the working level, that again there are so many people, levels below that have not received any training, or basically educational levels are so low that implementing or delegating it’s an issue. [...] “I think the donor should realize that Jakarta is not Indonesia, and that these capacities and management or coordination capacities of the governance on province or district level, this is maybe 5 or 10 years behind. So, what you see here is Jakarta and Jakarta is a bubble. If you go down on province level and if you go down even on district level, these are different worlds and you cannot expect the same, let’s say, education, the same priorities, the same brilliance like a decision-maker in Jakarta from a person on the district level.”

His view was supported by findings on the village level in Berau.

Among the practical challenges on the working level in Berau raised by respondents entrusted with the implementation of REDD+ activities were cultural differences between NGO and community members and their different languages. Mainstreaming the idea of REDD+ was, moreover, perceived as a difficulty despite the fact that this was a prerequisite for establishing a local commitment among villagers. In this context, especially the deeply rooted livelihoods and life strategies, many of them unsustainable, constituted a barrier to overcome.

Interviews also revealed that the REDD+ process on the local level in a certain jurisdiction was often driven by one single person, so called “local champion”, that was influential in that area at a given time. While this could result in important progress, respondents highlighted the risk of the absence of a ‘network of influential people’, especially when this one local champion would leave at a given point and with him/her the whole progress of the last years.

Time resources

“Time” was a perennial problem mentioned among local and international organizations, especially in relation to the (short) project durations, as for example expressed by the following statement of an officer of an government-government organization that works on all three administrative levels:

“[...] So, you have 1.5 years of let's say deadlock, if you're a normal project of 2-3 years, what to do? What to do? I mean, we have the advantage, and I mean, that is also maybe for your BMEL recommendations: forget this short-term project! It does not work!”

5.5.1.2 Hindrances related to policy arena

Several hindrances related to the policy arena in which REDD+ developed were identified for the focus area. All of those were somehow related and influenced by each other. Figure 50 summarizes the identified factors and their interplay.

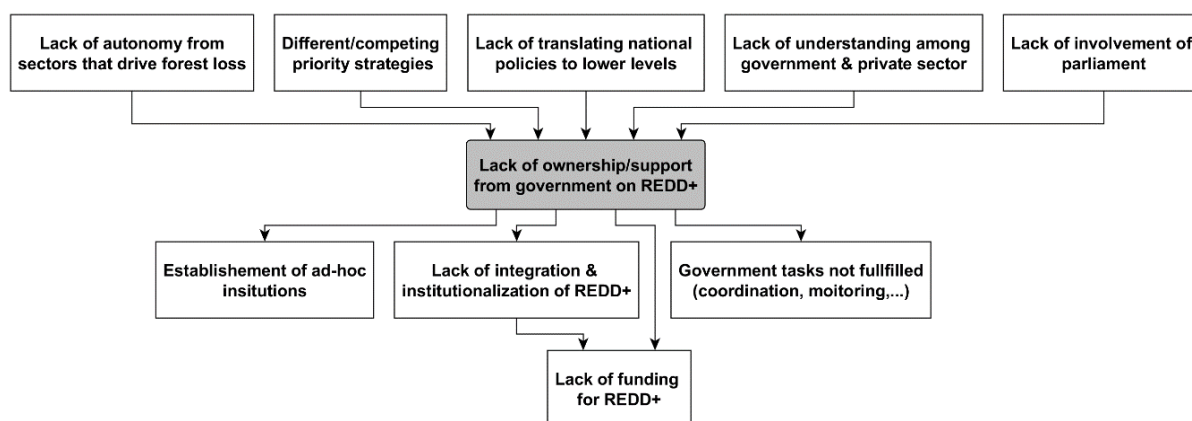


Figure 50: Interplay of identified hindrances related to the policy arena of the subnational REDD+ process in the focus area

The central issue for the limited success in achieving the envisaged emission reduction targets in both East Kalimantan and Berau were the limited governmental ownership and support in the REDD+ readiness process. This was especially apparent on the district level in Berau. A number of factors were identified that could explain this limited governmental support, among those the ‘limited understanding of climate change related issues among governmental members’ and the little autonomy from sectors that drive deforestation.

The little ownership and support in the REDD+ process in turn could explain the absence of important government tasks in relation to the REDD+ readiness process, among those the little guidance, coordination and monitoring. It could also explain the missing integration of REDD+ related strategies into regional development plans and its missing institutionalization to decision-makers until 2016. These aspects ultimately influence decisions over issues of land use planning and budget allocation, aspects that were not dealt with in favour of REDD+. A related risk of the missing integration and institutionalization was the dependence of the REDD+ readiness process on single political leaders and “local champions” that – once they resigned – jeopardized the long-term sustainability of the REDD+ process.

The single factors are in more detailed explained in the following.

Lack of governmental ownership and support

It was a common perception among interviewees that the limited progress of the BFCP on the district level was a result of the little governmental support. While the main ownership on REDD+ in the focus area, especially in Berau, lied among CSOs, the ownership from governmental actors and institutions was perceived “*as just too little*” to implement the strategic plan of the REDD+ program in Berau successfully. As a consequence, programs and activities officially supporting the BFCP were carried out individually following the objectives and interests of the individual organization rather than working towards a common BFCP strategy.

Although, governmental officials were initially represented in all newly established REDD+ institutions, respondents repeatedly mentioned that the political level had not sufficiently been involved in the BFCP process. This was also expressed by the following statement of a member of the provincial REDD+ working group:

“I mean the sense of belonging of the local government related to the strategic plan [the BFCP strategic plan] seems too weak. I mean, we feel that it is just for tasks of the working group or of that of the TNC. But it's not part of the product of the local government. That's why the support of the local government was, according to our opinion, very weak, or too limited in order to be able to implement whatever is mentioned in the strategic plans successfully.”

Stakeholders in this context reported that among the government and CSOs, the BFCP was frequently referred to as a “*TNC-thing*” – something that was also observed during the interviews. Respondents, for example, said, “*this is TNC's program*”. And in fact, study observations indicated that much of the information surrounding the BFCP lied among a few bigger organisations, especially TNC. There, it was concentrated among a few key persons that were highly important to drive the REDD+ process while respondents of other international organizations stated that they have never even read the BFCP strategy.

On the provincial level, especially the missing involvement of the parliament that hold decision making authority over financial matters, was mentioned a key obstacle to the REDD+ readiness process. The little ownership and support from the government on REDD+ in the focus area, was, therefore, also expressed by the available budget. In both East Kalimantan and Berau, budget was mainly from international donors but not from the state.

In the following, factors that can explain this little governmental ownership on REDD+ are outlined. In a next step, the consequences of this limited governmental support are closer described.

Lack of autonomy from sectors that drive forest loss and different interests

Many interviewees stated that land use permit issuance in favour of land use sectors such as the timber and oil palm plantation business, constituted a major threat to forests and, therefore, to the achievements of REDD+'s objectives.

It was for example widely perceived that political campaigns on the district level during periods of election were financially supported from such land use businesses. This low level of autonomy of district political leaders from the business sector was reflected by the following statement of a government official:

“The main, the major threat in East Kalimantan are coming from the deforestation, this is the biggest problem for us all [...]. And this deforestation, this is in our observation, this is related to politics. It's from the general election [...]. The candidates for the head of the district try to absorb [...], try to involve the investor [business sector] into getting [to get] the financial matters [...]. In compensation, the investor will get some land use permits to manage a certain area of the forest [...] whether in mining or in many cases issue big plantation, oil palm.”

The respondent referred to deals with oil and mining companies that were made to financially support the election campaign of district candidates while the business in turn received land use permits. The pursuit of other strategies such as the exploitation of East Kalimantan's resources or the infrastructure development, were enabled and driven through national strategies that conflicted with the idea of REDD+.

Poor understanding among and communication with government and non-forestry sector

The limited understanding of REDD+ and climate change related issues among stakeholders from the government and private sector both in the forestry and non-forestry sector was identified as another challenge to implement REDD+.

Some interviewees on the provincial level perceived the lack of involvement of the parliament, that is in charge of legislative and financial decision making, and their related limited understanding as one of the major weaknesses of the subnational REDD+ process in the focus area as the following statement shows:

“The weakness point is the understanding of so many stakeholders, especially who are already involved in the decision making, for instance like the legislative. I mean the parliament, the local parliament. I'd say most of the members of the parliament they don't really know about the REDD+ and also [not] about the climate change issues. But actually, they have the power in order to decide for instance the financial support.”

The limited involvement of the parliament was among other things explained by the communication and information flows that were rather built on personal relationships and networks by respondents. In contrast, mainstreaming the idea of REDD+ and climate change to those actors that were not directly involved in such aspects but hold decision making authority, was cited as a major problem:

“This [the lack of ownership of the government] is a kind of also, if I can say, our mistake in the civil society [...]. You try to avoid difficult people. So, you are working mainly with somebody who are easy to approach, [you are] comfortable with. But maybe they are not really influential, or maybe after several years they are going somewhere, and then you find out: ok, maybe at the time, you feel like you have succeeded at doing everything or achieved a lot. But it's only him who is working on that. So, when he's moving somewhere else then you start from zero”

In Berau, internal discrepancies between governmental officers and key players of the BFCP were mentioned as related challenges.

A lack of understanding about REDD+ and climate change among villagers was also very prominently reported from those interviewees involved on the community level, and for the non-forestry sector.

Lack of legal basis and authority

A related problem of the limited involvement of the parliament, was the fact that the newly established REDD+ institutions such as the DDPI on the provincial level, were established as ad-hoc bodies outside the traditional government structures. Their responsibilities should later be taken over by the government organizations. As an ad-hoc institution, they had only little legitimacy to act and decide, for example, on budget or permit allocation issues.

Interviewees consequently raised concerns about the ability of the DDPI to coordinate other ministries and to translate REDD+ related strategies into the different provincial services, for example, the forestry service. They perceived that communication was rather built on personal relationships than on legal authority between those institutions.

Similar concerns were raised by interviewees for the Berau REDD+ working group that was also established as an ad-hoc institution. As such it had neither been provided with an authority to take decisions nor to actually coordinate.

Lack of translating national policies to lower levels

A challenge to implement REDD+ related policies from the national level was also perceived to be the poor mainstreaming of national policies to lower levels among interviewees and in key documents. Respondents pointed towards a lack of guidance, technical support and capacity on the field level and towards a lack of concrete concepts for actions to effectively implement REDD+ readiness elements. One interviewee working for an international organization described the situation as follows:

“[...] we have a number of documents on action plan for REDD, but you see, there is a problem between the document, there is still a gap between the document to the real-life implementation. And that still take some time. For example, the director of DDPI is always talking about how FMU will reduce emissions. Of course, theoretically, we can explain it but how much and when? That's the question.”

Interviewees further reported a lack of execution of decisions that had been made in REDD+ working group meetings. The fact that government officials in East Kalimantan participated in such meetings did not automatically mean that they would translate the decisions to their ministries.

The implementation gaps could also be explained by the vastness and heterogeneity of the country and a lack of capacity among stakeholders as explained earlier.

Together with the poor understanding of, communication with and involvement of important stakeholders from the government and the lack of autonomy from sectors that support BAU, the poor translation and mainstreaming of national policies to the local level can explain the limited governmental ownership and support in the REDD+ readiness process in the focus area. The limited governmental supported in turn resulted in a number of gaps within the REDD+ readiness process. Those are described in the following.

Lack of integration and institutionalization of REDD+

The lack of integration and institutionalization of REDD+ related activities into regional development plans was a central aspect raised that hampered the development around REDD+ on the subnational level. Such integration into regional plans provides the legal basis for budget allocation and is necessary to secure the sustainability of strategies beyond the term of office of governors.

However, by the time of study conduction, the REDD+ process primarily depended on the willingness of the governor or district head. The fear of a ‘changing commitment’ to REDD+ under a new governor/district head was, therefore, a key risk expressed by interviewees.

It was already mentioned that the local REDD+ process in the focus area, especially in Berau, was influenced by individual people or “local champion”. Without the institutionalization and integration of REDD+ related issues into development plans, the resignation of such local champions was perceived a risk that could jeopardizes the future process as was the frequent rotation of people working in political and institutional leadership. This was explained by one member of an international organization working on all levels:

“[...] Like in Berau for example, there is one head of DINAS [forestry office] at the time, he was very supportive, but right now he's not there anymore. So, what can you do? You have to start from zero. So, this is a problem with what they call the 'local champion'. So, then we find a local champion and we do a lot of things in the time but it's only a local champion. And after that, nothing happens.

Similar drawbacks have been described in relation to the rotation of FMU heads.

Findings also revealed that the BFCP strategic plan had not been institutionalized among decision makers and had not been integrated into the Berau District Medium-Term Development Plan of 2011-2015. Consequently, there existed a lack of state budget allocation for the implementation of the BFCP.

Coordination

“In fact, the main weakness is that we [in East Kalimantan] don’t have a systematic approach of the whole, there is a lack of coordination, this is a very weakness in addition to the lack of good governance.”

The issue of coordination was a key challenge identified by interviewees and from the document analysis ranging from the coordination between single ministries over the coordination of organisations on the field level to related strategy and action plans. The poor inter-ministerial coordination and communication was, for example, expressed by a member of a government-governmental organisation:

“Today we discuss MRV and we have the Ministry of Forestry coming. We discuss from the forestry perspective. The day after, there is a project of [the] World Bank coming with the same idea, so we attend the meeting. And on Wednesday we have the BAPPENAS, the National Planning Agency, talking about greenhouse gas emissions monitoring at the larger level, we come again to the same meeting. But they never talk to each other [...]”

In East Kalimantan and Berau, there was further a lack of coordination among the organisations formally participating under the REDD+ program and a lack of alignment of their activities to the provincial and/or district REDD+ strategies and ER targets observed.

By the time of study conduction, East Kalimantan harboured several funding programs (TFCA, MCIA, FCPF) but there was no single umbrella institution or forum that would coordinate those different programs, organizations and activities. Although this was by mandate the role of the DDPI, several stakeholders confirmed that this task has not sufficiently been carried out. The same situation was found on the district level where the local government, through the district REDD+ working group and the steering committee, should have coordinated the REDD+ process. But instead, actors and donors came to Berau with their own programs and concepts rather than with concrete plans of how to serve the specific objectives of the provincial and district action plans. By the time of study conduction, there were, for example, 28 NGOs, mostly local, working in nearly 70 villages in Berau. Most of them were financed by TFCA and MCIA but there was no central institution taking over the responsibility of coordinating the different NGOs. Apparently, TNC hesitated to take over this role of coordination and saw the BFCP-responsibility with the government but the government, as well as other organizations and funding schemes, did not feel responsible for it either and showed little ownership on the district REDD+ process. The district REDD+ working group could also not take over this role, because of a lack of authority to coordinate the NGOs and because of struggles with restricted funding. This situation was summarized as follows:

“[...] the program of TFCA is something like running by themselves, there’s not really connection with the idea on how to achieve efficiency and the goal of the BFCP, because the Pokja [REDD+ working group in Berau] is very weak [...]. In the beginning of Pokja, they’re trying to bring what we called the Forum of NGOs or something [...]. Twice a year there is a meeting on how to coordinate and communicate with the programs [...] but now, until 2015, there’s not at all of the coordination meeting.”

This specific case of the BFCP demonstrates how the lack of oversight and coordination could easily lead to questions of who is actually doing what.

Interviewees, moreover, raised their concern about the multitude of strategy and action plans that existed in East Kalimantan in relation to climate change. Respondents pointed to the need of one provincial key reference to which every district could refer in this context.

Monitoring

Discussions with staffs working for different organizations, revealed that there was no central monitoring from the provincial or district government gathering all REDD+ activities and achievements. All of the domestic and international organizations had their own monitoring schemes imposed by their

donors. This absence of period monitoring and evaluation resulted in a lack of information on REDD+ related activities, resources spend, achievements and their gaps on the program/project level.

5.5.2 Driving forces of subnational REDD+ process

A number of factors that enabled and drove the REDD+ process and its current achievements were identified for the focus area. As for the hindrances, they could be either related to the institutional setting or to the REDD+ policy arena.

Among the driving factors that characterized the institutional setting were East Kalimantan's and Berau's geographical settings, their vast intact forest resources, the existing capacity and network of civil society, academia and the private forestry sector, and the long history of conservation activities and its related established trust in (non-)governmental organisations, see Figure 51. The factors categorized to the REDD+ policy arena comprised the establishment and consultation of new coalitions and actors, political commitment and the availability and prospect of new funding sources. There were, however, important differences in the extent to which these factors were in effect between the provincial and district level as highlighted under each of the next paragraphs.

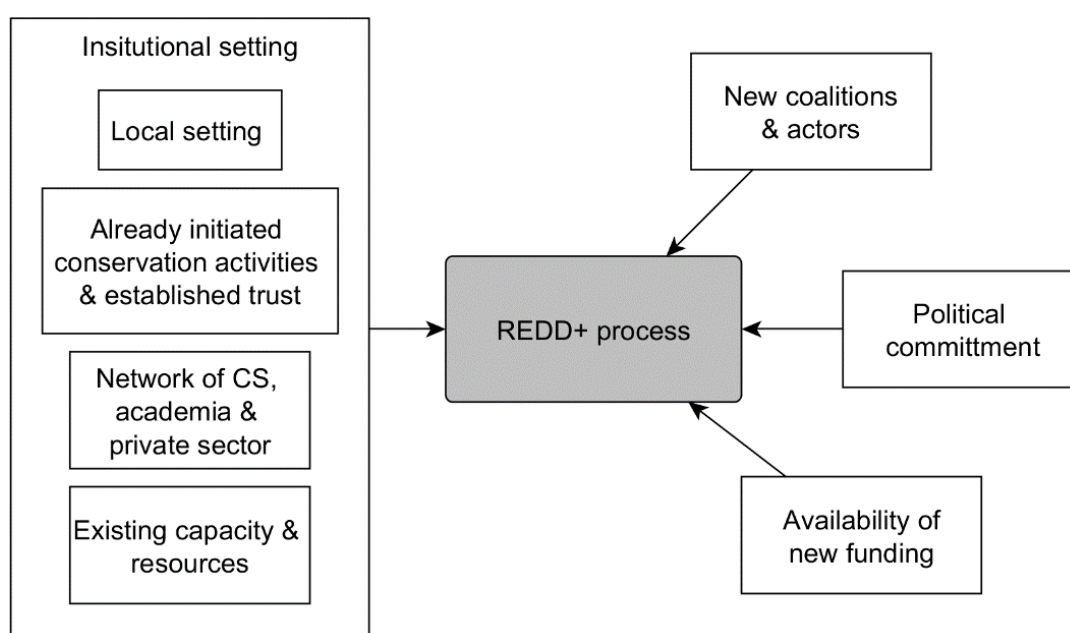


Figure 51: Interplay of identified driving forces of the subnational REDD+ process in the focus area; CS = civil society.

5.5.2.1 Driving forces related to institutional setting

Interviews and key documents suggested that the following factors and conditions favoured the REDD+ process in the focus area and formed an advantage over other districts.

Local setting of focus area: forest cover and deforestation drivers

Because of their remaining high forest cover, East Kalimantan and especially the Berau District provided a high potential to conserve forest resources under a REDD+ program.

This high forest cover and the fact that Berau's forests historically experienced exploitation mainly due to selective logging, made the district a suitable jurisdiction to test REDD+ (Pokja REDD Berau, 2009b). The drivers of forest destruction had only recently changed from selective logging towards the conversion of logged over forests to oil palm and timber plantations. It was expected that these new trends in forest conversion would threaten Berau's forest resources dramatically in the future without further interventions. The potential of emission conservation was consequently high.

Local setting of focus area: geographical & economical setting

East Kalimantan and especially the Berau District have a geographical and economic advantage over other districts/regions. Berau's location provides the districts with a relatively good accessibility by plane, land and sea. The access to the international market and the high number of active (exporting) forest concessions consequently played an important role in piloting timber management activities under the REDD+ program.

Economically, East Kalimantan and Berau are relatively well-equipped. Especially the development of the coal mining industry has brought the province and the District Berau important development which was expressed by the following statement:

“Berau is through coal industry and to the access to the market, much much more developed, much much more advanced.... and professional... you have lots of oil palm there coming in, mining and Malinau [another district] is just sleepy”

Already initiated conservation activities & established trust

In East Kalimantan and there especially in the Berau District, international and local organizations had been present since the 90s. Local NGOs mostly focused on conversation and community development aspects while bigger international organisations worked with forest businesses and on nationally introduced instruments such as forest certification schemes. This interplay of local and international organizations enabled a wide range of support to various stakeholder groups.

Trust in those organizations that had been working in the region for decades from the government and civil society was an important advantage identified as the following statements from an officer working for an international organisation shows:

“You need first of all the trust building time. For us, to be frank with you, we're starting now to get really really productive because they trust us. They know us, “yeah yeah [name of organization] you're here since long time”, I had discussions with DINAS Kehutanan Provinsi in West Kalimantan, they said, “we don't want any other NGO. You do that! We know you, that's ok. [Others], they come and go, they have one workshop then they're gone, we have no idea what they're doing. We don't want them anymore.”

Some of the interviewees had constantly worked with the government since more than two decades.

Trust was also an important issue raised by stakeholders that worked with communities in Berau. They uniformly stated that one of the most important aspects of the implementation of their REDD+ related activities was to gain trust from the villagers. They all explained that their facilitators and staff had lived within the communities and took part in their daily lives. Those organisations that already gained trust and were now supporting the BFCP, therefore, had an advantage over new ones.

Existing network of CSO, academia & private sector

The REDD+ process in East Kalimantan was placed in a special setting that was shaped through the Forestry Faculty in Samarinda and the broad network of stakeholders from civil society, academia, international and domestic organizations, consultants and the private sector. This informal network was highlighted as one major strength of the REDD+ process in East Kalimantan.

There were several key players that had been present in the province for decades and that had played a critical role in facilitating the REDD+ process. Those key persons, many of them teaching at the University in Samarinda, had extensive working experience in the area and had been involved in the discursive process influencing the policy process for decades. They constantly maintained networks and forwarded new ideas such as the establishment of the Master Plan on Climate Change that aimed to integrate the various existing strategies and action plans on climate change issues and the establishment of the REDD+ working group. They were, moreover, present in both, the provincial REDD+ working group and the DDPI.

While the resignation of key persons or “champions” was frequently mentioned to be a risk on lower levels that could jeopardize the whole REDD+ readiness process, following study observations, such a capacity network facilitated the process substantially in East Kalimantan. In contrast, on the district level, interviews showed that this ‘network of key players’ with good relations to the governmental level was not as strong (compare also 5.5.1.1).

In East Kalimantan CSOs were frequently involved in and were pushing the REDD+ process and helped the government to develop strategy and action plans (e.g. LCGS, SRAP, Master Plan etc.). International organizations such as TNC or the GIZ have led the early REDD+ policy process with new ideas and concepts.

Study observations, moreover, showed that the multi-level nature of those international organizations allowed a frequent communication and information flow between their administrative levels.

Insights into the background of interviewees that were gained through the interviews, moreover, revealed that there existed several overlaps in working experience, education and organizations that could explain the good personal relationships and informal network that was observed on the subnational level. The fact that interviewees on the provincial and district level commonly referred to other stakeholders as “friends” underlined this particularity.

Despite this informal network that highly facilitated the communication, cooperation and progress on the provincial level, there remained a lack of cooperation outside this network. Interviewees stated that more complicated negotiations were often avoided. This involved the risk of not reaching other influential people⁸².

Existing capacity & resources

Strongly related to this ‘informal network’, was the existence of experiences, know-how and financial resources and capacity on which the REDD+ process in East Kalimantan could build. This basic readiness could explain the relatively fast drafting of REDD+ elements (e.g. strategy and action plans) and the presence of REDD+ pilot projects and donors (as e.g. the FCPF Carbon Fund ER project), as the following statement of a member of an international organisation shows:

“We were looking for concrete areas where there is perceived emission reduction potentials, where we had a good understanding of the situation on the ground based on our previous engagement and Berau was basically lobbied as well from our colleagues from [Name of organization], who had a big program there. “

Other officers of international organizations explained that there was a tendency of short-term projects to come to Berau in the need to show results after only a few years.

The Forestry Faculty in Samarinda was observed to be key in building this capacity network already mentioned earlier. Several of the staff members working for international and national organizations in East Kalimantan, had been trained at this faculty and most of the policy documents released for East Kalimantan had been highly facilitated by its members. Those members forwarded ideas and recommendations thereby influencing the provincial REDD+ policy processes.

For decades, there had, moreover, existed PhD exchange programs and cooperation with European universities. Many of the interviewed stakeholders and REDD+ key players on the subnational level in the focus area had received their PhD oversees at universities in Germany or the Netherlands.

Interviewees consequently stated that it was not the technical know-how that restricted the REDD+ process on the provincial level but rather aspects such as the coordination among ministries and institutions and the little political commitment and interest of certain stakeholders.

However, there was a clear decrease in capacity observed on the district level in Berau.

⁸² See also aspect on ‘poor understanding among and communication with government and non-forestry sector’ under 5.5.1.2.

5.5.2.2 Driving forces related to policy arena

New coalitions and actors

The analysis of interview transcripts and key policy documents showed that there existed transformational coalitions in East Kalimantan that drove the policy discourse around REDD+. Closely related to those were the introduction of new independent institutions like the provincial REDD+ working group and the DDPI early on in the REDD+ process in East Kalimantan. Both institutions provided a space for a broad range of stakeholder groups to engage in policies away from BAU. A central requirement for this was a certain access to the governmental level.

As such, the REDD+ working group in East Kalimantan involved several (non-)governmental organizations, the private sector, the academia and community representatives.

The DDPI involved members from the government and academia, but interviewees confirmed that CSO had always been involved in negotiations and were fully supportive towards the DDPI.

Placing the DDPI outside the traditional government structures followed the aim to coordinate the planning and implementation of the low-carbon development in East Kalimantan as an umbrella institution.

The provincial REDD+ working group and the DPPI have facilitated communication progress. With their support, funding partnerships such as the recent FCPF Carbon Fund were made possible.

The BFCP also initially involved members from the government, academia, the private sector and civil society. However, in contrast to the provincial level, the ability to influence decision-making on the governmental level, of actors supporting a policy change away from BAU was too marginal.

Political commitment

Support towards a low carbon development from the provincial political leaders was raised as one of the most important factors in the recent REDD+ process by interview respondents and in key documents. Actions like East Kalimantan's pledge to make the province a "green province", the stipulation of provincial emission reduction targets, the establishment of the provincial REDD+ working group and the DDPI and the release of a provincial forest moratorium on the issuance of new land use licenses demonstrated this commitment from the governor at that time. With such actions, the governor of East Kalimantan followed REDD+ actions at the national level. Besides the governor, also other actors from the government such as the head of the forestry service of East Kalimantan had been perceived as being very supportive towards the REDD+ process in by the time of study conduction.

Despite this support from certain government members in East Kalimantan, the REDD+ process on the provincial, and especially on the district level, was still largely driven by non-governmental actors. The study author observed a situation where international organizations were main drivers of the REDD+ policy process⁸³. The process, therefore, relied mainly on private relationships between and the 'informal network' of actors.

On the district level, there was a clear imbalance of local ownership on the jurisdictional REDD+ project of CSOs and the local government.

Availability of new funding and capacity

The presence of the many domestic and international organisations and funding schemes related to the conservation of East Kalimantan's natural resources and biodiversity for decades, attracted also new REDD+ donors to East Kalimantan. The promise of those new funding deals in turn prompted important progress within the REDD+ policy arena.

As the first result-based payment-deal, the promise of conditional payments under the FCPF Carbon Fund likely acted as a motivation to attract the ER program to East Kalimantan. Considering the state budget restrictions the Indonesian forestry sector was facing at the time of study conduction, the Carbon Fund was a promising opportunity for East Kalimantan (and Berau – one of the planned focus areas) to

⁸³ See also chapter 5.5.1.2.

fill financial gaps in ongoing policy reforms. For example one current strategy outlined in the FCPF ER-PIN (RoI, 2016) and ER-PD (Republic of Indonesia, 2018) was to strengthen management capacity within the State Forest Area through FMU development.

Following interview transcripts and the document analysis, the negotiations and preparations for the FCPF ER program had in turn prompted better coordination of the REDD+ progress in East Kalimantan. As one interviewee explained, activities and strategies in relation to climate change in East Kalimantan had been highly scattered in the past. This was, for example, shown by the number of existing strategic documents and by the number of organizations. The integration of those scattered strategies and activities into one program with the aim of achieving one ER target, was thus perceived as an important step to identify current achievements, challenges and gaps.

Another challenge that had frequently been raised, was the lack of concrete action of existing strategy and action plans. Following respondents, through the preparation of the Carbon Fund, discussions and decisions about real actions and measurable ER targets were finally prompted.

On the district level the funding from TFCA, MCAI, TNC and the World Bank also enabled multiple REDD+-related activities and supported various ongoing government strategies to improve forest governance (e.g. the FMU reform). However, there were no conditional (performance-based) funding deals observed in the district. Activities were scattered and therefore, not aligned to reinforce each other.

Table 29: Operationalization of enabling conditions to establish a REDD+ environment. Adapted and modified to the subnational context in East Kalimantan and Berau from Korhonen-Kurki et al. (2014), Brockhaus et al. (2016) and Korhonen-Kurki et al. (2018). Conditions in Berau and East Kalimantan based on interviews and key document analysis.

Factor	East Kalimantan	Berau District
Condition in (pre-existing) institutional setting		
Pressure from shortage of forest resources	High deforestation rate	High risk of forest conversion
	High risk of forest conversion	Remaining high forest cover
	Remaining high forest cover	
Key features of effective forest legislation, policy and governance	Tenure and rights are in many respects unclear and contested	Tenure and rights are in many respects unclear and contested
	There are unresolved contradictions between formal and customary law	There are unresolved contradictions between formal and customary law
	There are no adequate laws and policies	There are no adequate laws and policies
Contradicting strategies	There exist policies that hinder a change away from BAU, for example, policies that foster exploitation of natural resources	There exist policies that hinder a change away from BAU, for example, policies that foster exploitation of natural resources
Already initiated policy change	Anti-deforestation programs	Anti-deforestation programs
	Presence of conservation projects since decades	Presence of conservation projects since decades
	Trust in actors that drove this change (e.g. CSO) from affected stakeholders (governmental level, communities) have been gained	Trust in actors that drove this change (e.g. CSO) from affected stakeholders (governmental level, communities) have been gained
Capacity	The presence of the Forest and broad network of CSO fosters REDD+ uptake	Low capacity for example in institutions, working groups, among organizations is observed (e.g. REDD+ working group not operational)
	The effective implementation of national policy reforms is hampered by limited resources.	
	Underfinancing of the forestry sector There remain capacity gaps on the government level in terms of REDD+.	There remain capacity gaps on the government level in terms of REDD+.
Conditions in policy arena		
Ownership	Pro-REDD+ statements & actions by governor.	Pro-REDD+ statements & actions by district head only initially.
	National research and NGO actors engage in policy discourse.	National (N)GOs present but they could not influence policy.
	Engagement of national political institutions in REDD+ policy formulation (decrees, subnational forest moratorium) Policy formulation is mainly led by foreign actors.	Pro-REDD+ statements by international actors dominate policy discourse. Policy formulation is mainly led by international organizations.
	Donor agendas dominate process.	Donor agendas dominate process.
	No budget allocation to REDD+.	No budget allocation to REDD+.

Table 29 (continued)

Inclusiveness of the policy process	Key stakeholders, including civil society, private sector, are consulted during the REDD+ process. Limited knowledge about REDD+ at the local level, private sector and among parliament.	Key stakeholders, including civil society, private sector, are consulted during the REDD+ process. Limited knowledge about REDD+ at the local level, private sector and among parliament.
Trans-formational coalitions	Existence of coalition building among actors supporting REDD+ policies (e.g. umbrella organization, regular meetings, joint statements, personal relations), for example, DDPI. There are drivers of change (policy actors that lead discourse in pro-REDD+ direction) both inside and outside government institutions: but mainly from academia, CSO. Pro-REDD+ policy actors have good access to political decision makers (e.g. invited to expert hearings, members in advisory councils).	Coalitions of drivers of change are too marginal to influence policy making and are not visible in the political discourse on REDD+. Pro-REDD+ policy actors had no good access to political decision makers (e.g. invited to expert hearings, members in advisory councils); changed recently through TNC assistant.
Promise of results-based funding for REDD+	Recent FCPF fund. Traditional funding agreements.	No result-based funding schemes Traditional funding agreements.
Multilevel REDD+ characteristics	Coordination and monitoring related to REDD+ projects remains poor. Information flows remain restricted to personal relationships among stakeholders. Poor understanding of REDD+ related issues among many stakeholders, especially from parliament, private sector and village level.	Coordination and monitoring related to REDD+ projects remains poor. Information flows remain restricted to personal relationships among stakeholders. Poor understanding of REDD+ related issues among many stakeholders, especially from parliament, private sector and village level.
Autonomy from other sectors	Low autonomy of state actors from business interests that drive deforestation and degradation (e.g. issuance of land use permits in times of elections).	Low autonomy of state actors from business interests that drive deforestation and degradation (e.g. issuance of land use permits in times of elections).
Translating national policies to lower levels	National policies are poorly mainstreamed to lower levels. There exist poor guidance, technical support and capacity on the field level and concrete concepts for actions to effectively implement REDD+ elements designed on the national level.	National policies are poorly mainstreamed to lower levels. There exist poor guidance, technical support and capacity on the field level and concrete concepts for actions to effectively implement REDD+ elements designed on the national level.
Legal authority of new instruments	New institutions lack legal authority, for example, to coordinate other ministries and make decisions.	New institutions lack legal authority, for example, to coordinate other ministries and make decisions.
Institutionalization & integration of REDD+	Low institutionalization and integration of REDD+ in regional development plans in the past. Integration on the way. Frequent rotation of people working on the local level and in political leadership	Low institutionalization and integration of REDD+ in regional development plans in the past. Frequent rotation of people working on the local level and in political leadership (exacerbated through law 23/2014).
Activities to address drivers of deforestation	REDD+ activities do not address the major drivers of deforestation	REDD+ activities do not address the major drivers of deforestation.

6 Discussion

The discussion of the results is structured along the five research questions that were formulated to analyse the subnational implementation of SFM through REDD+ and FLEGT-VPA processes in East Kalimantan and the Berau District:

1. What are the current REDD+ achievements and limitations relevant to SFM on the subnational level?
 - 1.1 Do subnational REDD+ activities contribute to forest loss reduction on the jurisdictional level?
2. What are the current FLEGT-VPA-related achievements and limitations relevant to SFM on the subnational level?
 - 2.1 Do national forest certification schemes under a FLEGT-VPA contribute to forest loss reduction on the concession level?
3. What are the current driving forces of and hindrances to the subnational REDD+ implementation?

Research questions 1.1 and 2.1 were addressed through the analysis of remote sensing data. The remaining questions were addressed through an analysis of REDD+ and FLEGT-VPA interview transcripts and evaluation of project and policy documents.

Results of each research question are discussed in chapter 6.2 to chapter 6.6 in terms of their meaning, expectancy and vis-à-vis existing research – some of which were already introduced in the state-of-the-art chapter 2. Chapter 6.7 outlines limitations to the study. The discussion starts with a summary of the key findings.

6.1 Key findings

Several key messages and lessons for forest-based approaches that shape global forest governance can be drawn from the analysis of the REDD+ and FLEGT-VPA processes in the context of SFM on the subnational level.

Subnational level is as relevant as the national level

The analysis of the processes of REDD+ and FLEGT-VPA in the focus area show that their objectives in terms of SFM can only be achieved when they are also initiated at the subnational governmental level and when they engage the specific subnational sectors driving deforestation and forest degradation. This involves increasing ownership in the sustainable management of natural resources and improving the associated human and financial capacities among relevant stakeholders. Disregarding the lower governmental levels will render national policies unsuccessful.

Most forest loss in the ‘non-forest’ land class

This study demonstrates that most of the forest loss between 2001 and 2016 in both jurisdictions in the focus area occurred on land officially classified as non-forest land (APL), followed by the permanent production and limited production forest class. A reason for this lies in the Indonesian land classification system that does not necessarily coincide with the actual forest cover of the forest or ‘non-forest’ classes. APL land is destined for other land uses than forest management and forested land within APL can legally be converted.

Most forest loss within industrial land use permit boundaries

More than half of Berau’s forest loss between 2001 and 2016 occurred within industrial land use permit boundaries (natural forest concession, timber plantation, mining or oil palm plantation permits). Forest loss in oil palm plantation permit boundaries alone accounted for 52% of Berau’s total forest loss during that time. Results also suggest a recent expansion of timber plantations.

6.1.1 REDD+

REDD+ contributes towards the SFM elements

The study shows that REDD+ has a large potential to contribute to SFM in the focus area. Study observations reveal that REDD+ benefits are, however, rather non-monetary in nature. On the provincial level they relate, in particular, to providing enabling conditions for SFM and to the gathering and creation of new land use data which improved the understanding of deforestation and forest degradation drivers. On the project scale in Berau, achievements relate to building capacity on the management and village level. However, REDD+ was not able to achieve its initial goal of reducing deforestation and thereby emissions in the focus area. Progress, moreover, generally decreased from provincial to district level.

Non-carbon benefits remain on a pilot stage

Many REDD+ related achievements in the focus area were small-scale in nature and remained on a pilot stage without a clear impact on the jurisdiction level. Such achievements related to the rehabilitation of land, the trial of RIL-Carbon, the strengthening and establishment of protected areas and the negotiation of community forest management rights. Lessons and experiences drawn from these activities need to be upscaled.

Limitations of REDD+ to address drivers of forest loss

Triangulating the different study elements reveals that the major sources of forest loss remained unaddressed until 2016 under the REDD+ program in Berau. While forest loss largely occurred outside the forest estate, results demonstrate that REDD+ activities had concentrated on the forest concession and community level. The measures applied to improve forest management, that is, the support of forest concessions in obtaining national and voluntary certifications, also did not result in a reduction of forest loss within forest concession permit boundaries.

REDD+ process of influencing spatial planning very slow

During the investigation period the BFCP was not able to influence forest and land use policy in a way that would reduce forest loss in the focus area. Findings show that major achievements in this context could only recently been made, among them the assessment of Berau's regional development and spatial plan and the integration of the BFCP strategies into Berau's midterm development plan (2016-2021).

REDD+ provides additional resources for ongoing forest reform

Findings suggest that by supporting the implementation of the Indonesian TLAS and its related PHPL certification on the management level, by fostering the adoption of RIL(-Carbon) and by supporting FMUs on the ground, REDD+ contributes towards ongoing forestry reform in the focus area. In doing so, REDD+ fills resource gaps that would otherwise not be filled by institutions formally in charge, one of those, for example, being the VPA.

Ongoing forestry reform relies on external donors

Because REDD+ provides additional resources for the ongoing forestry reform, many related measures rely on external donor schemes and international organizations like TNC and the GIZ. This dependence on external donors and organizations makes the future progress very insecure.

Subnational REDD+ implementation dominated by civil society

This study showed that international organizations and academics are main drivers of the REDD+ policy process in the focus area while important coordination and monitoring tasks by the government are not fulfilled. The University of Samarinda played an important role in this process. It has shaped an informal network that is frequently involved in the REDD+ readiness process, especially on the provincial level.

Limited governmental support and ownership as a barrier to REDD+/SFM

A key gap in the focus area – especially in Berau – was the limited ownership, support and involvement of governmental members (beyond the political leaders). Explanations for this were a poor understanding and interest in REDD+ related issues, other nationally driven priority strategies and a

poor translation of REDD+ related policies from the national to the local level. The limited governmental support resulted in a lack of coordination and monitoring through the government and in a gap between envisaged REDD+ activities and the actual activities carried out on the ground.

Where the gaps between REDD+ and SFM exist

The literature review for this study⁸⁴ showed that REDD+ has thematic overlaps with every SFM element.

In the focus area, key measures of REDD+ were the establishment of REDD+ institutions and the conduction of activities on the community and forest concession level to improve forest management. Study findings suggest, however, that these applied measures were not sufficient and/or adequate to achieve REDD+'s full potential to conserve forest resources on the jurisdictional and management level. Reasons for this are the poor human and financial capacity and the lack of legal authority over other ministries of the established institutions that were consequently not able to influence the subnational policy process away from BAU practices that drive forest loss. Activities in communities and forest concessions did, moreover, not address the major drivers of forest loss in those areas.

Findings show that REDD+ not only needs the support of the national government but, and this is in contrast to FLEGT, also the support of subnational governments. To achieve REDD+'s full potential will require equipping newly established institution with more resources (human and financial wise). Stakeholders supporting and shaping the REDD+ readiness process, moreover, need to focus on the involvement of the parliament and private (non-) forestry sector. Challenges that need to be overcome in this context are the poor understanding of REDD+ and related issues among relevant stakeholders, national strategies that drive the exploitation of East Kalimantan's natural resources, capacity gaps and the poor involvement of governmental level and the (non-) forestry sector.

6.1.2 FLEGT

FLEGT contributes and contradicts to SFM

FLEGT shows several overlaps with SFM. Central achievements were the increased transparency in forest production and the implementation of the TLAS to track timber production destined for the export. Because of several gaps in terms of SFM within the existing Indonesian legal forestry framework, that is reinforced through the SVLK, the Indonesian VPA-TLAS does not contribute towards the conservation of forests but – given its legal compliance – tolerates its conversion.

FLEGT-VPA reinforces traditional unsustainable practices

The ability of FLEGT to reinforce SFM, depends on a country's legal SFM framework and the importance, i.e. the amount, of conversion timber.

In Indonesia, the FLEGT-VPA builds on a partly long-standing forestry regulatory framework that is too weak in terms of SFM. A major issue relates to the tolerance of the unsustainable harvesting system and 'conversion timber' (timber from legal forest conversion areas for other land uses). 'Conversion timber' and timber from forest plantations that might have been established at the expense of natural forests, are legalized under the SVLK. This implies that timber defined as 'legal' under the FLEGT-VPA might not originate from a sustainably managed forest. The PHPL shows additional weaknesses in that it does not require a certified timber plantation to demonstrate that it had not been established following the conversion of natural forests.

SVLK falls short on several aspects of SFM

Given that a TLAS does not necessarily include other certification schemes, like the PHPL in the Indonesian case, through its sole focus on legality, many issues of SFM remain unaddressed under a TLAS. In the case of Indonesia, this comprises aspects of forest biodiversity, soil and water protection and economic, social and cultural issues.

VPA-TLAS unable to address drivers of forest loss within forest concession boundaries

VPA-TLAS in the focus area does not address the major drivers of deforestation neither within nor outside forest concession permit boundaries in the focus area. While the major drivers of deforestation

⁸⁴ See state-of-the-art chapter 2.

lied outside the forestry sector and are as such not addressed by the VPA, the analysis shows that the mandatory certification schemes were also not able to influence the occurrence of forest loss within the forestry concession level during the investigation period. Results indicate that most of the forest loss within concessions can be attributed to mining or the conversion of forests to oil palm plantations. The application of the certification schemes under the VPA as single measures to reduce forest loss within natural concession boundaries is, therefore, not sufficient.

The PHPL scheme adopted under the VPA tolerates large-scale forest loss

In Indonesia, the legal framework of the SVLK comprises the PHPL scheme. In the focus area, large-scale forest loss occurred in forest concession boundaries that were PHPL certified. Although this loss was not associated with forest management activities – as frequently occurred in other (overlapping) land use permit boundaries – it was apparently tolerated by it.

Limitations to address illegal timber

Several of the sources of illegal logging are not addressed by the Indonesian TLAS because the certification scheme is not implemented on the domestic market, that has about the size of the export market. Timber destined for the domestic market, like that associated with the unplanned forest conversion for estate crop plantations, with land claims, and with timber destined for subsistence use remains unseen by the SVLK as long as it does not enter the export timber supply chain.

Knowledge gap on the impacts of VPA-related certification schemes

There remains a knowledge gap for the impacts of VPA certification scheme, the SVLK, on its main objective of reducing illegal logging and related trade. There also exists a knowledge gap on the impacts of the PHPL certification scheme on forest degradation, forest loss, the multiple functions of forests and on socio-economic aspects.

Where the gaps between FLEGT and SFM exist

Gaps between FLEGT-VPA and the holistic concept of SFM resulted from the national VPA design, that is, its limited thematic overlap with SFM, a lack of policy measures to follow up on stipulated objectives and the ineffectiveness of policy measures that were implemented to achieve their objectives.

First, through its sole focus on legality, some SFM aspects remain unaddressed by the Indonesian TLAS and are only – if at all – indirectly addressed through the PHPL scheme.

Second, many of the stipulated policy objectives of the EU FLEGT Action plan and the Indonesian VPA, like those related to a clarity of land tenure, the implementation of the TLAS on the domestic market and the support of SFM, lacked a clear follow up of policy measures to achieve those targets.

Third, policy measures that were defined to follow up on the objectives of the Indonesian VPA, contradicted with certain SFM elements. This was, for example, the case with the SVLK that was implemented as a measure to reduce illegal timber but tolerated forest conversion.

6.1.3 Joint lessons of REDD+ and FLEGT for SFM

REDD+ supports the implementation of third-party certification schemes

A common activity under REDD+ to improve forest management in the focus area, was to support the implementation of FSC and VPA-related certification schemes. With this, REDD+ provides additional resources for the VPA implementation.

However, by applying these certification schemes as a measure to improve forest management, REDD+ also relies on their effectiveness and credibility to do so. Results demonstrate that concerns exist about the SVLK in terms of its sustainability and that there remain knowledge gaps on the impacts of the Indonesian TLAS and PHPL.

SFM requires broader governments reforms

Study findings suggest that neither FLEGT-VPA through its certification approach nor REDD+ pilot projects are able to resolve land use conflicts on the site level. Land use conflicts in the focus area remained even when concessions obtained VPA-related certifications or when villages were supported under REDD+.

This suggests that clarifying tenure rights, as well as other aspects of poor governance, are aspects that exceed the capabilities of single forest concessions and forest-based approaches. Those aspects require broader governance reforms that break power traditions.

FLEGT and REDD+ with different strengths and weaknesses in terms of SFM

Study findings of FLEGT-VPA and REDD+ processes in the focus area reveal that forest-based approaches have different strengths and weaknesses in terms of SFM and, therefore, provide very different potentials to foster its implementation on the ground, specifically the conservation of forest resources. Stakeholders need to be aware of these different potentials and gaps in terms of SFM but also about the threats to forests that prevail in a specific region. Only in this way, policy measures of FbAs can be modified and aligned towards the need of an area, and FbAs unfold their full potential for SFM.

In Indonesia, FLEGT tolerates unsustainable forest practices and does not address the major drivers of deforestation. While its narrow focus on legality is its weakness, it is at the same time its strength. Regarding the many obstacles to the REDD+ readiness approach, it is likely that exactly this narrow focus and strictly regulated ‘certification-like approach’ imposed to the private sector, accounted for its implementation success.

In contrast, study findings show that REDD+ requires the engagement of the subnational government. Through its much wider focus, it demands addressing cross-sectoral issues and issues of poor governance. This holds the potential to address the main drivers of deforestation. REDD+, therefore, does not show such weaknesses in terms of SFM. This is on the one hand its strength but at the same time its weakness because gaining wider governmental support on every level is a difficult and long-lasting process which is much less likely to be achieved in a timely manner.

6.2 Subnational REDD+ achievements and limitations relevant to SFM

The REDD+ achievements and their limitations from the subnational level are discussed under the four ITTO objectives (Table 11). The four objectives are 1) Providing the enabling conditions for SFM, 2) Ensuring forest ecosystem health and vitality, 3) Maintaining the multiple functions of forests to deliver products and environmental services and 4) Integrating social, cultural and economic aspects to implement SFM. The aspect of ‘forest area and carbon stocks’ (ITTO criteria 2) is discussed under 6.3 based on the results of the remote sensing analysis.

REDD+-driven achievements in the focus area were identified for each of the seven SFM elements. Most of the achievements could be classified as ‘outputs’ while only few ‘outcomes’, that is, observable behavioural, institutional and societal changes that take place over 3 to 10 years of an intervention’s output, were found. No contradictions towards SFM were found. This suggests that consulted stakeholders are generally positive towards the REDD+ implementation in the study area. However, it is recognized that other studies have raised potential risks, for example, in terms of the exclusion of minorities within communities from REDD+ benefits and in terms of the risk that REDD+ could intensify already existing hierarchal structures within communities (Boer, 2017; Howson, 2017).

6.2.1 Objective 1: Providing the enabling conditions for SFM

Most of the identified REDD+ achievements in the focus area related to the enabling conditions for SFM, which is in line with the results of the desk review in chapter 2.1, and most of these to the entire jurisdiction. While some findings relevant for this ITTO objective are supported by findings from other studies in other regions, in the focus area there were also REDD+ achievements observed that had not been envisaged by scholars. Others had been expected or been observed on the national level but not so on the subnational level in the focus area.

Generally, REDD+ accomplishments in terms of forest governance in the focus area lacked behind those reported for the national level where REDD+ showed more far-reaching impacts. A similar conclusion was made by Ekawati et al. (2019) who investigated REDD+ implementation based on investigations in three provinces in Indonesia.

On the national level, existing research showed that REDD+ promoted better coordination amongst government ministries, greater transparency, and increased stakeholder participation (Mulyani & Jepson, 2017). Even though results of this study suggest that REDD+ contributed to some extent to ongoing forest policy reform and transparency on the provincial level in East Kalimantan, process was generally very slow and also much less on the district level.

Study findings also do not suggest that REDD+ outputs promoted observable changes in reducing deforestation and thereby emissions until 2016. There were also no signs of a notable influence on the resolution of land use conflicts yet. This suggests that an altered economic, regulatory and governance framework away from BAU practices to fully achieve REDD+'s potential remains to be achieved (Angelsen et al., 2012).

An important output in this context on the district level was, however, the recent assessment of Berau's regional development and spatial plan and the integration of the BFCP strategies into Berau's midterm development plan (RPJMD 2016-2021) in 2016. The FCPF ER Program of East Kalimantan is now, moreover, fully integrated into the provincial development planning processes (RoI, 2019). These recent developments on the district and provincial level give reasonable optimism that REDD+ can gain more far-reaching effects related to land-use planning, forest governance and forest loss reduction in the near future.

However, to do so, the established institutional framework of REDD+ in the focus area needs to be fully operationalized and translated to the management level where capacity building is needed. Otherwise REDD+ will not be able to achieve its full potential in terms of providing enabling conditions for SFM and reducing forest loss. Science should accompany this process in the focus area and identify important lessons from those jurisdictional pilot programs.

The generation of high-quality data on provincial and district forest resources, carbon sinks and land use cover (changes) was one REDD+ achievement that had also been suggested by authors like Tegegne et al. (2018) that based their analysis on global REDD+ policy documents. Such land use change assessments within and outside the forestry sector provide the basis to address all threats to forests in Indonesia, where the official forest/non-forest land classification does not necessarily coincide with the forest cover on the ground.

Results, moreover, suggest that the REDD+ program in the Berau District contributed to an increase of forest area under voluntary and mandatory compliance schemes, among them the Indonesian TLAS. None of the consulted authors in the desk review for the state-of-the-art chapter of this study (Cosslett, 2013; Neupane et al., 2019; Tegegne et al., 2018) had suggested such a contribution. This is likely because all of their analysis or perceptions were based on REDD+'s global design or related policy documents where no specific reference to legality or forest compliance schemes is made. In the focus area, the support of forest concessionaires in obtaining forest certifications was one common measure to improve forest management. In doing so, REDD+ generates additional resources to implement the commitments made under the FLEGT-VPA. With this, REDD+ fills capacity gaps that forest concessionaires face.

Capacity building measures provided to the government and those on the management level was consequently a major contribution of REDD+ in the focus areas. However, despite the many outputs in relation to building institutional capacity and capacity on the management level, results also reveal that most of these institutions (e.g. FMUs) still lack financial and human resources and that a sharp decrease exists towards the district and village level. Those findings from the project level in Berau are supported by Arts et al. (2019), Ekawati et al. (2019) and Duchelle, Seymour et al. (2018). Results suggest that to address such capacity constraints on the subnational level requires broader long-term efforts and reforms

in the educational sector that no forest-based approach can fill alone. Nevertheless, program planners should be aware of these capacity gaps, consider them and support their closure.

6.2.2 Objective 2: Ensuring forest ecosystem health and vitality

Authors like Cosslett (2013) and Tegegne et al. (2018) had assumed that REDD+ would generate significant co-benefits for forest health and vitality through reduced deforestation and forest degradation and the restoration of forests. Similarly, according to Neupane et al. (2019) stakeholders perceived a strong contribution of the REDD+ process in Indonesia towards the threats to forests that are caused directly by humans.

Because there were no signs of a reduction in forest loss on the jurisdictional scale in the focus area, the above assumption cannot be supported by study results at the current point. Moreover, although the rehabilitation and restoration of forests were also envisaged REDD+ activities in the focus area, the few documentations that were available, suggest that achievements were rather small-scale in nature and restricted to the village level without a clear outcome on the provincial level yet.

That achievements were limited to individual villages, forest concessions or institutions was also observed for those related to the ITTO criteria under the ITTO objectives 3 and 4, among those the RIL-Carbon trials in single concessions and first achievements in terms of strengthening and establishing protected areas. These achievements would now require a substantial upscaling. This aspect is not again repeated under each respective ITTO objective.

Despite these restrictions, results show that REDD+ contributed substantially towards the identification and quantification of threats to forests and towards raising awareness and understanding on related issues in the focus area. This identification and quantification of threats to forests – above all the direct and underlying drivers of deforestation and forest degradation – is a key condition to successfully reverse forest loss.

6.2.3 Objective 3: Maintaining the multiple functions of forests to deliver products and environmental services

Findings of Cosslett (2013) and Neupane et al. (2019) suggested that REDD+ could help to improve forest management through the implementation of FSC standards and RIL.

Investigations in Berau show that a common activity of organizations supporting the jurisdictional REDD+ program is indeed the technical support of those entrusted with the management of forests to improve forest management. This involved the trial of RIL-Carbon in single concessions, supporting the operationalization of the FMU and the support of natural forest concessions to comply with the standards of mandatory and voluntary certification schemes, namely the PHPL, legality and FSC schemes. In a review of the BFCP in Berau that was recently published, it was accordingly stated that through the certification of natural logging concessions under the SVLK and FSC schemes, “*more than a half million hectares of production forest concessions in Berau have demonstrated improved forest management*” (Hovani et al., 2018, p. 30).

The FCPF ER Program will continue to foster the implementation of these mandatory certification schemes to improve forest management in the upcoming years (RoI, 2019). However, as the analysis of the FLEGT-VPA-related certification schemes in this study revealed, those schemes show gaps in terms of SFM and are currently not able to reduce forest loss on the concession level in the Berau District. Results hence suggest that identified gaps need to be addressed first, before the implementation of such schemes are extended to yield the intended target.

Through the provision of additional resources for the implementation of VPA-related certification schemes, REDD+ also contributed towards the issue of forest product traceability systems. This contribution had been ruled out by authors like Tegegne et al. (2018) although study results from the ground showed otherwise.

Duchelle, Simonet et al. (2018) and Ekawati et al. (2019) reported a scarcity of non-carbon outcomes in REDD+ literature. Findings of this study reveal that REDD+ could help in creating enabling conditions for the preservation of ecosystems and biodiversity in forest areas. Related activities included the monitoring of endangered species and community survey trainings. Such activities are of special

importance amidst concerns that only those biodiverse forests could be protected under a REDD+ scheme that are at the same time carbon rich (Paoli et al., 2010). The double tracked aim of TFCA Kalimantan to reduce emissions from deforestation and forest degradation while at the same time supporting the implementation of biodiversity conservation is, therefore, an approach of conserving the exceptional biodiversity in Kalimantan independent of the carbon stock.

Statements on REDD+'s contribution towards forest biological diversity could also be derived from the remote sensing analysis when using forest loss as a proxy for biodiversity. As forest loss showed an increasing trend on both the provincial and district scale, there were no broader biodiversity benefits observed in the study area.

Despite the mentioned results, the author of this study shares the above perception of a scarcity of non-carbon outcomes in REDD+ literature that was also observed for forest functions in relation to water and soil protection.

6.2.4 Objective 4: Integrating social, cultural and economic aspects to implement SFM

Cosslett (2013) assumed from their analysis of REDD+ documents that REDD+ will have important impacts on the socio-economic functions of forests. Tegegne et al. (2018) based those impacts on the Cancun Safeguards, specifically on Safeguard 3⁸⁵ and 4⁸⁶. The study findings from the ground confirm the theoretical assumptions made by Cosslett (2013), and suggest that REDD+ can already prepare and deliver socio-economic outputs also before a SIS is in place. However, findings also demonstrate that despite the single outputs, their outcomes in terms of socio-economic benefits are yet to be understood.

In the focus area, REDD+ strengthened and increased the support to villages and communities. It was estimated that 78 villages, or 73% of the total 107 villages in the Berau District, received support from NGOs in 2017. Those NGOs supported villagers and communities in the production of non-timber forest products and related businesses, trained them in subsistence farming, helped them to map village boundaries and assisted them in the process of obtaining forest management rights.

The community empowerment approach (SIGAP), that was initiated and piloted under the BFCP, was in 2018, moreover, officially adopted by the Berau government as a district-wide approach (Hovani et al., 2018). Potentially, it will also be adopted by the provincial government in East Kalimantan (*idb.*). Given that these achievements actually lead to improved livelihoods and tenure security, this recent upscaling together with the small-scale achievements in terms of village forest management rights suggest that REDD+ can support more promising socio-economic outcomes in the future.

However, findings also reveal that it is still poorly understood in what way those multiple activities actually improved local livelihoods and increased income – as do the effects on small-scale deforestation associated with community forest conversion. This is supported by findings from Hovani et al. (2018). In their recent review of the BFCP, they acknowledged the lack of monitoring socio-economic impacts on the project and district level. Given that interventions related to sustainable community land use management had still been in their early stages and just being upscaled when the study was undertaken, their overall impact in terms of reduced deforestation and increased income was presumably still modest on the district and provincial scale. This would be in line with findings of Lawlor et al. (2013) that reviewed REDD+ projects certified by the Climate, Community, and Biodiversity Alliance standard across 22 countries. They found that REDD+ benefits related to jobs, income and education were modest while benefits in terms of tenure security and empowerment were more significant.

To raise understanding of the socio-economic benefits of REDD+ activities in the focus area and beyond requires that future efforts monitor related outcomes and impacts by the time they can be expected. A relevant aspect in this context is in what way REDD+ enhances socio-economic benefits to local populations instead of just “*avoiding to harm them*” (Lawlor et al., 2013). Barbier and Tesfaw (2012)

⁸⁵ Respect for the knowledge and rights of indigenous peoples and members of local communities, by taking into account relevant international obligations, national circumstances and laws, and noting that the United Nations General Assembly has adopted the United Nations Declaration on the Rights of Indigenous People.

⁸⁶ The full and effective participation of relevant stakeholders, in particular indigenous peoples and local communities, in the actions referred to in paragraphs 70 and 72 of this decision....

argue in this context that REDD+ may reduce poverty, where REDD+ efforts enhance tenure security – one of the essential requirements of SFM.

A good understanding of the complex tenure system is also a prerequisite to knowing who can and should participate and be rewarded in REDD+.

However, in the focus area, a recurring issue for REDD+ was exactly this frequent occurrence of land tenure conflicts. Conflicts occurred among communities and between those and license holders (forestry, mining, oil palm).

Although in Indonesian, REDD+ can theoretically be implemented in customary and village forests, in practice the persisting unclarity over forest boundaries and rights makes the implementation difficult. Forest Watch Indonesia estimated that there were 7 million hectare of overlapping forest concessions and 2,585 tenure conflicts in the period of 1990-2010 (Purba et al., 2014). A study published in 2015 by Rights and Resources Initiative, moreover, reported that only about 0.19% of Indonesia's country area was designated for indigenous people and local communities and 0% of the country was owned by them while most land was administered by the government. Clarifying such claims was envisaged as part of the national One Map Initiative (OMI) where the developed map of forest concessions should be overlaid with a map of tenure claims from communities, but progress was slow (Astuti & McGregor, 2016). Despite the fact that the base map that was created during the OMI is now accessible online, only around 30% of the administrative borders at the regency level were clearly defined by the national government (Shahab, 2016).

These facts place special importance on efficient and fair mechanisms to resolve these problems. Against this background, current activities related to village forestry rights and participatory village boundary mapping carried out on the village level in Berau by REDD+ proponents are of highest importance. By the time of study conduction, consulted stakeholders, however, claimed that land use conflicts remained to persist in some cases even when organisations had already intervened.

Land right uncertainty was also a central component in the findings of Sills et al. (2014) that presented early lessons of REDD+ projects in several countries including the BFCP in Berau. They found that some communities in Berau cleared forests either to get compensation fees from potential investors or as a proof of land ownership (proof of activity). They, moreover, estimated that households managed on average 2 ha of land for agricultural purposes, mostly slash and burn, at any given time. These findings of Sills et al. (2014) support that progress in terms of clarifying land rights was rather slow during the last years.

Clarifying those rights in a timely manner remains, therefore, important not only to prevent the risk of excluding the poor population from REDD+ benefits because of a lack of formal land rights (Loft et al., 2016) but also to avoid deforestation and forest degradation associated with such unclarity over land (Hajjar, 2015).

Cosslett (2013) also highlighted the issue of 'opportunity costs' that may limit REDD+' potential socio-economic impacts. Further, REDD+ may also reduce available land for agricultural expansion thereby limiting income sources for communities actively engaged in this management.

In Indonesia this is especially related to community palm oil plantations that are a common, lucrative short-term source of income. Although this study did not examine the aspect of 'opportunity costs' in more detail, the issue and limitations to REDD+ in this context were recurring aspects during the interviews.

6.3 Contribution of REDD+ to forest loss reduction

A special emphasis of this study focused on the potential contribution of REDD+ towards a reduction in forest loss (refers to ITTO criterion: extent and conditions of forests). It was specifically asked, if subnational REDD+ activities contributed to forest loss reduction on the jurisdictional level. A reduction in forest loss would ultimately lead towards a reduction in emissions from the forestry sector.

While existing studies such as Gaveau et al. (2018) provide valuable lessons on the forest loss dynamics in East Kalimantan, they were not primarily undertaken to measure the effectiveness of REDD+ related

activities on a reduction in forest loss. Literature had accordingly acknowledged that there were too few evaluations in the context of carbon outcomes of REDD+ initiatives (Duchelle, Simonet et al., 2018). By putting REDD+ achievements in the broader context of forest loss dynamics in the focus area, this study contributes towards a so far under investigated area.

Results of the satellite image analysis do not suggest a contribution of REDD+ activities towards a reduction in forest loss, neither on the provincial nor on the district level in East Kalimantan and Berau during the investigation period. Total and mean annual forest loss in East Kalimantan during the ‘REDD+ period’ (2009-2016) tripled in comparison to the ‘non-REDD+ period’ (2001-2008) (Table 19). In Berau, annual forest loss exceeded that of the previous years from 2011 on with the same peaks in 2012, 2014 and 2016 as had been observed on the provincial level. This suggests that Berau’s forest loss profile influenced that of East Kalimantan noticeably.

Results also do not suggest an effect of REDD+ on a reduction in forest loss in single land use classes and permit types. In all land use classes total forest loss doubled to tripled from the non-REDD+ to the REDD+ period. In Berau, total forest loss almost doubled and annual forest loss more than doubled in all land use classes from the ‘non-REDD+’ to the ‘REDD+ period’ (Table 20). Total forest loss in all land use permit boundaries under investigation (HA, HTI, oil palm & mining), moreover, roughly doubled and mean annual forest loss more than doubled from the ‘non-REDD+’ to the ‘REDD+ period’ (Table 21).

This analysis only considers the net forest loss on the provincial and district scale. On a smaller scale there could have thus been a net forest loss reduction achieved. And in fact, the document analysis demonstrates that on the village level, small forest areas (each about 5,000 ha) could be conserved under the TFCA Kalimantan program but amidst the total district and provincial values, this numbers appears very low.

The analysis in Berau and East Kalimantan thus shows that the REDD+ readiness process was not able to influence policy in a way that would have prevented or reduced emissions from deforestation since REDD+ was introduced there until the year 2016. Reasons for this are manifold.

Forest cover in East Kalimantan and Berau

In 2000, the basis year of the analysis in this study, 51% of East Kalimantan’s and 82% of Berau’s land area were still forested. In both jurisdictions, forest cover was highest in the limited production forest land use classes (HPT). This is not surprising given that this land use class is formally under forest estate. Remarkable was, however, the forest cover in the same year in the ‘non-forest’ area land use class (APL) in both jurisdictions that nearly resembled that of the permanent production forest class (HP) (Table 16 and Table 17).

In total in 2000, ~24% of the APL class, that were 1.01 million ha, were still covered with forest in East Kalimantan and even 64%, that were 384,018 ha, in Berau. Forest cover in the APL corresponded to 16% and 22% of the total forest cover in East Kalimantan and Berau, respectively, in that year. Adding to this, the forest cover within the convertible production forest class⁸⁷ (HPK), an area of 1.06 million ha – that corresponds to 17% of East Kalimantan’s forest cover – and 410,898 ha – that corresponds to 23% of Berau’s forest cover – potentially could have been legally converted to other land uses in 2000. The basis for this is given in Indonesian law, namely in Government Regulation 10/2010 (GoI, 2010), under which forested areas in the HPK class can be released to ‘non-forest area’ (APL) that is generally destined for other land uses than forestry. Conversion of forested areas are possible here. Most of the non-forest area in Berau will be allocated for oil palm activities (SEA Taskforce of Berau District, 2016).

Upscaling these estimations to the country-level by using recent numbers of the Ministry of Environment and Forestry and Republic of Indonesia (2018) (Table 2), a forest area of 14.4 million ha⁸⁸ could legally be converted to other land uses in Indonesia in the future. Given legal compliance, the resulting forest loss can be regarded as planned and legal.

⁸⁷ Formally under forest estate but destined for the release to non-forest land for other land-uses than forestry.

⁸⁸ Calculation based on the assumption that HPK area was 12.8 million ha and that 49.1% of it was forested, and that 12% or 8.1 million ha of the ‘Non-forest area’ (APL) was forested in 2017.

These forest cover results for East Kalimantan, Berau and whole Indonesia reflect the particularity of the Indonesian land classification system, namely that the administrative land use-classes do not match the realities on the ground. This means that formally defined forest estates do not necessarily contain forest cover and areas formally classified as non-forest land can actually harbor trees.

Forest loss on the jurisdictional level

The additional analysis of forest loss development in this study then demonstrated the risk that the just introduced Indonesian forest/non-forest classification involves, namely that the non-forest area could become a major driver of forest loss. Study results show that in both East Kalimantan and Berau the APL class alone accounted for more than 60% of the total forest loss between 2001 and 2016.

These results have far-reaching implications for forest-based approaches like REDD+ and FLEGT that aim to contribute towards the conservation of forests in the focus area. The forest cover estimations of 2000 and the forest loss estimations between 2001 and 2016, emphasise the need to improve the spatial land use planning in both jurisdictions and align the land classification of forest and non-forest land to the actual realities on the ground.

Indonesian law, namely Government Regulation 10/2010 (GoI, 2010), provides the legal basis for such a process where land-swap⁸⁹ is a legal option to change land function and classification between forested land in APL and non-forested land under forest estate. But such processes require political will and good governance.

Forest loss patterns for East Kalimantan identified in the current study corresponded to those of the study of Gaveau et al. (2018). They analyzed forest loss dynamics between 2001 and 2017 in Borneo and showed that annual forest loss showed an increasing trend with a maximum in Indonesian Borneo in 2016 followed by a sharp decline in 2017 (Gaveau et al., 2018). The peak in 2016 was explained by forest fires that occurred throughout Kalimantan in that year (Gaveau et al., 2018).

Annual forest loss patterns presented by Hovani et al. (2018) for Berau between 2001 and 2016, moreover, corresponded to annual forest loss dynamics in this study. Actual forest loss numbers in this study were, however, lower than those reported by Hovani et al. (2018) which may be due to different forest base maps used.

Forest loss in land use permits

Results showed that to reduce forest loss in the focus area requires involving the private sectors. This is because between 2001 and 2016 more than half of the forest loss in Berau occurred within industrial concession boundaries. About 52% of Berau's total forest loss during that time occurred within oil palm concession boundaries, ~ 22% in natural production forest concession boundaries (HA), ~18% in mining concession boundaries and ~11% in permanent production forest concession boundaries (HTI). Results, moreover, suggest a recent expansion of timber plantations (Figure 32). These results coincide with the fact that in both jurisdictions, more than 95% occurred within the APL, HP and HPT land classes.

Gaveau et al. (2018) showed in their study in Indonesian Borneo that the variation in annual expansion of industrial plantations (timber and oil palm) positively correlated with the variation in annual forest loss. Considering that more than 60% of East Kalimantan's and Berau's forest loss between 2001 and 2016 occurred within the non-forest land (APL) – that is where oil palm plantations are legally established – and that, half of Berau's forest loss occurred within oil palm permit boundaries, forest loss results of this study also suggest a positive correlation with the expansion of oil palm plantations. Gaveau et al. (2018) explained the peaks in industrial plantation expansion in 2009 and 2012 in Indonesian Borneo with the price of crude palm oil that peaked in 2008 and 2011 which might also explain the peak in 2012 observed in this study (Figure 34).

⁸⁹ Swap of forest area: a change in permanent production forest and/or limited production forest into non-forest area accompanied by incorporating substitute land from non-forest area into forest area (Government of Indonesia, 2010)

Findings of this study are also supported by trends given in the FCPF Emission Reduction Program Document (ER-PD) (Republic of Indonesia, 2018). There, more than 51% of the reported forest loss from 2006 to 2016 in East Kalimantan was associated with the expansion of oil palm, 14% with timber plantations, 10% with mining and 8% with overlogging and poor concession management. Despite those similar trends, actual numbers of recent forest loss are hardly comparable between the ER-PD and this study because of different forest definitions and base maps. The forest cover maps given in the ER-PD show that large parts in the center of East Kalimantan were apparently handled as still being forested. Those had been handled as being already deforested in 2000 by Gaveau et al. (2016) and were thus not considered in the forest cover and forest loss estimations in this thesis. Logically, resulting forest loss estimations in this study were much lower than those reported in the ER-PD. This difference between MoEF data and data from other independent studies like that of Margono et al. (2014), that Gaveau et al. (2016) used, was also highlighted by Wegscheider et al. (2018) and Margono et al. (2016).

Findings of this study are also supported by studies of Abood et al. (2015) and the World Resource Institute (WRI)⁹⁰ in Indonesia. In their studies, about half of the forest loss in Indonesia between 2000 and 2015 occurred within industrial concessions and half outside these boundaries. In the study of WRI, oil palm and timber fibre plantations were the largest contributors to forest loss, each contributing to about 1.5 million ha. Both studies, moreover, suggest that small-scale openings likely constituted an important deforestation driver outside concession boundaries. The study of the WRI also argued that much of this deforestation likely stemmed from licensed concession holders that extended their management beyond the legal permit boundaries which are aspects that could also be considered in the focus area.

While the mentioned studies had not particularly analysed REDD+ impacts on forest loss, an internal evaluation commissioned by TNC (Internal evaluation report (Noor, 2016)) was among the few ones that existed for Berau by the time of study conduction to the authors knowledge that did so. The report concluded that there was an increase of deforestation/emissions by 34% to 198% in the period 2011-2014 (under REDD+) compared to the period 2000-2010 (before REDD+) (Internal evaluation report (Noor, 2016)). Seventy percent of that increase in deforestation/emissions was attributed to the conversion of natural forests for oil palm plantations and 22% to the conversion for timber plantations (*idb.*). Calculations of this study can thus be regarded as rather conservative. One explanation for this drastic expansion during the BFCP phase given by Hovani et al. (2018) was that a significant share of this forest loss was associated with oil palm plantation that had already been approved before the start of the BFCP.

Overlapping land use permits

Another issue related to the forest loss in industrial concession boundaries is that of overlapping land use permits. The map in Figure 33 shows that there are areas in Berau where oil palm and mining land use permits overlapped. From the current analysis it is, therefore, impossible to identify, which land use activity provoked the forest loss in the first place.

Overlapping land use permits were also observed between natural forest concession (HA) and mining permit boundaries in the centre of Berau. Those overlapping areas show large-scale forest loss. Forest loss in those areas was considered for each forest loss calculation in each of those permit types.

These overlaps suggest that large areas of deforestation within HA-boundaries were not due to forest management activities, but rather due to land use changes associated with mining or oil palm activities. This aspect will be taken up again under 6.5.

All these results have further implications for forest-based approaches that aim to reduce deforestation in the focus area. Besides the required better spatial planning process introduced earlier, reducing forest loss in the focus area requires, in particular, involving the oil palm, forestry and mining sectors. As land use permits are already assigned and might not be revoked as easily engaging respective industries that

⁹⁰ World Resource Institute: <https://www.wri.org/blog/2017/07/drivers-deforestation-indonesia-inside-and-outside-concessions-areas> (accessed on 22.03.2019)

already hold land use licenses in better land use management will be necessary. For all sectors, this involves dispensing with forest conversion, which will also require improving related management standards like that of the PHPL and legality certification schemes that so far tolerate forest conversion. All this will require far-reaching land use reforms. However, such reforms and processes are long-lasting processes – as had been observed in the case of Berau – and might go beyond the capability of single approaches like REDD+ or FLEGT.

Regardless of the time needed for such reforms, the REDD+ readiness process in the study area showed that REDD+ can support the application of stricter voluntary SFM certification schemes, like FSC, and support and drive broader land use reforms.

Promising future progress

The interview transcript and document analysis showed that REDD+ has recently made some important achievements that have the potential to affect forest loss in the near future. Among those are the integration of REDD+ strategies into regional development plans and the evaluation of Berau's spatial plan. And in fact, according to Gaveau et al. (2018) forest loss in East Kalimantan declined sharply in 2017. They named the national peat conversion moratorium from 2016, fewer fires in 2017 and reduced use of fire in land management following awareness campaigns and enforcement as potential reasons for this recent slowdown.

The slowdown of the expansion of industrial plantations since 2012 in their study were explained by the national forest moratorium on new plantations in 2011, improved legal context for community-based land claims, lower crude palm oil prices, relocation to other areas, attention from NGOs, pressure from consumer nations and increased government oversight.

6.4 Subnational FLEGT-VPA-related achievements and limitations relevant to SFM

To investigate how FLEGT-VPA contributes towards the implementation of SFM on the ground, it was specifically asked, 'What are the current FLEGT-VPA-related achievements and limitations relevant to SFM on the subnational level?'. In accordance with the discussion of the achievements of REDD+, results of the analysis of FLEGT-VPA interview transcripts and policy, evaluation and implementation reports are discussed along the four ITTO objectives presented in Table 11. Results from the remote sensing analysis, that primarily relates to ITTO criteria 2: extent and condition of forests classified under ITTO objective 1, are separately discussed under 6.5.

In line with the REDD+ achievements, also the FLEGT-related achievements relevant for East Kalimantan could mostly be classified as outputs while only few outcomes were observed. This is likely due to the fact that the VPA was only recently, in 2016, fully implemented. As such outcomes (and impacts) could not widely be expected to be observed by the time of study conduction. However, it also has to be noted that the identification of potential outcomes and related limitations was hampered by a lack of available data on VPA's core issues, namely illegal logging and related trade, and by a lack of monitoring of the effects of the Indonesian TLAS on the multiple functions of forests. The findings of this study contribute in this regard towards a better understanding of such issues but also urge the need for additional research in this context.

The analysis suggests outputs relevant for the focus area to each of the seven ITTO criteria. There were, however, quantitative and qualitative differences in terms of their dimension and scope and also important differences between the contribution of the SVLK and PHPL schemes.

Regarding only the achievements of the SVLK (Table 22), shows that the Indonesian TLAS could contribute towards several aspects of ITTO criteria 1, 2, 3, 4 and 7. But given its focus on legality, it fell short on criterion 5: Forest Biodiversity and criterion 6: Soil and water protection. It also missed important aspects under criterion 7: Economic social and cultural aspects.

Through the adoption of the PHPL scheme into the legal framework of the SVLK, the Indonesian TLAS indirectly contributed towards several other of the ITTO criteria. However, there remain knowledge gaps on the effects of the PHPL scheme on forest degradation, forest loss and ecological, socio-economic and environmental aspects. This made it difficult to estimate the field level impacts of related indicators of the PHPL scheme. The few available documentations and the interviews suggest that the PHPL scheme may be too weak to deliver benefits under the related criteria. It also shows that the knowledge gaps on the PHPL schemes are not a matter of distributing the lessons, but that they result from a lack of assessments.

6.4.1 Objective 1: Providing the enabling conditions for SFM

Most of the achievements relevant for the focus area were found for the criteria ‘enabling conditions for sustainable forest management’ whereas the key accomplishments, the implementation and strengthening of the SVLK and PHPL schemes, were related to ‘forest area in compliance schemes’ (ITTO criterion 2) and ‘forest product tracking system’ (ITTO criterion 4).

The legality of timber production is one important step towards sustainability in the forestry sector. The VPA, therefore, had a major impact on SFM and forest governance on all administrative levels in the focus area and positively contributed towards ongoing forest reform. Related outcomes were an enhanced transparency and information availability on forest production and related timber flows and an increased capacity to audit the certification processes. Despite these outcomes, study results suggest that the VPA was not able to push for broader governance reforms related to tenurial clarity or improve forest management. Outcomes on the subnational level in the focus area apparently, moreover, remained behind those on the national level. Such issues will be discussed in more detail in the following and under ITTO objective 3 in 6.4.3.

Given the nationwide roll-out of the SVLK and PHPL, the mentioned outcomes should be more or less the same for all provinces and districts in Indonesia – provided that they are actually implemented. There are, however, important differences between the achievements on the national and local level suggested. On the national level in many countries, VPAs have also resulted in an increased stakeholder participation and capacity of the private sector and the Independent Monitoring (Jonsson et al., 2015; Overdeest & Zeitlin, 2018; TERE A et al., 2016). Such outcomes could not be observed on the subnational level in the focus area.

Increased stakeholder participation in national forest governance was, for example, a key achievement reported for the VPA process in Indonesia (Overdeest & Zeitlin, 2018; TERE A et al., 2016). Participation of civil society on the national level was made possible through new multi-stakeholder platforms such as the Joint Implementation Committee, technical working groups and the Independent Monitoring (*idb.*). Apart from the fact that those multi-stakeholder platforms established on the national level may have also involved organisations actively engaged on the local level, there were no signs that the VPA process led to an increased participation of civil society within the provincial and district governments.

On the provincial level, the only respective institution that could have theoretically had an influence was the provincial Independent Monitoring focal point. However, visits and interviews conducted by the current study confirmed that the Independent Monitoring focal point could not be regarded operational by the time of study conduction. The conduction of its monitoring tasks was nearly impossible given its limited resources. It was also hard to imagine that the focal point would have had the capability to communicate with, let alone influence, the provincial government. Lesniewska and McDermott (2014, p. 20) also concluded in their assessment, that CSOs were indeed centrally involved, but that they did not represent “*civil society*’ in its entirety”.

Results suggest that future efforts under the VPA process should now focus on the subnational level and extend the achievements of the national level to the lower levels.

Results also demonstrate that there remain substantial capacity and resource gaps on the subnational level to fully implement all elements of the VPA and that the operationalisation of the VPA’s core elements relies on the technical and financial support of external sources.

One such example is that of the Independent Monitoring already mentioned above. Based on the briefing notes on FLEGT that were published by the European Commission (EC, 2007), national governments should ensure that resources for the Independent Monitoring are available. In Indonesia, the Independent Monitoring was in the past mainly funded by external donors such as the MFP, but study observations show that the resources were not sufficient to implement the vast monitoring tasks.

Another example is the missing support of the private sector. Based on study observations there was neither financial nor technical support from the government or VPA process provided to the forestry sector that carries the financial burden related to the implementation of the SVLK and PHPL certifications on the management level.

As already discussed in 6.2.1, such technical support was provided under the REDD+ programs in the focus area and by The Borneo Initiative⁶¹ (TBI). The TBI has created a dual certification model for both SVLK and FSC to reduce the burden of concessionaires. The support of those initiatives and programs, was likely a factor that drove the adoption of the certification schemes in Berau. Consequently, both VPA-related certification schemes were operational by the time of study conduction in the focus area and all active concessions certified by at least one of them. This leads to the question of how the certification schemes are taken up in areas that do not receive such external support. Chances are that the adoption of the schemes require much more time and that concessions face multiple challenges which could ultimately lead to a poorer implementation of the standards when no further technical and financial support is provided.

The VPA's main achievement in this regard was thus to strengthen the legal basis for the certification standards and their enforcement, rather than their uptake and implementation on the management level which was strengthened through other programs.

The VPA – through the SVLK regulations – sets the legal framework to fight illegal logging on the management level in Indonesia. Results of the document and interview analysis suggest that through its promotion and enforcement, the SVLK has led to an increased awareness on the issues of illegal logging and poor governance and to a decline in illegally harvested and processed timber destined for the export. These perceptions are in line with those of Indonesian stakeholders consulted in the study of Neupane et al. (2019).

With this, the VPA contributed directly towards combating of one of the major threats to Indonesia's and East Kalimantan's forests because it was estimated that illegal logging in Indonesia accounted for at least 40% of Indonesia's wood supply leading to annual tax losses of around US\$ 2 billion in 2006 (Luttrell et al., 2011).

However, illegal logging is only one of several drivers of forest loss, among which are drivers that have a much more devastating impact on East Kalimantan's forest resources like those associated with mining, oil palm and timber plantations. Under 6.3 it was already discussed that in East Kalimantan and Berau the non-forest land class accounted for more than 60% of the total forest loss between 2001 and 2016. Results also showed that most of the forest loss within natural forest concession boundaries (HA permit)⁹¹ was associated with large-scale forest loss (permanent forest conversion), some of which could be associated with overlapping oil palm and mining permits.

Through its sole focus on timber legality, the VPA does not address these major deforestation drivers of East Kalimantan's forests. The VPA's potential to contribute to sustaining forest resources in the focus area – a fundamental requirement for the implementation of SFM – is, therefore, limited, something that had also been hypothesized by Lesniewska and McDermott (2014) for Indonesia. By the time of study conduction, there were no studies available to confirm this assumption. Results of the forest loss analysis on the concession and jurisdictional level in East Kalimantan and Berau in this study are, therefore, valuable.

Considering then that more than half of the forest loss in Berau between 2001 and 2016 occurred within land-use concession permit boundaries, the resulting forest loss could be regarded as planned and legal. Because most of this loss was further most likely linked to the establishment of oil palm plantations and mining activities, clear cuts were the prevailing land-use activity here. Given its full legal compliance

⁹¹ See also discussion in 6.5

with laws, the resulting timber could legally be processed under legality standard four of the SVLK and traded under FLEGT.

This shows that timber defined as legal under the FLEGT-VPA might not originate from sustainably managed forests. Associated concerns in this context had also been raised by authors like Lesniewska and McDermott (2014).

Results revealed that another related concern refers to the reporting of such conversion timber that enters the EU market. Official numbers were available on the ‘sources of timber consumption of primary industries’ in the RPBBI database including numbers on timber consumed from conversion areas, but it remained unknown how much of this timber was processed and destined for the European market (probably also due to difficulties related to timber products from mixed sources).

The issue of conversion timber shows that the Indonesian VPA supports and legalizes unsustainable practices rather than that it provides strategies to combat the underlying drivers of that forest loss. The issue of legal and sustainable timber should thus be of high concern for the interventions (policies, frameworks, institutions) related to sustainable management of forests in Indonesia.

The content analysis of key documents and interviews, moreover, reveals that there are discrepancies between what the SVLK is, namely a legality licensing system, and as what it is often promoted. The newest annual progress report on the Implementation of the IDN-EU FLEGT-VPA (Indonesia & EU, 2017) that was published in 2017 for example still stipulated that: “*The objective [of the SVLK] was to combat illegal logging and ensure the sustainability of Indonesia’s forests by promoting legal trade of timber* (Indonesia & EU, 2017, p. 6).”

The study shows that the SVLK is often promoted as an incentive for sustainability. As a certification scheme that is mandatory for concession holders that want (to continue) to export their wood, the SVLK cannot be seen as an incentive to SFM nor legality, but rather as a necessary requirement to be able to further export.

Clarifying these differences would be an important step towards sustainability.

6.4.2 Objective 2: Ensuring forest ecosystem health and vitality

The above-mentioned remaining gaps and concerns lead to the question in what way the Indonesian VPA is able to achieve its ultimate objective of reducing illegal timber and related trade. Answering this question remains difficult. While results of the document and interview transcript analysis point towards a reduction in illegal logging associated with timber destined for the export market, results also show that more evidence is needed to make these conclusions.

An important issue in this context are the sources of illegal logging that are covered by a VPA. In Indonesia, drivers of forest loss are classified into planned and unplanned drivers (Table 4). While planned deforestation and forest degradation are usually legal, that is, they comply with Indonesian law, and timber that originates from these forest losses is, as such, tolerated by the SVLK, unplanned forest loss is not. Unplanned drivers are, for example, unplanned forest conversion for estate crop plantations (e.g., oil palm), land claims that lead to the conversion of forest areas and land-management activities conducted for the subsistence use.

Timber that originates from these harvesting or conversion activities falls out of the scope of the current SVLK as long as it does not enter the export supply chain. This is because, based on study findings, the Indonesian TLAS has not been implemented on the domestic market by the time of study conduction, despite objectives to do so. The Indonesian TLAS is, therefore, practically only able to detect timber that was illegally harvested within concession boundaries and destined for the export market (harvesting outside/beyond annual allowable cut) and timber that is illegally processed by exporting industries.

This discussion gains on relevance by contrasting the actual amount of timber produced for the domestic and international markets. Jonsson et al. (2015) and Lesniewska and McDermott (2014) both cite that over 80% of Indonesian timber production was for domestic use and that a significant amount of this was produced by small-scale operators. In line with this, Anti Forest-Mafia Coalition and Forest Trends (2015) suggested that large companies accounted for less than 37% of timber used in Indonesia, leaving most of the consumed wood to small and medium-scale operators.

These numbers and aspects show the significant limitations of the current VPA in terms of reducing illegal logging in countries like Indonesia where local demand for legally harvested wood does not exist.

Despite these theoretic discussions, further evaluations and detailed case studies on how successful VPAs are in achieving their ultimate goals are needed. This study has made a first attempt to evaluate the effects of VPA-related certification schemes on forest loss reduction. Results are discussed in detail under 6.5.

6.4.3 Objective 3: Maintaining the multiple functions of forests to deliver products and environmental services

Results show that the FLEGT-VPA contributes to the assessment of timber resources (inventories), forest management planning, and the implementation of a log tracking system. Given that both certification schemes appeared to be operational in the focus area, and that no hints of objections were found in interviews or reviewed documents, this study assumes a positive contribution towards those aspects relevant for SFM.

Apart from these contributions, Tegegne et al. (2018), based on global FLEGT policy documents, and consulted stakeholders by Neupane et al. (2019) had assumed that FLEGT could contribute towards more sustainable logging practices, for example, RIL, and timber harvesting arrangements in natural production forests. Based on study results, these assumptions cannot be supported.

First, in Indonesia, sustainable logging practices like RIL are not a requirement under the TLAS itself, but under the PHPL scheme that forest concessionaires have to comply with no later than three years after obtaining a legality certificate. This means, if not integrated into the broader legal forestry framework of a country, the VPA does not necessarily address this issue. The same holds true for biodiversity conservation on the concession level, aspects related to soil and water protection and socio-economic issues. All are not explicitly dealt with under the Indonesian TLAS. In turn, the limited literature available on the PHPL scheme suggests that in comparison to global voluntary SFM certification schemes, the RIL requirements of the PHPL scheme remain weak (Maryudi et al., 2017; Ruslandi et al., 2014).

Second, the interview transcript and document analysis of FLEGT evaluation and implementation reports suggests that on the management level, Indonesian FLEGT-VPA showed strong limitations to SFM in regards of silvicultural operations. The Indonesian FLEGT-VPA, through the integration of the PHPL scheme, builds on and thereby reinforces existing and partly long-standing practices of forest management that were known to be unsustainable. A major concern relates to the adoption of the Indonesian harvesting system, the TPTI, through the PHPL and the already mentioned legalization of conversion timber under the SVLK. Similar problems were reported by C. P. Hansen et al. (2018) in Ghana where the TLAS upheld management rules that had long been outdated. Related concerns had already been raised by Lesniewska and McDermott (2014) in 2014 before the VPA between Indonesia and the EU was fully implemented, which was in 2016.

Tegegne et al. (2018) also assumed that through better forest law enforcement, the conduction of environmental and social impact assessments related to harvesting operations could be ensured. Results showed that the Indonesian TLAS indeed requires EIA from forest concession permit holders to verify compliance with environmental and social aspects related to timber harvesting. Literature, however, suggests that associated requirements are rather weak, and that documentation alone is not always sufficient proof of implementation. Gokkon (2018) and Spitz and Husin (2009) reported, for example, that the quality of EIA documents was often the outcome of a cut-and-paste practice. It has also been stated that the EIA monitoring capacity at any governmental level were inadequate (Gokkon, 2018).

These aspects show that relying on and not further questioning the existing legal forestry framework of a country, will not necessarily support SFM on the ground. Although these aspects had already been acknowledged early on in the EU FLEGT process, no such forestry reforms have been promoted by the VPA process in Indonesia.

The EU Action Plan states, for example, that only where a legal forestry framework of a country is not based on the principles of SFM, the EU should encourage a review of this legal framework (EC, 2003). Later it had been acknowledged that law enforcement could only promote sustainability if existing legislation in a country reflected the three pillars of SFM (social, economic and ecological) (Federal Ministry for Economic Cooperation and Development [BMZ], 2007). However, more than ten years later, exactly these issues are still of major concern in VPA implementing countries. Based on study findings, the legal framework should also be interrogated for its effectiveness in terms of SFM for those countries that, on paper, confess towards SFM.

6.4.4 Objective 4: Integrating social, cultural and economic aspects to implement SFM

As a central requirement of SFM, the clarity over land tenure, local access to forest resources and the recognition of local forestry rights, are also a central aspect under FLEGT. In the European Council conclusion on FLEGT it is accordingly stated that VPAs should “*strengthen land tenure and access rights especially for marginalized, rural communities and indigenous peoples*” (The Council of the European Union, 2003, p. 1). The VPA between the EU and Indonesia, moreover, acknowledged that to reinforce monitoring and evaluation of the functioning of the SVLK, information on land and forest allocation needs to be ensured (EU, 2014).

Authors like Tegegne et al. (2018), that built their analysis on global policy documents like those above-mentioned ones, accordingly concluded that FLEGT could help to clarify and strengthen tenure rights of private forest operators and local and indigenous communities. In countries like Indonesia, this would imply that the FLEGT-VPA process must promote governance and forest reforms. Study results from the subnational level in the Berau District did not support this assumption.

First of all, for Indonesia, there were important differences between the SVLK and PHPL schemes in terms of their requirements for tenurial clarity, resolution of conflicts over land and access to forest resources. Although the PHPL scheme is integrated into the SVLK and its standards thus required to be implemented by forest permit holders no later than three years after the obtainment of the legality certificate, it is important to notice that only those standards that relate to the legality of the timber product (those of the SVLK scheme) are relevant for entering the EU market. All remaining standards under the PHPL scheme, like those related to social, production and environmental aspects, are not further required for legality (and also not accepted as a proof of improved forest management).

Regarding only the SVLK standards for natural production forests, it appears that the legality scheme does not provide for any standards related to tenurial clarity, resolution of land use conflicts or recognition of customary rights. The only requirement in this context is proof of the ‘legal status of the area and right to utilize’ while social and environmental aspects are only indirectly dealt with through the requirement to possess an EIA that has frequently been criticized in Indonesia⁹².

The process of legal permit allocation and whether a permit is adequately issued (in the case of timber plantations for example on degraded land), remains, therefore, untouched under the SVLK (and the PHPL).

There are even less requirements in this context⁹³ for forested areas in the ‘non-forest class’ and convertible production forest class that can be subject to clear-cutting for other land uses under legality standard four⁹⁴.

When taking also into consideration the PHPL standards for state production forest, additional indicators related to customary rights and the implementation of conflict resolution mechanisms among them indicators over the tenurial clarity and Free, Prior and Informed Consent (FPIC) exist. Despite their formal adoption into the PHPL, study results suggest that their implementation is rather weak.

First, the review of the PHPL certification standards reveals that the PHPL scheme classifies its verifiers into dominant (higher weight) and co-dominant verifier (lower weight). The verifier that relates to tenurial clarity (verifier 1.1.3.) is a co-dominant verifier despite the fact that this is one central aspect of

⁹² See discussion under 6.4.3

⁹³ See chapter 5.3.7.2

⁹⁴ See Table 6 for legality standards of the SVLK

sustainability. This means that concession holders can get certified even when they score poorly on this verifier. In relation to FPIC, Maryudi et al. (2017) moreover showed that auditors used EIA documents to verify FPIC.

Second, for the focus area in Berau, study results show that forest concessions were certified for legality and SFM (under the PHPL scheme) even when conflicts over land resources existed. Similar concerns were raised by Maryudi et al. (2017) and Lesniewska and McDermott (2014) for Indonesia and by C. P. Hansen et al. (2018) for Ghana.

These results indicate that the current Indonesian VPA-TLAS, through its related standards, does not contribute towards clarifying land tenure and access to forest resources. Ruslandi et al. (2014) argued in this context that it was beyond the capacity of forest concessionaires to solve such problems that actually demand governmental solutions. A national led land use assessment is, therefore, highly needed before the standards of voluntary and mandatory certifications can be fulfilled on the ground.

Given the need of the Indonesian VPA, and FLEGT's broader objective of clarity over land tenure and forest access, one could still claim that the FLEGT-VPA process has not promoted such governance reforms (C. P. Hansen et al., 2018; Lesniewska & McDermott, 2014). In Indonesia a recent measure to bring clarity over forest land use and allocation was the enactment of the OMI process that, according to authors like Mulyani and Jepson (2017), was prompted through REDD+.

Due to the fact that there was only very limited information available on the effects of the VPA certification schemes on aspects related to equitable sharing of benefits, conflict resolution mechanisms and labour rights in production forests, this study cannot draw conclusions on such outcomes. This highlights the importance of future research in this area.

6.5 Contribution of FLEGT-VPA to forest loss reduction

This study specifically asked whether the national forest certification schemes of the Indonesian FLEGT-VPA contributed to forest loss reduction on the concession level.

Study results suggest that the mandatory certification schemes, namely the SVLK and the PHPL, were not able to reduce the occurrence of forest loss on the concession level, neither the occurrence of loss associated with forest management activities (small-scale loss), nor that associated with the conversion of forests (large-scale loss).

The following discusses the study's major findings in terms of their meaning, expectancy, and position vis-à-vis existing research. Due to a lack of similar studies, the comparison with other literature was difficult.

Forest loss in natural forest concession permits

This study found that annual forest loss within the HA area in Berau spanned by the 18 concessions under investigations tended to increase between 2001 to 2016 (Figure 39). This trend was also visible when separating forest loss into small- and large-scale forest loss (Figure 41) and in many single concessions (Figure 40).

Fifty-eight percent of the total forest loss (39,160 ha) observed between 2001 and 2016 in the entire area covered by the 18 considered concessions, was classified as loss associated with the conversion of forests (large-scale loss), the remaining 42% was associated with forest management activities (small-scale loss).

Relating these results to those from the REDD+ forest loss analysis showed that the total forest loss within the HA investigation area accounted for 20% of Berau's total forest loss in the same period. Forest loss associated with forest conversion accounted for 11.5% and loss associated with forest management activities for 8.4% of Berau's total forest loss.

By regarding the single forest loss values of each concession (Table 31), it becomes clear that concession no. 5, with a total forest loss of 23,749.44 ha, is an outlier. This one concession accounted

for more than half, namely 61%, of the total forest loss that occurred between 2001 and 2016 within the regarded HA-area in Berau. The separation into small- and large-scale forest loss reveals that most of this loss was classified as large-scale forest loss and thus associated with conversion activities.

These results support the assumptions made earlier under 6.3 that showed that overlapping land use permits existed for the same area in the center of Berau, which, moreover, showed large areas of forest loss. These overlaps already suggested that the forest loss in the forest concession permit boundaries was likely not due to forest management activities, but rather related to the overlapping land use permits of the oil palm and mining sectors.

Regarding closer the occurrence of large-scale forest loss in Figure 38 and Figure 33, however, also shows that there remain some losses that are not covered by any non-forest permit. It, therefore, remains unclear what activity provoked this loss in those areas.

Generally, large-scale loss accounted for the biggest share of total forest loss between 2001 and 2016 in the HA area in Berau while *annual* small-scale forest loss was mostly higher than *annual* large-scale loss (compare 5.4.1). The ratio of annual loss is not surprising as the main intervention within natural forest concession permit boundaries should be harvesting operations.

The contrasting ratios of annual and total losses can be explained by the fact that total large-scale forest loss from 2001 to 2016 was mainly composed by the loss in that single concession mentioned above. In the remaining HA-area (without this concession), total small-scale forest loss from 2001 to 2016 would in contrast be higher than total large-scale forest loss in the same period.

These results show that large-scale activities (associated with forest conversion from the non-forestry sector) in only one single concession, can have devastating impacts on the total forest loss-profile of an entire HA area in a district and even skew the profile owing to the much larger area that is lost in comparison to forest management activities.

Taking the results of the overlapping land use permits into consideration, these findings show how difficult it is to identify the actual land use activities behind the forest loss and in turn to estimate the tree loss of forest management activities alone in countries like Indonesia where overlapping land claims are very common.

The use of remoting sensing data like the one in this study reaches its limits here. Ground-checking would be thus required.

Certification effects on forest loss in natural forest concessions

Results suggest that forest loss observed during the certification periods was higher than that observed in the reference period (without certification). Annual forest loss in the PHPL period was clearly higher than that in the reference and legality certification periods and annual loss in the legality period slightly higher than in the reference period (Figure 44).

The same trend was observed when separating forest loss into small- and large-scale loss (Figure 47) whereas annual small-scale loss was in each period higher than large-scale loss.

Most of the concessions under investigation further showed an increase in the mean annual forest loss in their certification compared to their reference period(s) (Figure 46). The same trend was apparent for the small-scale forest loss of a concession (Figure 48).

An explanation for the higher losses during the certification periods than during the reference period could be a general increasing trend of forest loss within HA-boundaries that could be associated with other aspects than the certification, for example, higher timber prices, from 2010 on. Given that the certification schemes became only mandatory in 2009, concessions started to adopt them consequently exactly when forest loss would have increased due to those other reasons. In fact, as demonstrates the remote sensing analysis on the district level, there was a general increasing forest loss trend within HA, HTI and mining permit boundaries (Figure 31, Figure 32 and Figure 35).

However, annual forest loss of concessions without a certification was relatively stable from 2010 on, while values for concessions with a certification, especially with PHPL certificates, were remarkably higher in the period from 2010 on (Figure 45).

A similar trend was observed when separating forest loss into small- and large-scale forest loss (Figure 48). However, since the aim of this study was not to identify causal factors, no statement can be made about the causality between the certifications and the higher forest loss.

Certification effects on forest loss associated with harvesting activities and forest conversion in natural forest concessions

Above it was already outlined that many of the trends of the forest loss in the regarded HA-area also occurred when separating small- from large-scale forest loss.

In summary, findings suggest that annual forest losses associated with both, forest management activities and the permanent conversion of forests, during the certification periods were higher than during the reference period (without certification), whereby annual loss was always highest in the PHPL certification period (Figure 47, Figure 48, **Figure 49**). That means that between 2001 and 2016 in HA concessions in Berau, there was yearly more loss due to forest management activities and to forests conversion observed when concessions were certified.

It was also already shown that large- and small-scale forest loss in individual concessions occurred generally more from 2010/11 on (Figure 41). Despite this trend, findings show that annual small- and large-scale losses in concessions without a certification did not increase remarkably from 2010 on, but remained relatively stable over the entire investigation period (Figure 41). In the PHPL certified concessions, however, especially forest loss associated with the conversion of forests (large-scale loss), but also with that of forest management activities (small-scale loss), was clearly elevated in comparison to that of concessions in the reference period (Figure 48).

The analysis further demonstrates that in the PHPL period, total loss associated with the conversion of forests was higher than that associated with forest management activities. (This was not the case for the non- and the legality certification periods and also not for the annual forest losses of each period where results for the small-scale losses were higher compared to the large-scale loss (Table 26 and Figure 47).

The above results lead to the following considerations: first, while certifications were not expected to have an effect on forest loss associated with forest conversion, it could have been assumed that they would affect forest loss that was associated with forest management activities. This is, because there are standards under the certification schemes that directly relate to the management of forests, such as the PHPL standard for the implementation of RIL, the standard for the implementation of a silvicultural system that ensures forest regeneration and the standard to possess a management plan. Tritsch et al. (2019), that used high resolution maps of forest-cover changes to analyze the impacts of forest management plans on deforestation in the Congo Basin, for example found that between 2000 and 2010, deforestation in concessions with an forest management plan was 74% lower compared to others.

That this study found no evidence that the forest certifications had a positive effect on small-scale forest loss can have different explanations. One would be that the certification schemes might not have provoked significant improvements in forest management, that is, that changes have been minor or rather in relation to non-environmental factors, something that was also argued in relation to FSC certifications by Blackman et al. (2015). This would be logical for the legality certification that primarily deals with the aspect of legalizing the wood product chain rather than with aspects of forest management. Under 6.4.3 it had already been argued that the standards, or rather the implementation of the PHPL standards, were in many regards too poor to foster SFM, for example, in regards to implementing RIL, the Indonesian harvesting system and the EIA. These aspects could explain the limited effects of the certification schemes on a reduction in small-scale forest loss associated with forest management activities.

Another explanation would be that the certification schemes did indeed provoke some changes, but rather in relation to forest degradation while this study focused on forest loss. Tritsch et al. (2019), moreover, showed in their study that reduced deforestation in concessions with a forest management plan was also associated with a better regulation of access to and monitoring of concessions that limited illegal activities. Such aspects had not been studied in this study but may, together with forest losses that were provoked by other land-use activities than the concessions' forest management, play an important role when they are absent.

Second, while no effects on large-scale loss were assumed from the VPA-related certifications, one could have asked in what way they tolerated forest conversion. Interesting in this context are the results of large-scale losses in PHPL certified concessions.

Considering that annual forest loss associated with the conversion of forests (large-scale loss) was higher for PHPL certified concessions than for non-certified concessions (Figure 47), and that large-scale loss largely appeared within PHPL certified concessions but not so in legality-certified or non-certified concessions (Figure 48), the PHPL certification scheme appears to tolerate losses associated with the conversion of forests inside forest concession boundaries. Even if those losses were not associated with a concessions' forest management and might have occurred under a (different) valid land use license (aspect of overlapping land use permits) and, therefore, have fallen out of the concession parts that were in the scope of the PHPL, these findings nevertheless show that large-scale losses *did* occur in PHPL certified concessions.

From these findings, it can be concluded that, first, PHPL certifications fail to address forest conversion and second, that they even seem to tolerate it. To draw clearer conclusions would (have) require(d) to ground-check forest loss within concessions that showed losses due to forest conversion within concession boundaries.

Third, relating these findings to the discussion of the aspect of 'timber from legal forest conversion' in 6.4.2, demonstrates the following. No matter the primary land use activity behind this large-scale forest loss in PHPL certified (and also legality certified) concessions, as long as this large-scale forest loss occurs under a valid license (as it probably did, at least partly, given the overlapping land use permits) and complied with all other requirements laid out under the SVLK legality standard four⁹⁵ that relates to timber from conversion areas, this timber could legally be processed and exported to the EU under the Indonesian TLAS. Because FLEGT solely focuses on legality, it thus tolerates wood that originates from areas that resulted from such legal land use change.

Results support that VPAs have limited potential to address the major drivers of deforestation within and outside natural forest concession boundaries.

The hypothesis that FLEGT, through improved legality, which is often a precursor of wider forest loss, could reduce forest loss on the concession level cannot be supported by the study results.

To reduce large-scale deforestation successfully within those HA concessions would thus, first, require clarifying the overlapping land claims and second, replacing the establishment of mining sites or oil palm plantations to non-forested sites. In other words, it would require better land use planning.

This conclusion from the concession level coincides with the conclusions made for the district and provincial level in 6.3, namely that FbAs aiming to help halt deforestation in the focus area need to engage in the subnational spatial planning process, influence forest governance on the subnational level, and involve the private sector in better land use management including the forestry, oil palm and mining industry. Based on the study results, FLEGT had not provided any successful measures to do so on the subnational level in the focus area.

6.6 Driving forces of and hindrances to subnational REDD+

Above the REDD+ and FLEGT achievements in terms of SFM on the subnational level were discussed. In this chapter the findings to the research question 'What are the current driving forces of and hindrances to the subnational REDD+ implementation?' are discussed in terms of their meaning and their implications for turning identified challenges into potentials. Many of the identified forces and conditions can explain the (limitations to the) identified achievements of REDD+ (and partly also of FLEGT-VPA).

The interview transcript and key document analysis shows that the REDD+ process in East Kalimantan (including the Berau District) is characterized by a complex interplay of factors that drive and those that

⁹⁵ Standard for the timber utilization rights within non-forest zones on state-owned lands

hamper the subnational process. Many of the identified factors influence each other and act in parallel, for this reason it is hard to regard them independently from each other.

Comparing the factors that can explain the achievements and limitations on the subnational level with those reported by Korhonen-Kurki et al. (2018) for the national level in Indonesia, shows that many of the forces on the national level were equally present on the provincial level. Among those is the initial ownership of REDD+ from provincial and district political leaders, the already initiated policy change and the existence of transformational coalitions on the provincial level. On the district level, however, many of those were not as strong or entirely absent. Examples are that existing coalitions did not have sufficient access to the decision-making level and that established REDD+ institutions were not operational by the time of study conduction on the district level.

There were also a number of aspects identified that played an important role in the REDD+ readiness process on the subnational level in the focus area that had not been highlighted for the national process by the above-mentioned authors, among those ‘the informal network of stakeholders’ and the ‘translation of policies to lower levels’.

Results of the interviews and document review suggest that, despite the initial ownership of governmental leaders, REDD+’s further success was hampered by a lack of a wider governmental ownership and support and especially by the low involvement of parliament members. The poor governmental support resulted in gaps related to coordination and monitoring tasks, integrating and institutionalizing REDD+ into regional development and spatial plans and in addressing the major drivers of deforestation and forest degradation. Astuti and McGregor (2015a) and Luttrell et al. (2014) argued that any policy reform, including REDD+, necessarily needed the parliamentary and public support in order to be successful on the field level, which is in line with the conclusions in this study.

Study findings related to the identified hindrances are largely supported by other studies, for example by those of Ekawati et al. (2019) that carried out research on policies affecting the implementation of REDD+ in Indonesia in the provinces of Papua, Riau and Central Kalimantan, and of Austin et al. (2014) that presented challenges to the national forest moratorium at the local level. Austin et al. (2014) interviewed local government officials responsible for land or forest management and found that the effectiveness of the national forest moratorium was hampered by a poor understanding of the local scope of the moratorium (e.g. understanding of the exact locations of the moratorium areas), a clear mandate and lack of funding for monitoring. This resulted from the fact that the central government had only provided very limited technical guidance and that it remained unclear who should have been responsible for the monitoring. Those aspects were in line with findings from this study, for example, in terms of translating national REDD+ policies to lower levels and the low capacity at the local level.

Ekawati et al. (2019) concluded in their study that subnational governments would now need assistance, capacity building and financial support to overcome barriers. Based on their observations in Indonesian provinces, they suggested, moreover, that local governments have to allocate funding to build REDD+ elements and institutions instead of purely relying on international partner institutions (Ekawati et al., 2019). The same conclusions can be made for the focus area in this study.

Considering the rather limited success in achieving the BFCP’s objectives in Berau suggests that one of the failures of the REDD+ project was the setting of unrealistic and too ambitious objectives within a period of only five years. This becomes especially apparent when considering that the success would have required involving the non-forestry sector and engaging the governmental level, for example, in better land-use planning. This would have required breaking long standing traditions and power relations. That the expectations of the BFCP were unrealistic, was also acknowledged by BFCP project proponents (Hovani et al., 2018). However, despite these lessons from past failures, the new ER Program is again expected to achieve (gross) emission reductions of 86.3 million tCO₂e within a period of only five years (2020-2024) (RoI, 2019). “*Close to half of this is expected to come from reduced deforestation within areas allocated to estate crops*” (RoI, 2019, p. 3). Such plans require the involvement of the agriculture sector. While this is a reasonable strategy and coincides with the recommendations of this study, the given time frame of, again, only four years can be seen critically. That is because findings of

this study showed that the inclusion of the non-forestry sector within the first six years proved to be difficult on the provincial and district level.

From the above-mentioned hindrances, as well as from the findings of the other research questions of this study, the following lessons can be drawn. A central requirement for the success of REDD+ in the focus area will be inevitably to overcome the barriers to a wider political support beyond the political leader. Involving and improving the understanding of subnational government stakeholders that hold decision-making power is thereby fundamental.

Findings moreover show that it will be important to institutionalize and integrate REDD+ strategies and measures into regional development and spatial plans. Otherwise REDD+ will keep suffering from a lack of state budget, continue to rely on donor agencies and their agendas, and consequently remain an unstable process that could be eliminated after the next election.

There is a need for stronger coordination and guidance to align the activities to REDD+ related strategies and ER targets and a need to strengthen REDD+ related institutions in the focus area.

Engaging the private sector in more sustainable practices, especially those actors from the industrial sectors that rely on the conversion of forests and influence policy on the subnational level – which is related to the low autonomy of the governmental level from other sectors that drive deforestation – will be necessary. Both issues will require more guidance and support from the national level.

Not all of the factors that restricted the REDD+ readiness process in the focus area can, however, be equally addressed. In particular hindrances that relate to the institutional setting, but also factors like the ‘lack of autonomy from other sectors’, are aspects that likely require broader changes. The reason for this is that these aspects often relate to political traditions and regimes, that is, “*the set of procedures determining the distribution of power*” (Luttrell et al., 2014, p. 68), that are less likely to be turned into opportunities in a timely manner. Similarly, capacity gaps at the very local level will likely not change rapidly given the vastness of the Indonesian country.

For any intervention on the local level in Indonesia, it is, therefore, necessary to take into account the capacity gap between the national and subnational level, but also the potential gap among provinces and districts. In regions where no infrastructure of conservation projects, organisations and human and financial capacity pre-exists, REDD+ short-term projects are less likely to achieve results in a timely manner. This is because the development of enabling conditions will take several years and, therefore, likely exceed the actual project timeframe. Building on the long-term presence of technical facilitators to establish trust and increase the understanding of local processes instead of rushing short-term projects might, therefore, be an option.

Besides those factors that hampered the subnational REDD+ process, a number of factors that drove the process in the focus area were identified. Among those were very region-specific aspects like the geographical and economical setting of East Kalimantan and Berau.

Remarkable was the already existing human capital and human resources established through the University of Samarinda, the related existing informal network of civil society, academia and the private sector and the already initiated conservation activities in the focus area on both levels. These aspects highly influenced and drove the REDD+ readiness process in the focus area. These observations are supported by findings of Anderson (2016) that studied new forms of environmental governance in East Kalimantan, and concluded that the forestry faculty in Samarinda had played a critical role in forming a strong civil society. This indicates that cooperation between institutions, schools, (international) universities and organisations and the formation and extension of new and existing networks are promising measures to foster the implementation of SFM through forest-based approaches.

However, results in this study also reveal that a civil society-driven process alone is insufficient in achieving REDD+ objectives.

Based on study results, the formation of new coalitions and actors, the commitment to REDD+ by political leaders and the promise of new funding and resources to implement provincial strategies can also help to accelerate the REDD+ process on the subnational level.

However, Korhonen-Kurki et al. (2018) also concluded from their comparative study of several countries (including Indonesia) that one aspect would likely not be sufficient to drive policy change. Regarding the interplay of the driving forces in the focus area, this will likely also hold true for East Kalimantan and Berau.

This study has made a first attempt to identify forces that drove and hindered the REDD+ process on the subnational level. However, lessons from other subnational jurisdictions would now be desirable to identify common factors that drive policy processes of forest-based approaches on the subnational level.

6.7 The methodological approach and its limitations

In this study a methodological framework was developed and tested to investigate the implementation of SFM through recent forest-based approaches (FbAs) on the subnational level. The framework included the triangulation of the following methods and data sources:

- REDD+ and FLEGT-VPA related evaluation, policy and project documents
- Semi-structured in-depth interviews with REDD+ and FLEGT stakeholders
- Field observations involving informal discussions with stakeholders and key informants, natural forest concession and FMU visits and a plywood company guided tour
- Remote sensing data
- Content analysis
- Forest loss analysis on various levels and in different land use classes and permits

The triangulation approach aimed at cancelling out the weakness of each individual method and data source and validate their findings. For the analysis of the different data sources, different analytical frameworks were chosen and applied. For the identification of the achievements of REDD+ and FLEGT-VPA relevant for SFM, the SFM criteria framework by ITTO (ITTO, 2016) was applied. For the analysis of the driving forces and hindrances of REDD+, an evaluative framework had been developed based on a literature review of factors that drove and hampered the national REDD+ process.

It could be shown that the analytical frameworks were valid to investigate the study objectives. It was shown that the triangulation of different methods and data sources could supplement each other and help to better understand the contribution of FbAs towards SFM. This was especially apparent for the aspect of ‘sustaining forest resources’ where the findings of the forest loss analysis complemented findings of the document and interview analysis.

The ITTO analytical framework proved useful for structuring the REDD+ and FLEGT-VPA achievements and targeting the various elements of SFM. The adoption of the driving forces and hindrances derived from research on the national level, moreover, demonstrated that these were largely adequate for the subnational level. Based on the study findings, the framework could, however, be modified for the subnational level in the focus area. To draw reliable conclusions for such a modification would now require an extension to and comparison with other provinces.

One data source for the analysis of REDD+ and FLEGT-VPA achievements were semi-structured in-depth interviews. It was decided to use broad interview questions. Interviews, therefore, referred to REDD+ and FLEGT-VPA achievements and their challenges in general. Questions were, where necessary, specified during the interview process. Reported achievements and other relevant aspects were then later translated to the context of SFM by the study’s author. This was in line with the objective to capture respondents’ perceptions on the major accomplishments of REDD+ and FLEGT-VPA, but might have implied that respondents ‘only’ thought of the main aspects of REDD+ and FLEGT-VPA, namely reducing emissions from deforestation’ and ‘illegal logging’, rather than of its co-benefits. One reason for the limited findings and clarity about certain outcomes in relation to some SFM elements, for example those related to biodiversity and the soil and water function, might have thus been that it was not specifically asked for. To ensure that no aspects were missed, the interviews were supplemented by document and remote sensing data analysis.

Apart from those limitations that refer to the conceptualization of the study, there are also limitations in terms of the generalization of the results. The more local the research scale, the more influential are local factors and the more decreases the transferability of findings to other areas and regions. Research in this study was carried out on the subnational level with a focus on the Province of East Kalimantan and the Berau District. Results are, therefore, based on the local conditions of the focus area. Translating and comparing the results can, therefore, only be done with caution and by taking into account the different conditions of other regions.

For example, on the concession level the outstanding forest loss in one single forest concession skewed the total forest loss of the concession area covered by the 18 concessions under investigation.

To derive more general conclusions, all methodological approaches, that is, the forest loss analysis and document and interview analysis need to be extended/increased to other provinces and districts and preferably also to other REDD+ programs and projects in and FLEGT-VPA with other countries.

The forest area definition has a significant impact on the forest cover base map which potentially explains differences in findings of other studies. This was already discussed under 6.3. It could, however, be shown that the forest loss *trends* observed in this study are very similar to other studies that had undertaken similar analysis in the focus area.

In this study the contribution of REDD+ and FLEGT-VPA processes in the focus area was assessed based on the outputs and outcomes that were achieved under both processes. Impacts are only to be expected after 10 years or more and could, therefore, not be studied. Some recent but very promising developments, for example, the evaluation of Berau's spatial plan whose outcomes might have only been visible after the data collection was undertaken, could, therefore, not be included.

Apart from these issues there are also limitations specific to the single methods. To investigate the effects of REDD+ and FLEGT-VPA processes on a reduction in forest loss, this study analyzed forest loss dynamics in the jurisdictions of East Kalimantan province and the Berau District and in forest concessions in Berau. Special attention was given to different land use classes and permits in Berau.

Based on the argumentation of Blackman et al. (2015), the analysis on the concession level faces the following limitations. First, this study analysed the forest loss within the HA area in Berau but was not able to test for the certification schemes' effects on forest degradation. Second, the analysis was carried out on the concession level and not on the harvest stand level. As such it was not possible to directly make statements about the effects of the certifications on the harvesting zones.

There were, moreover, limitations in terms of the drivers of forest loss. Statements about the drivers of forest loss in this study were drawn from the current/latest land use class and permit for the area in which the forest loss occurred. It is, however, acknowledged that the driver that provoked the forest loss in the first place could have been different from the current land use permit in cases where there existed an earlier land use permit for the same area. Similarly, overlapping land use permits made it difficult to make statements about the actual drivers of forest loss. In such cases, ground-checking would be required.

These results show that in countries with frequent overlapping land use permits and land use claims, the use of remote sensing data has its limits when not supplemented with other data sources.

This study used the best available data to investigate the impact of FLEGT-related certifications on forest loss. However, the analysis was impeded by a lack of data on necessary variables. First, there was not one single database that provided comprehensive information on the date concessions in Berau obtained their first certification. For this reason, information on certifications were among others obtained from audit company websites and the certifications they provided there. Depending on the audit company, issued certificates varied widely in regards of the information they displayed. Some only showed the current certification date, others the date the first certification was obtained. In individual cases, information on the certification history was, therefore, missing and other sources, like concession lists, needed to be consulted. This process was very time consuming and might involve inaccuracies in cases those lists were not reliable.

For matters of transparency, FLEGT-VPA-related certificates should display the certification history and provide uniform information.

Second, the BPKH wilayah IV Samarinda concession spatial data set only provided information about the current concession permit although in some cases this permit was a renewal of a former permit. Unfortunately, the study's author had no access to a comprehensive concession lists that contained information on the history of forest permits. As most of the permits were already issued before (or in) 2001 when the study period began, most calculations were not affected by this. For those concessions with a permit obtained after 2001, the study's author cross-checked other concession lists to determine if the recent permit was only a renewal. Because of the multiple data sources, some inaccuracies might have been introduced related to the reliability of these sources. However, only four recent concession permits were issued after 2001. Trends and results should, therefore, not have been affected substantially.

Through the use of in-depth interviews and a document analysis, this study gathered existing knowledge to investigate how REDD+ and FLEGT-VPA contributed towards SFM in the focus area. In-depth interviews can provide detailed information on a program or process, but they are usually very time consuming. For reasons of time resources, interviews were limited in their number and restricted to some stakeholder groups. The governmental level was underrepresented in this study, especially in the FLEGT interviews.

Findings from interviews are generally drawn from the subjective experience, knowledge and perception of the interviewee and the person who analyzes them. To minimize potential perception bias, validation steps were undertaken. They are described and discussed in chapter 4.5.2. They likewise apply to the use of grey literature.

7 Conclusion

Forest-based approaches (FbAs) like REDD+ and FLEGT aim to foster the implementation of SFM. This study offers important new insights into the debate on how REDD+ and FLEGT-VPA interlink with the holistic concept of SFM on the ground.

Results show that REDD+ and FLEGT have different strengths and weaknesses in terms of SFM on the subnational level. While FLEGT-VPA showed stronger limitations and even contradicted with the concept of SFM, REDD+ showed initial achievements in terms of influencing subnational forest governance, but its implementation on the subnational level faced several barriers.

The following implications to fostering SFM on the subnational level through FbAs like REDD+ and FLEGT-VPA can be drawn from the results.

Results showed that achieving SFM related agreements through FbAs on the national level is only the first step towards their achievement on the ground. In practice, their implementation requires the consideration of regional circumstances, especially the region-specific drivers of forest loss. Unless these sources are addressed, no FbA will be able to ensure sustainable forest management.

In the focus area, this means that forest losses associated with the non-forestry and plantation sectors – especially in those areas for which land use permits are already approved – need to be addressed by involving respective actors. Improving the regional spatial planning process, matching the official forest and non-forest land-use classification to the actual forest cover and clarifying overlapping land use permits will be, moreover, important. Indonesian law provides the basis for such an improvement where the swap of forested and non-forested land is possible.

Because these issues of land-use governance cannot be achieved on a village scale, jurisdictional approaches appear generally better suited for approaches like REDD+ (projects) under similar conditions.

Policymakers and practitioners must acknowledge these issues and address the remaining gaps. One way to do so, is the integration of related strategies into regional development plans. Key to the success of these processes will be the engagement with subnational governments in order to gain their support and ownership in FbAs like REDD+ and equipping relevant institutions with more resources. Identifying and using existing networks and supporting their extension can, moreover, be an opportunity for FbAs aiming to promote SFM. Against this background, it will be important to strengthen local universities and research centres to increase the pool of potential “champions”. Similarly, expanded cooperation between national and international universities, the technical and financial support of local institutions and working groups as well as the support in developing networks among stakeholders (academia, organizations, private sectors, government) is recommended.

Findings specific to REDD+ imply that REDD+ has the potential to push (ongoing) policy reforms on the subnational level that are integral for SFM, but that such processes require time and resources. Upscaling activities that have been successful on a pilot stage and securing financial resources for this will now be important aspects to be addressed by policymakers.

Study findings specific to FLEGT-VPA demonstrated that FLEGT-VPA’s ability to conserve tropical forests is – due to its sole focus on timber legality – limited and that VPAs can even reinforce unsustainable – sometimes longstanding – practices when they do not consider the existing legal forestry framework of a country. Policymakers therefore need to acknowledge that, to ensure sustainability and contribute to forest loss reduction in natural forest concession boundaries, also requires questioning the practices enforced through VPAs in terms of their sustainability. In the case of Indonesia, study results indicate that the TLAS and its related PHPL standards need to be revised in order to guarantee that legal timber also complies with sustainability, even though this will ultimately reduce national sovereignty. Policymakers also need to consider the need for greater transparency regarding the amount of traded timber that stems from forest conversion under a VPA. This would ultimately bring more clarity into the amount of legal but unsustainable timber traded to the European market.

Beyond that, it will be crucial to re-consider the actual potential of VPAs – and their legal timber verification systems – to reduce illegal logging in a timber producing country. Results revealed that large market segments, namely the domestic market, fall out of the scope of the Indonesian TLAS

despite commitments to implement the TLAS there. This severely limits the VPA's overall potential to reduce illegal logging.

This study moreover demonstrated that the stipulated objectives of the EU FLEGT Action Plan and the Indonesian VPA lacked a clear follow up of policy measures. Examples related to the clarity of land tenure and the mentioned implementation of the TLAS on the domestic market. To achieve those and related objectives of forest governance on the subnational level, new policy measures under the VPA are required. Those may among other things involve stronger certification standards and the allocation of resources aimed to improve land use governance on the subnational level.

Given these inferences, FLEGT may contribute more effectively towards SFM in countries where SFM is anchored in and enforced through national law, where (legal) forest conversion is not a major concern to forests and where the domestic timber market is not as relevant. In other words, in countries that are less urgently in need of systems to address illegal logging.

To better understand the limitations and potentials of forest-based approaches like REDD+ and FLEGT in terms of SFM, future research should focus more on the subnational and management level. Specifically, research should focus on the outcomes and impacts of VPA-related certification schemes in terms of their main objectives of improving forest management and reducing illegal logging and related trade. More information is also needed on the effects of REDD+ on local socio-economic benefits. Supplementing the use of satellite data with ground checking may be applied as a method to analyze the occurrence of forest loss where land use permits overlap.

The above-mentioned implications and gaps need to be acknowledged and addressed so that approaches like REDD+ and FLEGT can meet their potential in terms of SFM and benefit from and supplement each other. Study findings imply, however, that broader governance reforms to promoting sustainability are needed, because the individual approaches currently in place lack the capacity to resolve the many identified gaps on their own. Furthermore, the fostering of processes and value chains that do not rely on the exploitation of natural resources could prove highly advantageous.

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Annex I: List of interviewees

Table 30: List of consulted interviewees.

Approach	Institution/ Organisation	Role of interviewee	Initials of interviewee	Stakeholder group	Type of interview
REDD+	University of Wageningen	Researcher	R. R.	Academia/ research	Structured
REDD+	CIFOR	Research Officer	C. M.	Academia/ research	Structured
REDD+/ Tenure	Working Group on Forest Land Tenure	Executive Director	E. W.	Multistakeholder forum	Structured
REDD+	FORDA	Researcher	R. S.	Academia/ research	Structured
REDD+	DDPI	Head of the Center for social forestry studies; DDPI MRV section head	F. P.	Government institution	Structured
REDD+	University Mulawarman; DDPI;	Vice Rector of Academic Affairs; Head of REDD+ section of DDPI	M. A. S.	Academia/ research Multistakeholder forum	Structured
REDD+	Independent Consultant	BFCP Evaluator	F.		Structured
REDD+	GIZ (ForClime TC)	Advisor for SFM and REDD+	T. B.	CSO	Structured
REDD+	TNC	Improved Forest Management Manager	B. W.	CSO	Structured
REDD+	GIZ (ForClime TC)	District coordinator Berau	S. S.	CSO	Structured
REDD+	TNC	Forest Management Unit Specialist	F. K.	CSO	Structured
REDD+	Operasi Wallecea Terpadu (TFCA)	local NGO	S.	CSO	Structured
REDD+	Payo Payo (TFCA)	local NGO	A.	CSO	Structured
REDD+	GFA (ForClime FC)	District Facilitator Berau	A. H.	CSO	Structured
REDD+	TNC	Green Growth Compact Program Leader at TNC; Director at PT Tropisindo	A. S.	CSO	Structured
REDD+	GIZ (ForClime TC)	Program Director Forest and Climate Change Program (FORCLIME) Indonesia	G. B.	CSO	Structured

Table 30 (continued)

FLEGT	Lembaga Ekolabel Indonesia	System Develop Manager	H. W.	CSO	Structured
FLEGT	Lembaga Ekolabel Indonesia	Executive Director	H.	CSO	Structured
FLEGT	CIFOR	Scientist	A. D.	Academia/ research	Structured
FLEGT	FORDA	Researcher	F.	Academia/ research	Structured
FLEGT	Trustindo	SVLK Audits	Several	Private sector	Structured
FLEGT	Pad Indonesia (JPIK)	Monitor	A.	CSO	Structured
FLEGT	Nupani (JPIK)	Monitor	I. H.	CSO	Structured
FLEGT	Trustindo	Director of Trustindo; SVLK Audit	I. K.	Private sector	Structured
FLEGT	Forest Watch Indonesia (JPIK)	Monitor	K.	CSO	Structured
FLEGT	FORDA	Senior Scientist	S. A.	Academia/ research	Structured
FLEGT	DDPI; Independent Consultant	Head of Green economic growth section of DDPI; Concessionaire supervisor	S. S.	Multistakeholder forum; Private sector	Structured
FLEGT	PT Karya Lestari	Concessionaire	T. S.	Private sector	Structured
FLEGT	PT Wanabhakti	Concessionaire	S.	Private sector	Structured
FLEGT	PT Amindo Wana Persada	Concessionaire	A.	Private sector	Structured
REDD+/ Tenure	FMU Berau Barat	Section Head of Forest Protection, Conservation of Natural Resources and Ecosystems & community empowerment of FMU Berau Barat; former staff of REDD+ WG Berau and ex-head of forestry service	H.	Government institution	Unstructured
REDD+	Yakobi (TFCA)	local NGO	G.	CSO	Unstructured
REDD+	(former) Menapak	local NGO		CSO	Unstructured
REDD+	REDD+ Working Group Berau	REDD+ Working Group Berau	M.	Multistakeholder forum	Unstructured
FLEGT	Independent Consultant	Scientist; Consultant	K. O.	Individuals	Unstructured
FLEGT	HTI concession		M.	Private sector	Unstructured
REDD+	TNC	Manager of TNC; FSC & RIL-C officer & other staff	S. & R. and others	CSO	Unstructured

Table 30 (continued)

FMU	FMU Berau Barat	former FMU staff meeting	A. and others	Government institution	Unstructured
FMU	FMU Berau Barat	former Head of FMU	A.	Government institution	Unstructured
REDD+	TNC Model village	Head of villlage	n.n	CSO	Unstructured
REDD+	Global Green Growth Institute (GGGI)	GGGI officer; former secretariat of provincial REDD+ Working group	D. C.	Government institution	Unstructured
REDD+	Regional Council of Climate Change (DDPI)	Manager of DDPI	D. R.	Government institution	Unstructured
FLEGT	Provincial Forestry Office East Kalimantan	Departement of Forest Product industry under Provincial forestry service	S. & I. I.	Government institution	Unstructured
	Provincial Forestry Office East Kalimantan	Head of Provincial Forestry Service	W. W. H.	Government institution	Unstructured
FLEGT	Provincial Forestry Office East Kalimantan	Head section of the forest management; Provincial Forestry Service	M.	Government institution	Unstructured
FLEGT	Concessionaire Association (APHI)	Chair of the APHI	D.	Private sector	Unstructured
FLEGT	Sumalindo Group (Plywood company)	Deputy Head of Logging Division	U. R. J.	Private sector	Unstructured
REDD+	University Mulawarman; DDPI; Independent Consultant	Vice Rector of Academic Affairs; BFCP Evaluator; Head of REDD+ section of DDPI	M. A. S.	Academia/ research; Multistakholder forum	Unstructured
REDD+	GIZ (ForClime TC)	Advisor for SFM and REDD+	T. B.	CSO	Unstructured
REDD+	GIZ (GE-LAMA)	Staff	L. C.	CSO	Unstructured
REDD+	GIZ (ForClime TC)	District coordinator Berau	S. S.	CSO	Unstructured
REDD+/ FLEGT	TNC	Improved Forest Management Manager	B. W.	CSO	Unstructured

Annex II: Interview guidelines

REDD+ interview guideline

Introduction
<ul style="list-style-type: none"> - Introduction of interviewer (and interview assistant) - Introduction to the study background - Outline of the aim of the interview - Explanation of the process of the interview
Topics to discuss with interviewee
<ul style="list-style-type: none"> - Interviewees background (experience with REDD+) - Familiarity with the concept of SFM - The major threats to the sustainable management of forests in East Kalimantan/Berau
<ul style="list-style-type: none"> - Familiarity with the concept of REDD+ - For implementing interviewees: main objectives and activities of his/her organization in relation to the BFCP - The major achievements of REDD+ in East Kalimantan/Berau - Threats to SFM discussed earlier that can be addressed through REDD+ related activities in East Kalimantan/Berau - Expected/observed risks to SFM from the current implementation of REDD+ in East Kalimantan/Berau
<ul style="list-style-type: none"> - For implementing interviewees: REDD+ activities that are the most challenging (& why) - The major challenges to implement REDD+ in East Kalimantan/Berau
<ul style="list-style-type: none"> - For implementing interviewees: alignment of the activities of the institution/organization the interviewee is working for to the BFCP strategy - Coordination of REDD+ activities on the provincial/district level - For implementing interviewees: Monitoring and evaluation of the activities of the institution/organization the interviewee is working for - Transfer and distribution of REDD+ related results and lessons learnt - The role of the DDPI/REDD+ Working group(s)
<ul style="list-style-type: none"> - Concluding question: major strength of, weakness/limitations of, opportunities of and threats to the current REDD+ process in East Kalimantan

FLEGT interview guidelines

Introduction
<ul style="list-style-type: none"> - Introduction of interviewer (and interview assistant) - Introduction to the study background - Outline of the aim of the interview - Explanation of the process of the interview
Topics to discuss with the interviewee
<ul style="list-style-type: none"> - Interviewees background (experience with FLEGT-VPA/SVLK) - Familiarity o with the concept of SFM - The major threats to the sustainable management of forests in East Kalimantan/Berau
<ul style="list-style-type: none"> - Familiarity with FLEGT, VPA and its objectives - Contribution/impact of the VPA/SVLK towards SFM - Threats to SFM discussed earlier that can be addressed through FLEGT-VPA/the SVLK - The impact of the SVLK in terms of reducing illegal logging
<ul style="list-style-type: none"> - Expected risks to the legality and sustainable management of forests from the current implementation of the Indonesian TLAS and/or the VPA - Aspect of forest conversion (conversion timber) under SVLK
<ul style="list-style-type: none"> - The major challenges to implement the VPA-SVLK - The role of the Independent Monitoring and its effectiveness
<ul style="list-style-type: none"> - Concluding question: the major strength of, weakness/limitations of, opportunities of and threats to the SVLK
Topics to discuss with forest concessionaires
<ul style="list-style-type: none"> - Interviewees background - Familiarity with FLEGT and the VPA - Familiarity with the difference between the objectives of the SVLK and the PHPL
<ul style="list-style-type: none"> - Expected and observed benefits to the interviewee's business from the SVLK certification - Potential disadvantages attached to the legality certifications for the interviewee's concession (what kind?) - Potential negative effects on other forestry actors from the legality certification (What kind?)
<ul style="list-style-type: none"> - Does the interviewee have communities within his concession? - Did his concession have/had land use conflicts with communities? What conflicts? Let him/her explain
<ul style="list-style-type: none"> - Potential gaps in the SVLK scheme that would threaten the legality of timber exported to the EU
<ul style="list-style-type: none"> - The role of the independent monitoring

Annex III: Forest loss in forest concessions in Berau

Table 31: Forest loss in concessions in Berau from baseline year to 2016. CN = concession number; n year permit = number of years with concession permit; %-values = forest loss expressed as percentage of a concessions' 2000 forest cover; values for comparison among concessions = annual (yr) forest loss [%].

CN	Total loss [ha]	Total loss [%]	Mean yr loss and range [ha]	Mean yr loss and range [%]	Med yr loss [ha]	Med yr loss [%]	N year permit
1	796.69	2.1	49.79 (11.61-145.54)	0.13 (0.03-0.38)	45.18	0.12	16
2	513.1	1.13	32.07 (2.07-131.14)	0.07 (0-0.29)	19.35	0.04	16
3	389.25	1.63	24.33 (3.78-59.22)	0.1 (0.02-0.24)	17.95	0.08	16
4	84.42	1.24	5.28 (0-36.36)	0.08 (0-0.54)	0.63	0.01	16
5	23,749.44	18.4	2,159.04 (758.01-	1.67 (0.59-3.49)	1,613.05	1.25	11
6	2,721.33	4.21	170.08 (14.22-565.76)	0.26 (0.02-0.87)	101.43	0.16	16
7	2,659.68	3.9	166.23 (22.86-677.01)	0.24 (0.03-1)	57.28	0.08	16
8	388.45	1.65	24.28 (0.81-131.23)	0.1 (0-0.56)	6.17	0.02	16
9	732.25	1.57	45.77 (4.86-168.22)	0.1 (0.01-0.36)	32.53	0.07	16
10	181.89	2.12	11.37 (0.18-35.01)	0.13 (0-0.41)	7.11	0.08	16
11	2,912.79	5.45	182.05 (45.18-317.44)	0.34 (0.08-0.59)	171.91	0.32	16
12	381.06	1.71	42.34 (0.81-87.21)	0.19 (0-0.39)	49.5	0.22	9
13	546.49	2.23	68.31 (0.63-257.23)	0.28 (0-1.05)	39.33	0.16	8
14	358.2	3.01	22.39 (0.36-76.59)	0.19 (0-0.64)	18.86	0.16	16
15	866.55	1.34	54.16 (1.08-234.82)	0.08 (0-0.36)	25.06	0.04	16
16	771.4	1.95	64.28 (8.46-174.61)	0.16 (0.02-0.44)	54.77	0.14	12
17	880.14	2.07	55.01 (2.97-177.58)	0.13 (0.01-0.42)	29.16	0.07	16
18	227.16	2.51	14.2 (0.36-42.03)	0.16 (0-0.47)	13.68	0.15	16
	39,160.29			0.22 (0-3.49)		0.09	

Table 32: Small-scale forest loss in concessions in Berau from baseline year to 2016. CN = concession number; n year permit = number of years with concession permit; %-values = forest loss expressed as percentage of a concessions' 2000 forest cover; values for comparison among concessions = annual (yr) forest loss [%].

CN	Total loss [ha]	Total loss [%]	Mean yr loss and range [ha]	Mean yr loss and range [%]	Med yr loss [ha]	Med yr loss [%]	N year permit
1	677.08	1.78	42.32 (11.61-131.32)	0.11 (0.03-0.35)	36.36	0.10	16
2	497.17	1.08	31.07 (2.07-129.25)	0.07 (0-0.28)	19.08	0.04	16
3	346.86	1.44	21.68 (3.78-59.22)	0.09 (0.02-0.24)	17.91	0.08	16
4	82.8	1.22	5.17 (0-36.36)	0.08 (0-0.54)	0.58	0.01	16
5	5,125.26	3.97	465.93 (180.01-927.94)	0.36 (0.14-0.72)	467.39	0.36	11
6	1,803.57	2.76	112.72 (6.93-277.3)	0.17 (0.01-0.43)	100.22	0.15	16
7	1,554.35	2.29	97.15 (14.76-295.03)	0.14 (0.02-0.44)	42.8	0.06	16
8	365.59	1.55	22.85 (0.81-127.36)	0.1 (0-0.54)	5.94	0.02	16
9	688.33	1.47	43.02 (4.86-140.32)	0.09 (0.01-0.3)	31.05	0.06	16
10	179.91	2.11	11.24 (0.18-34.92)	0.13 (0-0.41)	7.11	0.08	16
11	1821.4	3.42	113.84 (30.78-232.12)	0.21 (0.06-0.43)	107.06	0.20	16
12	364.32	1.63	40.48 (0.81-82.08)	0.18 (0-0.37)	46.98	0.21	9
13	287.01	1.17	35.88 (0.54-113.13)	0.15 (0-0.46)	16.52	0.07	8
14	353.61	2.98	22.1 (0.36-76.59)	0.19 (0-0.64)	18.86	0.16	16
15	777.9	1.19	48.62 (1.08-207.82)	0.07 (0-0.32)	24.26	0.04	16
16	631.9	1.60	52.66 (5.13-161.74)	0.13 (0.01-0.41)	42.34	0.11	12
17	820.29	1.93	51.27 (2.97-161.74)	0.12 (0.01-0.38)	29.16	0.07	16
18	182.52	2.00	11.41 (0.36-40.68)	0.12 (0-0.45)	5.89	0.06	16
	16,559.87			0.13 (0-0.72)		0.08	

Table 33: Large-scale forest loss in concessions in Berau from baseline year to 2016. CN = concession number; n year permit = number of years with concession permit; %-values = forest loss expressed as percentage of a concessions' forest cover in 2000; values for comparison among concessions = annual (yr) forest loss [%].

CN	Total loss [ha]	Total loss [%]	Mean yr loss and range [ha]	Mean yr loss and range [%]	Med yr loss [ha]	Med yr loss [%]	N year permit
1	119.61	0.32	7.48 (0-20.52)	0.0197 (0-0.0542)	6.30	0.0166	16
2	15.93	0.03	1.00 (0-8.28)	0.0022 (0-0.0181)	0.09	2.00E-04	16
3	42.39	0.17	2.65 (0-32.49)	0.0109 (0-0.1335)	0	0	16
4	1.62	0.02	0.10 (0-1.53)	0.0015 (0-0.0227)	0	0	16
5	18,624.19	14.42	1,693.11 (503.3-3,747.57)	1.3105 (0.3896-2.9006)	1,433.04	1.1092	11
6	917.76	1.42	57.36 (0-352.54)	0.0885 (0-0.5440)	5.72	0.0088	16
7	1,105.35	1.63	69.08 (0.81-381.98)	0.1019 (0.0012-0.5635)	12.29	0.0181	16
8	22.86	0.10	1.43 (0-7.83)	0.0061 (0-0.0334)	0.36	0.0016	16
9	43.92	0.09	2.75 (0-27.9)	0.0059 (0-0.0597)	0.05	1.00E-04	16
10	1.98	0.02	0.12 (0-1.08)	0.0014 (0-0.0126)	0	0	16
11	1,091.36	2.04	68.21 (9.63-157.69)	0.1274 (0.0180-0.2945)	58.95	0.1101	16
12	16.74	0.08	1.86 (0-5.13)	0.0084 (0-0.0232)	1.80	0.0081	9
13	259.48	1.06	32.44 (0-144.1)	0.1326 (0-0.5889)	9	0.0368	8
14	4.59	0.04	0.29 (0-2.70)	0.0024 (0-0.0226)	0	0	16
15	88.65	0.14	5.54 (0-27.00)	0.0086 (0-0.0419)	3.02	0.0046	16
16	139.5	0.35	11.62 (1.35-36.00)	0.0293 (0.0034-0.0906)	8.42	0.0212	12
17	59.85	0.14	3.74 (0-35.19)	0.0087 (0-0.0823)	0	0	16
18	44.64	0.49	2.79 (0-9.72)	0.0309 (0-0.1076)	0	0	16
	22,600.42			0.09 (0-2.9)		0.0034	

Table 34: Total forest loss results of each concession by certification status. CN = concession number; Ref = period without certification (reference); LK = period with legality certification; PHPL = period with PHPL certification; Σ loss = total forest loss from baseline year to 2016; Y = length of reference or certification period in years; %-values = forest loss expressed as percentage of a concessions' 2000 forest cover..

CN	Ref Σ loss [ha]	Ref Σ loss [%]	Ref Y	LK Σ loss [ha]	LK Σ loss [%]	LK Y	PHPL Σ loss [ha]	PHPL Σ loss [%]	PHPL Y
1	600.58	1.58	12	196.11	0.52	4	-	-	-
2	275.22	0.61	14	237.88	0.52	2	-	-	-
3	330.03	1.39	15	59.22	0.24	1	-	-	-
4	54.27	0.80	9	-	-	-	30.15	0.44	7
5	5,158.29	4.00	4	-	-	-	18,591.15	14.4	7
6	598.51	0.94	10	-	-	-	2,122.82	3.27	6
7	974.99	1.41	12	-	-	-	1,684.69	2.49	4
8	227.70	0.97	12	-	-	-	160.75	0.68	4
9	377.46	0.81	13	-	-	-	354.79	0.76	3
10	170.19	1.99	12	-	-	-	11.70	0.13	4
11	2,158.29	4.04	12	-	-	-	754.50	1.41	4
12	6.84	0.02	3	105.66	0.48	2	268.56	1.21	4
13	107.46	0.44	2	181.80	0.74	5	257.23	1.05	1
14	274.68	2.31	12	-	-	-	83.52	0.70	4
15	283.68	0.44	12	-	-	-	582.87	0.90	4
16	378.27	0.96	9	-	-	-	393.13	0.99	3
17	649.19	1.54	12	230.95	0.53	4	-	-	-
18	188.01	2.07	14	39.15	0.44	2	-	-	-
	12,813.66		189	1,050.77		20	25,295.86		55

Table 35: Average annual forest loss values of each concession. CN = concession number; Reference = without certification; LK = with legality certification; PHPL = with PHPL certification; \bar{X} = mean annual forest loss from baseline year to 2016; Y = length of reference or certification period in years; %-values = forest loss expressed as percentage of a concessions' 2000 forest cover.

CN	Reference period					LK period					PHPL period				
	\bar{X} & range [ha]	\bar{X} & range [%]	Med [ha]	Med [%]	Y	\bar{X} & range [ha]	\bar{X} & range [%]	Med [ha]	Med [%]	Y	\bar{X} & range [ha]	\bar{X} & range [%]	Med [ha]	Med [%]	Y
1	50.05 (11.61-145.54)	0.13 (0.03-0.38)	42.80	0.11	12	49.03 (30.42-58.23)	0.13 (0.08-0.15)	53.73	0.15	4	-	-	-	-	-
2	19.66 (2.07-43.74)	0.04 (0-0.10)	18.00	0.04	14	18.94 (106.74-131.14)	0.26 (0.23-0.29)	118.94	0.26	2	-	-	-	-	-
3	22.00 (3.78-52.74)	0.09 (0.02-0.22)	15.93	0.07	15	59.22 (59.22-59.22)	0.24 (0.24-0.24)	59.22	0.24	1	-	-	-	-	-
4	6.03 (0-36.36)	0.09 (0-0.54)	0.54	0.01	9	-	-	-	-	-	4.31 (0-15.75)	0.06 (0-0.23)	0.81	0.01	7
5	1,289.57 (758.01-1,613.05)	1.00 (0.59-1.25)	1,393.62	1.08	4	-	-	-	-	-	2,655.88 (1,234.58-4,505.94)	2.06 (0.96-3.49)	2,761.76	2.14	7
6	59.85 (14.22-127.54)	0.09 (0.02-0.2)	52.97	0.085	10	-	-	-	-	-	353.80 (262.18-565.76)	0.55 (0.4-0.87)	313.25	0.48	6
7	81.25 (22.86-353.53)	0.12 (0.03-0.52)	43.47	0.06	12	-	-	-	-	-	421.17 (246.79-677.01)	0.62 (0.36-1.00)	380.45	0.565	4
8	18.98 (0.81-104.58)	0.08 (0-0.45)	4.95	0.02	12	-	-	-	-	-	40.19 (7.47-131.23)	0.17 (0.03-0.56)	11.03	0.045	4
9	29.04 (4.86-9.75)	0.06 (0.01-0.15)	26.19	0.06	13	-	-	-	-	-	118.26 (76.41-168.22)	0.25 (0.16-0.36)	110.16	0.24	3
10	14.18 (0.18-35.01)	0.17 (0-0.41)	7.56	0.09	12	-	-	-	-	-	2.93 (0.27-8.55)	0.03 (0-0.1)	1.44	0.02	4
11	179.86 (45.18-317.44)	0.34 (0.08-0.59)	164.08	0.31	12	-	-	-	-	-	188.62 (69.75-313.12)	0.35 (0.13-0.58)	185.81	0.35	4

Table 35 (continued)

12	2.28 (0.81-5.13)	0.01 (0-0.02)	0.90	0	3	52.83 (38.88-66.78)	0.24 (0.18-0.30)	52.83	0.24	0.24	0.24	67.14 (49.50-87.21)	0.30 (0.22-0.39)	65.92	0.30	4	
13	53.73 (0.99-106.47)	0.22 (0-0.44)	53.73	0.22	2	36.36 (0.63-87.30)	0.15 (0-0.36)	26.10	0.11	0.11	0.11	257.23 (257.23-257.23)	1.05 (1.05-1.05)	257.23	1.05	1	
14	22.89 (0.90-66.33)	0.19 (0.01-0.56)	22.68	0.19	12	-	-	-	-	-	-	20.88 (0.36-76.59)	0.18 (0-0.64)	3.29	0.03	4	
15	23.64 (1.08-59.67)	0.04 (0-0.09)	22.01	0.04	12	-	-	-	-	-	-	145.72 (27.63-234.82)	0.23 (0.04-0.36)	160.21	0.25	4	
16	42.03 (8.46-94.41)	0.11 (0.02-0.24)	35.55	0.09	9	-	-	-	-	-	-	131.04 (100.35-174.61)	0.33 (0.25-0.44)	118.17	0.30	3	
17	54.10 (2.97-177.58)	0.13 (0.01-0.42)	29.16	0.07	12	57.74 (12.51-133.66)	0.13 (0.03-0.31)	42.39	0.10	0.10	0.10	-	-	-	-	-	-
18	13.43 (0.36-42.03)	0.15 (0-0.47)	13.68	0.15	14	19.57 (7.92-31.23)	0.22 (0.09-0.35)	19.57	0.22	0.22	0.22	-	-	-	-	-	-
		0.14 (0-1.25)		0.07			0.17 (0-0.36)		0.16	0.16	0.16		0.52 (0-3.49)		0.34		

Table 36: Total small-scale forest loss results of each concession by certification status. Reference = without certification; LK = with legality certification; PHPL = with PHPL certification; Σ loss = total forest loss from baseline year to 2016; Y = length of reference or certification period in years; %-values = forest loss expressed as percentage of a concessions' 2000 forest cover.

Concession no	Reference period			LK period			PHPL period		
	Σ loss [ha]	Σ loss [%]	Y	Σ loss [ha]	Σ loss [%]	Y	Σ loss [ha]	Σ loss [%]	Y
1	525.61	1.38	12	151.47	0.40	4	-	-	-
2	269.46	0.58	14	227.71	0.50	2	-	-	-
3	287.64	1.20	15	59.22	0.24	1	-	-	-
4	54.18	0.80	9	-	-	-	28.62	0.42	7
5	1,151.51	0.89	4	-	-	-	3,973.75	3.08	7
6	564.75	0.85	10	-	-	-	1,238.82	1.91	6
7	708.32	1.04	12	-	-	-	846.03	1.25	4
8	214.74	0.91	12	-	-	-	150.85	0.64	4
9	374.22	0.80	13	-	-	-	314.11	0.67	3
10	169.29	1.99	12	-	-	-	10.62	0.12	4
11	1,282.27	2.41	12	-	-	-	539.13	1.01	4
12	6.84	0.02	3	102.96	0.46	2	254.52	1.15	4
13	97.74	0.40	2	76.14	0.31	5	113.13	0.46	1
14	270.09	2.28	12	-	-	-	83.52	0.70	4
15	251.19	0.38	12	-	-	-	526.71	0.81	4
16	275.94	0.70	9	-	-	-	355.96	0.90	3
17	591.59	1.40	12	228.7	0.53	4	-	-	-
18	152.01	1.66	14	30.51	0.34	2	-	-	-
	7,247.39		189	876.71		20	8,435.77		55

Table 37: Average annual small-scale forest loss values of each concession. CN = concession number; Reference = without certification; LK = with legality certification; PHPL = with PHPL certification; \bar{X} = mean annual forest loss from baseline year to 2016; Y = length of reference or certification period in years; %-values = forest loss expressed as percentage of a concessions' 2000 forest cover.

CN	Reference period						LK period						PHPL period					
	\bar{X} & range [ha]	\bar{X} & range [%]	Med [ha]	Med [%]	Y		\bar{X} & range [ha]	\bar{X} & range [%]	Med [ha]	Med [%]	Y		\bar{X} & range [ha]	\bar{X} & range [%]	Med [ha]	Med [%]	Y	
1	43.80 (11.61-131.32)	0.12 (0.03-0.35)	35.28	0.09	12		37.87 (28.98-45.63)	0.10 (0.08-0.12)	38.43	0.10	4		-	-	-	-	-	
2	19.25 (2.07-42.21)	0.04 (0-0.09)	17.91	0.04	14		113.85 (98.46-129.25)	0.25 (0.22-0.28)	113.85	0.25	2		-	-	-	-	-	
3	19.18 (3.78-47.97)	0.08 (0.02-0.20)	15.84	0.07	15		59.22 (59.22-59.22)	0.24 (0.24-0.24)	59.22	0.24	1		-	-	-	-	-	
4	6.02 (0-36.36)	0.09 (0-0.54)	0.54	0.01	9		-	-	-	-	-		4.09 (0-14.22)	0.06 (0-0.21)	0.81	0.01	7	
5	287.88 (180.01-531.11)	0.22 (0.14-0.41)	220.19	0.17	4		-	-	-	-	-		567.68 (276.49-927.94)	0.44 (0.21-0.72)	504.83	0.39	7	
6	56.48 (6.93-114.66)	0.09 (0.01-0.18)	50.72	0.08	10		-	-	-	-	-		206.47 (126.19-277.3)	0.32 (0.19-0.43)	220.82	0.34	6	
7	59.03 (14.76-174.79)	0.09 (0.02-0.26)	38.61	0.06	12		-	-	-	-	-		211.51 (92.79-295.03)	0.31 (0.14-0.44)	229.11	0.34	4	
8	17.89 (0.81-96.75)	0.08 (0-0.41)	4.72	0.02	12		-	-	-	-	-		37.71 (6.66-127.36)	0.16 (0.03-0.54)	8.41	0.04	4	
9	28.79 (4.86-69.66)	0.06 (0.01-0.15)	26.10	0.06	13		-	-	-	-	-		104.70 (65.52-140.32)	0.22 (0.14-0.3)	108.27	0.23	3	
10	14.11 (0.18-34.92)	0.17 (0-0.41)	7.56	0.09	12		-	-	-	-	-		2.65 (0.27-7.47)	0.03 (0-0.09)	1.44	0.02	4	

Table 37 (continued)

10	14.11 (0.18-34.92)	0.17 (0-0.41)	7.56	0.09	12	-	-	-	-	-	-	2.65 (0.27-7.47)	0.03 (0-0.09)	1.44	0.02	4
11	106.86 (30.78-162.37)	0.20 (0.06-0.3)	104.44	0.20	12	-	-	-	-	-	-	134.78 (38.25-232.12)	0.25 (0.07-0.43)	134.38	0.26	4
12	2.28 (0.81-5.13)	0.01 (0-0.02)	0.90	0	3	51.48 (37.98-64.98)	0.23 (0.17-0.29)	0.23	0.23	2	2	63.63 (46.98-82.08)	0.29 (0.21-0.37)	62.73	0.285	4
13	48.87 (0.99-96.75)	0.20 (0-0.4)	48.87	0.20	2	15.23 (0.54-36.9)	0.06 (0-0.15)	0.06	0.03	5	5	113.13 (113.13-113.13)	0.46 (0.46-0.46)	113.13	0.46	1
14	22.51 (0.90-66.33)	0.19 (0.01-0.56)	21.33	0.18	12	-	-	-	-	-	-	20.88 (0.36-76.59)	0.18 (0-0.64)	3.29	0.03	4
15	20.93 (1.08-54.81)	0.030 (0-0.08)	18.99	0.03	12	-	-	-	-	-	-	131.68 (24.03-207.82)	0.20 (0.04-0.32)	147.43	0.23	4
16	30.66 (5.13-58.41)	0.08 (0.01-0.15)	24.93	0.06	9	-	-	-	-	-	-	118.65 (88.74-161.74)	0.3 (0.22-0.41)	105.48	0.27	3
17	49.3 (2.97-161.74)	0.12 (0.01-0.38)	29.16	0.07	12	57.17 (12.51-132.85)	0.13 (0.03-0.31)	0.13	0.10	4	4	-	-	-	-	-
18	10.86 (0.36-40.68)	0.12 (0-0.45)	5.17	0.055	14	15.26 (6.21-24.3)	0.17 (0.07-0.27)	0.17	0.17	2	2	-	-	-	-	-
		0.10 (0-0.56)					0.14 (0-0.31)	0.14 (0-0.31)					0.24 (0-0.72)			

Table 38: Total large-scale forest loss results of each concession. Reference = without certification; LK = with legality certification; PHPL = with PHPL certification; Σ loss = total forest loss from baseline year to 2016; Y = length of reference or certification period in years; %-values = forest loss expressed as percentage of a concessions' 2000 forest cover.

CN	Reference period			LK period			PHPL period		
	Σ loss [ha]	Σ loss [%]	Y	Σ loss [ha]	Σ loss [%]	Y	Σ loss [ha]	Σ loss [%]	Y
1	74.97	0.198	12	44.64	0.118	4	-	-	-
2	5.76	0.013	14	10.17	0.022	2	-	-	-
3	42.39	0.174	15	0	0	1	-	-	-
4	0.09	0.001	9	-	-	-	1.53	0.023	7
5	4,006.78	3.101	4	-	-	-	14,617.41	11.314	7
6	33.75	0.052	10	-	-	-	884.01	1.364	6
7	266.68	0.393	12	-	-	-	838.67	1.237	4
8	12.96	0.055	12	-	-	-	9.90	0.042	4
9	3.24	0.007	13	-	-	-	40.68	0.087	3
10	0.90	0.011	12	-	-	-	1.08	0.013	4
11	875.99	1.640	12	-	-	-	215.37	0.402	4
12	0	0	3	2.70	0.012	2	14.04	0.064	4
13	9.72	0.040	2	105.66	0.432	5	144.10	0.589	1
14	4.59	0.038	12	-	-	-	0	0	4
15	32.49	0.050	12	-	-	-	56.16	0.087	4
16	102.33	0.258	9	-	-	-	37.17	0.094	3
17	57.60	0.135	12	2.25	0.005	4	-	-	-
18	36.00	0.398	14	8.64	0.096	2	-	-	-
	5,566.24		189	174.06		20	16,860.12		55

Table 39: Average annual large-scale forest loss values of each concession. CN = concession number; Reference = without certification; LK = with legality certification; PHPL = with PHPL certification; \bar{X} = mean annual forest loss from baseline year to 2016; Y = length of reference or certification period in years; %-values = forest loss expressed as percentage of a concessions' 2000 forest cover.

CN	Reference period					LK period					PHPL period				
	\bar{X} and range [ha]	\bar{X} and range [%]	Med [ha]	Med [%]	Y	\bar{X} and range [ha]	\bar{X} and range [%]	Med [ha]	Med [%]	Y	\bar{X} and range [ha]	\bar{X} and range [%]	Med [ha]	Med [%]	Y
1	6.25 (0-14.22)	0.017 (0-0.038)	6.30	0.017	12	11.16 (1.44-20.52)	0.030 (0.004-0.054)	11.34	0.03	4	-	-	-	-	-
2	0.41 (0-2.07)	9e-04 (0-0.004)	0	0	14	5.08 (1.89-8.28)	0.011 (0.004-0.018)	5.08	0.011	2	-	-	-	-	-
3	2.83 (0-32.49)	0.012 (0-0.134)	0	0	15	0	0	0	0	1	-	-	-	-	-
4	0.01 (0-0.09)	1e-04 (0-0.001)	0	0	9	-	-	-	-	-	0.22 (0-1.53)	0.003 (0-0.023)	0	0	7
5	1,001.70 (503.30-1433.04)	0.775 (0.39-1.109)	1035.22	0.801	4	-	-	-	-	-	2,088.20 (889.60-3,747.57)	1.616 (0.689-2.901)	2,160.54	1.672	7
6	3.38 (0-12.87)	0.005 (0-0.02)	1.62	0.002	10	-	-	-	-	-	147.34 (52.92-352.54)	0.227 (0.082-0.544)	125.02	0.193	6
7	22.22 (0.81-178.75)	0.033 (0.001-0.264)	7.61	0.011	12	-	-	-	-	-	209.67 (138.43-381.98)	0.309 (0.204-0.564)	159.13	0.235	4
8	1.08 (0-7.83)	0.005 (0-0.033)	0.09	0	12	-	-	-	-	-	2.48 (0.72-4.50)	0.010 (0.003-0.019)	2.34	0.010	4
9	0.25 (0-2.43)	5e-04 (0-0.005)	0	0	13	-	-	-	-	-	13.56 (1.89-27.90)	0.029 (0.004-0.06)	10.89	0.023	3
10	0.08 (0-0.45)	9e-04 (0-0.005)	0	0	12	-	-	-	-	-	0.27 (0-1.08)	0.003 (0-0.013)	0	0	4

Table 39 (continued)

11	73.00 (9.63-157.69)	0.136 (0.018-0.294)	60.53	0.113	12	-	-	-	-	-	-	-	-	-	-	-	-	53.84 (31.5-81)	0.100 (0.059-0.151)	51.44	0.096	4	
12	0	0	0	0	3	1.35 (0.90-1.80)	0.006 (0.004-0.008)	1.35	0.006	2	3.51 (2.43-5.13)	0.016 (0.011-0.023)	3.24	0.015	4								
13	4.86 (0-9.72)	0.020 (0-0.04)	4.86	0.02	2	21.13 (0-50.40)	0.086 (0-0.206)	8.28	0.034	5	144.1 (144.1-144.1)	0.589 (0.589-0.589)	144.1	0.589	1								
14	0.38 (0-2.70)	0.003 (0-0.023)	0	0	12	-	-	-	-	-	0	0	0	4									
15	2.71 (0-11.25)	0.004 (0-0.017)	1.71	0.003	12	-	-	-	-	-	14.04 (3.6-27)	0.022 (0.006-0.042)	12.78	0.020	4								
16	11.37 (1.35-36)	0.0289 (0.003-0.091)	6.03	0.015	9	-	-	-	-	-	12.39 (11.61-12.87)	0.031 (0.029-0.032)	12.69	0.032	3								
17	4.80 (0-35.19)	0.011 (0-0.082)	0	0	12	0.56 (0-0.81)	0.001 (0-0.002)	0.72	0.002	4	-	-	-	-	-								
18	2.57 (0-9.72)	0.029 (0-0.108)	0	0	14	4.32 (1.71-6.93)	0.048 (0.019-0.077)	4.32	0.048	2	-	-	-	-	-								
							0.034 (0-0.21)												0.28 (0-2.9)				

Declaration on oath

I hereby declare upon oath that I have written the present dissertation independently and have not used further resources and aids than those stated.

Hamburg,



Laura Prill